

The Orchidaceae of German New Guinea

(incorporating the Figure Atlas to the above)

Rudolf Schlechter

A translation into English of

Die Orchidaceen von Deutsch-Neu-Guinea

as published in Fedde's *Repertorium specierum novarum regni vegetabilis*,
Dahlem bei Berlin (1914)

with contents, foreword, introduction to English edition and incorporating the

Figuren-Atlas zu den Orchidaceen von Deutsch-Neu-Guinea

as published in Fedde's *Repertorium specierum novarum regni vegetabilis*,
Dahlem bei Berlin (1923-1928)

R S Rogers, D F Blaxell, H J Katz, & J T Simmons



Rudolf Schlechter
(1872-1925)



German New Guinea [now part of Papua New Guinea]



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by

Rudolf Schlechter

(with original Latin descriptions)

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(1923-1928)

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Friedrich Richard Rudolf Schlechter (1872-1925)



Rudolf Schlechter was born in Berlin, in what was then Prussia, now Germany, on 16 October 1872. In 1891, after serving an apprenticeship at the University of Berlin and, at age nineteen years, he set off on what would become a nineteen-year continuous exploration and orchid collecting tour of Cameroon, Togo, South Africa, Sumatra, Java, Celebes (Sulawesi), Borneo, New Guinea and Australia. He was a prolific writer and described in excess of 1,000 new orchid species, paying particular attention to their habitat and growing conditions.

Of all his numerous publications, and at over 1,000 pages, his work entitled *Die Orchidaceen von Deutsch-Neu-Guinea* (*The Orchidaceae of German New Guinea*), published in 1914, was by far one of his greatest legacies.

After returning to Berlin in 1913 he worked as the curator of the Botanical Museum at Dahlem, Berlin and continued to write works on taxonomy as well as general orchid cultivation and care. He died prematurely, 16 November 1925, aged 53 years resulting in some of his works being completed and published at a later date. His large collection of specimens and records was moved to the Botanical Museum at Dahlem but, sadly, was destroyed by Allied bombing in 1943.

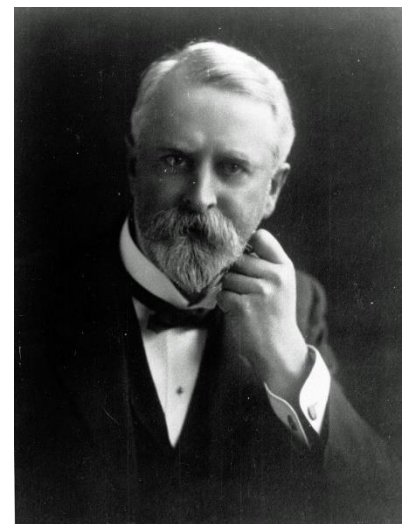
Sources: *Wikipedia*, 2022 and Oakes Ames, 1933 & 1944, *American Orchid Society Bulletin*.

Richard Sanders Rogers (1861-1942)

Richard Sanders Rogers was born on 2 December 1861, at Adelaide, South Australia. He studied at the University of Adelaide before studying medicine at the University of Edinburgh.

On returning to Adelaide, he worked at the Royal Adelaide Hospital from 1897 to 1942 as well as being a Board member of the South Australian Medical Board and the Royal Australasian College of Physicians and Lecturer in Forensic Medicine at the University of Adelaide.

His other interest was in the field of orchids where he published 25 papers between 1906 and 1932, collected more than 5,200 specimens, described over 80 Australian species, three from New Zealand and 30 from New Guinea. He corresponded widely, including with Rudolf Schlechter, William Rupp and William Nicholls.



At some stage he commenced translating Schlechter's *Die Orchidaceen von Deutsch-Neu-Guinea* (*The Orchidaceae of German New Guinea*) following its publication in 1914. His unfinished manuscript was gifted to the Barr Smith Library at the University of Adelaide. He died 28 March 1942, in Adelaide.

Source: *Wikipedia*, 2022.

Hilbert John Katz (1915-2005)



Hilbert 'Hil' John Katz was born in London, of German parents, on 10 February 1915. He was educated in England and completed a PhD in chemistry in Germany before escaping to Switzerland during World War II where he remained until 1948 when he was repatriated to England. Hil later emigrated to Australia.

In Australia, Hil worked as a research chemist in Sydney and Melbourne before moving to Geelong to work with the CSIRO in the area of wool technology.

Hil became interested in orchids following his retirement and while living at Blackwood, Victoria; he built his own glasshouse and networked with other orchid enthusiasts at the Kew, Canberra, Melbourne and Sydney Botanic Gardens.

In the late 1970s, Hil teamed with Jim Simmons and Don Blaxell to undertake the mammoth task of translating Schlechter's work, *Die Orchidaceen von Deutsch-Neu-Guinea (The Orchidaceae of German New Guinea)*, which at 1180 pages, was, by far, the largest of a number of works by R Schlechter and J J Smith that the Foundation's translation team undertook.

As well as being an active member and contributor to the Orchid Species Society of Victoria, Hil served as an Associate and, later, as a Director of the Foundation for many years. He died 9 February 2005.

Sources: The Australian Orchid Foundation, *Memorial Register*, 2022; *Progress Press*, newspaper, 31 July 1991, p 22; Greg Campbell, *conversations with Hil Katz*, late 1980s; and AOF archives, 2022.

James Tapley Simmons (1922-1987)

James Tapley 'Jim' Simmons was a Founder member and past President of the Native Orchid Society of South Australia.

In 1978, Jim contacted the Foundation and advised Gerald McCraith of the work that R S Rogers had undertaken in attempting a translation of Schlechter's *Die Orchidaceen von Deutsch-Neu-Guinea (The Orchidaceae of German New Guinea)* prior to his death in 1942. Gerald became interested in the opportunity to complete Rogers's translation and publish the work. Later in 1978, with Jim's encouragement, the Foundation formed an Editorial (later named Publications) Committee to work on this mammoth task as well as the many other smaller publications of R Schlechter, J J Smith and van Bodegom. Jim served on the Committee from its inception and from 1984, as Editor-in-Chief, until he was unable to continue due to ill health.



After retiring from Gilbarco, Adelaide, in 1982, Jim died, 28 July 1987.

Sources: NOSSA, *Journal*, August 1987; AOF archives, 2022; Ancestry.com, *Broadbridge family tree*, 2022; and Sate Library South Australia, *Savill Index to The Advertiser Funeral Notices*, 2022.

Donald Frederick Blaxell OAM (1934 -)

Donald 'Don' Frederick Blaxell was born 1 February, 1934, in Sydney.

After working for the Rosella Preserving Company in Victoria, Don moved to Sydney and took up a position as a Technical Officer at the Botany School, University of New South Wales, where he remained for 11 years.

In 1968, he moved to the Herbarium at the Royal Botanical Gardens, Sydney, where he worked as a Botanist. During his time at the Royal Botanic Gardens, Don travelled widely collecting specimens of his

favourite botanical subjects: orchids; and eucalypts. In 1974, Don was appointed to the position of Australian Botanical Liaison Officer at Kew Gardens where he remained for two years before returning to Sydney to take up the position of Assistant Director (Living Collections) at the Royal Botanic Gardens; a position he held until his retirement in 1998. It was during this time that Don managed the establishment of the native species botanic garden, at what is now the Mt Annan Botanic Garden in south-west Sydney.



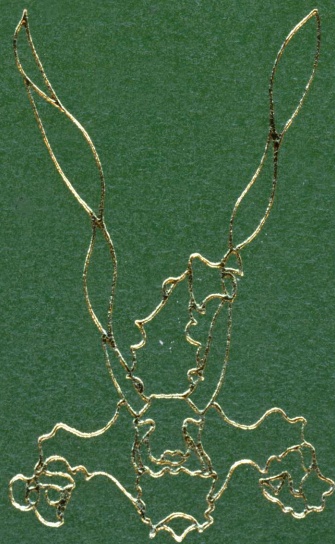
Don's connection with The Australian Orchid Foundation commenced in April 1975 when he penned a four-page letter (written in his favourite colour: 'red') to Gerald McCraith expressing interest and advice on hearing that Gerald and others were looking to establish The Australian Orchid Foundation. Don went on to be a Foundation Member of the Research Committee, Chairman, 1977 to 1979, and continued to serve on the Committee until he retired in 1998.

Sources: Don Blaxell, *correspondence*, 2022; *Wikipedia*, 2022; Council of Heads of Australasian Herbaria, Australian National Herbaria, *Biographical Notes*, 2022; and AOF *archives*, 2022.



August 1982, the Foundation's Publication Committee proof-reading the translation of Schlechter's *Die Orchidaceen von Deutsch-Neu-Guinea* (*The Orchidaceae of German New Guinea*). Left to right: Hil Katz; Don Blaxell and Jim Simmons.

THE
ORCHIDACEAE
OF
GERMAN
NEW GUINEA



AUSTRALIAN ORCHID FOUNDATION

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FOREWORD

Friedrich Richard Rudolf Schlechter, a German born in Berlin in 1872 and who died there in 1925, was one of the greatest orchid botanists. It was Schlechter who said “Without a good memory it is of no use trying to become a botanist; one had better give it up and become a merchant.” In addition to outstanding memory, he had a combination of attributes that founded his forefront contribution to the Science of Botany and his special leadership in orchid classification and ecological and horticultural knowledge.

Schlechter was very impatient with those who described and wrote on plant species from the comfort and convenience of a large city centre such as an Herbarium or University, with inadequate knowledge of habitat or field conditions; this is evident in many pages of this book where he openly, even dogmatically, differs from such botanical bureaucrats. While he expressed little forbearance for the sensibilities of his fellow taxonomists, his voluminous and valuable contributions to Orchidology clearly reveal a kindly affection and appreciation to his fellow men no matter their colour or education. In this book we can read facets of this side of his life, such as his dedication of several species to their actual discoverers: examples of these are in the descriptions of species such as *Dendrobium sikini* and *D. takedui* paying tribute to his native collectors Sikin and Takedu.

New Guinea is a country that has needed and relied on air travel and transport more than any other: imagine the problems that confronted Schlechter while he was collecting, packing and transporting the species described in this book as well as assembling and protecting his field notes and drawings, in a land without mechanical vehicle of any sort and relying on human transport for virtually everything that he needed for food and for collecting and forwarding his botanical specimens to the coast.

Those of us who have walked over the terrain that Schlechter worked in, know that it is incredibly mountainous and difficult of access. One can ascend for hours a rocky steep slope only to reach a razor-back ridge that then switches from what in Pidgin is called “bigfela goap-goap” to “bigfela godaun”; with not even a few square metres of space on which a tent or camp can be sited. To find even a place to sit is often difficult. Schlechter knew where he would find richness of flora; far removed from the idyllic tropical seafront and sandy beaches, and way up in the misty rain-drenched, challenging and difficult of access mountains. His official assignment was to seek rubber-bearing plants and this he did effectively even in places where few latex-bearing plants grow. However, he had an all embracing mind and purpose, so that he collected and described many other plants such as Orchids, Asclepiads, Gesneriads, Balsams and so on.

He worked largely in the field during 1901-02 and again in 1906-09 on these official and unofficial botanical matters and his results are staggering. The orchids enumerated in this book record only part of his work in New Guinea, yet is so thorough and complete that it is easily the best and basic reference on New Guinea orchids to-day. His work was so complete that, despite the limited areas in which he collected and has described in this book, subsequent discoveries and descriptions are but a minor fraction of the species he found and described herein.

Several aspects of the treatise are treasures of prose and botanical philosophy: his description of the New Guinea scene in his essay in the Introduction reads like a lovely dream, a fairytale; a true one of course, but he does not dwell on the daily downpours, the discomfort and of very limited fresh food, especially meat, in that land with virtually only marsupial nocturnal mammals available for food; even these are scarce, contrasting with say Africa, as abundance with precarious poverty. Leeches and, above all, malaria,

tropical ulcers and other virulent infections were constant threats and problems in those days of tincture of iodine and analgesic balms which have been completely displaced by anti-malarials and antibiotics. One can only humbly salute such determination and endurance as well as his never-failing devotion to duty and to Botanical Science.

In this book Schlechter's marvellous memory enabled him to classify several complex and difficult genera into logical divisions and compartments that endure to this time; herein one finds the original discussion and work. His introduction to such genera as *Dendrobium* and *Bulbophyllum* are the basis for modern classifications. As part of world knowledge they are the gift of a widely travelled, indefatigable and observant man of unique memory for taxonomic details. He had to rely on his field drawings and had no access to library illustrations; such were implanted in his mind.

His work embraced any orchid from inconspicuous *Agrostophyllums*, *Oberonias* and such minor orchids in their human appeal. However, he was alert to appreciate attractive useful floral qualities and his recommendations of horticulturally meritorious species are backed up with valuable field notes on such species' requirements. In these pages one will find many enticing species for a collection.

Like many men of genius, Schlechter was neither a smooth-tongued nor gentle demeanoured man; he spoke and wrote with all the confidence of an expert who knew his qualifications and experience.

This monumental work will increase in stature as time goes on and habitats fall to bulldozers and man's incursions that lead to irreversible destruction and change: Schlechter's 'Orchids of German New Guinea' is a priceless gift from earlier days never to return. The more the book ages, the more important and valuable it will become.

G. Hermon Slade
Vila. Vanuatu. 21/12/81

INTRODUCTION TO ENGLISH EDITION

This translation into English of one of Rudolf Schlechter's major works on *Orchidaceae* was instigated by G. Hermon Slade, the well-known orchid grower and enthusiast and patron of numerous orchid studies. The original idea was to find someone with the rare combination of fluency in German and knowledge of botany, particularly orchidology, to do the job. A fortuitous find of R.S. Rogers' partial translation amongst his notes and manuscripts in the University of Adelaide's Barr Smith Library provided the impetus needed to commence the project.

Rogers had obviously translated most of the German part of the book for his own purposes of study of the orchids of this part of the globe, but with various abbreviations and, unfortunately, omissions and errors. The editors converted Rogers' longhand script into reasonably readable English and then sought a volunteer to "finish off" that part of the work not translated by Rogers, some 250 pages of the original 1000, plus all 1500 or so of the specimen details which followed each species description. The volunteer was Dr. Hil. Katz who diligently translated the "remainder" and, after doing so, checked the whole text. Without wanting to sound critical of R.S. Rogers, we must emphasize that his literal translation was for his own use and never intended for publication. Jim Simmons undertook the task of transcribing Rogers' notes and his wife Nan typed and re-typed the product. Don Blaxell co-ordinated the operation and proof-read two sets of page proofs and read and re-read the English text many times. The resultant text has been exhaustively checked for accuracy of translation and sentence construction as well as endeavouring to keep Schlechter's style of phraseology as intact as possible within the constraints of a readable translation.

It will be obvious to the reader that we could have re-constructed the sentences into more modern English, but we deliberately retained the quaint Schlechterian style as faithfully as possible without sacrificing accuracy of observation and botanical description. What we have done, however, is to add editorial comments where appropriate throughout the text. These comments are contained in square brackets and are preceded by the word "Ed." in most instances. By far the greatest number of such editorial comments appears in the section devoted to details of specimen collections. Here, Schlechter's collection numbers and dates of collection cited in the German edition have many obvious inaccuracies. We have drawn attention to these where they differ from the known and well-documented itinerary of Schlechter's travels in New Guinea (see Appendix).

Throughout this edition we have corrected obvious and numerous misspellings and printing errors without comment, but in some instances we have retained the original spelling and added a comment in square brackets.

Author abbreviations and abbreviations of published works in the German edition were often cited in different forms. For the sake of consistency we have standardised the abbreviations used in these two situations. The full titles of the publications and the complete names of the authors are listed in two Appendices.

Originally cited place names (current in 1914) are retained throughout and their 1980's names are listed in a third Appendix. Likewise, a map of Schlechter's collecting localities is included for clarity.

Taxonomic comments are omitted entirely, since we consider that future monographers are the relevant people to make such judgements on Schlechter's taxa. However, an occasional nomenclatural comment is made where we consider some readers' attention should be drawn to the statements made by Schlechter.

Regarding the arrangement of this edition; we have followed the original very closely only altering minor aspects. For example, we have placed the genus *Pseuderia* into its correct sequence, as indicated by Schlechter in a footnote later in the German edition. Another major departure occurs with the plates from the "Figuren-Atlas". The original edition of this volume has been used to produce the plates incorporated into the text of this edition and modern photographic and reproduction techniques have, in fact, enhanced the originals.

Since Schlechter referred, generally, to the Groups, sub-genera, sections etc. in the singular, we have not altered this incorrect usage. Currently, in modern usage, the names of these taxa are correctly treated as plural nouns.

The Editors would be grateful for any comments regarding errors or omissions contained in this edition, particularly from readers who are fluent in German.

D.F. Blaxell
H.J. Katz
J.T. Simmons

October 1982

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- The staff of the Special Collections Section, Barr Smith Library, University of Adelaide.
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PREFACE TO ORIGINAL EDITION

When I started on my second expedition to [German] New Guinea at the end of 1906, principally for the purpose of investigating problems connected with colonial agriculture, I hoped also to obtain useful botanical information in my old and special field; the study of the *Orchidaceae*. When I then left New Guinea in October 1909, to become better acquainted with the related plant-geography of the Celebes, I knew that, so far as the botanical and orchidological results were concerned, my expectations had been much more than realised.

The number of orchidaceous species which I brought with me, which I had analysed and sketched at the collection sites, was five times greater than all others previously collected in the Territory [German New Guinea]. I resolved to write a treatise on this rich material and combine it with an enumeration and critical examination of the *Orchidaceae* previously found in that region.

The revision is now embodied in this book, the value of which should be increased by brief reference to species from other parts of Papuaia [Ed.—comprising New Guinea and off-shore islands, the Bismarck Archipelago and the Solomons].

The individual groups and genera have been dealt with in detail in a general way as regards their growth, distribution and classification to provide information which should be of much interest to the systematist and biologist, as well as the plant-geographer and horticulturist.

Concerning the sections of this book, the Systematic Part was issued first, since the evaluation of such a vast amount of material occupied several years and only after its completion was the arrangement of the shorter General Part possible; hence the separate pagination. In the Systematic Part I have followed, in general, Pfitzer's system, but where I considered it necessary to deviate, I have made alterations on the basis of my own and others' observations. The complete findings are embodied at the end of the General Part in the fifth chapter on 'Classification' and are recapitulated in a short table. The delimitation of the genera is not always easy in such a polymorphic family as the *Orchidaceae* and is very often only a matter of opinion. I have endeavoured to bring species, which naturally belong together, under the same genus and have, therefore, made certain modifications by amplification or stricter delimitation of generic characters. I have tried also, at least in the case of all the larger genera, to divide them into sections, so that the closely related species may be recognized more readily.

The individual species have been arranged as naturally as possible within the genus and, in describing new species, one has been selected as the Type so that there can not be the slightest doubt regarding relationships. [Ed.—this is not always so, since for many species, only Syntypes are listed.] Since I considered it desirable, for reasons of priority, to give precisely the date of publication of each new species, that information will be seen at the foot of the first page of each set of fascicles as published [Ed.—see Table at end of Preface as compiled from footnotes in German text]. Unfortunately, there is little prospect of early publication, as originally intended, of the 'Figurenatlas der Orchidaceen von Deutsch-Neu-Guinea' [Illustrated Atlas of the *Orchidaceae* of German New Guinea], containing the analytical drawings I made on the site, since insufficient subscribers have applied for the intended work, and the financial sacrifices already made by us have been considerable.

I now have the pleasant duty to thank publicly those who have lent a helping hand in the publication of this work. In particular, special thanks are due to Baron von

Fürstenberg of Schloss Hugenpoet near Mintard (Ruhr) and Prof. H. Goldschmidt at Essen (Ruhr) who enabled the work to be completed in spite of the few subscribers.

In conclusion I desire to express the hope that this book, which contains the very first systematic arrangement of the orchidaceous flora of one of our larger colonies, may receive a friendly reception from those who are interested in this family or in the flora of our colonies.

Berlin—Schöneberg
March 1914

R. Schlechter

Publication Date	German Text Page No.	Fascicle Nos.	English Text Page No.
1/7/1911	1	1 — 5	55 — 134
1/10/1911	81	6 — 10	134 — 214
1/12/1911	161	11 — 15	214 — 309
1/2/1912	241	16 — 20	309 — 360
1/4/1912	321	21 — 25	360 — 466
1/6/1912	401	26 — 30	466 — 536
1/8/1912	481	31 — 35	536 — 588
1/10/1912	561	36 — 40	588 — 639
1/12/1912	641	41 — 45	639 — 774
1/2/1913	721	46 — 50	774 — 826
1/5/1913	801	51 — 55	826 — 878
1/7/1913	881	56 — 60	878 — 1045
1/9/1913	961	61 — 65	1045 — 1133
1/4/1914	1041	66 — 68	1135 — 1165 (Index)
31/3/1914	I	I — V	4 — 53

PREFACE AND POSTSCRIPT TO THE FIGURE ATLAS

The Figure Atlas is intended as a supplementary volume to 'Die Orchidaceen von Deutsch-Neu-Guinea' and publishes the line-drawings of the many species I collected in German New Guinea during 1907 to 1909. The previously known species are shown also, so that as far as in any way possible all those known in the Territory until 1914 are illustrated and placed in their order of appearance in the abovementioned book. The determination of species from New Guinea, thereby, is facilitated greatly. For large herbaria, furthermore, it will be of greater help if the illustrations are inserted in sequence.

Berlin-Dahlem Botanical Museum 15th February, 1923

R. Schlechter

After the unfortunate, premature decease of the author, Dr. Mansfeld, his successor at the Botanical Museum at Dahlem, kindly undertook the publication of his line-drawings, for which I wish to thank him here expressly. A large number of incomplete drawings was finished, whilst the missing ones had to be omitted.

A further series of drawings is currently in preparation, namely those of new species from the South American Andes countries of Venezuela, Colombia, Ecuador, Peru and Bolivia. (Beiheft VI-X of the Repertorium).

24th December, 1928

F. Fedde

GENERAL PLANT-GEOGRAPHICAL AND SYSTEMATIC REMARKS

The island of New Guinea with an area of 786,000 sq. km., excluding its archipelagoes, is the largest of all islands in the world, if we disregard certain imperfectly known land complexes belonging to the Arctic and Antarctic. As far as can be ascertained the Portuguese Antonio Abreu and Francisco Serrano, who sighted the island in 1511, are its real discoverers, but Gomez de Meneses who was shipwrecked there in 1526 when on a voyage to the Moluccas, usually is named as the discoverer. The name 'Papua' was given by the Spanish navigator Alvaro de Saavedra, who dropped anchor there in 1527 on a voyage from Tidore to the west coast of Africa. In 1528 Antonio Urbanetta sighted the island and in 1545 Yingo Ortez de Rey sailed along the north coast, landing several times to take on fresh water. He called the land 'New Guinea' on account of the similarity of the natives, in skin colour and hair, to those of African Guinea.

Space will not permit me to follow subsequent visitors in detail. It may be mentioned, however, that the whole of the western part of the country was appreciably under the influence of the Malayan Sultanate of Tidore and from there bartering certainly took place with the natives; also the importation of certain useful plants and animals must have occurred before the first Europeans ever saw this land.

Among the better known navigators who also visited these regions, I will mention only Shouten and Le Mair (1646), Dampier (1699) and Carteret (1767).

A more detailed knowledge of New Guinea and its smaller islands was acquired by the French navigators Freycinet, Duperry and D'Urville, who explored these waters in the corvettes 'L'Uranie', 'La Coquille' and 'L'Astrolabe' in 1818-1829. These voyages are especially important to us, because on them the investigation of the flora of the regions touched was undertaken in greater detail for the first time.

The work of the French was continued subsequently and completed by the British, who had taken over command of those seas, until in 1885 the whole country, with its archipelagoes, was divided between Germany, England and Holland, each nation taking over a smaller area of interest.

This partitioning was carried out as follows:

Holland received about half of the region [island] while the other half was divided so that the southern three-fifths lying nearest to Australia was allotted to England with the northern two-fifths going to Germany, which also received the Bismarck Archipelago and a part of the Solomon Islands. This territory was designated 'German New Guinea' and, according to the most recent estimates, covers an area of about 238,750 sq. km., and is subdivided thus:

Kaiser-Wilhelms-Land (of New Guinea)	181,650 sq. km.
Bismarck Archipelago	47,100 sq. km.
Solomon Islands	10,000 sq. km.
Total	238,750 sq. km.

The colony comprises in area a little less than two-thirds of the Kingdom of Prussia, or rather less than three-sevenths of Germany. More graphic is a comparison with Italy of which it falls short by 48,000 sq. km. The Protectorate goes by the official name of 'German New Guinea';* it is placed under a Governor and divided into several Districts, each administered by an Official, who also is in charge of the European population. To facilitate the administration, there are stations distributed throughout the Districts and these are controlled by superintendents who have

*The British call their territory 'British Papua' and the Dutch theirs 'Nederlands Nieuw-Guinee'.

jurisdiction over natives, but not Europeans. How little our influence has penetrated into the interior is shown by the fact that in the enormous territory of Kaiser-Wilhelms-Land there are only four such administrative stations, viz. Eitape [Aitape] in the west, the Sepik-Station only recently established on the Kaiserin-Augusta River [Sepik], Friedrich-Wilhelms-Hafen at Astrolabe Bay, and Adolph-Hafen in the east in the vicinity of the mouth of the River Waria. With the exception of the Sepik-Station, these are situated right on the coast and their influence can extend only to the vicinity of the latter, especially since there are no trading stations and no proper main roads in the interior.

As to the conditions in New Guinea, especially in Kaiser-Wilhelms-Land, it is very characteristic that the various native villages have little or no inter-communication, particularly in the interior where they are hostile to each other and strictly avoid crossing certain boundaries when hunting in the forests. This is probably the reason why the regional languages are so restricted and local and that during a day's march into the interior, one may pass through three or four village areas, each of which has a different language. It is evident that trade with these people is very limited. Under these circumstances interpreters are of little use and all communication has to be carried out by signs. As a result, misunderstandings which cause friction follow and the traveller has to use much skill and discretion in conducting transactions with the natives.

Concerning the geology of the Territory, especially of the central ranges of Kaiser-Wilhelms-Land, very little is known at present, although this has received more careful attention on the coast, particularly on the islands of the Bismarck Archipelago. It is apparent that great volcanic activities have occurred, as shown by the presence of extinct volcanic cones, and even now a series of other important volcanoes is still active. Clearly, a row of volcanoes extends along the north coast of New Guinea and then again from Finschhafen in an easterly direction along the island of Neu-Pommern to the Solomons. The active craters indicate that this line of volcanoes is by no means extinct. It would even appear that submarine craters exist, as indicated by the large tidal wave which occurred about 35 years ago in the strait between Finschhafen and Neu-Pommern. The very characteristic form of the beach-line just in the neighbourhood of Finschhafen shows that very abrupt upheavals of the coast have occurred in recent times. Besides this, I have found rocks in the Rössell Range of Neu-Pommern at about 600 m altitude, as well as in the Finisterre Range at 900 m, which were clearly of pure coral origin. Thus there can be little doubt that in recent times these mountains, in their present shape, have experienced a considerable upheaval.

In studying the contours on a map of Kaiser-Wilhelms-Land, a striking feature is the way in which the otherwise straight coast suddenly recedes in a peculiar manner at the Huon Gulf, and continues its course only where the Markham River enters the sea. Proceeding up the Markham River, its insignificant rise in this extremely mountainous part of the country is very striking, but it is still more surprising that in the upper reaches of the river, the watershed lying between it and the second-largest stream in Kaiser-Wilhelms-Land consists of a slight rise of only about 400 m. The exceptionally broad Ramu Valley behind this watershed extends with a hardly noticeable westerly drop to the sea. On the northern declivities of the Finisterre Range, also at 300–600 m, I have seen coral, still found in the south seas, which precludes all doubts that very considerable rises must have taken place here. If that is so there can be no doubt that the Ramu-Markham Valley has been flooded recently by the sea, i.e. that the Finisterre Range must have been an island which has become connected (by an enormous elevation) with the mainland only in recent times.

Another factor also supports this theory. In nearly all countries, and especially in New Guinea, it is particularly noticeable that the typical shore and coastal flora are never found far from the sea. During my stay on the upper Ramu, respectively the Kenejia, River I collected a series of plants which I had been accustomed to consider as typical shore plants for New Guinea. Thus I found, albeit as a single specimen only, *Hibiscus tiliaceus* L'Her., also *Dodonaea viscosa* L., *Cassytha*, *Ipomaea pes-caprae* L., *Heritiera*, *Jussieuia*, *Lippia nodiflora* Lindl., and a number of other forms which I had never expected to see here, and which I have never seen before far from the coast in New Guinea. The occurrence of a coastal orchid, *Dendrobium antennatum* Lindl., as well as the presence of typical epiphytic coastal ferns, particularly *Polypodium sinuatum* Wall., surprised me. I could mention further instances, but these may suffice to support the view which I have expressed.

On the south side of the wide valley, that is, at the foot of the Bismarck Range, the picture is a very different one. Slightly wavy hills or steep abrupt mountains rise up, the soil is no longer sandy or gravel-like, but contains much humus and is soft. Nowhere have I found any traces of coral, but very often clay, partly yellow and partly red, but in the watercourses much quartz and what appeared to me to be gneiss and granite. Further up I found different kinds of rocks, one of which especially arrested my attention by its brown horn-like colour, but, unfortunately, I did not collect samples since our packages were over-loaded already and we were a long way from the coast. We must, therefore, leave it to the geologists to clear the matter up, which hopefully will be done soon.

Before discussing the climate of the Territory, I would like to say a few words about the surface configuration.

Kaiser-Wilhelms-Land is a large mountainous country, crossed by mighty, grossly-disrupted ranges, which run mostly west to east parallel with the coast, while here and there spurs are found running either to the south or north. The wild, disrupted nature of the country, particularly in the main mountain regions might be compared with the summits of our Alps, were it not that the former are covered with a dense primary forest which envelopes everything up to and often above 3000 m and rounds off the contours. If a suitable watercourse is followed and penetrated into the interior, range after range is encountered, often separated by deep and steep valleys. Advance is rendered particularly difficult by the circumstances that nowhere can one obtain a view sufficiently clear to be of service in the continuation of the march, so that a definite direction can only be pursued by means of the hand-held compass.

The central range attains an altitude of 4000 m according to some measurements and to 4300 m by others, whilst at close distance I estimated its summit at over 4000 m. This central range is called 'Gorum' by the natives. In front of it there is another range, which at Saugueti [Mt] seems to reach the maximum height of 3000 m. While the very broad valley of the Kaiserin-Augusta River extends in the western part of Kaiser-Wilhelms-Land behind the lower coast ranges at an altitude of about 1000 m the ranges assume enormous dimensions in the upper reaches of the river-territory, that is to say in the south-western corner and at the southern boundary. In the central part of the Territory we find the lofty Finisterre Range rising to a height of nearly 3,000 m and separated from the Bismarck Range only by the Ramu-Markham Valley. In the east, the configuration of the mountains is different and very complicated, since chain after chain, separated only by narrow and usually steep valleys, follow each other from the coast.

The broader river valleys on the coast are bordered mostly by hills. These hills are joined gradually to the mountain ranges, so that it is hardly possible to speak of a true

hill-country unless the borders of the very broad Kaiserin-Augusta River or those of the Lower Ramu should be so designated. Otherwise Kaiser-Wilhelms-Land may be described as a mountainous country. Really extensive plains are found only where they are formed by large rivers, such instances being the plains of the Kaiserin-Augusta, the Ramu and the Markham Rivers.

A large part of these plains, especially in the lower part of the river courses, is swampy and covered with tall reeds or sago, but where the soil has settled sufficiently and become firm, the forests soon begin to grow. I will deal in more detail with the vegetation later on.

I would like to mention a frequent formation, which is seen quite occasionally in New Guinea, viz. the sago-swamps situated in the valley depressions at higher altitudes which form very disagreeable obstacles when penetrating into the interior. I have found them at an altitude of 600 m, but not to such an extent as in the lower courses of the rivers.

Where the coast is flat, lagoons frequently extend behind the narrow sandy strips, which may be of considerable extent near the mouths of the larger rivers, running chiefly parallel to the coast and not extending far inland.

Corresponding to its considerable rainfall, New Guinea possesses innumerable watercourses, but has only two large rivers capable of extensive navigation, viz. the Ramu and the Sepik (Kaiserin-Augusta).

The probable origin of the broad Ramu-Markham Valley has been discussed already, but whether the larger Sepik Valley (at all events in its lower part) could be traced to similar volcanic elevation, I am not able to say, since I know too little about the western part of the Territory. It is, however, remarkable that the mouths of both streams open nearly at the same place, i.e. opposite the summit of the still active and lofty Lesson Volcano, and as recent explorations have shown, they are, apparently, connected by an extensive system of lagoons and canals.

Besides the two large rivers mentioned hardly any of the others are navigable. The other watercourses, either as mountain streams or rivers with very stony and rocky beds, flow directly into the sea. Only a few are navigable by boats for several miles in their lower reaches. The quantities of water flowing into the sea from these mountain streams may be seen easily on making a trip along the coast by boat and locating the mouths of the streams and rivers, and even then many are missed because their outlets are obscured by sand-bars.

In the Bismarck Archipelago and the Solomons, the conditions are nearly identical. All the islands are mountainous, with the exception of a few coral ones scattered along the coast. Their rivers, in almost every case, reach the sea in a flooded state, some even emptying themselves in the form of magnificent waterfalls. In Neu-Pommern, the volcanoes, which are still active, show that volcanic evolution is still proceeding, and that at any time elevations or depressions of the coast may be expected.

The soil of Neu-Pommern, especially in the northern part, is often mixed with limestone, lava and volcanic ash, in layers, indicating how frequent and destructive the eruptions must have been in recent times.

To understand the conditions under which the rich orchidaceous flora of New Guinea has developed and could be maintained or further developed, it is necessary to consider the meteorological conditions of this region.

As in the Eastern-Asiatic-Malayan Archipelago, the temperatures in New Guinea are very uniform. The best review on this subject is provided in the temperature tables published by J. Hann in his excellent 'Handbuch der Klimatologie' [Handbook of

Climatology], and which are appended below.

As will be seen at once from this table, observations have been made only at locations of low altitude.

[Temperature Table]

Location Altitude	Kaiser-Wilhelms-Land		Neu-Pommern	
	Maclay Coast 10 m	Hatzfeldthafen 3 m	Herbertshöhe 60 m	Ralum 10 m
	°C	°C	°C	°C
January	26.5	26.4	26.1	26.0
February	26.6	26.7	25.8	25.9
March	26.2	26.3	25.9	25.7
April	26.7	26.1	25.8	26.0
May	26.1	25.8	26.0	26.2
June	25.9	25.2	25.2	26.4
July	25.8	25.4	25.2	26.4
August	25.3	26.2	25.2	26.1
September	26.0	25.9	25.5	26.2
October	26.5	26.0	25.8	26.2
November	26.5	25.9	26.0	26.0
December	26.5	26.2	26.0	26.1
Annual Av.	26.2	26.0	25.7	26.1

Unfortunately, temperature tables from higher locations are not available, but it is assumed that the decrease of temperature occurs at about the same ratio as in the Moluccas and the Sunda Islands. Accordingly, the annual average at about 300 m altitude would be 24.5 °C to 24.9 °C, at about 1000 m 17–18 °C, and at about 2000 m 14–14.5 °C. Similar figures might also apply to New Guinea, although I am under the impression that the average at about 1000 m would, probably, be a little less since the cold mists, noticeable as early as noon, cause a considerable reduction in temperature.

My observations in the mountains at various altitudes could be carried out only for several days or at most weeks, but were always similar in that the maximum temperature was reached always about 10–11 a.m., and very rarely lasted beyond noon, as the initially lighter, later thicker mists caused a fall in the early afternoon. Very seldom did the temperature rise above 22 °C on warm days, and the morning temperature rarely exceeded 14°, very often dropping to 10 °C at night; those were my observations at 1000 m. Further up in the mountains at 1600 m altitude, at a very unfavourable period during my fortnight's stay, I often registered 6 °C in my camp, in the early morning very seldom up to 10 °C, and only once 22 °C in the forenoon; at 2000 m 4 °C.

In British New Guinea, in his ascent of the Owen Stanley Range, Sir Wm. MacGregor determined temperatures of 16–21 °C at 2400–2600 m during the day and 4–7 °C at night, under similar conditions. At 3800 m he states that at night there were frosts and large icicles. But in our Territory, as the forest rises higher, and the summits seem to be covered with forests, or at least stunted forests at an altitude of 3000 m, I think it probable that the temperatures are more moderate.

As regards rainfall, reliable records exist for the coast which show that it varies considerably at two locations lying close together. I include J. Hann's lists, supplemented by further data which has become available. The three more precise tables, are for Stephansort, Finschhafen and Herbertshöhe.

[Rainfall Table]

Location	Stephansort	Finschhafen	Herbertshöhe (Bismarck Arch.)
Altitude [Rainfall]	c. 10 m cub. mm	c. 5 m cub. mm	60 m cub. mm
January	449	71	255
February	405	74	201
March	440	134	288
April	313	226	196
May	220	326	134
June	102	440	116
July	72	476	155
August	68	473	148
September	133	323	140
October	159	371	114
November	323	243	157
December	377	98	282
Annual amount	3061	3255	2186

The great difference in rainfall distribution as shown in these tables is very striking. Stephansort and Herbertshöhe have their rainy season in our winter, particularly in December and January, while Finschhafen has it in our summer (July). Since the observations on this rainfall distribution have been shown to be uniform over large areas, it has been proved that the Bismarck Archipelago and the Solomon Islands, as well as the western part of Kaiser-Wilhelms-Land, receive their rain by the north-west monsoon, while the eastern part of Kaiser-Wilhelms-Land (from about the Sattelberg) receives it by the south-east monsoon. This is explained by the north-west monsoon being held back by the high mountains extending in the west in front of the deep receding coast of the Huon Gulf, whilst the continuation of the coastline towards the south-east enables the south-east monsoon to reach these areas.

The tables shown above indicate in a general way the average rainfall for the coastal areas concerned, but recent observations have shown that some areas receive more, others less.

For the Tami Islands, H. Meyer gives an annual average of 6,558 [cub.] mm, whereas Potsdamhafen has only 1667 [cub.] mm. This contrast may be explained by the location of the Tami Islands on the boundary of the two monsoon regions, benefiting by the rain from the north-west as well as the south-east monsoons, whereas Potsdamhafen is sheltered from the north-west monsoon by the volcanic island of Manam, which is directly opposite it, and also by the level hinterland of the Ramu Delta and the broad Ramu Valley, therefore it is quite outside the 'rain-shadow' of the higher mountains. Accordingly, it would appear that the average rainfall for the coastal zone of Kaiser-Wilhelms-Land may be accepted as nearly 3000 cub. mm, while in the Bismarck Archipelago it could be only 2000 to 2500 cub. mm.

As soon as we enter mountainous country the rainfall increases considerably.

During my stay in New Guinea, the greater part of which was spent in the mountains, I formed the opinion that more than double the quantity of rain falls there than on the coast. At an altitude of 1000 m it rained nearly every day and one felt this, particularly when it was followed by a few dry days. The clearer part of the day was usually the morning or forenoon with the temperature rising until 10 or 11 a.m. The mist then gathered and in the afternoon the rain set in with short heavy showers. Often it cleared up towards evening before sunset, but only to be followed by fresh mists. The trees and shrubs soon began to drip moisture, leading one to believe that the rain had only then ceased.

The fall of dew in the mountains and hill-country is very striking, since after a short distance on the march in the early morning, one is as wet as though just coming out of water.

At the former Ramu-Station, situated in the interior just at the foot of the Bismarck Range at an altitude of 150 m, a rainfall of 5768 cub. mm was recorded. Should this measurement prove correct (though personally I think it too high) at an altitude of 1000 m the rainfall in the central part of Kaiser-Wilhelms-Land would considerably exceed 6000 cub. mm, and at an altitude of 1800 m, even 8000 cub. mm might not be considered too high an estimate. In fact, the rainfall of the mist-forest region of New Guinea considerably exceeds that of Java. When I was in camp at about 1600 m in the Bismarck Range for a fortnight in November 1908, it rained almost continuously, whereas in the valley at our Saugueti Base below only three wet days were reported. During this time we did not once see the sun, and in the tents our blankets were so wet that the moisture could be wrung out of them. Matches could be used only if they were kept day and night in the trousers' pocket. Under these circumstances no-one could consider changing clothes.

I have formed the impression that the eastern part of Kaiser-Wilhelms-Land, i.e. the Huon Gulf area and the Bismarck Archipelago, does not receive as much rain as the mountains, although I am convinced that the total quantity of rain is certainly not less than that of the mist-forests of Java, and probably exceeds the latter. What is really important in these two areas is that the dry season is more distinct than in the central part of Kaiser-Wilhelms-Land. The eastern part of Kaiser-Wilhelms-Land may be similar to the western part, the reason being, that the higher mountains are a long way from the coast.

Concerning Sattelberg, the average rainfall at about 970 m is stated to be 4194 cub. mm. I would like to remark, that in consequence of its position on a projecting and fairly isolated summit, this station is distinguished by a lower rainfall, which is, likewise, proved by measurement at the lower-lying station of Deinzerhöhe.

HISTORY AND PLANT-GEOGRAPHY OF THE ORCHIDACEAE OF THE TERRITORY

I will now proceed to make a few remarks about the history of the investigation of the orchidaceous flora of the Territory, and in this connection will make a comparison between the richness of this flora and that of other known tropical regions and, likewise, deal with its relationship to that of the neighbouring countries.

The history of the investigation of the flora of New Guinea has been dealt with only recently by K. Schumann and K. Lauterbach in their 'Flora der Deutschen Schutzgebiete in der Südsee' [Flora of the German Protectorates in the South Seas]. Since I do not wish to repeat these facts, I will confine my remarks to the history of the investigation of the orchidaceous flora, especially of German New Guinea.

The first *Orchidaceae* reaching Europe from German New Guinea were those collected on the island now called Neu-Irland [New Ireland] in 1823, by Dumont d'Urville, the second officer of the corvette 'La Coquille'. These were described and illustrated by A. Richard in the 'Sertum Astrolabianum' in 1834. The species were as follows:

Oberonia gladiata A. Rich.; *Carteretia paniculata* A. Rich.; *Dendrobium macrophyllum* A. Rich.

After that time our Territory was visited repeatedly and some botanical collections were made with hardly any attention being given to the orchids, but as far as can be gleaned from the literature at least five more species were collected by Moseley in those regions on the Challenger Expedition, which touched at the German Admiralty Islands in 1874.

About the same time, at the instigation of Ferdinand von Mueller, small botanical collections were made by Parkinson, resulting in two more orchids becoming known. One of these, *Dendrobium bifalce* Lindl., was found by E. Betche a few years later in 1883 during a short visit to the Bismark Archipelago and it was passed to Mueller in Melbourne.

When the New Guinea Company assumed its authority over German New Guinea, a new era began in the exploration of the country and its islands, the extent of which was scarcely known at that time. Various expeditions were sent out for this purpose and, in particular, a systematic exploration of regions near the coast began, since nothing could be expected from the opening up of the hinterlands until an operations base existed near the coast, for only too soon were they convinced that no help could be expected from the natives. Credit is due to the Company for its appointment of several scientists to investigate the flora, and also for its support accorded to others in every possible way. First and foremost came Max Hollrung, a botanist employed by the Company, who made the first large collection of about 900 Papuan plants, amongst which were 18 orchids, the majority of which were described subsequently by Kränzlin as new species. Hollrung's stay in New Guinea extended from 1886–1888.

Another of their collectors, L. Kärnbach, operated diligently in the Territory, although he seems to have neglected the orchids, adding only two new species, both dedicated to him.

In 1889, the present Colonial Botanist, O. Warburg, on an extended voyage to East Asia and the south seas, visited our Territory for a short time, during which he collected very actively. As far as I can ascertain, however, his collections included only three Papuan orchids which were found in the vicinity of Finschhafen and in the Bismarck Archipelago.

For a very considerable advance in our knowledge of the flora of German New Guinea, and especially of the orchids, we have to thank the botanist Fr. C. Hellwig, who unfortunately was only able to withstand the climate for about 13 months. His collections include no less than 22 orchids, many of which proved to be new. Hellwig, while attached as botanist to Zöller's expedition, was also the first to give us a glimpse into the orchid flora of the higher mountains, for among the above specimens are to be found the first representatives from the upper zone of the mist-forest, collected on the Finisterre Range. This expedition into the interior was the first to be crowned with success.

C.A.F. Weinland, 1889–1891, as physician to the New Guinea Company up to the time of his death, interested himself in his spare time untiringly in the investigation of the flora in the vicinity of his base at Finschhafen. His vocation precluded him from making extensive excursions into a very unhealthy country, nevertheless his collection (of which unfortunately only a part remains) contained a series of new orchids.

C. Lauterbach visited New Guinea on several occasions (viz. 1890–1, 1896 and 1899–1900) first as a private scientist, and later as Director of the New Guinea Company. During the early years of his residence, on numerous small expeditions, he examined the flora of the Territory and did more to extend our knowledge than any of his predecessors. But his most important expedition was in 1896, when he successfully penetrated far into the interior as far as the Ramu River, which he navigated for a considerable distance. According to the published records of his collections, these contained 40 orchids in 31 species, of which about half proved to be new.

Around 1890 the orchid collector Micholitz visited the island of Neu-Mecklenburg under instructions from the English firm of F. Sander of St. Albans and afterwards he sent a small herbarium of orchids to Fr. Kränzlin, who recorded ten new species from it. Likewise, at about the same time the zoologist Fr. O. Dahl., who was in Neu-Pommern for scientific studies, forwarded a collection containing ten species of orchids.

With these collections as a basis, 90 species had been listed for the German Territory when I first visited it in 1901–2, these were reduced subsequently to 75. Since I had been interested particularly in orchids, they naturally claimed my special attention and I soon saw that the proportion based on the above number was far too low, especially in the forests of the higher mountains where new forms revealed themselves almost at every step. The Bismarck Range, which I successfully penetrated in 1902, proved strikingly rich. I reached New Guinea in October 1901 and left again in 1902. In spite of this short stay, I found, on resuming my work in Europe, that I was able to determine 230 new species. Whereas formerly 32 genera had been represented, this number was increased to 56, of which nine were previously unknown to science. It was only natural that, with these results I desired again to visit this country of which only infinitely small parts had become known. I, therefore, gladly availed myself of an opportunity to undertake a second journey to German New Guinea in connection with agricultural problems. This visit lasted about three years.

The orchidological results are presented in this book, in which the previous findings also receive consideration, and I believe I may say without exaggeration, that they have surpassed my most sanguine expectations. I have been able to record no less than 116 genera and 1450 [1463] species, 1102 of the latter being new. There is, consequently, in New Guinea a fabulous wealth in orchids, which is not even approximately reached in any of the neighbouring regions of similar latitude, nor indeed in any other country or island complex of similar size in the world. To form an idea of this abundance it is worthwhile making a comparison with other countries.

There are, of course, comparatively few tropical countries in which the orchidaceous flora has been described in a manner similar to that attempted here. The closest comparison is with Java, where an extensive compilation by J.J. Smith is available. That island has always hitherto been regarded as having the richest orchid flora of any country in the world. Its climate resembles that of New Guinea and it is situated in similar latitudes; its surface area being about 126,000 sq. km. According to present investigations it is improbable that the number of species will greatly exceed 550–600, even when the country is explored thoroughly.

In contrast, German New Guinea, which is nearly double the area (i.e. 238,750 sq. km.), despite its imperfect exploration, already claims 1450 [1463] species. It should be stressed that the orchid-flora of certain areas, particularly of the Bismarck Archipelago and the Solomon Islands, is still almost unknown, and that, after my recent experiences, we undoubtedly may still expect considerably more than 100 new species from there.

The enormous territory of British India with an area of 4,809,100 sq. km. contains, according to the compilation of Sir Joseph Hooker and more recent publications, scarcely 1,500 species of the family. Thus, despite its favourable situation and the differences between its separate regions and provinces, it is proportionately far behind German New Guinea.

Tropical Africa, a territory which cannot be regarded as very rich in orchids because the entire northern part (the Sudan) must be excluded from our estimate, contains, according to 'The Flora of Tropical Africa' and those subsequently published, about 750 species. These are distributed over an area, which, after excluding the part mentioned, nevertheless represents 6,000,000 sq. km.

Central America, with an area of about 2,400,000 sq. km., has about 2000 species. In South America there are, unfortunately, no data from the countries of Colombia, Ecuador, or Peru which are rich in orchids, but these countries are not even approximately equal in orchid-wealth to that of New Guinea.

Enormous Brazil, with its extensive area of 8,468,950 sq. km., has been regarded always as one of the major countries for orchids, but according to the interesting description of Cogniaux, they number only about 1,850 species and are, therefore, far below those of German New Guinea.

Even if the whole of New Guinea, with 786,000 sq. km., were used as a comparison the same result would be arrived at since, inclusive of the Dutch and English parts, 2000 species have been recorded already in the island. This becomes even more apparent when it is considered that the latter parts have been investigated in only a small way for orchids and how rapidly the number of orchid species has increased up to the present.

For a clearer review the above comparisons are recapitulated in the following table:

The orchid flora of	Area (sq. km).	No. of species
German New Guinea	c. 238,750	1450
Java	c. 126,000	600
British India	c. 4,809,100	c. 1500
Tropical Africa	c. 6,000,000	c. 750
Central America	c. 2,400,000	c. 2000
Brazil	c. 8,468,950	c. 1850
The whole of New Guinea	c. 786,000	c. 2100

If we calculate how many square kilometres, under these conditions, must be allotted on an average to each species, we reach not less interesting and perhaps even clearer conclusions, which are set out in the following table:

The orchid flora of	Average number of sq. km to each orchid species
German New Guinea	164
Java	210
Central America	1200
British India	3206
Brazil	4579
Tropical Africa	8000

A few more comparisons with Java may throw some light, not only on the richness of the orchid flora of New Guinea and in particular on the striking development of certain groups, but also on the relationships between these two floral regions. Later on, the relationship of New Guinea to the nearer neighbouring countries as well as to the related floral regions, will be discussed.

The known flora of Java, with the same family restriction and genera (i.e. excluding the *Apostasiaceae*), may be estimated at 104 accepted genera. In New Guinea this number is increased to 116, which is not very significant in considering the very large number of species there, but is explained readily by the unprecedented number of forms which have developed in some genera. Even endemic genera are seldom monotypic, and several of these possess five species and more. These relationships will be discussed later on.

The largest orchid genera in Java, i.e. those with 20 or more species, are as follows:

- | | | | |
|------------------------|---------|--------------------|---------|
| 1. <i>Bulbophyllum</i> | 64 spp. | 4. <i>Eria</i> | 31 spp. |
| 2. <i>Dendrobium</i> | 60 spp. | 5. <i>Oberonia</i> | 20 spp. |
| 3. <i>Liparis</i> | 31 spp. | | |

In German New Guinea we find the following:

- | | | | |
|-------------------------|----------------|---------------------------|---------|
| 1. <i>Bulbophyllum</i> | 322 spp. [329] | 9. <i>Agrostophyllum</i> | 32 spp. |
| 2. <i>Dendrobium</i> | 256 spp. | 10. <i>Glossorrhyncha</i> | 32 spp. |
| 3. <i>Phreatia</i> | 75 spp. | 11. <i>Appendicula</i> | 27 spp. |
| 4. <i>Oberonia</i> | 59 spp. | 12. <i>Calanthe</i> | 23 spp. |
| 5. <i>Taeniophyllum</i> | 59 spp. [63] | 13. <i>Habenaria</i> | 22 spp. |
| 6. <i>Liparis</i> | 50 spp. | 14. <i>Cadetia</i> | 22 spp. |
| 7. <i>Microstylis</i> | 48 spp. | 15. <i>Ceratostylis</i> | 21 spp. |
| 8. <i>Eria</i> | 36 spp. [37] | 16. <i>Microtatorchis</i> | 21 spp. |

Whereas, at the present time [1914], only five genera in Java contain more than 20 species, German New Guinea easily exceeds that figure with 16, and it is probable that in the near future this number will be increased considerably. The numbers of species in *Bulbophyllum* and *Dendrobium* are very striking and this is probably the only instance in the world where an extraordinary development in two different genera can be found within so small an area. It is not particularly surprising that both in Java and New Guinea these two genera should head the list, since it is what might be expected in monsoon areas. In the Malay Peninsula *Dendrobium* is rather a large genus of 78 species, as is also *Bulbophyllum* with 58 species (excluding *Cirrhopetalum*). In 'The Flora of British India', 158 species of *Dendrobium* are enumerated, with only

79 of *Bulbophyllum*, but the latter genus at present exceeds 100. In that publication *Habenaria* figures with 105 species, but after the exclusion of *Platanthera* reduces to below 100, so that the proportions here remain the same as above.

Further to compare the flora of Java with that of New Guinea, one need only instance the development of *Taeniophyllum* and *Phreatia*. Of the first, nine species are known in Java, and at the beginning of this century only about 20 species had been described for the whole of the world. Here in German New Guinea 50 species have been recorded already. Still more extraordinary is the case of *Phreatia*, which is represented in our Territory by 75 species, whilst Kränzlin in his monograph quotes 77 for the whole genus, of which 32 are Papuan. Of the balance (i.e. 45) there are only about five species which have not yet been withdrawn. In Java, the genus is represented only by ten species. The *Liparidinae* occurs in similar proportions in both territories, where it comprises about one tenth of the total species of the orchid flora.

An unexpected development is noted in the *Glomerinae*, of which nearly all known genera are found, and which possesses no less than six endemic Papuan genera. These comprise 130 species, and of which *Glossorhyncha*, *Mediocalcar*, *Epiblastus* and *Agrostophyllum* are to be noted especially for the unexpected abundance of species.

The *Phajinae* occurs in about the same proportion in both countries, and constitutes about 1/30 of the remaining *Orchidaceae*. At the same time in German New Guinea a very peculiar separation of *Spathoglottis*, *Calanthe* and *Plocoglottis* is observed.

The *Habenariinae*, with 23 species, is not very developed, and as with the genus *Eria* of the *Dendrobiinae*, a larger number of species might have been expected.

Three endemic genera occur in Java, viz.

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|-------------------------------|-------|----------------------------|-------|
| 1. <i>Sylvorchis</i> J.J. Sm. | 1 sp. | 3. <i>Ceratochilus</i> Bl. | 1 sp. |
| 2. <i>Queteletia</i> Bl. | 1 sp. | | |

New Guinea has 19, these are:

- | | | | |
|----------------------------------|--------|------------------------------------|---------|
| 1. <i>Eurycentrum</i> Schltr. | 4 spp. | 11. <i>Pedilochilus</i> Schltr. | 13 spp. |
| 2. <i>Chitonochilus</i> Schltr. | 1 sp. | 12. <i>Dactylorhynchus</i> Schltr. | 1 sp. |
| 3. <i>Giulianettia</i> Rolfe | 3 spp. | 13. <i>Tapeinoglossum</i> Schltr. | 2 spp. |
| 4. <i>Sepalosiphon</i> Schltr. | 1 sp. | 14. <i>Monosepalum</i> Schltr. | 3 spp. |
| 5. <i>Ischnocentrum</i> Schltr. | 1 sp. | 15. <i>Chitonanthera</i> Schltr. | 5 spp. |
| 6. <i>Aglossorhyncha</i> Schltr. | 7 spp. | 16. <i>Ridleyella</i> Schltr. | 1 sp. |
| 7. <i>Chilopogon</i> Schltr. | 3 spp. | 17. <i>Calymmanthera</i> Schltr. | 5 spp. |
| 8. <i>Cyphochilus</i> Schltr. | 7 spp. | 18. <i>Dryadorchis</i> Schltr. | 2 spp. |
| 9. <i>Aulostylis</i> Schltr. | 1 sp. | 19. <i>Porphyrodesme</i> Schltr. | 1 sp. |
| 10. <i>Saccoglossum</i> Schltr. | 2 spp. | | |

From a comparison of published species, German New Guinea has only four species in common with the Indian flora, viz.

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|--------------------------------------|--|
| 1. <i>Habenaria goodyeroides</i> Don | 3. <i>Epipogum nutans</i> Rchb. f. |
| 2. <i>Pholidota imbricata</i> Lindl. | 4. <i>Microstylis latifolia</i> J.J. Sm. |

The number of species identical with those of the Malay Archipelago is considerably higher. They are as follows:

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|--------------------------------------|--|
| 1. <i>Habenaria goodyeroides</i> Don | 4. <i>Chrysoglossum villosum</i> Bl. |
| 2. <i>Epipogum nutans</i> Rchb. f. | 5. <i>Microstylis latifolia</i> J.J. Sm. |
| 3. <i>Nervilia Aragoana</i> Gaud. | 6. <i>Eulophia macrorrhiza</i> Bl. |

- | | |
|---|---------------------------------------|
| 7. <i>Habenaria Rumphii</i> Lindl. | 10. <i>Pholidota imbricata</i> Lindl. |
| 8. <i>Nervilia crispata</i> (Bl.) Schltr. | 11. <i>Eulophia emarginta</i> Bl. |
| 9. <i>Corymbis veratrifolia</i> Bl. | 12. <i>Eulophia squalida</i> Lindl. |

Northern Australia has six related species, viz.

- | | |
|--|--|
| 1. <i>Epipogum nutans</i> (Bl.) Rchb. f. | 4. <i>Nervilia Aragoana</i> Gaud. |
| 2. <i>Pholidota imbricata</i> Lindl. | 5. <i>Eulophia venosa</i> R. Br. |
| 3. <i>Geodorum pictum</i> R. Br. | 6. <i>Microstylis latifolia</i> J.J. Sm. |

In considering these three lists, we first of all see that certain names are repeated in the three different areas, so that they represent plants whose occurrence one might also expect in New Guinea. We further note that all the species, with the exception of the ubiquitous *Pholidota imbricata* Lindl., are terrestrial species belonging chiefly to the alang-association. The fact must be emphasized always that the species are defined here as they exist today. Even if very minor differences are noticed, this does not alter the affinities of the 'form-groups' amongst themselves. Above all, we arrive at the conclusion that the orchid-flora of New Guinea is composed almost exclusively of species which are peculiar to the island. Further, it is apparent that the number of those species which occur simultaneously in German New Guinea, Dutch New Guinea and British Papua will increase gradually since these three regions all adjoin. Nevertheless, it is a striking fact how few of the described species from the three regions are specifically identical. In any case there is no doubt that many of them are very localised, frequently restricted to a single mountain ridge and completely absent in the surrounding district. This is more apparent in some groups than in others, and it is especially noticeable that plants at lower altitudes have a more extensive distribution than those of the mist-forest communities.

It is now my intention to consider the relationships of the orchid-flora of the neighbouring regions with that of German New Guinea, but stressing that I consider New Guinea inclusive of the Dutch and English parts as a whole. Here and there, I shall feel compelled to select a case from the neighbouring regions where it may help to illustrate special affinity. Even though the number of endemic species is very large in each of the three parts their affinities, nevertheless, are by nature more-or-less similar, such as, for example, those existing between the eastern and western parts of Kaiser-Wilhelms-Land, or between the latter region and the Bismarck Archipelago.

Next I should like to consider the relationship with Australia, and here we are concerned only with tropical Australia. Unfortunately, we have at present ascertained very little regarding the orchid-flora of the southern portion of British Papua which lies opposite the Australian Continent. That available seems to indicate typical Malay-Papuan elements, but in all probability only the more noticeable species have been collected. The section *Phalaenanthe* of the genus *Dendrobium* is reported to occur there, although it belongs otherwise almost exclusively to tropical Australia. Again, we must not forget that we can trace an undeniable mixing with Malayan elements in the orchid-flora of tropical Australia.

From Dutch New Guinea, we have in *Dipodium elatum* J.J. Sm. from the southern part of the island, a form which apparently suggests an Australian origin, although there is an analogy in *Dipodium squamatum* R. Br. from New Caledonia—a similar migration of the Australian group of the genus.

In New Guinea J.J. Smith and I have traced several species of the section *Rhizobium* of the genus *Dendrobium*, which, without doubt, points to an Australian origin; it occurs for New Guinea under exceptionally dry conditions.

In conclusion, R.A. Rolfe also has described a species of *Pterostylis* from a high

altitude in British Papua. This naturally indicates a former connection with Australia, in the same way as other forms of various families, found in the mountain-flora of the Malayan floral-regions as far as Borneo and Formosa, are representatives of Australian genera and sections. But I am inclined to regard these high altitude forms as relics, which must not be taken too seriously in considering the present day connections between the different floral regions. The remaining species or genera of orchids in Australia which show close affinities with Papuan orchids, e.g. *Cheirostylis ovata* (Bail.) Schltr., *Dendrobium smilliae* F.v.M., and the two species of *Galeola*, I regard as migrations of the Malay-Papuan flora into Australia. To these also belong the six orchid species referred to above, which I have determined provisionally as identical with Papuan species.

To recapitulate, it would seem that the orchid-flora of tropical Australia has been subject to a strong influence from Papuan-Malayan elements, but has in turn exerted little influence upon the Papuan flora.

We shall now consider [the orchid-flora of] the south sea islands. In searching for relationships between the orchid-flora of New Guinea and that of the south sea islands, they are soon found in the representatives of *Habenariinae* in the south seas, in the genera *Chrysoglossum* and *Collabium*, in the section *Scytophyllum* of *Oberonia*, in the genera *Mediocalcar* and *Epiblastus*, as well as in the section *Scyphosepalum* of *Bulbophyllum*, apart from certain *Phreatia*—groups and certain genera of the *Sarcanthinae*. In considering the orchid-flora of the tropical south sea islands (with the exception of isolated New Caledonia, the northern-most point of which alone stands within the tropical zone) we must conclude that we are dealing exclusively with Malayan-Papuan genera.

The only genus of tropical south seas orchid not found in New Guinea is *Earina*, and the form occurring is undoubtedly of New Caledonian origin; indeed it can hardly, if at all, be differentiated from a New Caledonian species. Unfortunately, the orchid-floras of the New Hebrides and Solomons have, until now, been neglected noticeably, and in spite of all my endeavours it has not been possible to obtain further collections from these localities. Consequently, we are not in a position to say much about land-bridges, which in all probability existed between New Caledonia and the New Hebrides, and extended eastwards from Papua to the Solomons. Nevertheless, I am fairly certain that there is no indication of any influence of a tropical south seas flora in Papuasias because it is obvious that the south seas flora migrated from the west, i.e. from Papuasias. This is apparent in that there is not a single endemic genus from there, nor has one been found which has reached any particular development.

The orchid-flora of the island groups lying to the north of New Guinea, which we call Micronesia, is extremely poor and judging from the material at present available, there seems to be no doubt that the flora migrated from New Guinea. Only a few forms seem to have come from the Philippines. There is no evidence of endemic genera, nor of endemic sections, occurring here.

I now consider that region which even by virtue of its position points to an earlier close connection with New Guinea; the Moluccas. I would like to add Amboina and the Celebes, at least the northern portion of the latter, the Minahassa Peninsula, on account of their plant-geography. Whether or not the whole of the Celebes Island belongs thereto, we are not in a position to say, since the flora of the remaining parts of the island has received very little consideration. The Moluccas and northern Celebes have a series of genera and sections in common with New Guinea, which entirely disappear as we go westward; such as *Glossorhyncha*, *Epiblastus*, *Mediocalcar*, *Pseuderia*, *Bulbophyllum* (*Hybochilus*) and *Codonosiphon*. Many species show, in

addition, a strong approach to Papuan forms. In spite of this an overwhelming influence of pure Malayan elements is undeniable. There is a certain mixture of Philippine forms in the northern part of the area, especially in the orchid-flora of northern Celebes, chiefly in certain species of *Dendrobium* and *Octarrhena*, as well as in some species of *Bulbophyllum*. I am convinced that the orchid-flora of the Moluccas, as described above, represents a mixture of Malayan and Philippine basic forms with in-part a strong influence by Papuan elements. It is remarkable that those genera, formerly regarded as purely Moluccan, have now proved to be radiants, represented in unforeseen multiplicity of forms in New Guinea. I am thinking particularly of *Glossorhyncha*, *Mediocalcar*, and *Pseuderia*.

From these considerations, I am of the opinion that, in New Guinea we are dealing with a centre of distribution of a special orchidaceous flora which, of course, has been influenced strongly by the influx of eastern (i.e. Malayan) elements, while a strong influence has also been exerted by it on the flora of the surrounding regions. This assumption is strengthened, not only by the large number of endemic genera but also the number of endemic species, which for the greater part belong to sections occurring only in New Guinea. That a further development of the *Orchidaceae* is still taking place may be assumed, because in some genera such as *Phreatia*, a separation into well-characterised vegetative groups and species has taken place already, although the flowers frequently resemble each other. Thus, without a knowledge of the vegetative parts, the determination even of an inflorescence is, in many cases, impossible.

At the conclusion of this chapter I would like to draw attention to those groups and genera which have developed specially in German New Guinea, and to those the centre of development of which lies in the island of New Guinea. The *Bulbophyllinae*, which heads the numbers list of *Orchidaceae* in German New Guinea and is represented, according to my count, by 347 species belonging to eight genera, five of which are endemic to New Guinea. Outside of the region, only a single species from the Celebes is known. The genus *Bulbophyllum* itself is developed in a whole series of, partly, very important sections, which are also typically Papuan. From these facts, I may well assume that one of the centres of development of the genus has been found.

This group is especially remarkable, in that it evidently possesses separate centres of development at four different parts of the tropical belt, viz. in India, in tropical Africa and in tropical America, in addition to Papuasias. The genus *Cirrhopetalum*, also found in New Guinea, evidently belongs to an emigrant group from the Indo-Malayan region.

The second largest group, the *Dendrobiinae*, with its 320 species in four genera, likewise indicates that one of its centres of development must lie in New Guinea. In a broader sense we must also regard the two genera *Cadetia* and *Pseuderia* as Papuan, both occurring only in a few species outside this area; thus a single species of *Cadetia* occurs in the Moluccas and two in Australia, whilst *Pseuderia* has a single representative in the Moluccas. Of the sections of the genus *Dendrobium*, a large proportion, very rich in species, is endemic to New Guinea.

The third largest group is the *Liparidinae* which consists of 159 species. Particularly rich in species are the genera *Microstylis*, *Oberonia* and *Liparis*, which all contain several typical Papuan sections. The fourth genus, *Hippeophyllum*, was described originally as Papuan; but several species have been recorded already beyond the Territory, viz. in the Celebes, on the Malay Peninsula and in Java.

The *Sarcanthinae*, with 143 species in 25 genera of which three are endemic, contains very characteristic forms. Several genera indicate a migration from the west,

while others undoubtedly have their centre of development in New Guinea, e.g. *Ascoglossum*, *Hymenorchis*, *Microtatorchis* and *Taeniophyllum*. With regard to the first two genera, radiants are known only towards the west, but in the case of *Microtatorchis* and *Taeniophyllum*, species are known to occur in Polynesia also.

The *Glomerinae* forms one of the most characteristic groups in New Guinea. No less than 130 species occur in the German sector alone. We have little doubt, from our observations, that the centre of development of the group is located in New Guinea. Five genera are endemic here, furthermore *Mediocalcar*, *Epiblastus* and *Glossorhyncha* contain only a few non-Papuan species. *Ceratostylis*, *Agrostophyllum* and *Glomera* are present in an unforeseen number of species, the group having multiplied itself five times since the opening up of New Guinea, and each new collection still brings in new species.

A similar situation exists for the *Thelasinæ* which, since the opening up of New Guinea, has grown to 91 species in five genera, of which the genus *Chitonanthera* (with five species) is endemic. The centre of development of this group is located with certainty in New Guinea. About 15 years ago this group contained barely 15 species, whereas we now know of about 150, due mainly to the fabulous multiplicity of *Phreatia* in New Guinea.

The *Physurinae*, with 60 species in 14 genera, is fairly well represented numerically, but its centre of development would appear to lie further west. The only endemic genus in New Guinea is *Eurycentrum*, but *Macodes* and *Vrydagzenia* are especially well developed, having arrived here from the west and then returned.

Very surprising is the occurrence here of two species of *Lepidogyne* and two of *Hylophila*, since, up to the present, both these genera were monotypic and apparently confined to Malaya and Java.

As regards New Guinea, there is not much to be said about the next largest group, the *Phajinae*. A relatively strong representation of the Malayan species was known already in tropical Australia and Polynesia, so that the number of species (50 in nine genera) which have been found in New Guinea, is hardly a matter for surprise. The only endemic genus, *Aulostylis*, should perhaps be regarded merely as a constant locally established transformation of a *Calanthe* from the section *Preptanthe*. The abundance of species in the genera *Calanthe* (23), *Spathoglottis* (11) and *Plocoglottis* (10) is noticeable.

The *Podochilinae*, of which we already know 48 species in five genera from German New Guinea, seems also to have a centre of development here, with two endemic genera, *Chilopogon* and *Cyphochilus*, occurring. The principal genus, *Appendicula*, is represented in all its known sections and occurs in very characteristic forms. The existence of two species of *Lectandra* is very interesting, because up to the present the genus has been represented only by a single species in Java and Malacca [Malaya].

Among the remaining groups, I would like to draw attention to certain genera which are of special interest owing to their abundance of species, isolated position and distribution. *Platanthera* indicates in its sole species the most eastern radiant of the genus. The occurrence of a single species of *Disperis* is very remarkable and important from a plant-geographical point of view, since the migration of this genus from Africa, across Madagascar and Ceylon, is indicated today by a chain of Asiatic species.

Corysanthes, formerly regarded as Australian, has proved to be a thoroughly Papuan group, of which there are already 13 species from German New Guinea. The representatives of the genus in Australia, New Caledonia, Samoa, Java, the Philippines and the Himalayas may be regarded as radiants from a Papuan centre of development.

The genus *Nervilia* has shown singular special development. In the Territory it occurs as nine species, seven of which are endemic.

Very remarkable is the presence of the two genera *Claderia* and *Bromheadia*, originally known from Singapore and later also from Borneo, but curiously enough missing in Java. Both of them have been recorded by me from the Celebes in 1909 and 1910.

In conclusion, the only endemic Group is the fairly isolated *Ridleyellinae*, represented in New Guinea by a single species, *Ridleyella paniculata* Schltr.

DISTRIBUTION AND OCCURRENCE OF THE ORCHIDACEAE IN GERMAN NEW GUINEA

Before we go into detail regarding the occurrence of the *Orchidaceae* in the Territory, it may be advisable to form a concept of the flora in general. For this purpose I will quote some portions of my descriptions of the flora of German New Guinea from my book, 'Die Guttapercha und Kautschukexpedition nach Kaiser-Wilhelms-Land' [The Guttapercha and Rubber Expedition to Kaiser-Wilhelms-Land].

The flora of New Guinea is, in general, a typical primary one, that is to say, the entire Territory is more-or-less covered with primary forests, and it is only in places, where, owing to cultivation or other destruction of the primary forest, a new vegetation has appeared, that we find a different flora. Some areas, in particular those in the vicinity of Finschhafen or Fortifikationsspitze [Fortification Point] show, of course, a typical grass landscape, although the presence of such an exceptional formation for New Guinea is explained clearly by the plainly visible coast line.

The coast flora may be divided into two sharply defined formations, viz. the mangrove-formation and the general shore-formation.

The mangrove-formation does not differ from the same formation so frequently described in the Malayan Archipelago, when we have *Rhizophora*, *Avicennia* and *Sonneratia* growing on stilt-like roots before us. Amongst them *Clerodendron inerme* L., *Lumnitzera* and other common members of the Malayan mangrove-formation grow as bushes. Everywhere one may see *Acanthus ilicifolius* L. with its blue flowers and *Derris uliginosa* L. with white flowers. Amongst these, as shrubs, are found *Sesuvium portulacastrum* L. and *Ipomoea digitata* L. We further notice as epiphytes such characteristic forms as *Acrostichum aureum* L. and species of *Platyserium*. Besides these, species of *Hoya* and *Dischidia*, as well as certain *Myrmecodia*, seem to grow here by preference.

The flora of the shore, where it is not covered by the mangrove vegetation, can be constituted variously. In most cases it consists of a very narrow belt of coastal forest, which merges gradually into the primary forest. Less frequently in certain places, such as at Astrolabe Bay, we have comparatively open coastal scrub. The scrub is then composed of different genera and species, amongst which only a few will be mentioned: *Allophylus litoralis* Bl., *Codiaeum variegatum* Bl., *Cordia myxa* L., *Desmodium umbellatum* L., *Dodonaea viscosa* L., *Flemingia strobilifera* DC., *Pipturus argenteus* Wedd., *Quisqualis indica* L., *Salacia Naumannii* Engl., *Scaevola Koenigii* L., *Sophora tomentosa* L., *Vitex trifoliata* L., *Ixora* and many other *Rubiaceae*. These, for the most part, are widely distributed species. Amongst them we find, partly as lianes and partly as slender climbers, various *Leguminosae* and *Menispermaceae*, *Aristolochia*, *Colubrina*, *Flagellaria* and others. The ground is covered with various herbs and grasses. *Lochnera rosea* Gaertn. develops its rose-red or white flowers everywhere, and *Ipomoea pes-caprae* L. covers wide areas, as also does the Lauraceous plant *Cassytha filiformis* L., reminding us of our Flaxdodder [*Cuscuta epilinum* Weihe].

The shore-forest directly adjacent to it is composed of a whole series of trees, such as *Hibiscus tiliaceus* L., species of *Celtis*, *Alstonia*, *Calophyllum inophyllum* L., *Heritiera litoralis* Dryand., species of *Myristica* and *Horsfieldia*, *Erythrina indica* Lam., *Kleinhofia hospita* L., *Abroma*, *Allophylus timorensis* Bl., *Barringtonia speciosa* L.f. and many others, the enumeration of which would lead us too far. *Pandanus* and

palms also are not lacking, and everywhere formerly, or still, occupied by human settlements, the stately Cocos-palm rears its slender stem with its elegant crown. In places may be seen the palm-like *Cycas circinalis* L., the pith of which produces a kind of sago.

In the shade of the forest, herbs and small shrubs are developed generally and often form an impenetrable thicket. Here we meet much the same species of shrubs with which we became familiar in the mangrove-formation. In their vicinity there may, frequently, be found Rotang-palms (species of *Calamus* and *Dendrocalamus*), the many various *Acanthaceae* and a whole series of *Araceae*.

The epiphytic flora contains, in addition to a number of orchids (which I shall describe later), a rich selection of ferns, as well as numerous Asclepiads and different *Rubiaceae* belonging to the myrmecophilous genera *Hydnophytum* and *Myrmecodia*. The lianes are represented by *Aristolochia*, *Menispermaceae*, *Cucurbitaceae*, *Ipomoeaceae* (*Polyporandra*) and the beautiful *Bignoniaceae* (*Dendrophila*), the rose-red flowers of which often cover the ground. If we follow one of the watercourses from the coast to the interior (generally the most convenient way to penetrate inland) we will then see that the flora undergoes a distinct change. The above-mentioned part of the very characteristic coast plants disappears, and we soon meet a flora which resembles much more closely that of the typical New Guinea primary forests. Above all there are certain characteristic trees which we often see in the interior along the rivers, such as *Alphitonia excelsa* Reiss., *Tabernaemontana* with large white flowers and orange-yellow fruit, *Alstonia* with its branches in peculiar tier-like formation, the very characteristic *Eucalyptus Naudinianus* F.v.M., different tree-like species of *Timonius*, *Kleinhofia*, *Semecarpus* with nut-like fruit, *Linociera* with white or yellow flowers, *Saurauja* with fasciculate or single-stalked white flowers, and other striking trees among which *Cananga* and *Trema* may be noted especially in certain districts. Right on the shore and in moister places, species of *Pandanus*, with its peculiar stilt-like roots and spirally-arranged long leaves, often may be seen. Smaller trees or shrubs grow in front of them. *Solanum verbascifolium* L., *Decaspermum* with whitish rose-red flower-panicles, species of *Laportea*, the leaves of which inflict a burning pain more severe than our nettles, and *Leea* with pretty, coloured fruit. Amongst these shrubs there often develops a fair tangle of lianes and other climbers, especially the *Aristolochiaceae* twiners, *Cucurbitaceae*, *Rhamnaceae*, *Asclepiadaceae* and other families. If the shores are sufficiently sunny, the wild sugar-cane, *Saccharum spontaneum* L., is usually present.

It is beyond the purpose of this sketch to deal in detail with the composition of the entire flora of the Territory. I will, therefore, merely mention that a whole lot of different smaller shrubs and herbs grow on the river banks: such as various *Rubiaceae*, *Myrsinaceae*, *Urticaceae*, species of *Impatiens* with magnificent red flowers, grasses and ferns, as well as many others, which will not be referred to particularly. Everywhere on the borders of the forest rise elegant Rotang-palms, and here and there *Freycinetia*, with its narrow grass-like leaves, may be seen.

The forest itself is composed of the representatives of different families and is characterized by a fairly thick undergrowth of various shrubs, but is poor in herbs. The most important families comprising this forest are the *Leguminosae*, *Annonaceae*, *Meliaceae*, *Lauraceae*, *Moraceae*, *Myrtaceae*, *Euphorbiaceae*, *Sapotaceae*, *Sterculiaceae*, *Elaeocarpaceae*, *Sapindaceae* and others. They nearly all form hardwood. Under these conditions the liane flora is naturally a rich one, and an account of this would not be complete without special mention of the numerous *Leguminosae*, especially the magnificent scarlet-red species of *Mucuna* and the blue

Macropsychanthus which deserve particular reference, the *Annonaceae*, the *Menispermaceae*, the *Gnetaceae*, *Vitaceae*, *Apocynaceae*, *Asclepiadaceae*, *Oleaceae* and *Piperaceae*.

The undergrowth is formed principally by genera of *Pittosporaceae*, *Icacinaceae*, *Monimiaceae*, *Myrsinaceae*, *Verbenaceae*, *Rutaceae*, *Annonaceae*, *Rubiaceae*, *Myrtaceae*, *Moraceae*, *Gesneriaceae* and other families. The ferns play a great part as epiphytes as well as inhabitants of the soil, and the whole Territory is distinguished by their striking abundance.

Wherever open spaces have resulted following cultivation by the natives or by destruction of the forests, a grass-formation which is typical for the Malayan and Pacific areas becomes established. This is the alang-formation, which is then followed, though not always, by the secondary forest. In this alang-formation the Alang-grass (*Imperata*) predominates, and is accompanied by several other grasses. All of these together form such a close tangle that the growth of other herbaceous plants is almost impossible. If, however, a little space is created by the burning of these alang-fields, a whole host of different herbs develops with the grasses, above all *Compositae*, *Leguminosae*, *Scrophulariaceae*, *Polygalaceae*, *Malvaceae*, *Cyperaceae*, *Zingiberaceae* and many others.

In places, especially where the alang-formation is older or where it has not been burnt, certain trees appear as forerunners of the secondary scrub; chiefly, for instance, *Albizia*, *Commersonia*, *Cycas*, *Trema*, *Sarcocephalus*, *Bridelia* and species of *Ficus*. Room is thus made gradually for a new form of vegetation in the alang-formation, and this gradually develops into the secondary forest. It is by no means certain that the secondary forest must always follow the alang, this depends entirely on climatic and other influences, but principally on the frequency of the rainfall. The secondary forest, when it does not directly follow the primary one, generally develops as follows: there appear other quick-growing species of trees, which are associated with new ones under the protection of those trees already mentioned in the alang-formation. Thus in a short time a dense undergrowth arises, which gradually pushes back the Alang-grass and very quickly shoots up into a forest. It is characteristic of this secondary forest that it rarely produces valuable timber or useful plants. Among the quickly growing trees of the secondary forest I would like to mention the following as most important: *Alchornea javanica* Mueller Arg., *Artocarpus incisa* Forst., species of *Callicarpa*, *Commersonia echinata* Forst., *Dracaena angustifolia* Roxb., *Endospermum formicarum* Becc., a large number of *Ficus* species, *Grewia laevigata* Vent., *Hernandia peltata* Meissn., species of *Homolanthus*, *Macaranga* and *Mallotus*, *Premna*, *Trema*, *Pterocarpus* and *Vitex monophylla* K. Sch., the latter being especially interesting on account of the singular hardness of its wood.

Naturally a large quantity of shrubs, shrublets and herbs collect under the protection of this quickly growing forest. These chiefly consist of *Urticaceae*, *Moraceae*, *Euphorbiaceae*, *Leguminosae*, *Zingiberaceae* and *Marantaceae*. The ground is covered with ferns, shade-loving grasses, *Commelinaceae*, *Acanthaceae* and *Achyranthes* as well as *Alternanthera*. The lianes resemble those of the other primary forests surrounding them, but certain epiphytic species of *Hoya*, which are abundant in places, are evidently distributed by ants.

It would lead too far to deal in detail with the composition of the flora of the forests of the hill-country and mountains of about 900–1000 m altitude, because the higher we ascend, the more diverse are the elements of the forest, now covering everything. It is distinguished from the forest of the lowlands by the greater complexity of its composition. In particular, the species of trees change and increase in number,

without one of the above-mentioned families disappearing. Of other families, which play an important role in the forests of the hill-country and mountains up to the lower limits of the mist-forests, I would like to mention the oaks, *Lauraceae*, *Annonaceae*, *Sterculiaceae*, *Elaeocarpaceae*, *Euphorbiaceae*, *Meliaceae*, *Guttiferae*, *Sapindaceae*, *Myrtaceae*, *Dilleniaceae* and *Sapotaceae*.

The lianes and shrubs may be composed of the same families as in the forests of the lowlands, but the species is increased here also.

The forest picture is an entirely different one if the above-indicated altitudes are crossed, to enter the mist-forest, because the latter is not dependent on the moisture of the soil as in the rain-forest and the gallery-forest, but on the intense humidity of the air. In its composition, it is very different from the rain-forest, as this in turn is from the gallery-forest.

This mist-forest is distinguished externally from the common primary forest by the trees (trunks and branches, sometimes even the leaves) which are covered with dense layers of moss harbouring an innumerable host of other epiphytes. A closer examination of the flora shows that it comprises a whole series of plant families, which are absent entirely from the lower regions and that others which are represented sparsely are distinguished here by their richness in species and by the addition of other genera; on the other hand, plants which occurred in large numbers at lower levels are now absent either completely or are seen only in a few forms. In general, it may be said that the flora of the mist-forest is disproportionately richer in species numbers than the primary forest.

Very characteristic of the mist-forest is the addition of a few families, such as the *Taxaceae*, *Pinaceae*, *Saxifragaceae*, *Cunoniaceae*, *Theaceae* and *Ericaceae*, as well as a great number of genera which are missing altogether in the lower primary forest.

In a general way we find that the forest flora is composed mainly of *Casuarinaceae*, *Meliaceae*, *Annonaceae*, *Elaeocarpaceae*, *Myrtaceae*, *Moraceae*, *Tiliaceae*, *Sapindaceae*, *Lauraceae*, *Ebenaceae*, *Sapotaceae*, *Pittosporaceae*, *Fagaceae*, *Dilleniaceae*, *Symplocaceae* and many other families. As especially characteristic forms, I would like to name: some species of *Podocarpus*, *Araucaria Hunsteinii* K. Sch., *Libocedrus torricellensis* Schltr., *Astronia Hollrungii* Cogn., *Bammlera insignis* K. Sch., *Argyrocalymma arboreum* Laut. et K. Sch., *Casuarina* in an evidently as yet undescribed form, and species of the genera *Chisocheton*, *Dysoxylon*, *Elaeocarpus*, *Sloanea*, *Fagraea*, *Ficus*, *Polyosma*, *Grewia*, *Cupaniopsis*, *Eurya*, *Harpullia*, *Jambosa*, *Litsea*, *Euryandra*, *Maba*, *Palaquium*, *Pandanus*, *Parartocarpus*, *Antiaris*, *Pittosporum*, *Quercus*, *Sauraujia*, *Hibbertia*, *Schuurmansia*, *Syzygium*, *Metrosideros*, *Grevillea* and *Helicia*. The number of species in some of the genera enumerated here is very considerable, and it would fill a special book to name them all. Besides the tree-genera mentioned here, there are found in the mist-forest, as well as in the lower forests, numerous palms which often grow to a considerable height. I am not speaking of the Rotang-palms which extend to an altitude of about 1500 m, but of straight-stemmed species with the appearance of the Cocos and Areca-palm. The number of species of *Pandanus* growing in the mist-forest is very considerable; likewise there are very many species of tree-fern belonging to the genera *Cyathea*, *Alsophila*, *Dicksonia* and *Balantium*, which quite ornament the forest, especially when growing in large groups, as is very often the case.

In the mist-forest the undergrowth is fairly dense, and is composed of species belonging to genera similar to those we have mentioned already under the description of the trees; the *Annonaceae*, *Gesneriaceae*, *Solanaceae*, *Melastomataceae*, *Monimiaceae* and *Rubiaceae* play a large part in their composition. Shrubs, however,

must not be overlooked; of these *Zingiberaceae* and *Marantaceae* are especially rich in species and often form dense thickets exceeding the height of a man. The ground is covered usually by species of *Selaginella*, *Araceae*, smaller and larger ferns, *Impatiens*, *Begonia*, leafy *Rubiaceae*, and many other interesting and beautiful growths. We shall see, further on, the role played by the orchids. The epiphytic flora includes a large number of ferns, the like of which is to be found hardly in any other place on earth. The branches of trees are, furthermore, laden with *Orchidaceae*, species of *Rhododendron* and other *Ericaceae*, as well as *Urticaceae*, *Gesneriaceae*, *Rubiaceae*, *Asclepiadaceae*, *Apocynaceae*, and numerous representatives of other families. Since this sketch is a general one, I will not enter into particulars regarding the saprophytic flora or the description of other regions. It consists chiefly, and for all altitudes, of *Triuridaceae*, *Burmanniaceae*, *Corsiaceae*, *Orchidaceae*, *Gentianaceae* and *Polygalaceae*.

The lianes are less numerous than in the forests of the hill-country and include species of *Calamus* (Rotang), *Ficus*, *Jasminum*, *Freycinetia*, *Apocynaceae*, *Piperaceae*, *Rubiaceae* and *Asclepiadaceae*.

In the Finisterre Range, on steep precipitous rocks facing south, I found a very striking vegetation-formation, which I would particularly like to mention here. This formation did not seem to be distributed generally but still it was very noticeable in some parts of the mountains, and might be designated as the formation of the open mountain-slopes. It is the only mountain terrain below the forest boundary which I have observed in regions without primary forest, which I had the opportunity of visiting. These open slopes are found at an altitude of 1000–1300 m. Probably they are more numerous higher up on the mountains, because, from an exposed position at a high altitude, I was able to distinguish various areas which seemed to have a similar formation. The vegetation here consists, for a major part, of low, creeping, ground plants, from the midst of which arise scattered shrubs about one metre in height. Occasionally a single small tree was observed, these consisting chiefly of a very characteristic species of *Saurauja*. Now and again, specimens of a Myrtaceous plant with small yellow flowers, as well as a few specimens of a *Casuarina*, were also seen. The shrubs consisted partly of *Rhododendron* with orange-yellow, multi-flowered umbels, a stem-flowering *Cyrtandra*, several *Geniostoma*, *Vaccinium*, *Elaeocarpus*, *Pittosporum* and similar plants, all represented by a proportionately small number of species. The ground was covered thickly with different *Cyperaceae*, among which crept species of *Selaginella* and *Lycopodium*. Among them could also be noted *Viola*, *Scutellaria*, *Gunnera*, various *Hydrocotyle*, a whole series of interesting ferns and, curiously, a large number of interesting ground orchids. Frequently, on the trees and shrubs, there were epiphytic orchids to which I shall refer later on. This formation may be found also to exist in the Bismarck Range and is very remarkable, since the mountains in New Guinea are covered densely with trees to an altitude of 3000–3500 m. The forest boundary in German New Guinea seems to be at about 3000–3500 m, at least as far as I could estimate from a distance, in the Waria Valley and in the Bismarck Range.

The flora of the treeless, high mountain zone of German New Guinea is unexplored almost entirely. According to observations in British Papua and Dutch New Guinea, it contains a series of low, leafy shrubs, various grasses, *Cyperaceae*, and smaller bushes which are related to certain Australian forms.

After we have obtained a general survey of the distribution of the flora of the mountains, I will endeavour to describe the orchidaceous flora of German New Guinea in detail. I must, naturally, restrict myself to the consideration of those areas

which I have visited; however, I believe that I have acquired a fairly clear impression of conditions in the unvisited regions from observations made elsewhere.

The orchid-flora of the coast-formation of the entire Territory is subject to fewer changes than that belonging to the formations of the interior. Some of the coast-orchids which are numerous in German New Guinea, indeed most of them, are distributed also throughout the whole of Papuaia.

The trees of *Calophyllum*, which usually bend over the shore, are the favourite locations of various species of typical coast species. Here we find the beautiful *Grammatophyllum scriptum* Bl., a plant of vigorous growth with multi-flowered racemes of yellowish green, brown-spotted flowers in association with the interesting *Dendrobium bifalce* Lindl., the greenish yellow flowers of which have long slender stems and last a long time; *Eria Micholitzii* Krzl. with white flowers, and the robust *Vandopsis Warocqueana* Schltr., its brown-spotted flowers standing in dense panicles. From the Bismarck Archipelago to the Moluccas, epiphytic shore orchids are distributed also, especially *Trichoglottis litoralis* Schltr. and the interesting *Dendrobium insigne* Rchb. f. with pretty, large flowers (which unfortunately only last a day) which also occur on the coast of Kaiser-Wilhelms-Land. In places where some of the trees are more exposed to the sun, here and there scattered specimens of *Acriopsis Nelsoniana* Bail. may be seen, and more often *Dendrobium antennatum* Lindl., with its long, slightly twisted petals and *Dendrobium veratrifolium* Lindl. in the best examples often with 20 or more elegant racemes, each bearing 15–30 flowers. Better varieties of the latter that I have seen in Kaiser-Wilhelms-Land are orchids suitable for horticultural cultivation. On tall, exposed trees, right on the shore, as well as in the coastal forest, *Dendrobium Holrungii* Krzl. is seen occasionally; its flowers are yellowish white and fleshy with deep, dark green labellum tips and form a dense pendant multi-flowered raceme, which lasts for several weeks, and which, by its peculiar combination of colours, must inspire every orchid-lover.

The species just mentioned also occur in the coastal forest itself, where they are accompanied by further species, some of which belong to other genera. This is the case with *Luisia Beccarii* Rchb. f. which resembles a miniature edition of *Vanda teres* Lindl. with its terete leaves, as well as a few species of *Thrixspermum*; likewise the small-flowered *Oberonia* with sword-like, pointed leaves, various *Bulbophyllum* and, here and there, a *Liparis* is to be seen. Rarely, but still occasionally, there are found some terrestrial orchids, such as *Corymbis minor* Schltr., *Tropidia*, *Zeuxine Erimae* Schltr. and *Hetaeria Erimae* Schltr.

If we now penetrate further into the forest, the orchidaceous flora becomes more abundant in the lower forest, especially as we approach the hill-country. Here we find a few of the first saprophytes, e.g. *Epipogum nutans* Rchb. f., and also a few of the terrestrial species, among which we soon become acquainted with *Phajus amboinensis* Bl. with its large white flowers, the graceful *Nervilia Aragoana* Gaud. and *N. crispata* Schltr., *Tropidia gracilis* Schltr., *Vrydagzenia*, *Eulophia emarginata* Bl., *Microstylis xanthochila* Schltr. and other shade-loving species. At the foot of the hill we also find *Calanthe Engleriana* Krzl., a species with a dense raceme of large, white flowers and about 1.5 metres high, which I am inclined almost to regard as the most beautiful species of the subgenus *Eu-Calanthe*. Together with this there appear the first species of *Plocoglottis*, which raise their slender inflorescences of lax, yellow, rusty-spotted flowers to a height of about two ft [sic] and are especially interesting on account of a certain irritability of the labellum. Nevertheless, it would lead too far to enumerate the whole of the many species which are found in the lower forest. Still greater is the number of epiphytes. In the two largest genera, *Bulbophyllum* and *Dendrobium*, the

number of species is already overwhelming, and to these must be added the species of other quite different genera, such as *Oberonia*, *Liparis*, *Appendicula* (many species) *Podochilus scalpelliformis* Bl., *Thrixspermum*, *Vanda*, *Taeniophyllum* and others.

On arriving at any place in the alang-plain, we may collect in the most favourable season, i.e. after the first rains, many very interesting orchids. They all have subterranean tubers, or bulb-like, thickened rhizomes, which are exposed occasionally to the drying influence of the sun, or to grass-fires. Scattered here and there are found *Habenaria goodyeroides* Don and *H. Rumphii* Lindl., the former with pale yellow flowers, the latter with white flowers in short dense racemes. Especially in places where the grass has received fresh rain after fire, the various species of *Nervilia*, with attractive flowers, shoot up and develop their beautiful scarlet-red-coloured leaves later on. With them also appear the dainty, slender *Eulophia Dahliana* Krzl., which bears racemes of violet-pink-coloured flowers up to 30 cm long. Rarer and taller are the two other species of the genus, *E. squalida* Lindl. and *E. venosa* Rchb. f., the former with yellowish white or violet-white flowers, the latter with multi-flowered racemes of whitish green, red-veined flowers on a stem of about 1 m. In places where the terrain is undulating, there may be found one of the prettiest orchids of the alang-formation, *Spathoglottis portus-Finschii* Krzl., a species leafless at the flowering season, with a 30–45 cm stalk, bearing a lax raceme of beautiful, pale violet-pink-coloured flowers. On the islands of the Bismarck Archipelago this species is represented by the slender, but less beautiful, *S. albida* Krzl. with smaller whitish flowers.

The secondary forests also have their distinctive orchidaceous flora. There are, in particular, three species which generally appear first, viz. *Nervilia Aragoana* Gaud., *N. crispata* Schltr. and *Acanthephippium papuanum* Schltr. which is distinguished by its vigorous growth and large, whitish purple-veined flowers with red apices. After these, *Vrydagzenia*, *Microstylis xanthochila* Schltr. and *M. Zippelii* J.J. Sm., with its orange-yellow lip, frequently follow, furthermore *Eulophia emarginata* Bl., with its graceful slender inflorescences, often occurs here in shady places. According to the location some of the rarer species of *Nervilia* may be found also.

Because of the quick growth of the trees comprising the secondary forest, these are not suitable for epiphytic orchids. Nevertheless, some species of *Taeniophyllum*, isolated specimens of *Oberonia*, *Liparis confusa* J.J. Sm. and *Thrixspermum collinum* Schltr. are seen often.

But a real Eldorado for the orchid collector is found by following the streams and rivers at the foot of the hill-country. Almost every tree on the banks bears a number of epiphytes and, among these, there are usually many orchids. In all places where the banks rise rather sharply, will be seen the long stalks of the pretty rose-red-coloured flowers of *Spathoglottis papuana* Bail., and in the more shady places, the still more robust and more richly flowering *S. grandifolia* Schltr. which even in its flowerless condition produces a very ornamental effect with its large broad leaves. Under similar conditions, I often have observed *Coelogyne pustulosa* Ridl. in splendid specimens, growing terrestrially, but it appears as though the plant in these circumstances exhausted its whole energy in the formation of the vegetative parts, for I have never seen a growing specimen in flower under such conditions. In association with *Coelogyne*, at a locality near the Maijen River, I saw a *Thrixspermum* related to *T. lilacinum* Rchb. f., but since there were no flowering specimens, I was unable to determine the species.

Along the banks of the rivers and streams epiphytic orchids are very numerous; it would take too long to name them all so I will restrict myself to the principal forms. The genus with the most species is *Bulbophyllum* of which the sections *Coelochilus*, *Sestochilus*, *Polyblepharon*, *Fruticicola*, *Hybochilus* and others are represented richly.

I would, in particular, draw attention to such species as *B. Wernerii* Schltr., *B. nummularioides* Schltr., *B. leve* Schltr., *B. marginatum* Schltr., *B. lepanthiflorum* Schltr. and others. *Dendrobium* is comparatively rare, but a few species such as *D. leucorhodum* Schltr., which is as beautiful as *D. superbum* Rchb. f., and *D. minjemense* Schltr., a small interesting species, *D. pseudocalceolum* J.J. Sm. and a few more appear from time to time. More abundant here are species of *Phreatia*, which are all small and graceful, usually with snow-white (more rarely yellowish green) flowers. Species of the genera *Oberonia*, *Liparis*, *Cadetia*, *Eria*, *Thrixspermum*, *Taeniophyllum*, the rarer *Vanda Hindsii* Lindl. and the peculiar *Vandopsis Muelleri* Schltr. are still more uncommon. The last is one of the most remarkable orchids known and from a 1½–2 ft [sic] compressed stem lignified branched inflorescences about 5 m long are produced.

We now enter the hill-country, and will continue our wanderings for this purpose in a river bed which brings us to the lower boundary of the mist-forest. The further we ascend, the greater becomes the number of orchids which we find. Along the river bank and in the near surroundings in the forest soil, we note further species of *Spathoglottis*; also here and there, either in the crevices of rocks or in shady places, there are seen the pretty *Macodes Sanderiana* Rolfe and other ground orchids with coloured leaves belonging to the genera *Eurycentrum*, *Goodyera* or *Zeuxine* with blue-green, almost silver-glittering leaves, also *Goodyera papuana* Ridl., different species of *Habenaria* partly green-flowered, partly white, numerous *Microstylis* and *Liparis*, of which some are distinguished by brown or red-striped or dark purple leaves, many of them with dark purple and others with yellow flowers. At the foot of the trees stands the peculiar *Claderia papuana* Schltr., whilst *Plocoglottis* and *Calanthe* are more common, some of them showing green, yellow-spotted leaves, which contrast pleasantly with the long raceme of flowers, partly yellow-spotted and partly snow-white. Epiphytic orchids now are found on almost all trees. Many of them belong to the small-flowered kinds known to the gardener as 'botanical' genera, such as the prolific *Oberonia*, *Taeniophyllum*, *Phreatia*, *Oxyanthera*, *Agrostophyllum*, *Appendicula*, *Podochilus*, *Cadetia* and *Trichoglottis*, nevertheless there are some very beautiful forms of certain genera like *Dendrobium*, *Bulbophyllum*, *Coelogyne*, *Phalaenopsis*, *Robiquetia*, *Eria* and so on. Of these, for example, may be mentioned *Dendrobium spectabile* Bl. with its beautiful, bizarre flowers and other partly-red, partly-white-flowered species of the genus; *Bulbophyllum foetidum* Schltr., *B. stictosepalum* Schltr. and *B. hymenobracteum* Schltr.; *Coelogyne pustulosa* Ridl., almost identical to but perhaps a little more beautiful than *Coelogyne asperata* Lindl.; *C. Beccarii* Rchb. f. with its large flowers on a long stalk, reminiscent of *C. speciosa* Lindl. *Dipodium pandanum* Bail., a tall climbing species; *Phalaenopsis amabilis* Bl. var. *papuana* Schltr. and *Robiquetia Mooreana* J.J. Sm. A whole series of species worthy of cultivation especially *Dendrobium*, *Eria* and other genera is also found. On the trees and in the hill-forests, one may also admire (and that not altogether rarely) species of *Vanilla* which climb up the trunk and then hang down in long garlands, on which are developed pretty yellow flowers with a white and red-marked lip, arranged in dense clusters, and later forming thick green pods up to 15 cm long.

In describing the terrestrial orchids of the hill-country, I have refrained purposely from mentioning the leafless saprophytes, since these form a special category on their own. Related to *Vanilla*, there are found peculiar plants, species of *Galeola* (the so-called giants of the saprophytes), rising to a height of 5 m or more and forming leafless (or almost leafless), extremely slender, pale, fragile structures, which finally end in a

gigantic strongly branched panicle of *Vanilla*-like flowers, mostly yellow with a curly white-red labellum. Belonging biologically to this group of plants we also find *Lecanorchis*, with its almost black, wiry stalk and rose-red flowers, the pale *Epipogum nutans* Rehb. f., *Didymoplexis papuana* Schltr., *Cystorchis peliocalos* Schltr. and the dark, brown-red *Eulophia macrorrhiza* Bl., all highly interesting and peculiar growths.

According to the aspect of the mountains, we enter the sharply defined mist-forest at an altitude of 600 to 1000 m. Here the orchid collector enters the true field of his activity, such indeed as regards richness of forms is not to be found elsewhere in the whole world. Quite suddenly the orchid-flora is changed completely. An astonishing number of genera appear, which are not found below this formation, the larger genera are represented only by sections which are restricted to this region, in short we are confronted with a perfectly new picture. Of course, there are a few species which have penetrated here from the forests below, but their number is almost negligible, so that they may be missed easily, and all of them soon vanish as we ascend into the interior of the mist-forest formation.

As far as is possible to judge at present, we may estimate the mist-forest formation at an altitude of about 3000–3500 m, i.e. to the upper forest boundary; for, although the flora, and with it the *Orchidaceae*, is somewhat changed in the upper parts of these forest-zones, a sharp separation below the forest border seems hardly indicated, at least up to the highest point of about 2500 m reached by me. However, these questions only can be decided finally in the future, when we know more about the mountain-flora, especially the high mountain-flora of German New Guinea. I may now state that the boundary of the mist-forest is considerably lower in the Torricelli Range of Kaiser-Wilhelms-Land near the coast, as well as in the mountains of Neu-Mecklenburg, than in those of the middle and eastern parts of Kaiser-Wilhelms-Land further away from the coast, for, while in the latter places, the mist-forest begins at about 1000 m, in the Torricelli Range and in the Rössel Mountains of Neu-Mecklenburg, the sharp boundary is found at about 600 m. It is beyond doubt that these differences are related to the entire orographical formation of the land.

The terrestrial orchids of the mist-forest are so numerous that I must restrict myself to the mention of the genera, and in some cases even to the sections, especially since most of the species are distributed very locally and often have been replaced by others on nearby mountains. This peculiar localization of species concerns not only the terrestrial plants, but also the epiphytes, and is especially characteristic, for instance, in species of the section *Oxyglossum* of *Dendrobium*.

One of the most interesting discoveries among the terrestrial orchids of German New Guinea is the pretty *Paphiopedilum violascens* Schltr., the introduction of which into cultivation would be very desirable. This species has nothing in common with the other species recorded from Dutch New Guinea, but is related rather more closely to the Indo-Malayan forms; it appears to be distributed widely in the Territory. A dissimilar local occurrence is found in species of *Habenaria*, certain forms of which seem to be restricted to specific mountain ranges. Closely related to them is *Platanthera*, monotypic at present, which also belongs to the mist-forest. The rich development of the genus *Corysanthes* in New Guinea must be a matter of surprise to every orchidologist; all its species are local in their occurrence and, strictly speaking, it has to be regarded as a terrestrial genus. All species recorded from the Territory belong to the mist-forest flora. Many of them grow on the ground between moss or in humus, where their solitary leaf, often much ornamented with red and silvery veins, grows close to the ground, and on top of it they develop their solitary, variegated and often bizarre-shaped flower. All these species possess the peculiarity that, after fertilization,

the previously short pedicel is elongated greatly, thus elevating the seed capsule. Other species grow only on tree-trunks, mostly on the lower parts of such trunks, where they are covered with a certain amount of humus. These latter species do not elongate their pedicels after fertilization. I have found a few epiphytic species on taller trees. In the remarkable species of *Cryptostylis*, attaining a height of about 50 cm, the flowers include the most bizarre forms with which I am acquainted in the terrestrial *Orchidaceae*. The group *Physurinae* is distinguished by its great variety of form, and many of the species are particularly note-worthy on account of their wonderful leaf designs, especially amongst the genera *Goodyera*, *Eurycentrum*, *Cystorchis*, *Macodes*, *Eucosia* and *Vrydagzenia*, but in this respect all are excelled by *Macodes pulcherrima* Schltr. (from the Finisterre Range) which I may designate as the prettiest leaf-orchid [Jewel orchid] presently known. Of other terrestrial forms may be named various species of *Tropidia*, *Chrysoglossum*, *Collabium*, *Mischobulbum*, *Tainia*, *Microstylis* with the magnificent metallic lustre on its frequently dark purple leaves, many *Liparis*, terrestrial species of *Appendicula* and *Cyphochilus*; magnificent species of *Calanthe*, partly with yellowish gold or rose-red as well as white flowers, of which, for instance, *C. aceras* Schltr. with whitish flowers attains the height of a man; and lastly *Cymbidium papuanum* Schltr., which likewise lives in the humus. But, once more, I will return to the *Physurinae*, which has also been found in numerous green-leaved forms of the genera *Goodyera*, *Platylepis*, *Cystopus*, *Erythrodes*, *Zeuxine* and *Vrydagzenia* and which has reached its highest stage of development in the 2 m high *Lepidogyne sceptrum* Schltr. This vigorous plant, with the inflorescence alone attaining about a metre in length, is covered densely with long, orange-red bracts and forms such an adornment to the forest with its stiff upright racemes, that I have seen natives standing before it in admiration.

The saprophytic flora of the mist-forests of New Guinea is distinguished by its particular wealth. Besides the species mentioned below the only saprophytic species of *Corysanthes* even occurs here. *Lecanorchis* occurs as a further saprophytic species; besides *Galeola* and the peculiar *Aphyllorchis*, which are found as representatives in each of the two typical groups. Further we note another *Didymoplexis* and a *Gastrodia*. Taking into account that the total number of saprophytic orchids in the world is not very large, then the number occurring here must be regarded as very considerable.

The characteristic epiphytic orchids of the mist-forest formation constitute about three-fifths of the entire orchidaceous flora of German New Guinea. A reasonable review is, therefore, possible only by treating them generically, so I will proceed systematically.

Genera which we have known elsewhere only as terrestrial orchids are seen here as epiphytes, such as *Corysanthes* and *Macodes*, two species of the latter having been recorded as growing on trees. Of the *Physurinae*, *Cheirostylis* is also recorded as an epiphyte. The *Coelogyninae* shows itself to us most explicitly in some species of the genus *Coelogyne*, of which *C. fragrans* Schltr., with its rather large fragrant flowers, and the magnificent snow-white *C. Veitchii* Rolfe, deserve special mention, also *Dendrochilum Bartonii* Schltr. and, lastly, various species of *Pholidota*.

We can hardly overlook the abundance of species provided by *Microstylis*, *Oberonia*, *Hippeophyllum* and *Liparis*. Especially in the last genus we find *L. spectabilis* Schltr. and species of the section *Genychilus* as very conspicuous representatives of the group and worthy of cultivation.

Mediocalcar and *Epiblastus* are well represented and are distinguished by their shining scarlet-red flowers, which often have white, green or yellow tips. *Ceratostylis*

and *Agrostophyllum* exhibit a similarly rich, or even richer, development and their clusters of flowers may be observed everywhere on trees or tree-trunks. *Glossorrhyncha*, however, is restricted mostly to the branches of taller trees, the pretty white flowers appearing singly and showing a grey or greenish tip to the short labellum, while in *Glomera*, occurring as a genus with many species, the flowers are compressed into round heads and are mostly white or yellow, with a cinnabar-red (rarely black) conspicuously blunt labellar plate. Further related genera of the epiphytic orchid-flora of the mist-forest may be mentioned in *Sepalosiphon*, *Giulianettia*, *Ischnocentrum* and *Aglossorrhyncha*.

Podochilus, *Chilopogon*, *Appendicula* and *Lectandra*, with their numerically rich species, represent the *Podochilinae* of the mist-forest. Most of them grow on the branches of tall trees, but there is also a not inconsiderable number to be found on the trunks of trees. Usually they grow obliquely downwards.

Quite a conspicuous role is played by the *Dendrobiinae*. Of these, the genus *Cadetia* grows in colonies or tufts, with its small white, sometimes yellow or rose-red-marked flowers, as individual species characteristic of certain mountain ranges. The large genus *Dendrobium* is seen in beautiful perfection. Certain of its sections, such as *Oxyglossum*, *Calypstrochilus*, *Trachyrhizum* and even *Herpethophytum*, are restricted to the mist-forest formation. What a glorious sight to suddenly find trees, the trunks of which are covered with the dark purple-flowered *D. Lawesii* F.v.M., or with the cinnabar-red-flowered *D. phlox* Schltr., *D. flammula* Schltr., or with a less magnificent relative. In other places, such as the Torricelli Range, the large-flowered *D. eximium* Schltr., a member of the section *Latourea*, with its white, red-veined flowers, is very common in some places, and it seems a pity that this beautiful plant is not yet cultivated in Europe. One has the same feeling in regard to other species of this section, viz. *D. Alexandrae* Schltr., *D. Forbesii* Ridl., *D. polysema* Schltr., *D. pulchrum* Schltr. and many others, all of which occur in the mist-forests of the mountains. But the most beautiful species of the section, *D. magnificum* Schltr., with orange-yellow, red-marked perianth segments, and olive-green, red-veined lip, will arouse admiration if seen for the first time in flower on account of its peculiar combination of colours.

Further characteristic sections of *Dendrobium* are *Oxyglossum* and *Cuthbertsonia* which grow in colonies and produce abundantly, between the leaves on the apex of the pseudobulbs, their normally shining, red-coloured, pretty flowers. No less than 28 of these species are known already. *Dendrobium sophronites* Schltr. has the habit of *Sophronites grandiflora* Lindl. and does not bear this name unmerited, since it is able to compare with *Sophronites* in beauty, particularly since both have nearly the same flower-colouring. The flowers of *D. auricolor* J.J. Sm. and *D. regale* Schltr. exceed 7 cm in width, and, although unfortunately of very short duration, are yet the prettiest in the genus. In the first species they are orange-yellow, with red crests on the lip, and in the other dark rose-red with a white, purple-spotted labellum. To deal in detail with these species of *Dendrobium* of the mist-forest formation of New Guinea, another book would have to be written.

Eria, belonging to the *Dendrobiinae*, is not a very large genus, but is represented by some very characteristic forms which indicates an immigration from the west.

Still richer in species than the *Dendrobiinae* is the *Bulbophyllinae*, which, although including a number of species worthy of cultivation, mostly consists of 'botanical' species. Their number is astounding, each mountain chain showing new species. It is enough to frighten one if requested to review this multiplicity of forms. A large part of the sections of the genus, as they have been established in the Systematic Part, is found only in the mist-forest, but peculiar related genera occur here also.

Such, for example, are *Pedilochilus* with a labellum reminding one of *Cypripedium*, *Saccoglossum* with a similarly formed lip, *Dactylorhynchus* with its striking rostellum, and, above all, the remarkable genus *Monosepalum*, the pedicels of which remind one of *Masdevallia muscosa* Rehb. f.

I have referred repeatedly to the strong development of the *Thelasinae*. Here in the mist-forest not only has *Phreatia* been recorded, but also the endemic genus *Chitonanthera*, as well as *Octarrhena*, *Oxyanthera* and *Thelasis*. The first three have developed significantly.

With regard to *Phreatia*, of which nearly all sections are represented here, one must ask how it is possible that a genus, the various species of which display such similarity in the structure of the small flowers, can attain such a multiplicity of forms. It appears certain that the multiplicity of forms is not produced by hybridization, that many of the species are represented by a fairly large number of individuals, and that even then they grow with intermediate forms.

Quite an astonishing localization of a genus is found in *Chitonanthera*. All the five species grow on the Bismarck Range, and so closely together, that it is possible to collect all of them within an hour's walk. Although I have climbed quite a number of mountains, I have nowhere else seen any trace of this genus. A very remarkable endemism of the mist-forest is found in *Ridleyella*. This dainty epiphyte with small, bell-shaped, violet-blue flowers, that is with a flower colour very uncommon among the *Orchidaceae*, was described originally from the Forbes' Sogeri Collection from British Papua, as a *Bulbophyllum*. It has the habit of *Acriopsis*, but forms a special group by itself, related to the *Thelasinae*.

The last group, the *Sarcanthinae* with 143 species, is the fourth-largest in number in the Territory, but apparently plays an inferior role in the composition of the orchidaceous flora of the mist-forest, since a large number of the species belonging to it, especially from such numerically rich genera as *Taeniophyllum* and *Microtatorchis*, are so very minute that they are found only when searched for. In fact, therefore, I am the only person who has collected the 80 species of these two genera known in German New Guinea. Some very interesting species of *Thrixspermum* also occur, but the frail flowers are too small to attract any attention. Isolated species of the tiny *Calymmanthera*, *Bogoria*, *Adenoncos*, *Saccolabium* and *Schoenorchis* likewise can be observed, but all of them are very inconspicuous plants. The endemic genus *Dryadorchis* has been recorded as two species and *Hymenorchis* as six and these are indicative of the great endemism prevailing amongst the mist-forest epiphytes. Now it only remains to mention the interesting representatives of *Sarcochilus*, *Robiquetia* and *Pomatocalpa*, which grow abundantly in some parts of the mist-forest, sporadically in others, then we shall have enumerated the principal genera which contribute to the flora of that region in New Guinea.

The immense quantity of material from these formations [vegetation types] has not made it possible to describe the orchids in any other way than carried out here, but to give some idea of their general growth, I would like to give a short illustration of the orchid-flora of a typical mist-forest, viz. of the forest on the ridge of the Kani Range which extends fairly evenly at an altitude of from 950–1100 m. Since I had a better opportunity to become acquainted with it than all the other ranges, I was able to obtain a more complete picture of the orchid-flora than from the other mountains which I only managed to visit for a short period. The Kani Range is situated on the upper Minjem which flows into the sea at Astrolabe Bay, near Stephansort, between the fresh-water rivers Mudjene and Djamu. If we ascend the front of the mountain range from the Djamu side, we reach the beginning of the ridge at an altitude of about

900 m, rising gradually to about 1000 m, and then extending fairly level, in order to reach its highest point at about 1100 m, a little behind our former base (the re-organized Kani Base). We will examine the orchid-flora from the commencement of the ridge.

As soon as we reach the beginning of the ridge, we are met with a refreshing breeze after our steep and strenuous ascent from the valley. When we observe the forest trees around us, we see that the growth of epiphytes already is more abundant than at lower levels and particularly is it apparent that the covering of moss is much more in evidence. On closer inspection we notice here and there on the tree-trunks, specimens of a very dainty little *Taeniophyllum* and on fallen trees isolated little plants of *Schoenorchis sarcophylla* Schltr., as well as various species of *Bulbophyllum* clinging to the dying branches. After a short march our path again rises fairly steeply and we reach a new, but welcome, obstacle in a fallen tree, for such trees are always a treasure-trove to the orchid collector. Walking along the bole we soon reach the crown of the tree. We are confronted with a considerable quantity of epiphytes and these for the greater part prove to be ferns, but suddenly there are noted shining white stars belonging to a little pendant-branched bush, which on closer inspection proves to be the first species of *Glossorhyncha*, an indication of the proximity of the mist-forest formation. A long, pendant unbranched plant with racemes of tiny, white hanging flowers is recognised as a *Phreatia*, and is undoubtedly *P. elongata* Schltr. In close proximity to this are two more orchids belonging to the same genus, with narrow pointed leaves and a stem which is not elongated. From the same tree we collect other orchids, such as some small species of *Bulbophyllum* and *Oxyanthera*, a single specimen of the magnificent *Dendrobium Johnsoniae* F.v.M., *D. trachyrhizum* Schltr., as well as the beautiful *Dendrochilum Bartonii* Schltr. and the magnificent *Coelogyne Beccarii* Rchb. f.

We are climbing further up the narrow ridge and suddenly see before us a very curious wiry stem which bears a flower brownish on the outside and white within. This is the saprophyte *Lecanorchis papuana* Schltr. which grows here in association with some *Triuridaceae* and *Burmanniaceae*. In the humus of the forest we also see a specimen of the small, green-flowered *Habenaria papuana* Krzl. and of *Microstylis undulata* Schltr.

On attaining the summit a more level terrain is reached. The trees now are covered thickly with moss and full of epiphytes of all kinds. The atmosphere is cool and pleasant, but the air is laden with moisture.

Up here, the number of epiphytes on the tree trunks is very remarkable. There are not only ferns, *Gesneriaceae* and *Zingiberaceae*, but also orchids in large proportion. The genus *Bulbophyllum* is, especially, well represented, particularly in species belonging to the sections *Brachypus*, *Polyblepharon*, *Leptopus* and *Pelma*. Very frequently two species of *Liparis* also are seen, viz. *L. truncicola* Schltr. and *L. genychila* Schltr. with olive-green flowers, as well as the very peculiar *L. schistochila* Schltr. Of *Dendrobium*, the charming *D. Lawesii* F.v.M. hangs everywhere from the stems of trees. Further up the tree-trunks we find certain robust plants with conspicuous racemes of large creamy white, violet-marked flowers. These are the very pretty *D. Forbesii* Ridl. var. *praestans* Schltr., which often is accompanied by a relative, *D. musciferum* Schltr. with smaller greenish flowers. In *D. leucohybos* Schltr. with white flowers and an orange-yellow lip, we find another charming section-representative. On the larger trunks, broad bushes with flat stems often are found with spreading leaves and dense round heads of small white flowers, all at the same level; these are species of *Agrostophyllum* of which a large and unexpected number occur in

New Guinea. Another pretty plant, a species of *Glossorhyncha*, *G. brachychaete* Schltr., hangs down from the trees and is recognised by its white flowers, contrasting with which the long-stemmed, shining, scarlet flowers of *Epiblastus lancipetalus* Schltr., arranged in fascicles, are very conspicuous. This plant also is very pendant, but has long, single-leaved pseudobulbs arranged after the manner of *Pholidota articulata* Lindl., one on top of the other.

Monopodial orchids also are present, for often the yellow flowers of *Sarcochilus chrysanthus* Schltr. may be seen, or one of the dense pendant racemes of *Robiquetia hamata* Schltr., with brownish red, dark-spotted flowers, catches the eye.

If we had time to penetrate still further into the primary forest we could collect many beautiful and interesting plants, but to become acquainted with the epiphytes visible on the branches of the trees we will fell one of these primeval giants, a task by no means easy, but one which brings its reward, as we shall see presently. With a terrific crash the tree eventually falls, carrying with it a number of smaller trees. What we now see exceeds all expectations. It is in itself an orchid-garden, which if it could be transported to Europe as we now see it, would excite general admiration. Of course, orchids are not the only epiphytes to be admired here; they grow in association with numerous ferns, *Lycopodiaceae*, species of *Hoya* and *Dischidia*, various ant-plants belonging to the genus *Hydnophytum*, numerous *Zingiberaceae* with beautiful coloured flowers, especially species of *Riedelia*, and magnificent species of *Rhododendron*, of which *R. Schlechteri* Lauterb. must be regarded as the crown of the genus, and which alone would warrant a visit from a plant collector to New Guinea.

But to return to the orchids: in the forks of the lower limbs we find large branched bushes, an orchid with tiny white flowers, which is noticed only when seriously searched for. This plant is called *Bulbophyllum dichotomum* J.J. Sm. on account of the dichotomous branching of its somewhat wiry stems. Also seen is a brown-haired *Eria*, *E. iodantha* Schltr. of the section *Trichotosia*, as well as another species with long racemes of small white, woolly flowers, *E. bifalcis* Schltr., and alongside them specimens of the pretty fragrant *Coelogyne fragrans* Schltr. with large yellowish white, brown-marked flowers, together with the handsome *Dendrochilum Bartonii* Schltr.

The more we search the crown of the tree, the richer becomes our treasure. The almost globular, shining, scarlet-red flowers of *Mediocalcar kaniense* Schltr. with their green tips, are conspicuous here, as well as *M. latifolium* Schltr.; so also are the shining orange-yellow racemes of the large and pretty *Liparis spectabilis* Schltr. which would form an adornment in any European collection, and the globular heads of white flowers with orange-red or green lip-callus of *Glomera kaniensis* Schltr. and *G. subpetiolata* Schltr. Over there the branches are covered with the pretty *Dendrobium pentapterum* Schltr., the orange-red tips of the labellum contrasting daintily with the otherwise pale sulphur-coloured flower. If we approach the tips of the branches closer, still further different forms become apparent; such as the small *Oberonia* and *Liparis* species; small [species of] *Bulbophyllum* in all stages of development, the delicate [species of] *Ceratostylis* such as *C. kaniensis* Schltr., furthermore a series of genera belonging to the *Sarcanthinae*, represented often by tiny species, among which may be mentioned especially *Calymmanthera montana* Schltr., the charming delicate-flowered *Hymenorchis kaniensis* Schltr., species of *Microtatorchis*, and the minute *Taeniophyllum*, such as *T. kaniense* Schltr., *T. pubicarpum* Schltr. and *T. ovale* Schltr.

We continue our march, and here and there collect a terrestrial orchid, which we have not found previously, such as *Calanthe kaniensis* Schltr. and *C. cruciata* Schltr., both with white flowers; also the striking and stately *Habenaria polyschista* Schltr. with its finely slit petals and lip-segments. Some terrestrial species of *Liparis*, and

particularly of *Microstylis*, e.g. *M. laevis* Schltr., *M. diploceras* Schltr. and *M. leucodon* Schltr. occur sparsely, the latter with dark violet flowers, and each with a white bi-dentate lip.

Everywhere we may enrich our collection from tree-trunks and sometimes from shrubs. From the latter in particular, species of small *Oberonia* and *Bulbophyllum* can be obtained, while various species of *Liparis*, *Podochilus*, *Appendicula* are to be seen on the trunks and numerous species of *Dendrobium* and *Bulbophyllum* may be found at every step. Every rotting or living branch, broken off by the wind, may bear one or more species still unknown, so that I was able to collect quite a large number in this way. Should we be fortunate to come across fresh foliage, there is no end to the variety of forms. What can be collected here exceeds our utmost expectations. It may be said that every tree supplies a number of peculiar species. It frequently happens that a score or more different orchids may be collected from a single tree in the mist-forest formations of Kaiser-Wilhelms-Land. On the other hand, I also have seen trees which were covered completely with one or several species always in great numbers, such as species of *Bulbophyllum* belonging to the sections *Manobulbon* and *Pelma*, as well as various *Glomerinae*.

A fairly general distribution is shown by many of the small species of *Bulbophyllum* and *Dendrobium*, e.g. *D. cyanocentrum* Schltr., and the dainty, abundantly flowered *D. pumilio* Schltr., *Eria oligotricha* Schltr., *Appendicula tenuispica* Schltr., *Phreatia kaniensis* Schltr., *P. urostachya* Schltr., and a few species of *Taeniophyllum*. The remarkable *Ridleyella paniculata* Schltr., with its small violet-blue flowers, is found in isolation and never in large numbers, so also the pretty *Bulbophyllum oobulbum* Schltr. and many other species of this genus, as well as numerous, and sometimes very beautiful, species of *Dendrobium*. It is remarkable that one may remain on such a mountain range for a long time and yet always find something new and unexpected, since individual species are in flower at different times, sometimes once, sometimes more often during the year.

A very special category, amongst the terrestrial inhabitants of the humus, is formed by the coloured-leaved orchids of the mist-forests, as also was the case on the Kani [Range]. By no means are they detected easily, since their leaves are mostly of a dark colour, and they grow by preference beneath shrubs in dark places or at the foot of very old trees. Many of them are discovered more easily after they have opened their white flowers.

I will now conclude this sketch which is intended to give a general survey of the occurrence of orchids on the Kani Range. A study of the Systematic Part [of this book] will convince everyone that the number of species occurring on these mountains is considerably larger than mentioned here.

BIOLOGICAL-MORPHOLOGICAL

In this short chapter, I would like to publish some biological-morphological notes collected during my stay in New Guinea, and I will begin by drawing attention to some especially interesting forms.

I already have had the opportunity to refer to the remarkable manner in which some terrestrial orchids elongate their fruiting pedicels after fertilization. That this elevation of the fruit has the purpose of distributing the seed over a wider area cannot be doubted. Such elongation of the fruiting stem I have observed in four genera, viz. *Didymoplexis*, *Gastrodia*, *Corysanthes* and the single-flowered species of *Nervilia*. These cases now will be considered in detail.

In *Didymoplexis* and *Gastrodia* we are discussing saprophytes with more than one flower and 5–10 cm high. In fertilized specimens, we can see plainly that the ovary, being sessile, elongates slightly before fertilization, and that the elongated part is chiefly the lower portion, which may attain double the length of the rest of the plant at the time of maturation of the fruit; that is to say the fruit discharges its contents at a height of over 30 cm instead of 10 cm. This makes it possible for it to rise above the vegetation which surrounds the plant and to come within reach of air-currents, which carry the extremely light and fine seeds for at least some distance. The three species in both genera known from New Guinea behave similarly.

In *Corysanthes* the conditions are slightly different. The species are normally single-flowered, and I do not remember seeing a species of *Corysanthes* with more than one flower. All of the species growing in the humus are so short that, without special provision, the seed would have to fall to the ground close to the mother plant. Here also, however, the lower part of the sessile ovary is elongated into a long stem (up to 20 cm in length) by means of which the same purpose is attained as in the case of *Didymoplexis* and *Gastrodia*. The capsule itself remains short and moves to-and-fro in the slightest breeze. The scattering hairs, by means of which the capsule is emptied, are strongly hygroscopic, so that the emptying occurs chiefly on damp days. In New Guinea in particular, a fair proportion of the species of *Corysanthes* are epiphytic, and it is characteristic of these that, since they already grow at a breezy altitude, they do not elongate their flower stems after fertilization, but possess sessile seed capsules. In my opinion, it is perfectly clear that the elongation of the fruit-stem in the terrestrial species serves solely to enable them to distribute the tiny seeds as far as possible.

The single-flowered species of *Nervilia* are distinguished, in many biological respects, from the single-flowered species of *Corysanthes*. In them, from the beginning, the flower stands more-or-less upright. After fertilization, a contraction of the flower-stem occurs, but there is no elongation. The consequence is, that the flower hangs downwards, and there now occurs a marked elongation of the peduncle but not of the pedicel, while the capsule ripens and swings to-and-fro on its contracted stems by its growing weight. When ripe, the least draught is sufficient to carry the dust-like seed from the very light, swinging capsule. In species of *Nervilia* with more than one flower, a longer peduncle is normal, hence special elongation under these circumstances does not occur.

Another saprophytic genus, *Lecanorchis*, is distinguished by its wiry stems, which always form new side-branches when the main part of the upper terrestrial shoots is exhausted, and the older they are the more rigid they become. The fruits stand on the stiff upright points of the stem which is always about a foot high, and open in such a

way that the uppermost part, called the 'calculus', is dismembered, so that the carpellary leaves and the three connecting ribs become free and gradually spread apart. The seed is now shed from the fruit by the least movement of the wiry stem. An ordinary breeze is insufficient to cause such a movement, which owing to the stiffness of the stem must be somewhat jerky in its nature. The plant, therefore, shows a preference for a location on exposed narrow mountain ridges, where it is subject to severe storms, even in a fairly dense covering of forest and shrubs.

Unfortunately, in the tropics it is almost impossible to remain at the same place for even the short time at the disposal of Europeans in order to conduct observations on the development of terrestrial orchids. Likewise in Europe, few facts concerning such matters have become known. If we consider what a large quantity of fertile seed actually is formed annually, and likewise how sparsely specimens of most species of terrestrial orchids occur in the New Guinea forests, we reach the conclusion, that, if only one seed out of many thousand develops into a flowering plant, this would be sufficient to maintain the species. However, one of the most remarkable facts is that of the many terrestrial orchids produced in the primary forests, seedlings are hardly ever encountered, except in certain groups of orchids which mostly occur in colonies. We are here faced with certain puzzles. It is impossible that plants can develop just as well under natural conditions as the hybrids produced in cultivation from seed, but it seems feasible for plants living in close symbiosis with mycorrhiza to invigorate their subterranean parts, to develop for years subterraneously without showing a sign of life on the surface when external conditions are unfavourable to them. It is remarkable, for instance, that in plants so difficult to observe as *Ophioglossum* and *Salvinia*, the development was known long ago, whereas in the higher saprophytic orchids, even in European species, the problem remains quite uninvestigated. Here, however, it would appear that the plant only shows signs of life above the surface when it is ready for flowering. It is thus evident that interesting biological questions still exist and that the solution will be possible only when an opportunity is available to observe the species concerned over a series of years.

The above remarks refer mainly to the *Basitonae* and to certain groups of the *Polychondreae*. In the *Physurinae* an increase by seed seems to occur very rarely, though here an increase by division occurs naturally. There are *Physurinae* whose rhizomes creep about 10 cm annually, and from time-to-time form side-branches, which soon become separate individuals as the stem grows in front and later turns into a rhizome in its lower part, so the rhizome disappears gradually from behind. Wherever branching exists, the branches become free in this way, thus becoming independent plants, nourished by their own roots and growing in various directions. In epiphytic *Polychondreae*, propagation by seed occurs more frequently.

Another group, *Liparidinae*, which also includes a considerable proportion of terrestrial orchids, seems to multiply more readily by seed since seedlings very often may be observed. The case is similar in the *Phajinae* for the genera *Acanthephippium*, *Spathoglottis*, *Plocoglottis*, *Phajus* and *Calanthe*, while in *Pachystoma*, as well as in the *Cyrtopodiinae* and the *Collabinae*, the method is practically the same as that stated for the *Basitonae*. The only *Paphiopedilum* known from the Territory seems to propagate freely from seed.

There is not the least doubt that epiphytic orchids, even in those cases where they occasionally occur as rock-epiphytes, develop from seeds much more readily than do the terrestrials. Possibly, it may be that seeds on rocks or on bark find more favourable conditions for germination or, rather for appreciably better development, than on soil, even though this is opposed by the fact that on high mountains, where epiphytic

orchids frequently are close to the ground, the development of the seeds is just as favourable.

Seedlings are observed always in most groups of epiphytic orchids. Of course, the conditions are not the same in all cases, yet a few observations convince one that various genera would multiply copiously were they not checked somehow by various enemies. On large thick trunks with cracked bark, especially in the mist-forests, the development of certain species from small seedlings up to large flowering plants may be studied closely. In many species of *Agrostophyllum*, *Oberonia*, *Phreatia*, *Bulbophyllum*, *Dendrobium* and other genera growing under similar conditions, the seed falls perpendicularly and remains near the stem under the plant concerned, where it develops in the usual way, and often hundreds of small plants, at all stages, may be found below the mother-plant.

Certain species and genera, found high up on trees, such as *Ceratostylis*, *Glossorrhyncha*, *Ischnocentrum*, certain species of *Dendrobium*, *Bulbophyllum* and others, where they are exposed to the winds, are often quickly dispersed over the whole crown of the tree, so that there is hardly a branch without them. From here the seed is carried in all directions by the wind. In this way I have seen species of *Glossorrhyncha* and *Ischnocentrum* distributed very rapidly. It is evident that certain epiphytic species display a preference for specific trees or bark, indeed some certainly are restricted to such trees. It is characteristic of epiphytes with short rhizomes, i.e. those which form colonies, that they are more capable of multiplying from seed than those with long-creeping rhizomes, such as the species of *Bulbophyllum* belonging to the sections *Hedyothyrsus* and *Uncifera* which cover the entire crown of the tree, and which increase by a subsequent division of the rhizome into many individuals.

Of special interest is the discovery that certain minute and mostly leafless species of *Taeniophyllum*, and similar [orchids], may bloom within a year after being sown. I have observed that some species of *Taeniophyllum* and *Microtatorchis* establish themselves by preference on the tips of branches, and I was able to show that these tips on which the flowering specimens of the orchid concerned were found could not be more than a year old at most, and that, consequently, the epiphytes concerned must be younger still. Certain species are quite characteristic in their preference for certain parts of the crown of the tree or trunk. Many are found almost only in the forks of branches, others prefer the middle of the crown and, lastly, many of the smaller species occur on the tips of the branches, where it is easy to estimate their age by the age of the sub-stratum.

It must strike every student of the *Orchidaceae* that in New Guinea a very large proportion of them hang down perpendicularly from the branches of trees, and wave to-and-fro in the slightest breeze, but on the ridges of the mountains, they are so lashed about by storms that it is surprising that the main parts forming the rhizomes are not broken or torn off completely. As far as I could ascertain, Nature seems to have interposed in a peculiar manner to prevent this. The roots, always reforming on the rhizome after completion of the pseudobulbs, creep under cover of the involucreal leaves surrounding the rhizome, and thoroughly penetrating these throughout, though not visible from the outside, grow right up to the base of the plant and reinforce the roots already there to obtain a new and firmer hold, for the better support of the plant which is exposed to great strain. If the plant now is fastened securely, the rhizome loosens, beginning at the base, and indeed more quickly than the involucreal leaves belonging to it. The lower part of the swinging stem now consists only of intertwining roots, which form a string-like lacing, occasionally used by me in New Guinea when I required short strings. I have seen specimens of *Bulbophyllum lepanthiflorum* Schltr.

hanging perpendicularly in lengths of 1.5 m, indeed even longer in *B. djamuense* Schltr., while the growing apical part of the uninjured rhizome is seldom more than 20–30 cm long. Thus, it will be seen that Nature has found a good means for the protection of the plant. The cause of this common geotropism in many New Guinea epiphytic orchids is difficult to explain. We are, of course, acquainted with some cases of this kind in America, e.g. in *Epidendrum vesiculosum* Lindl. and *Pleurothallis pectinata* Lindl., also in Malaysia, but nowhere in such great numbers as in New Guinea. The very delicate flowers must, to some extent, be protected from the heavy rain. I may at least assume this where the leaves, as in the above-mentioned American *Orchidaceae* and likewise in *Bulbophyllum lepanthiflorum* Schltr., form a roof over the flowers. Moreover, it may well be assumed that the plant in this position requires a less tense stem. Characteristic of nearly all geotropic species is the usually single-flowered inflorescence, which hardly ever exceeds the leaves in length.

More common than might be supposed is self-fertilization in the orchids of New Guinea. Here we must separate self-fertilization occurring in expanded flowers, from that which takes place in closed flowers (cleistogamy). I will now explain my observations on the first group.

To begin with we shall consider those cases in which the transformation of the two outer floral whorls (sepals and petals, including labellum) has not taken place. Here self-fertilization is due nearly always to the non-development of the rostellum. The mucus secreted by the stigmatic surface overflows its borders and comes into contact with the pollen-masses, causing them to shoot forth their tubes at once. It is remarkable that in genera, the pollinia of which are provided normally with stipes and viscid discs, these latter parts do not develop and the pollinia lie perfectly free at their bases. Such conditions are not rare in *Calanthe*, *Appendicula* and *Phreatia*. More rarely the pollinia produce their tubes before coming into contact with the stigmatic surface, as for instance in some species of *Calanthe*, or they may be pressed out by the shrinkage of the anther and then fall on the stigmatic surface lying directly beneath them.

The cases in which there is a transformation of the inner floral whorl, mostly of a pelorial nature accompanied by self-fertilization, are by no means rare. Such transformations, especially, occur in *Spathoglottis*, *Agrostophyllum*, *Appendicula* and *Oxyanthera*.

Since these genera are not always alike we will consider them separately. The pelorial flower of *Spathoglottis* has been described as a separate genus, *Paxtonia*, in which the sepals, petals and labellum are almost similar. Since the column has no definite foot in the normal flower, a transformation is caused here merely by its direct stretching, and, contrary to the condition in the normal flower, the lower part is hardly thinner than the upper. Fertilization is caused by the pollinia being pressed out by the shrinking of the anther and then falling on the stigmatic surface.

In *Agrostophyllum*, the sepals of the pelorial flowers usually are more pointed and lanceolate than the segments of the inner whorl. The column, which is normally footless, thickens and shortens itself, and not infrequently shows two conical appendages in front of the stigma, which may be regarded as rudimentary anthers. The stigmatic surface secretes a remarkable quantity of mucus, which oozes over its margins and reaches the pollinia, which are not protected by a rostellum.

In *Appendicula* two degrees of transformation may be recognised. In the first case, there is certainly a reduction [in size] of the column-foot, but it is still always present to the extent that the flower is easily recognisable from the outside as zygomorphic. The lip and petals resemble each other very closely. The column differs in its upper part from that in the normally developed flower only by the complete

suppression of the, otherwise, erect rostellum. Since this, of course, means the obliteration of the partition separating the pollinia or anther and the stigmatic surface, self-fertilization follows, especially if the anther inclines forwards, since in this way the pollinia are pressed against the margin of the stigma. The second pelorial transformation, which I have designated '*Lobogyne*', is characterised by a complete suppression of the column-foot-formation, so that outwardly the flower appears actinomorphic. Here the sepals are almost similar to one another, and the petals and labellum have the same elongated shape. The column is very short and thick and has in front the stigma appendages similar to those described in the *Agrostophyllum*-form. Fertilization also takes place in a similar way.

Especially interesting are the stages in *Appendicula*, where, in spite of the transformation in the inner floral-whorl and also partly of the column, a normal rostellum is present, as for example in *A. bracteosa* Rchb. f. These cases, perhaps, may be regarded as a reversionary development to the normal flower-form of the genus, or as a transitional stage to self-fertilization of the peloria, which is still dependent on cross-pollination. I am inclined to accept the first alternative, since I regard self-pollination in the orchids as an adjustment to certain climatic conditions, which should assure the maintenance of reproduction in this highly organized family.

Also I must not neglect the genus *Oxyanthera*, in which the flowers likewise are distinguished frequently by complete suppression of the rostellum. The alteration which takes place in the shape of the lip under these conditions seems to differ from case to case. Here I have been able to establish considerable variations, which gradually merge into each other, but, of course, each case seems to be constant for the individual concerned, indeed even for the location concerned. The typical lip-shape in *O. papuana* Schltr. is lanceolate, linguiform, pointed at the apex, narrowed in the middle, and with a concave base provided with a callus. From this shape, to a simple lanceolate, very pointed, with or without a concave base, a whole series of transitions may be found, leading one almost to believe that a number of species are under examination. The column is short and thick, but since the rostellum (which is normally very high) to which the very long anther had to adapt itself, is missing, this is more-or-less shortened in the self-fertilized specimens, but as in the normal shapes it is situated obliquely and during its shrinkage expresses the pollinia, which are without either caudicle or viscid disc and are now brought into direct contact with the over-flowing stigmatic fluid, or else fall on to the stigmatic surface.

Cleistogamy is spread extensively in certain groups of New Guinea orchids, particularly in the *Liparidinae*, the *Podochilinae*, the section *Grastidium* of *Dendrobium* and in the *Thelasinae*. We must here distinguish between such cleistogamic flowers, as those in which (in contrast to the normal forms) a transformation takes place in the floral whorls, especially the inner one, and on the other hand, those flowers in which the whorls are developed normally, but which never open. The first case, especially, may be observed in the *Thelasinae*, but I have also been able to trace it in *Thrixspermum* and *Liparis* in the Malayan Archipelago. Possibly there should be included here certain species of *Microstylis*, which are not known at present in the normal form. The transformations in these genera are confined mostly to the labellum which assumes a more simple shape and approximates in outline to the shape of the petals. The column is shortened always and the rostellum never developed. Here the pollinia undergo no movement or dislodgement, but from the beginning already lie so close to the stigmatic surface that soon after their maturity they shoot out their pollen tubes, and thus set a capsule for every undamaged flower in the inflorescence.

Fairly large, or at least larger than was supposed up to the present, is the number of those species in which the other form of cleistogamy occurs, i.e. in which the segments of the two floral-whorls are exactly similar to those in the normal flower, but in which the flower never opens. Here the column is distinguished from the normal species, in that the development of the rostellum has been arrested. Such forms are found in *Microstylis*, *Oberonia*, *Liparis*, *Plocoglottis*, *Appendicula*, *Cyphochilus*, *Dendrobium* and *Phreatia*. It would appear that this form of cleistogamy is by no means *always* the rule for certain individuals, since I have seen normally developed flowers on plants, for instance in *Cyphochilus*, which at other times only developed cleistogamic flowers. But, usually, it is a remarkable fact that certain species evidently always bloom cleistogamically, that is to say cleistogamy has become a species-character with them, e.g. in *Appendicula cleistogama* Schltr. It is also a peculiar circumstance, that at certain high altitudes, the cleistogamic form is developed by some species, which a few hundred metres lower down otherwise would develop perfectly normal flowers. My attention was first directed to this peculiarity in 1907 when I found *Liparis caespitosa* Lindl. everywhere in the lower levels of the upper altitudes in the Padang district of Sumatra with normally developed flowers; but between the mountains in the so-called 'rainy spots' which are characterised by long continued rain, I always found the cleistogamic form. I continued my observations in New Guinea and came to the conclusion that the number of cleistogamic orchids was increased, especially in the 'rainy spots' of the mist-forest, and particularly in the wettest months. As the result of these observations, I think I may now assume that cleistogamy may be produced by excessive and continuous moisture, that is if the climatic conditions are unfavourable to the insect-agent for the pollination of the plant. But that there are still other factors at work in the production of cleistogamy is proved by the occurrence of cleistogamic species in the vicinity of the coast (for instance *Oberonia cleistogama* Schltr. and *Appendicula cleistogama* Schltr.) which are not subject merely to temporary cleistogamy like many mist-forest epiphytes, but in which cleistogamy has been established as a species-character. We thus see that there are here many interesting problems to be solved by the biologist.

Almost as striking as cleistogamy is ephemerism in orchids. This is observed frequently in New Guinea, and so far no explanation of it has been found. It is characteristic of ephemerism that not only do all flowers on one specimen usually open suddenly on the same day, but on all individuals of one species, often over very wide areas and frequently only for a few hours, only to wither the following day and fall off on the third day. It is obvious that under such conditions, very little opportunity is afforded for fertilization. But in order to attract insect-agents, Nature has provided most of these species very often with bright and conspicuous colours and frequently with very agreeable odours. However, the number of fertilized fruits in these species is very low. It has not been proved with certainty that the simultaneous opening of the flowers is in any way dependent on weather conditions, though this is probable, especially in connection with certain showers. This sudden opening repeats itself several times every year, but there are certain species, such as a number of those belonging to *Sarcochilus* and *Dendrobium*, in which this happens only once a year. In *Thrixspermum* and in the section *Desmotrichum* of *Dendrobium*, only one or two out of the many flowers in the inflorescence open; these are followed by others, at certain intervals, until the inflorescence is exhausted. It may happen in the bunched flowers of *Dendrobium*, *Desmotrichum* and *Rhopalanthe*, that isolated flowers appear at longer intervals on the pseudobulbs, i.e. stems several years old. Thus in the plant world, we have occurrences similar to those known in the animal world among certain insects,

such as termites, and the one-day-flies (*Ephemera vulgata* L.) which suddenly all appear in large numbers on a certain day, and again disappear just as quickly. That this remarkable sudden appearance of the flowers can be very striking is shown by the circumstances, already recorded by H.N. Ridley, that the days on which all the flowers of *Dendrobium crumenatum* Sw. suddenly expand, are known in Singapore as 'Pigeon-Orchid days'. This ephemerism has been recorded in New Guinea, up to the present, in the following genera: *Dendrobium* (*Desmotrichum*, *Goniobulbon*, *Diplocaulobium*, *Euphlebium*, *Grastidium*, *Dichopus* and *Eriopexis*), *Thrixspermum*, *Sarcochilus* and *Taeniophyllum*.

Generally, it is known that saprophytism is not rare in the *Orchidaceae*, nevertheless I believe there are few regions in the world in which such a great number of saprophytes, especially saprophytic orchids, occur, as in the monsoon region. New Guinea, likewise, is very rich in such species. At present, 13 saprophytic species are known and these are divided among the following genera: *Corysanthes* (1), *Galeola* (3), *Lecanorchis* (2), *Aphyllorchis* (2), *Epipogum* (1), *Didymoplexis* (2), *Gastrodia* (1) and *Cystorchis* (1). To these must be added a species of *Nervilia* and one of *Eulophia*, which I regard as semi-saprophytic.

Very remarkable is the fact, already observed by Ridley, that certain saprophytes of the primary forest always occur in association with other species, thus forming mixed colonies. The same thing applies to all smaller saprophytic orchids in New Guinea. These usually grow in colonies with *Triuridaceae*, *Burmanniaceae*, *Epirhizanthus* or *Cotylanthera*, indeed often all mixed together. I must thank this circumstance for more than one interesting find, since wherever I found one of these saprophytes, I looked for others, seldom in vain.

Considering the great number of species comprising the orchidaceous flora of New Guinea, it is surprising how small a number of hybrids has been reported from there, and I believe that very few of the species described by me will prove to be hybrids. According to this, New Guinea appears to be a country in which there is no marked tendency to hybridization among the orchids. This is all the more remarkable, because species of the same genera grow here mixed together more than in other countries. I feel inclined to believe that this rare occurrence of hybrids is traceable to the heavy rainfalls which do not appear to exert a favourable effect on the crossing of species, since those countries in which the number of orchid hybrids is a proportionately high one, such as the Mediterranean regions and that of Central America, are distinguished on the average by their fine weather.

CLASSIFICATION

The development of a system of classification of the *Orchidaceae* is a long story, and the number of authors who have assisted in building it up is considerable.

Whereas in the time of Linnaeus the few distinctive genera were placed merely side by side, Olaf Swartz in 1800 made the first attempt to group the genera, of which he arranged quite a number. He also was the first to recognise the difference between the *Monandreae* and the *Diandrae*. The *Monandreae* was divided further into three groups, characterised as follows:

1. Anther subterminal, connate with the very short style. Flowers spurred. Including the genera: *Orchis*, *Disa*, *Satyrium*, *Pterygodium*, *Disperis*, *Corycium*, *Ophrys*, *Serapias*.
2. Anther erect, parallel with the style, affixed to its posterior side. Including the genera: *Neottia*, *Cranichis*, *Thelymitra*, *Diuris*.
3. Anther lid-like inserted by the posterior margin on to the summit of the style. Including the genera: *Arethusa*, *Epipactis*, *Malaxis*, *Cyperbidium* [sic?], *Oncidium*, *Epidendrum*, *Vanilla*, *Aerides*, *Limodorum*, *Dendrobium*, *Stelis*, *Lepanthes*. We see indicated in this division, a separation of Lindley's later group, *Ophrydeae*.

The next division we owe to Robert Brown, who divided the orchids collected by him in New Holland [Australia] into five sections, which he characterised as described below. Since he attaches the designation '*Monandreae*' to each section-number, it is evident that he regards the Swartzian group '*Diandrae*' as strictly opposed to it.

- Sect. 1. Anther with separate lobes adnate near the apex of the column. Pollen-masses consisting of numerous lobules, cohering by elastic material, with difficulty dissolved into granules (compound). Terrestrial herbs. Genus: *Habenaria* W.
- Sect. 2. Anther parallel to the stigma, persistent, its loculi close together. Pollen-masses powdery, easily resolved into (single) granules, attached by the apex to a thread leading to a gland arising from the stigma. Terrestrial herbs. Genera: *Thelymitra* Forst., *Epiblema* R. Br., *Diuris* Sm., *Orthoceras* R. Br., *Cryptostylis* R. Br., *Prasophyllum* R. Br., *Genoplesium* R. Br., *Neottia* Jacq., *Calochilus* R. Br.
- Sect. 3. Anther terminal, persistent, loculi close together. Pollen-masses powdery, produced from single, separable granules, attached by their bases to a gland of the stigma. Terrestrial plants. Genera: *Microtis* R. Br., *Acianthus* R. Br., *Cyrtostylis* R. Br., *Chiloglottis* R. Br., *Eriochilus* R. Br., *Caladenia* R. Br., *Lyperanthus* R. Br., *Glossodia* R. Br., *Pterostylis* R. Br., *Corysanthes* R. Br., *Caleana* R. Br.
- Sect. 4. Anther terminal, movable, deciduous, loculi close together. Pollen-masses composed of numerous angular lobules cohering elastically together. Roots parasitic. Genus: *Gastrodia* R. Br.
- Sect. 5. Anther terminal, movable, lid-like, deciduous. Pollen-masses smooth, waxy. Parasitic, a few terrestrial. Genera: *Dipodium* R. Br., *Cymbidium* Sw., *Sarcophilus* R. Br., *Dendrobium* Sw.

Although this division was founded only on Australian genera, it must be admitted that here already a portion of the genera (even now regarded as related to each other) have been arranged correctly. Thus the first section contains the later *Ophrydeae*, sections 1, 2, and 4 contain the later *Neottieae*, and section 5, the later *Vandaeae* and *Epidendreae* of the Lindley-Bentham system.

The next attempt to divide the *Orchidaceae* into groups of genera was made in 1818 by Louis Claude Richard, who established four different sub-groups of the family as follows:

1. Pollen sectile. Caudicle retinaculate.

Containing 10 genera: *Serapias*, *Loroglossum*, *Anacamptis*, *Orchis*, *Ophrys*, *Nigritella*, *Gymnadenia*, *Platanthera*, *Herminium*, *Chaemorchis*. Even today these genera stand closely together.

2. Pollen sectile. No caudicle.

Containing 2 genera: *Epipogum*, *Goodyera*.

3. Pollen granular.

Including six genera of which five have only a single anther, viz. *Limodorum*, *Spiranthes*, *Neottia*, *Cephalanthera* and *Epipactis*. The sixth genus, *Cypripedium*, has two anthers placed opposite each other.

4. Pollen solid.

This fourth group also contains two sub-groups, viz. *Calypso*, *Liparis* and *Malaxis* with unilocular anther-cells and *Corrallorhiza* with bilocular anther-cells. In this division it will be noticed first of all, that L.C. Richard has founded his system on the *Orchidaceae* of Europe, and has not considered the extra-European genera, of which a considerable number were known already.

Finally, the first lucid classification, including all the genera known up to that time, was that of Lindley (1826) who often has been regarded rightly as the father of orchidology. He divided the family into four sub-families, containing eight tribes. His division and characterisation are as follows:

§ 1. *Neottieae*. Pollen simple or cohering loosely in granules.

Tribe 1. *Neottieae*. Anther erect, parallel with the stigma.

Tribe 2. *Arethusae*. Anther terminal, lid-like.

§ 2. *Orchideae*. Pollen cohering in waxy granules, indefinite in number.

Tribe 3. *Gastrodieae*. Anther terminal, lid-like.

Tribe 4. *Ophrydeae*. Anther terminal, erect or inverted.

§ 3. *Epidendreae*. Pollen cohering in waxy grains, definite in number.

Tribe 5. *Vandaeae*. Pollinia attached to the stigma by a diaphanous caudicle or gland.

Tribe 6. *Epidendreae*. Pollinia attached to the stigma by filiform powdery replicate caudicles.

Tribe 7. *Malaxideae*. Pollinia free; either cohering by the apices to viscid, powdery or granular material.

§ 4. *Cypripedieae*. Lateral anthers fertile; intermediate one sterile petaloid.

Tribe 8. *Cypripedieae*.

This classification was somewhat modified by Lindley, after he had finished his 'Genera and Species of Orchidaceous Plants' in October 1840, and in the following manner:

1. Anther only one.

A. Pollen masses waxy.

a) No caudicula or separable stigmatic gland:

Tribe 1. *Malaxeeae* (or *Malaxideae*);

b) A distinct caudicula, but no separable stigmatic gland:

Tribe 2. *Epidendreeae*;

c) A distinct caudicula united to a deciduous stigmatic gland:

Tribe 3. *Vandeeae*.

B. Pollen powdery, granular or sectile.

a) Anther terminal, erect: Tribe 4. *Ophreeae* (or *Ophrydeae*);b) Anther terminal, opercular: Tribe 5. *Arethuseae* (including *Gastrodieae*);c) Anther dorsal: Tribe 6. *Neottieae*.2. Anthers two: Tribe 7. *Cypripedieae*.

Unfortunately, H.G. Reichenbach f., the greatest orchidologist of all times who donned the mantle of Lindley, has never expressed his opinion with regard to a comprehensive classification of the *Orchidaceae*, so we must assume that he accepted the views of Lindley, and later on the modifications made by Bentham. Since he frequently met George Bentham, it is also possible that he influenced the latter in many ways. The largest comprehensive (partly compiled) work on the *Orchidaceae* which occupies the greater part of volume VI of 'Walpers Annales' (1861) is arranged in the Lindleyan tribes, and later on Reichenbach f. never expressed himself as definitely against this division, although he often differed in opinion from his predecessor with regard to the position and delimitation of certain genera.

The Lindleyan classification of the *Orchidaceae* was thus retained and in 1881 an alteration was made by G. Bentham in his 'Notes on Orchideae' and again in 1883 in vol. 2 of Bentham and Hooker's work 'Genera Plantarum'. Bentham reduced the seven Lindleyan tribes to five by uniting the *Malaxeeae* with the *Epidendreeae* and the *Arethuseae* with the *Neottieae*. A decided advance was made by establishing sub-tribes within the tribes, whereby the survey of the 334 genera accepted by Bentham was greatly facilitated. It would lead us too far to enumerate the characteristics of these 27 sub-tribes. These may be found in Bentham's work which is easily accessible. I will therefore content myself here with the mere enumeration of their names.

Tribe 1. *Epidendreeae*

- Sub-tribe 1. *Pleurothalleae*
 2. *Malaxeeae*
 3. *Liparieae*
 4. *Dendrobieae*
 5. *Erieae*

- Sub-tribe 6. *Bletieae*
 7. *Coelogyneae*
 8. *Stenoglosseae*
 9. *Laelieae*

Tribe 2. *Vandeeae*

- Sub-tribe 1. *Eulophieae*
 2. *Cymbidieae*
 3. *Cyrtopodieae*
 4. *Stanhopieae*

- Sub-tribe 5. *Maxillarieae*
 6. *Oncidieae*
 7. *Sarcantheae*
 8. *Podochileae*

Tribe 3. *Neottieae*

- Sub-tribe 1. *Vanilleae*
 2. *Corymbieae*
 3. *Spirantheae*

- Sub-tribe 4. *Diurieae*
 5. *Arethuseae*
 6. *Limodoreae*

Tribe 4. *Ophrydeae*

- | | | | |
|-----------|------------------------|-----------|---------------------|
| Sub-tribe | 1. <i>Euophrydeae</i> | Sub-tribe | 3. <i>Diseae</i> |
| | 2. <i>Habenariaeae</i> | | 4. <i>Corycieae</i> |

Tribe 5. *Cypripedieae*

(No Sub-tribe)

Much was gained already by Bentham's system, and great progress in the knowledge of the genera and their relationships became possible by the division of tribes into sub-tribes. Previously, it was usual to place side-by-side genera which, definitely, had little relationship but were placed thus by virtue of a classification based on one-sided characteristics. To form some idea of the very different genera which were grouped together under Bentham's system, it is only necessary to compare their order of succession with that of Lindley's classification and it will be surprising to note how considerably their positions differ and how very different are the relationships under the two systems.

In 1887, the great morphologist in Heidelberg, E. Pfitzer, published his 'Entwurf eines Natürlichen Systems der Orchideen' [Outline of a Natural Orchid System], which to a great extent overthrew existing views. For the first time vegetative characteristics were taken into consideration in establishing a system of classification of the orchids, whereas all the other systems, even that advocated by Bentham, had regarded only the floral structure. The more carefully the characteristics proposed by Pfitzer were examined, the more evident did it become that their neglect was unjustifiable. Perhaps, in some cases, he has given undue prominence to certain vegetative characteristics, but it is only rarely that conspicuous differences suggested by him are not applicable in distinguishing groups or in the distribution of genera.

An accurate survey of his system was published two years later, in the year of H.G. Reichenbach's death, 1889, on the occasion of his treatment of the *Orchidaceae* in Engler and Prantl's 'Pflanzenreich' [Plant Kingdom]. In this survey the classification of the orchids is presented very differently from that of previous authors, so that it may be worth while considering it in detail.

First of all, Pfitzer divided the *Orchidaceae* into two sub-families, the *Diandrae* with two anthers, and the *Monandrae* with a single anther. Whereas there are only a few genera (five), comprising two groups, contained in the first of these, by far the greater part of the family is included in the *Monandrae*, which therefore calls for sub-division.

The latter is separated firstly into the *Basitonae* and *Acrotonae*. The first of these, containing only the Lindleyan-Bentham tribe *Ophrydeae*, is distinguished by the development of a caudicle at the base of the pollinia, whereas in the *Acrotonae*, the caudicle is either absent, or else developed from the apices of the pollinia. Further sub-division now separates the *Acranthae*, with a terminal inflorescence, from the *Pleuranthae* with a lateral inflorescence. The first is divided into 11 principal groups characterised by convoluted leaf-buds and unjointed leaves. To these nearly all the *Neottieae* of Bentham's system belong. These are followed by three other groups in which the leaf-buds are convolute, but the leaves are jointed. Lastly, there are seven groups in which the leaf-buds are duplicate. This concludes the *Acranthae*. The *Pleuranthae* is again separated into principal groups according to whether the leaf-buds are (a) convolute or (b) duplicate. The first of these (a) contains three chief groups designated *Homoblastae* in which the pseudobulbs are composed of several symmetrically swollen internodes and three other chief groups known as *Heteroblastae*, in which a single internode swells into a pseudobulb.

Rather more complicated is the division of the principal groups in which the leaf-buds are duplicate in their veneration. Here the *Sympodiales*, with limited apical growth of the annual shoots, is divided into nine chief groups, and the *Monopodiales* with leaf-shoots with unlimited apical growth is divided into two chief groups.

According to Pfitzer's system, the whole family is divided therefore into 31 chief groups. In order that the review shall be more definite, I will repeat the above statements in the form of a table, according to which Pfitzer's system is represented as follows:—

1. *Diandrae*

Two anthers of the inner whorl fertile.

Chief groups:

- | | |
|------------------------|--------------------------|
| 1. <i>Apostasiinae</i> | 2. <i>Cypripedilinae</i> |
|------------------------|--------------------------|

2. *Monandrae*

Unpaired anther of outer whorl fertile.

A. *Basitonae*

The pollinia developing caudicles near the base of the anther.

Chief group:

3. *Ophrydinae*

B. *Acrotonae*

The pollinia either without caudicles or developing these towards the apex of the anther.

1. *Acranthae*. Inflorescence normally at the apex of the individual sympodially associated shoots.

Chief groups:

- | | |
|--------------------------|------------------------------|
| 4. <i>Neottiinae</i> | 10. <i>Podochilinae</i> |
| 5. <i>Thuniinae</i> | 11. <i>Glomerinae</i> |
| 6. <i>Coelogyninae</i> | 12. <i>Pleurothallidinae</i> |
| 7. <i>Collabiinae</i> | 13. <i>Laeliinae</i> |
| 8. <i>Liparidinae</i> | 14. <i>Sobraliinae</i> |
| 9. <i>Polystachyinae</i> | |

2. *Pleuranthae*. Inflorescence on special lateral shoots, which do not represent members of the sympodium.

(a) *Convolutae*. Leaf-buds convolute

+ *Homoblastae*. Internodes slender, or uniformly swollen.

Chief groups:

- | | |
|--------------------------|------------------------|
| 15. <i>Phajinae</i> | 17. <i>Catasetinae</i> |
| 16. <i>Cyrtopodiinae</i> | |

+ + *Heteroblastae*. A single internode swollen into a pseudobulb.

Chief groups:

- | | |
|-----------------------|--------------------------|
| 18. <i>Lycastinae</i> | 20. <i>Zygopetalinae</i> |
| 19. <i>Gongorinae</i> | |

(b) *Duplicatae*. Leaf-bud duplicate.

+ *Sympodiales*. Leaf-shoot with limited apical growth, sympodially associated.

Chief groups:

- | | |
|---------------------------|--------------------------|
| 21. <i>Dendrobiinae</i> | 26. <i>Steniinae</i> |
| 22. <i>Bulbophyllinae</i> | 27. <i>Maxillariinae</i> |
| 23. <i>Thelasiinae</i> | 28. <i>Oncidiinae</i> |
| 24. <i>Cymbidiinae</i> | 29. <i>Huntleyinae</i> |
| 25. <i>Thecostelinae</i> | |

+ + *Monopodiales*. Leaf shoot with unlimited apical growth.

Chief groups:

- | | |
|-----------------------|-------------------------|
| 30. <i>Dichaeinae</i> | 31. <i>Sarcanthinae</i> |
|-----------------------|-------------------------|

There is no doubt that this comprehensive system, founded by Pfitzer, must in general terms form the foundation on which a natural system of the *Orchidaceae* can be built. Thus the credit goes to him for indicating the directions to be followed for creating a natural system of the *Orchidaceae*.

It is evident that a natural classification of such a large and multiform plant-family like the *Orchidaceae* cannot be perfected at the first attempt, and that some alterations will, in one way or another, become necessary. Here we have to pursue the blazed trail laid down by Pfitzer and to remodel this and that, yet decades must pass before we evolve a system which will satisfy all requirements.

In contrast to Bentham's system, that of Pfitzer has first of all the advantage, as already stated, that important vegetative characteristics have received consideration. In addition to this the systematic value of certain floral morphological characters also seems to have been recognised more accurately by Pfitzer than by Bentham, since the latter was, particularly, inclined to unite many genera. Thus, 410 genera have been accepted by Pfitzer, as against 343 by Bentham.

If we compare these two systems, we see that the two sub-families, *Monandrae* and *Diandrae*, have been placed in very sharp contrast by Pfitzer. With regard to the *Monandrae*, the separation of the *Basitonae* from the *Acrotonae* is a decidedly happy idea, because it separates the *Ophrydeae* of Lindley and Bentham more completely from the rest of the monandrous orchids. For the first time the acranthous and pleuranthous genera of the *Acrotonae* have been separated, and in this way a new and important moment in the knowledge of generic relationships has been introduced. These are the chief important points in Pfitzer's classification. Evidently, there are many instances in this large family where the importance of some of the characteristics, as introduced by Pfitzer, is open to criticism, and with these I now propose to deal. The differences in veneration, in various genera, as distinctions between the larger groups, as laid down by Pfitzer are apparently less important than he believed, and are as yet too little known in many genera and species to form a good basis for such group-divisions. Besides this, it has been shown that in several genera, such as *Liparis* and *Eria*, there may be found species which belong partly to one and partly to another in Pfitzer's category. Even in the *Heteroblastae* and the *Monoblastae*, the pseudobulbs may vary within the same genus or group, e.g. in *Polystachya*, *Dendrobium*, *Laeliinae* and others, and therefore can not, as a rule, be regarded as important characters.

From my many years' observations on living material, I have come to the conclusion that Pfitzer has made insufficient use of the pollinarium characters, utilised by Lindley and previous authors for the division of the family, and that these are really more important than he thinks. For this reason, the chief group *Neottiinae* of Pfitzer should not be regarded as such, but rather as a special subdivision of *Acrotonae*. As a result of such considerations, I have established a classification of my own, which

closely resembles Pfitzer's in its fundamental principles, but differs very considerably from his in the *Acrotonae*. I first of all divide the family into the sub-families *Diandrae* and *Monandrae*, and then the latter, as by Pfitzer, into *Basitoniae* and *Acrotonae*. The *Acrotonae* is then sub-divided into the *Polychondreae* and *Kerosphaerae*, the first of which would, perhaps, correspond with Bentham's *Neottieae* and would comprise 19 groups. The *Kerosphaerae* is divided into two series, the *Acranthae* and *Pleuranthae*, with 12 groups in the former and 30 in the latter. Of these 30 groups, 26 belong to the *Sympodiales* and four to the *Monopodiales*.

A survey of my system presented in tabular form is as follows:—

First Sub-Family

Diandrae. The two lateral anthers of the inner whorl are fertile.

Group

1. *Cypripedilinae* The *Apostasiinae* is omitted because it forms a separate family as mentioned earlier.

Second Sub-Family

Monandrae. The unpaired anther of the outer whorl is fertile.

Division 1. *Basitoniae*. Anther erect, attached by a broad base.

Caudicles growing from the base of the anther.

Groups

2. *Habenariinae*
3. *Disaeinae*
4. *Disperidinae*

Division 2. *Acrotonae*. Anther attached by a fine filament and sunk in a clinandrium.

Caudicle, when present, growing near the apex of the anther.

Sub-division 1. *Polychondreae*. Pollinia granular or powdery.

- | | |
|-----------------------------|-----------------------------|
| 5. <i>Pterostylidinae</i> | 15. <i>Vanillinae</i> |
| 6. <i>Diuridinae</i> | 16. <i>Sobraliinae</i> |
| 7. <i>Thelymitrinae</i> | 17. <i>Cephalantherinae</i> |
| 8. <i>Prasophyllinae</i> | 18. <i>Gastrodiinae</i> |
| 9. <i>Drakaeinae</i> | 19. <i>Bletillinae</i> |
| 10. <i>Caladeniinae</i> | 20. <i>Cranichidinae</i> |
| 11. <i>Acianthinae</i> | 21. <i>Spiranthinae</i> |
| 12. <i>Cryptostylidinae</i> | 22. <i>Physurinae</i> |
| 13. <i>Chloraeinae</i> | 23. <i>Tropidiinae</i> |
| 14. <i>Listerinae</i> | |

Sub-division 2. *Kerosphaerae*. Pollinia waxy.

Series A. *Acranthae*. The sympodically associated shoots end normally in an inflorescence.

Groups

- | | |
|------------------------------|---------------------------|
| 24. <i>Collabiinae</i> | 30. <i>Laeliinae</i> |
| 25. <i>Adrorrhizinae</i> | 31. <i>Thuniinae</i> |
| 26. <i>Coelogyninae</i> | 32. <i>Dendrobiinae</i> |
| 27. <i>Liparidinae</i> | 33. <i>Glomerinae</i> |
| 28. <i>Pleurothallidinae</i> | 34. <i>Podochilinae</i> |
| 29. <i>Ponerinae</i> | 35. <i>Polystachyinae</i> |

Series B. *Pleuranthae*. Shoots sympodially associated, always with a lateral inflorescence.

Sub-series 1. *Sympodiales*. Shoots sympodially connected.

- | | |
|----------------------------|------------------------------|
| 36. <i>Corallorhizinae</i> | 49. <i>Zygopetalinae</i> |
| 37. <i>Phajinae</i> | 50. <i>Huntleyinae</i> |
| 38. <i>Bulbophyllinae</i> | 51. <i>Maxillariinae</i> |
| 39. <i>Genyorchidinae</i> | 52. <i>Eulophidiinae</i> |
| 40. <i>Ridleyellinae</i> | 53. <i>Trichocentrinae</i> |
| 41. <i>Thelasinae</i> | 54. <i>Comparettiinae</i> |
| 42. <i>Cyrtopodiinae</i> | 55. <i>Ionopsidinae</i> |
| 43. <i>Cymbidiinae</i> | 56. <i>Notyliinae</i> |
| 44. <i>Grobyinae</i> | 57. <i>Aspasiinae</i> |
| 45. <i>Thecostelinae</i> | 58. <i>Oncidiinae</i> |
| 46. <i>Catasetinae</i> | 59. <i>Ornithocephalinae</i> |
| 47. <i>Gongorinae</i> | 60. <i>Telipogoninae</i> |
| 48. <i>Lycastinae</i> | 61. <i>Lockhartiinae</i> |

Sub-series 2. *Monopodiales*. Growth monopodial.

Groups

- | | |
|---------------------------|-----------------------------|
| 62. <i>Dichaeinae</i> | 64. <i>Pterostemmatinae</i> |
| 63. <i>Pachyphyllinae</i> | 65. <i>Sarcanthinae</i> |

I have omitted here the characteristics of the groups, since these will be published, by P. Parey, Berlin, in my book, 'Die Orchideen' [The Orchids]. With regard to the Systematic Part of this book dealing with the succession of genera I would like to remark, that the *Dendrobiinae* is still in the position where Pfitzer placed it, since it was only later that I formed the opinion that members of that group are normally acranthous *Orchidaceae*.

In conclusion I will publish an enumeration of the genera accepted in the Systematic Part [of this book] together with the number of species by which they are represented in German New Guinea. In this way the survey of such a large number will be made somewhat easier, at the same time facilitating comparisons and the compilation of statistics when later on the orchidaceous flora of New Guinea is better known.

It is certain that, already, during the next ten years many of the numbers will increase.

Survey of the Genera of the Orchidaceae of German New Guinea

FIRST SUB-FAMILY: *Diandrae* (*Pleonandrae*) No. of Species

First sub-division: *Cypripedileae*

GROUP I: *Cypripedilinae*

- | | |
|--------------------------------|---|
| 1. <i>Paphiopedilum</i> Pfitz. | 1 |
|--------------------------------|---|

SECOND SUB-FAMILY: *Monandrae*

First division: *Basitonae*

GROUP II: *Habenariinae*

- | | |
|----------------------------------|----|
| 2. <i>Platanthera</i> L.C. Rich. | 1 |
| 3. <i>Habenaria</i> W. [Willd.] | 22 |

GROUP III. *Disperidinae*

- | | |
|------------------------|---|
| 4. <i>Disperis</i> Sw. | 1 |
|------------------------|---|

Second Division: <i>Acrotonae</i>	
Sub-division: 1 <i>Polychondreae</i>	
GROUP IV: <i>Acianthinae</i>	
5. <i>Corysanthes</i> R. Br.	No. of Species 13
GROUP V: <i>Cryptostylidinae</i>	
6. <i>Cryptostylis</i> R. Br.	2
GROUP VI: <i>Vanillinae</i>	
7. <i>Galeola</i> Lour.	3
8. <i>Vanilla</i> Sw.	3
9. <i>Lecanorchis</i> Bl.	2
10. <i>Aphyllorchis</i> Bl.	2
GROUP VII: <i>Gastrodiinae</i>	
11. <i>Epipogum</i> Gmel.	1
12. <i>Nervilia</i> Commers.	9
13. <i>Didymoplexis</i> Griff.	2
14. <i>Gastrodia</i> R. Br.	1
GROUP VIII: <i>Spiranthinae</i>	
15. <i>Spiranthes</i> L.C. Rich.	1
GROUP IX: <i>Physurinae</i>	
16. <i>Goodyera</i> R. Br.	8
17. <i>Platylepis</i> A. Rich.	2
18. <i>Lepidogyne</i> Bl.	2
19. <i>Hylophila</i> Lindl.	2
20. <i>Erythodes</i> Bl.	7
21. <i>Eurycentrum</i> Schltr.	4
22. <i>Cystorchis</i> Bl.	3
23. <i>Cystopus</i> Bl.	4
24. <i>Macodes</i> Bl.	4
25. <i>Cheirostylis</i> Bl.	1
26. <i>Eucosia</i> Bl.	1
27. <i>Zeuxine</i> Lindl.	11
28. <i>Vrydagzenia</i> Bl.	9
29. <i>Hetaeria</i> Bl.	2
GROUP X: <i>Tropidiinae</i>	
30. <i>Tropidia</i> Bl.	5
31. <i>Corymbis</i> Thou.	3
Sub-division 2: <i>Kerosphaerae</i>	
GROUP XI: <i>Collabiinae</i>	
32. <i>Chrysoglossum</i> Bl.	2 [3]
33. <i>Collabium</i> Bl.	1
34. <i>Mischobulbum</i> Schltr.	1
35. <i>Tainia</i> Bl.	1
GROUP XII: <i>Coelogyninae</i>	
36. <i>Coelogyne</i> Lindl.	5
37. <i>Dendrochilum</i> Bl.	1
38. <i>Pholidota</i> Lindl.	4

	GROUP XIII: <i>Liparidinae</i>	No. of Species
39. <i>Microstylis</i> Nutt.		48
40. <i>Oberonia</i> Lindl.		59
41. <i>Hippeophyllum</i> Schltr.		2
42. <i>Liparis</i> L.C. Rich.		50
	GROUP XIV: <i>Thuniinae</i>	
43. <i>Claderia</i> Hook. f.		1
	GROUP XV: <i>Glomerinae</i>	
44. <i>Mediocalcar</i> J.J. Sm.		13
45. <i>Epiblastus</i> Schltr.		8
46. <i>Ceratostylis</i> Bl.		21
47. <i>Agrostophyllum</i> Bl.		32
48. <i>Chitonochilus</i> Schltr.		1
49. <i>Glomera</i> Bl.		15
50. <i>Glossorhyncha</i> Ridl.		32
51. <i>Giulianettia</i> Rolfe		1
52. <i>Sepalosiphon</i> Schltr.		1
53. <i>Ischnocentrum</i> Schltr.		1
54. <i>Aglossorhyncha</i> Schltr.		5
	GROUP XVI: <i>Podochilinae</i>	
55. <i>Podochilus</i> Bl.		10
56. <i>Chilopogon</i> Schltr.		3
57. <i>Appendicula</i> Bl.		27
58. <i>Cyphochilus</i> Schltr.		6
59. <i>Lectandra</i> J.J. Sm.		2
	GROUP XVII: <i>Polystachyinae</i>	
60. <i>Bromheadia</i> Lindl.		2
	GROUP XVIII: <i>Phajinae</i>	
61. <i>Acanthephippium</i> Bl.		1
62. <i>Phajus</i> Lour.		2
63. <i>Calanthe</i> R. Br.		23
64. <i>Aulostylis</i> Schltr.		1
65. <i>Spathoglottis</i> Bl.		11
66. <i>Plocoglottis</i> Bl.		10
67. <i>Pachystoma</i> Bl.		2
	GROUP XIX: <i>Cyrtopodiinae</i>	
68. <i>Eulophia</i> R. Br.		5
69. <i>Geodorum</i> Jacks.		1
	GROUP XX: <i>Dendrobiinae</i>	
70. <i>Cadetia</i> Gaud.		22
71. <i>Dendrobium</i> Sw.		256
72. <i>Pseudieria</i> Schltr.		6
73. <i>Eria</i> Lindl.		36 [37]
	GROUP XXI: <i>Bulbophyllinae</i>	
74. <i>Saccoglossum</i> Schltr.		2
75. <i>Pedilochilus</i> Schltr.		13
76. <i>Bulbophyllum</i> Thou.		322 [329]
77. <i>Cirrhopetalum</i> Lindl.		3

No. of Species

78. <i>Dactylorhynchus</i> Schltr.	1
79. <i>Tapeinoglossum</i> Schltr.	2
80. <i>Codonosiphon</i> Schltr.	2
81. <i>Monosepalum</i> Schltr.	2
GROUP XXII: <i>Thelasinae</i>	
82. <i>Chitonanthera</i> Schltr.	5
83. <i>Octarrhena</i> Thw.	7
84. <i>Oxyanthera</i> Brogn.	2
85. <i>Thelasis</i> Bl.	2
86. <i>Phreatia</i> Lindl.	75
GROUP XXIII: <i>Ridleyellinae</i>	
87. <i>Ridleyella</i> Schltr.	1
GROUP XXIV: <i>Thecostelinae</i>	
88. <i>Acriopsis</i> Reinw.	1
GROUP XXV: <i>Cymbidiinae</i>	
89. <i>Grammatophyllum</i> Bl.	2
90. <i>Dipodium</i> R. Br.	1
91. <i>Cymbidium</i> Sw.	1
GROUP XXVI: <i>Sarcanthinae</i>	
92. <i>Calymmanthera</i> Schltr.	3
93. <i>Chamaeanthus</i> Schltr.	2
94. <i>Thrixspermum</i> Lour.	9
95. <i>Bogoria</i> J.J. Sm.	1
96. <i>Sarcochilus</i> R. Br.	5
97. <i>Phalaenopsis</i> Bl.	1
98. <i>Adenoncos</i> Bl.	1
99. <i>Luisia</i> Gaud.	1
100. <i>Vanda</i> R. Br.	1
101. <i>Vandopsis</i> Pfitz.	3
102. <i>Renanthera</i> Lour.	1
103. <i>Ascoglossum</i> Schltr.	1
104. <i>Dryadorchis</i> Schltr.	2
105. <i>Saccolabium</i> Bl.	1
106. <i>Malleola</i> J.J. Sm. & Schltr.	6
107. <i>Porphyrodesme</i> Schltr.	1
108. <i>Robiquetia</i> Gaud.	4
109. <i>Schoenorchis</i> Bl.	2
110. <i>Pomatocalpa</i> Breda	4
111. <i>Sarcanthus</i> Lindl.	4
112. <i>Camarotis</i> Lindl.	1
113. <i>Trichoglottis</i> Bl.	3
114. <i>Hymenorchis</i> Schltr.	6
115. <i>Microtatorchis</i> Schltr.	21
116. <i>Taeniophyllum</i> Bl.	59 [63]
[1463]	

FIRST SUB-FAMILY

Diandrae (Pleonandrae)

As I have explained in the year 1905 in 'Nachträge zur Flora der Deutschen Schutzgebiete in der Südsee' by K. Schumann and K. Lauterbach, I restrict this sub-family of the *Orchidaceae* to the group *Cypripedilinae* by excluding the *Apostasiinae* which I regard as a family by itself, viz. *Apostasiaceae* which occupies the first place in the *Microspermae*, and, in a sense, forms a transition to the *Liliiflorae*. The latter evidently has split into the two series *Scitaminae* and *Microspermae*, the last of which reaches the summit of its development in the *Orchidaceae*. During recent years, I have had the opportunity of studying a considerable amount of living material belonging to the *Apostasiaceae* and have come to the conclusion that the first separation of this family from the *Orchidaceae* by Ridley is justified fully.

FIRST DIVISION

Cypripedileae

Group I *Cypripedilinae*

1. *Paphiopedilum* Pfitz.

Up to the present, two species of this genus have been described from New Guinea, viz. *P. glanduliferum* (Bl.) Pfitz. and *P. praestans* (Rchb. f.) Pfitz. The first certainly originates in Dutch New Guinea, where it was discovered by Zippel about 1845 but, so far as I know, has not been found since. *P. praestans* (Rchb. f.) Pfitz. has been brought repeatedly to Europe in the living state, and is still to be found in cultivation in gardens in the northern part of the continent. Both species grow as epiphytes on tall trees. *P. praestans* (Rchb. f.) Pfitz. is said to have come originally from the southern part of Dutch New Guinea and has extended to the east into British Papua. Whereas the two species just mentioned belong to Pfitzer's Section *Caryopedilum* and have multi-flowered peduncles, the new species, *P. violascens* Schltr. described here, represents the section *Blepharopetalum*, and the peduncles always are single-flowered. Like all species of this section, it only occurs terrestrially, by preference in the semi-shade on the edges of precipices in the mountains and as an inhabitant of the humus on large rocks. It always grows in well-drained soil, which may be described as a form of root-peat.

1. *P. violascens* Schltr., sp. nov.

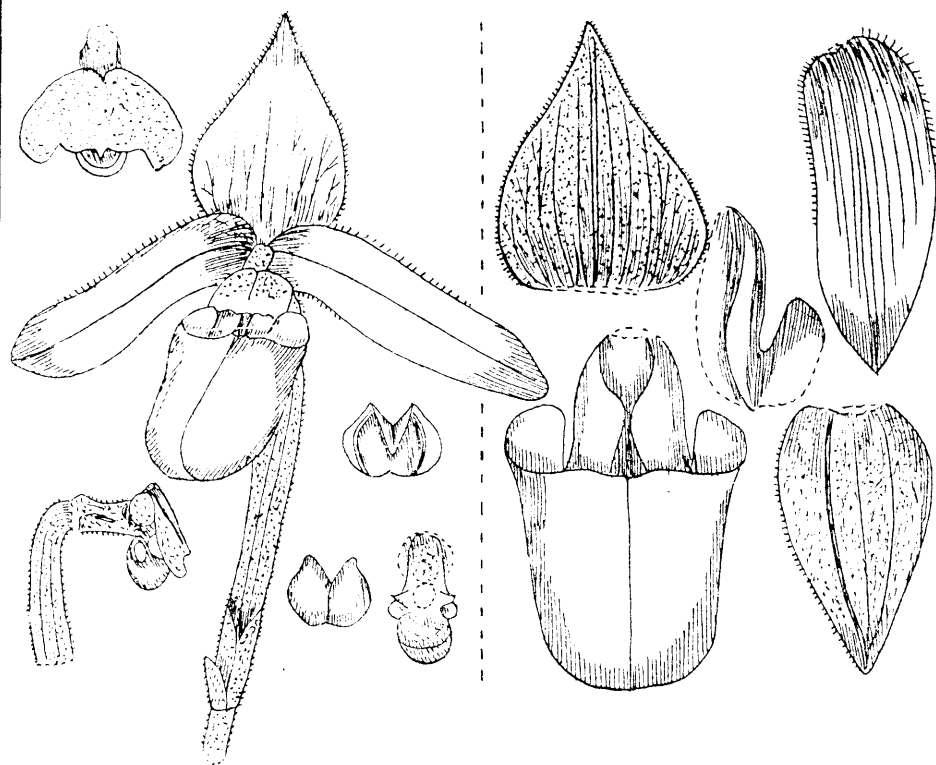
Terrestre, acaule; rhizomate valde abbreviato; radicibus crassis, flexuosis villosulis; foliis basilaribus 4–6, erecto-patentibus, oblongoligulatis, apice minute et inaequaliter tricuspidatis, superne leviter sed distincte tessalatis, 10–18 cm longis, medio fere 2.3–3.5 cm latis, glabris; scapis erectis, strictis vel substrictis, teretibus, puberulis, folia vulgo plus duplo superantibus, unifloris; bractea erecta, ovata, obtusiuscula, compressa, extus puberula, margine ciliata, ovario pedicellato 3–4-plo brevior; flore erecto, illo *P. purpurati* (Lindl.) Pfitz. simili; sepalo intermedio erecto, late ovato, acuto vel subacuminato, c. 15-nervio, extus minute puberulo, intus glabro, margine minute ciliato, 3 cm longo, infra medium 2.2 cm lato, synsepalo ovato, obtusiusculo, extus margineque minute puberulo, c. 3.7 cm longo, infra medium 1.6 cm lato; petalis patentibus, oblique oblongo-ligulatis, obtusis, margine superiore setulis distantibus ciliatis, margine inferiore minute ciliolatis, caeterum glabris, plurinerviatis, 3.5 cm longis, medio fere 1.2 cm latis; labello extus subglabro, intus praesertim basin versus minute puberulo, ungue calceolo distincte breviori, lobis inflexis, oblique lanceolato-oblongis, obtusiusculis, auriculis erectis, obtuse truncatis, 0.8 cm altis, calceolo antice truncatissimo, labello toto c. 3.8 cm longo, calceolo ad ostium c. 2.2 cm diametiente, nervis medianis 9 basi parallelis; staminodio subreniformi-lunato, superne minutissime puberulo, 0.7 cm longo, apice 1.2 cm lato, lobis lateralibus

falcato-ovatis obtusiusculis, sinu semicirculari cum apiculo mediano; antheris reniformibus obtusiuscule bilobatis; ovario stipitato cylindraceo, costato, dense puberulo, cum stipite 5–6 cm longo.

Kaiser-Wilhelms-Land: On rocky more open slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18182, flowering in May [Ed.—possibly Sept.] 1908; in humus in forests of the Maboro [Range], alt. c. 1300 m—R. Schlechter no. 19540, flowering in May 1907 [Ed.—probably 1909]; on rocks on the Govidjoa Creek, alt. c. 1000 m—R. Schlechter no. 19785, flowering in June 1909.

Undoubtedly this species is a relative of *P. javanicum* (Bl.) Pfitz. Apart from the colour of the flowers, to which I shall refer below, the latter species is well distinguished by the short dorsal sepal, the shape of the labellum and the staminodium. The colour of the flowers is as follows: The dorsal sepal is reddish violet with a white apex, with darker veins towards the base; petals reddish violet, darker in the centre; labellum greenish brown with violet flush; staminodium whitish brown with green veins in the centre. We are thus dealing with a rather pretty species, which deserves to be introduced into European collections.

The species of *Paphiopedilum*, previously mentioned by me from the Bismarck Range, in K. Schum. et Laut., Nachtr. [1905] p. 76, undoubtedly belongs here.

GROUP I *Cypripedilinae*

Paphiopedilum violascens Schltr.

SECOND SUB-FAMILY

Monandrae

FIRST DIVISION

Basitoniae

It is advisable to regard the various sub-groups of *Basitoniae*, e.g. *Serapiadeae*, *Gymnadenieae*, etc. as equivalent to the other orchidaceous groups of Pfitzer, and to deal with them in the same way as I have done recently with *Polychondreae*. Indeed, the first three groups of Pfitzer are related too closely to each other and would be regarded better as sub-groups of the group *Habenariinae*, from which the two other groups [of Pfitzer], *Disaeinae* and *Disperidinae*, are divided very sharply.

The divisions of *Basitoniae* would be arranged accordingly, as follows:

Basitoniae

Group 1. *Habenariinae*

Sub-Group a. *Serapiadeae*

Sub-Group b. *Platanthereae*

Sub-Group c. *Habenarieae*

Group 2. *Disaeinae*

Group 3. *Disperidinae*

So much in explanation of the following division.

In the enumeration below, I will number the individual groups consecutively in order to obtain a better survey, since those species are dealt with which occur in a definite floral-region.

Group II *Habenariinae*

Sub-Group b. *Platanthereae*

2. *Platanthera* L.C. Rich.

This genus, together with *Habenaria* Willd., is probably the most polymorphic genus of the *Basitoniae*. English and American botanists have united these two usually into one genus following Bentham's example. It is unnecessary to reiterate the reasons for and against unification since the matter has been discussed often from both points of view.

Personally, I consider it more appropriate to keep the two genera separate. The species of this large genus are distributed over nearly the whole world, but they reach their maximum development in the temperate zone of the Northern Hemisphere. Those occurring in the monsoon-region belong chiefly to the section *Mecosa*, which was formed originally into a separate genus by Blume, but was regarded correctly as a section of *Platanthera* by Lindley. The species found in New Guinea is a typical representative of this section, and closely related to the other four species known from Java and the Philippines, which, like *P. papuana* Schltr., are inhabitants of the higher mountains.

1. *P. papuana* Schltr., sp. nov.

Terrestris, erecta, c. 35 cm alta; radicibus incrassatis, carnosis, villosis; folio basilari singulo, erecto, elliptico, acuminato, basi cuneato, in petiolum brevem angustato, c. 8 cm longo, medio fere 3 cm lato, glabro; caule stricto vel substricto, tereti, glabro, basi vagina 1–2 praedito; foliis caulinis 3, distantibus,

erecto-patentibus, inferiore ovato, acuminato, cordato-amplexicauli, c. 6 cm longo, infra medium c. 2.7 cm lato, glabro, superioribus multo minoribus; spica erecta laxe pluri-(c. 8-)flora; bracteis erectis, oblongo-lanceolatis, acuminatis, glabris, inferioribus ovarium superantibus, superioribus sensim brevioribus; floribus illis *P. angustatae* (Bl.) Lindl. similibus et paulo minoribus, viridibus, glabris; sepalis intermedio erecto, ovato, obtuso, concavo, 0.5 cm longo, lateralibus deflexis, falcato-ligulatis, obtusis, intermedio aequilongis; petalis erectis, oblique ovato-lanceolatis, obtusis, dimidio inferiore margine anteriore dilatatis, sepalis intermedio paululo brevioribus; labello deflexo ligulato, obtuso, basin versus paululo dilatato, 0.5 cm longo, calcare deflexo vix curvato, cylindrico, obtusiusculo, 0.7 cm longo, glabro; anthera humili, subquadrata, loculis basi divergentibus, rostello humili, medio intus umbonato; ovario cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19610, flowering in May 1909.

In many respects this species stands midway between *P. Blumei* Lindl. and *P. angustata* (Bl.) Lindl. approaching the former in the shape of the basal leaves, but more like the latter in habit. The floral parts are, likewise, related more closely to those of *P. angustata*, though the spur is distinctly shorter than the ovary. Unfortunately, I found only a single specimen of this species, the first of the genus known from New Guinea.

Sub-Group c. *Habenarieae*

3. *Habenaria* Willd.

A great many species which belong to the various sections of this exceedingly numerous genus have been recorded already from New Guinea, and, beyond doubt, we may still expect a large number of new ones from this Territory.

The richest section is *Peristylus* which recently has been retained by some authors as a genus. I am convinced, however, that it should be regarded as a section, otherwise we shall soon find ourselves confronted with a difficult question, how to divide the whole genus *Habenaria* into small genera, because it is certain that many of the African groups are better defined in their characters than the species of *Peristylus*. Under *Peristylus* I place the species which are related closely to those forms as originally defined by Blume. In part, very diverging species have been placed here recently by Kränzlin.

The second largest group is *Salaccenses* which is represented by a number of closely related species growing in the humus of the forests.

Furthermore, species occurring in the Territory are known from the following groups, *Chlorinae*, *Plantagineae*, *Acuiferae*, *Medusaeformes*. Most of the species are endemic, but *H. goodyeroides* Don and *H. Rumphii* Lindl. are two inhabitants of the alang-plains which have a wider distribution. The former is distributed from India through the Malay Archipelago to New Guinea; the latter was described originally from the island of Ambon and, since then, in different forms, has been found in the intervening regions. Besides the species enumerated here, the following have been recorded from other parts of New Guinea, viz. *H. retroflexa* F.v.M. et Krzl. and *H. Bäuerleni* F.v.M et Krzl. from British Papua; and *H. cruciata* J.J. Sm. together with *H. Hollandiae* (J.J. Sm.) Schltr. (*Peristylus Hollandiae* J.J. Sm.) from Dutch New Guinea. [Ed.—the sections are not defined.]

§ 1. *Peristylus*

1. *H. goodyeroides* Don, Prodr. Fl. Nep., p. 25.

H. Lauterbachii Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds., p. 239 (nomen).

Kaiser-Wilhelms-Land: In alang-fields near Constantinhafen—K. Lauterbach no.

1310, flowering in Dec. 1890; on along hills near Djawer, alt. c. 100 m—R. Schlechter no. 16973, flowering in Dec. 1907; in along-fields on the Ramu [River], alt. c. 100 m—R. Schlechter no. 13870, flowering in Jan. 1902; on grassy hills near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18872, flowering in Nov. 1908; near Kalueng not far from Finschhafen—Hollrung no. 190, flowering in June 1886.

As already mentioned, this species is distributed widely from India to New Guinea. The flowers are pale sulphur-yellow.

2. *H. dolichocaulon* Schltr., sp. nov.

Valida, erecta, simplex, c. 130 cm alta; radicibus filiformibus, elongatis, flexuosis, villosis; caule valido, bene foliato, tereti, glabro, basi vaginis alte amplexantibus obsesso, basi c. 1 cm diametiente; foliis erecto-patentibus, ellipticis, acuminatis, glabris, 12 usque ad 27 cm longis, medio fere 5.5–10 cm latis; spica cylindrica, dense multiflora, elongata, c. 40 cm longa, c. 3 cm diametiente; floribus illis *H. goodyeroidis* Don similibus, sed bene majoribus, glabris; bracteis erecto-patentibus, lanceolatis, acuminatis, minutissime papilloso-ciliatis, ovarium plus minusve superantibus; sepalis oblongis, obtusis, sub apice apiculatis, concavulis, 0.6 cm longis, lateralibus obliquis; petalis oblique ellipticis, obtusis, tertia parte basilari margini anteriore gynostegio adnatis, sepalis paululo brevioribus; labello e basi cochleari oblongo, vix 0.6 cm longo, quarta parte apicali trilobo, lobis triangulis, obtusiusculis, aequilongis, calcare saccato, oblongoideo, obtuso, ostium versus paulo attenuato, 0.2 cm longo; anthera late oblongoidea, apice rotundata, canalibus abbreviatis; rostello humili, medio umbone semigloboso donato; processibus stigmatiferis canales antherarum conspicue superantibus, crassiusculis; ovario cylindraceo, glabro, apicem versus constricto, 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Mimi Mountain (in the Waria Valley), alt. c. 700 m—R. Schlechter no. 17414, flowering in Mar. 1908.

May possibly be identical with *Peristylus grandis* Bl. var. *papuana* J.J. Sm. but without ciliation of the sepals, also differing in the spur and in the shorter, divided, narrower lamina of the lip. The flowers are green with yellowish petals and labellum.

3. *H. silvicola* Schltr., sp. nov.

Terrestris, erecta, simplex, 35–65 cm alta; tuberibus oblongoideis; radicibus filiformibus, elongatis, flexuosis, villosis; caule stricto vel substricto, tereti, glabro, dimidio inferiore vaginis c. 5, alte amplexantibus oblecto, supra medium dense foliato; foliis 5–6 patentibus, subrosulato-approximatis, ellipticis, acuminatis, glabris, 10–24 cm longis, medio fere 4–8 cm latis; spica dense multiflora, cylindrica, nunc abbreviata, usque ad 10 cm longa, c. 2 cm diametiente; bracteis lanceolatis, acuminatis, glabris, nunc flores superantibus, nunc subaequilongis; sepalis oblongis obtusis, extus sparsim granuloso-punctatis, 0.5 cm longis, lateralibus paulo obliquis; petalis oblique ovatis obtusis, dimidio superiore margine anteriore angustatis, sepalo intermedio subaequilongis, basi columnae adnatis; labello circuitu late obovato, tertia parte anteriore trilobo, lobis aequilongis, triangulis, obtusis, vix 0.5 cm longo, calcare obovoideo obtuso, 0.2 cm longo; anthera apice leviter retusa, canalibus abbreviatis; rostello humili, medio in lobum brevem excavatum producto; staminodiis lineari-falcatis, parvulis; processibus stigmatiferis crassiusculis, falcatis, canales antherarum superantibus; ovario cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18088, flowering in August 1908; in humus in the forests on the Wakeak [River], alt. c. 500 m—R. Schlechter no. 18118, flowering in Aug. 1908.

In habit it is distinguished easily from related species by the leaves, which are crowded together above the middle of the stem in the form of a rosette. The colour of the flowers is pale blue-green.

4. *H. papuana* Krzl., in Warbg., Pl. Hellwig, p. 188; Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 79.

Peristylus remotifolius J.J. Sm., in Nova Guinea VIII [1909] p. 134.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 20163, flowering in Sept. 1909; no. 14484, flowering in Apr. 1902; in humus in the forests of Albo, alt. c. 500 m—R. Schlechter no. 16119,

flowering in May 1907; in humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17218, flowering in Jan. 1908; in humus in the forests of the Finisterre Range, above Meireka, alt. c. 600 m—R. Schlechter no. 17952, flowering in July 1908; on [Mount] Sattelberg near Essimbu—Hellwig no. 585, flowering in Apr. 1889; in humus in the forests near Jaduna, alt. c. 250 m—R. Schlechter no. 19263, flowering in Apr. 1909; in humus in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19516, flowering in May 1909.

From the above list of localities, it may be seen clearly to what extent the plant is distributed and that it may be found blooming at all seasons. *Peristylus remotifolius* J.J. Sm. also belongs here. I have specimens with leaves, which by no means approach each other, at the middle of the stem. I have observed also large falcate staminodia on all specimens and have sketched them from nature. The flowers are grass-green. The species is related very closely to *H. bambusetorum* Krzl. (*Peristylus gracilis* Bl.)

5. *H. triaena* Schltr., sp. nov.

Terrestris, erecta, simplex, gracilis, c. 35 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; caule stricto vel substricto, tereti, glabro, basi vaginis paucis laxe amplexantibus obsesso, usque ad medium foliato, supra medium vaginulis parvulis, lanceolatis, dissitis donato; foliis 3-4, erecto-patentibus, ellipticis, acuminatis, glabris, 5-6.5 cm longis, medio fere 1.2-1.6 cm latis; spica subdense 15-20-flora, ut videtur subsecunda; bracteis lanceolatis, acuminatis, glabris, ovario nunc aequilongis, nunc ovarium superantibus, nunc vix aequantibus; floribus in genere inter minores, viridibus, glabris; sepalis oblongo-ellipticis, obtusis, vix 0.2 cm longitudine excedentibus, lateralibus obliquis; petalis oblique ellipticis obtusis, tertia parte basilari margine anteriore cum labello connatis; labello usque supra basin tripartito, petalis aequilongo, partitionibus lateralibus falcato-linearibus, obtusis, partitione intermedia lanceolato-ligulata obtusa, lateralibus aequilonga, incrassatione humili antice retusa ad ostium calcaris, calcare deflexo clavato, obtuso, recto, 0.5 cm longo; anthera apice excisa, canalibus brevibus; rostellum triangulo, humili; staminodiis oblongis; processibus stigmatiferis crassiusculis, canales antherarum distincte superantibus; ovario cylindrico, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, in more open places, alt. c. 1100 m—R. Schlechter no. 18169, flowering in Sept. 1908.

This insignificant species may be distinguished from its relatives by the leaves more scattered on the stem, the straight spur, and by the labellum.

6. *H. umbonata* Schltr., sp. nov.

Terrestris, erecta, simplex, gracillima, c. 40 cm alta; tuberibus oblongoideis; radibus elongatis, flexuosis, pilosulis; caule stricto vel substricto, in tertia parte inferiore 2-3-foliato, supra medium vaginulis lanceolatis, acuminatis, dissitis obsesso; foliis ovato-lanceolatis, acuminatis glabris, erecto-patentibus, 5-6 cm longis, medio fere c. 2 cm latis, tenuissime marginatis; spica laxa pluri-(c. 10-15)-flora; floribus in genere inter minores, viridibus, glabris; bracteis erectis, lanceolatis, acuminatis, glabris, ovario aequilongis; sepalis intermedio ovato, obtuso, vix 2.5 mm longo, lateralibus deflexis, oblique lanceolato-ellipticis, apiculatis, intermedio aequilongis; petalis oblique elliptico-rhombeis, obtusis, tertia parte basilari margine anteriore labello adnatis; labello usque supra basin tripartito, vix 2.5 mm longo, partitionibus lateralibus lineari-ligulatis, obtusis, falcatis, intermedio triangulo, obtuso, lateralibus aequilongo, umbone humili ad ostium calcaris, calcare deflexo, subrecto, cylindraco, medio paululo ampliato; anthera apice leviter emarginata, canalibus perbrevibus; rostellum rhombeo, apice triangulo; processibus stigmatiferis, adscendentibus, canales antherae vix superantibus; staminodiis amplis oblongis; ovario cylindraco, utrinque attenuato, glabro.

Kaiser-Wilhelms-Land: In humus in the forests on the Dischore [Range] (Waria District), alt. c. 1300 m—R. Schlechter no. 19660, flowering in June 1909.

Here the leaves are fairly low down on the stem. Very characteristic is the spur which is thickened in the middle, and the large staminodia which are considerably higher than the short stigmatic processes.

7. *H. macra* Schltr., sp. nov.

Terrestris, erecta, gracillima, 25-50 cm alta; radicibus elongatis, flexuosis, pilosis; caule plus minusve flexuoso, tereti, glabro, medio fere foliis 2-3, approximatis praedito, caeterum vaginis dissitis, supra

medium bracteiformibus donato; foliis erecto-patentibus, lanceolato-ellipticis vel late ellipticis, acuminatis, margine leviter undulatis, glabris, 7–11 cm longis, medio fere 2–5.5 cm latis; spica vulgo plus minusve arcuata, laxa 10–20-flora, secunda; bracteis erectis, lanceolatis, acuminatis, glabris, ovario distincte brevioribus; floribus in genere inter minores, viridibus, glabris; sepalo intermedio late ovato, obtuso, concavo, vix 0.2 cm longo, lateralibus deflexis, falcato-ellipticis, apiculatis, aequilongis; petalis oblique elliptico-rhombeis, obtusis, sepalis subaequilongis; labello petalis aequilongo, usque infra medium trifido, partitionibus lateralibus falcato-ligulatis, obtusiusculis, intermedia triangulari, obtusa, lateralibus paululo brevioribus, umbonibus 2 rotundatis in basi labelli ad ostium calcaris, calcare cylindrico incurvo, apice obtusiusculo, vix 0.2 cm longo; anthera apice emarginata, canalibus perbrevibus, falcato-erectis; rostello humillimo; processibus stigmatiferis, teretibus, porrectis; staminodiis aequilongis tamen processibus stigmatiferis duplo latioribus; ovario rostrato, c. 0.6 cm longo, glabro.

Kaiser-Wilhelms-Land: On more open slopes of the Finisterre Range, on mossy limestone rocks, alt. c. 1200 m—R. Schlechter no. 18203, flowering in Sept. 1908.

From the species already described this may be recognised easily by the habit as well as the floral characteristics. It is peculiar that this group of *Habenarias* has developed in such profusion of form in New Guinea. The differences between the individual species, especially in the labellum and column, seem to be absolutely constant.

8. *H. listeroides* Schltr., sp. nov.

Terrestris, erecta, gracillima, 60–75 cm alta, simplex; radicibus elongatis, flexuosis, villosulis; caule stricto vel substricto, tereti, glabro, infra medium foliis 2 approximatis donato, basi vaginis paucis, dissitis, alte amplexantibus obsesso, supra medium vaginulis pluribus, lanceolatis, acuminatis, dissitis donato; foliis patentibus, late ovatis vel ovato-lanceolatis, acuminatis, tenuiter marginatis, 5.5–9 cm longis, infra medium 2.8–5.3 cm latis; spica laxa multiflora, elongata, secunda, usque ad 25 cm longa; bracteis lanceolatis, acuminatis, glabris, ovario subduplo brevioribus, floribus in genere inter minores, viridibus, glabris; sepalo intermedio oblongo, obtuso, 0.3 cm longo, lateralibus oblique oblongis, distincte apiculatis, aequilongis; petalis oblique rhombeo-ovatis, obtusis, quarta parte basilari margine anteriore labello adnatis, sepalo intermedio fere aequilongis; labello usque infra medium tripartito, petalis aequilongo, partitionibus lateralibus divergentibus, linearibus, obtusis, c. 3.5 mm longis, intermedio ovato-triangulo, obtuso, lateralibus duplo fere brevioribus, callo parvulo dentiformi in basi labelli ad ostium calcaris, calcare dependente subincurvulo, cylindrico, supra medium paululo ampliato, apice subacuto, 3.5 mm longo; anthera apice excisa, canalibus perbrevibus suberectis; rostello parvulo triangulo; processibus stigmatiferis clavatis, canales antherarum superantibus; staminodis rotundatis, loculis antherae subaequimiquis; ovario cylindraceo, apice rostrato, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19804, flowering in June 1909.

Greatly reminds one in habit of *H. macra* Schltr. described above, but the two stem-leaves are very close together, so that the whole plant resembles a species of *Listera*. The structure of the flowers, especially of the labellum, differs considerably in the two species.

9. *H. bismarckiensis* Schltr., sp. nov.

Terrestris, erecta, gracillima, c. 60 cm alta; caule medio fere foliis 2 approximatis donato, infra medium vaginis paucis, dissitis, alte vaginantibus obsesso, supra medium vaginulis dissitis, lanceolatis, acuminatis ornato, tereti, glabro, stricto vel substricto; foliis erecto-patentibus, ellipticis, acuminatis, glabris, margine leviter crispulato-undulatis, 7–10 cm longis, medio fere 2.8–3.2 cm latis; spica subaxe 20–25-flora, secunda, 10–15 cm longa; bracteis erectis, lanceolatis, acuminatis, glabris, ovario subduplo brevioribus; floribus in genere inter minores, viridibus, glabris; sepalo intermedio ovato, obtuso, 2.5 cm longo, lateralibus deflexis oblique ellipticis obtusis, intermedio aequilongis; petalis oblique rhombeo-ellipticis, obtusis, tertia parte basilari margine anteriore labello adnatis, sepalis subaequilongis; labello usque infra medium tripartito, petalis aequilongo, partitionibus rectis, aequilongis, lateralibus lineari-ligulatis, obtusiusculis, intermedio paulo latiore, gibbis 2 humilibus, haud bene conspicuis ad basin labelli ante ostium calcaris; calcare deflexo incurvulo, cylindraceo, supra medium sensim paululo inflato, obtuso, lateraliter paulo compresso, 3.5 mm longo; anthera apice retusa, canalibus adscendentibus, brevibus; rostello rotundato, parvulo; processibus stigmatiferis

cylindræis, canales antherarum plus duplo superantibus; staminodiis oblongis, processibus stigmatiferis aequilongis; ovario cylindræo, apice rostrato, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18761, flowering in Nov. 1909 [Ed.—probably 1908].

In habit resembles *H. macra* Schltr., but has a very different labellum, spur and column.

10. *H. nitida* Schltr., sp. nov.

Terrestris, erecta, simplex, nitida, 20–30 cm alta; radicibus elongatis, flexuosis, pilosulis; caule basin versus foliato, caeterum vaginulis sparsis, mox in bracteis abeuntibus obsesso: foliis 3–5, versus basin caulis, erecto-patentibus, lanceolato-ligulatis, acuminatis, glabris, 3–7 cm longis, medio fere 0.8–1.3 cm latis; spica sublaxe 10–15-flora, subsecunda; bracteis lanceolatis, acuminatis, nunc flores exedentibus, nunc haud aequantibus; floribus in genere minoribus, viridibus, labello brunnescente excepto, glabris; sepalo intermedio ovato-oblongo, obtuso, 0.3 cm longo, lateralibus deflexis, aequilongis, subfalcatis, oblongo-ligulatis, nervo medio extus incrassato; petalis subfalcato-oblongis, obtusis, tertia parte basilari margine anteriore labello adnatis, sepalis, paulo brevioribus; labello usque ad medium tripartito, petalis aequilongo, lobis lateralibus falcato-divergentibus, anguste linearibus, subacutis, 2.5 mm longis, intermedio ovato-triungulo, obtuso, lateralibus fere duplo brevioribus, calle linearis in medio ad basin labelli ante ostium calcaris, calcare incurvulo cylindræo, apice breviter exciso, 3.5 mm longo; anthera apice obtusa; canalibus adscendentibus; rostello parvulo, lobo intermedio dentiformi; brachiis stigmatiferis cylindræis, canalibus antherae fere aequilongis staminodia paululo superantibus; ovario cylindræo glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On more open slopes in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20291, flowering in Sept. 1909.

In appearance somewhat resembles *H. Parishii* Rchb. f., but is characterised markedly by the labellum and the spur, which is jagged distinctly at the apex. The flowers are green, except the lip which has a brownish flush.

11. *H. nana* Schltr., sp. nov.

Terrestris, erecta, nana, 5–15 cm alta; tuberibus oblongoideis; radicibus elongatis, flexuosis, pilosulis; caule ima basi tantum bifoliato, caeterum vaginis lanceolatis, acuminatis, amplectentibus distanter obsesso, tereti, glabro; foliis ad basin caulis patentibus vel erecto-patentibus, ellipticis vel ovato-lanceolatis, acutis vel breviter acuminatis, utrinque glabris, 0.7–1.8 cm longis, medio fere 0.4–1.2 cm latis; racemo sublaxe pauci-plurifloro (usque ad 10-floro), subsecundo, erecto; bracteis lanceolatis vel ovato-lanceolatis, acuminatis, glabris, erectis, nunc ovario longioribus nunc brevioribus; floribus in genere inter minores, viridibus, glabris; sepalo intermedio ovato, obtuso, glabro, 0.3 cm longo, lateralibus deflexis, oblique ovato-ellipticis, obtusis, intermedio aequilongis; petalis oblique rhombo-ellipticis, obtusis, sepalo intermedio aequilongis; labello circuitu rhombo-elliptico, 0.3 cm longo, e medio trilobato, lobis lateralibus parvulis, triangulis, obtusis, intermedio multo majore, triangulo-ovato, obtuso, calcare deflexo, cylindræo, apicem versus subclavato-ampliato, obtuso, 0.5 cm longo; anthera apice leviter trilobulata, canalibus mediocribus; rostello transverso, triangulo, obtuso, humili; processibus stigmatiferis clavatis, canalibus antherarum brevioribus; ovario cylindræo, glabro, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On rocks on the more open slopes of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18009, flowering in July 1908.

The smallest species of the genus so far known from the Territory. Like *H. pachyneura* Schltr. it is characterised in this section by a trilobate, but not tripartite lip.

12. *H. Nymaniana* (Krzl.) Schltr.

Peristylus spiralis Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds. p. 239 (nec A. Rich.)

Peristylus Nymanianus Krzl., in K. Schum. et Laut., Nachtr. [1905] p. 76.

Peristylus cynosorchoides Krzl., in K. Schum. et Laut., Nachtr. [1905] p. 76.

Kaiser-Wilhelms-Land: On grassy hills on the western side of Finschhafen—Hollrung no. 286, flowering in Aug.-Sept. 1886; Simbang—Nyman

no. 890 bis, no. 787; on grassy hills near Bussum—R. Schlechter no. 19920, flowering in July [Ed.—possibly June] 1909.

I cannot separate the plant originally known by Kränzlin as *Peristylus spiralis*, nor his *Peristylus cynosorchoides*, from this species.

13. *H. pachyneura* Schltr., sp. nov.

Terretris, erecta vel adscendens, 20–45 cm alta; radicibus elongatis, flexuosis, puberulis; caule tereti, glabro, tertia parte vel dimidio inferiore plurifoliato, caeterum vaginulis lanceolatis, dissitis, in bracteis abeuntibus donato; foliis 5–9, erecto-patentibus, lanceolatis vel alliptico-lanceolatis, acuminatis, glabris, superne nervis paulo incrassatis, 2.5–5 cm longis, infra medium 0.8–1.8 cm latis; spica densius multiflora, elongata, secunda; bracteis lanceolatis, acuminatis, ovario vulgo fere aequilongis; floribus in genere inter minores, viridibus, glabris, sepalo intermedio ovato, obtuso, 2.5 mm longo, lateralibus deflexis, oblique oblongis, obtusis, intermedio aequilongis; petalis oblique rhombeo-ellipticis obtusis, sepalo intermedio aequilongis, basi margine anteriore tertia parte cum labello connatis; labello circuitu late rhombeo, 2.5 mm longo, e medio trilobato, lobis lateralibus parvulis, triangulis, obtusiusculis, intermedio multo majore, ovato, obtuso, incrassatione vel potius tabula rhombea incrassata in basi labelli, ad ostium calcaris, calcare recto subdecurvo, cylindrico, apice leviter obovoideo-inflato, c. 4.5 mm longo; anthera obtuse apiculata, canalibus abbreviatis; rostello parvulo transverso, medio incrassato; brachiis stigmatiferis cylindraceutis, canales antherae superantibus; staminodiis amplis inaequaliter bilobulatis; ovario cylindraceuto glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18824, flowering in Nov. 1908.

This species is well characterised from all others in the Territory by its habit, labellum and spur. The thickened veins on the upper side of the leaves are very striking.

§ 2. *Plantagineae*

14. *H. chloroleuca* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 77.; J.J. Sm., in Nova Guinea VIII, p. 4, A.I., p.2.

Kaiser-Wilhelms-Land: In humus in the primary forests on the upper Djamu [River], alt. c. 500 m—R. Schlechter no. 17311, flowering in Feb. 1908; in humus in the forests of the Bismarck Range, alt. c. 700 m—R. Schlechter no. 13936, flowering in Jan. 1902; in humus in the forests of the Finisterre Range, above Meireka, alt. c. 600 m—R. Schlechter no. 18042, flowering in July 1908; in humus in the forests on the Gomadjidji [Mount] (Waria District), alt. c. 400 m—R. Schlechter no. 19347, flowering in May 1909; in humus in the forests on the Govidjoa [Creek] (Waria District), alt. c. 1000 m—R. Schlechter no. 19754, flowering in June 1909.

Neu-Mecklenburg: In humus in the range-forests near Punam, alt. c. 600 m—R. Schlechter no. 14704, flowering in July 1902.

This species is distributed widely in the Territory and has been reported recently from Dutch New Guinea. Whether it is identical with *H. Bäuerlenii* F.v.M. et Krzl., as I first supposed, is still uncertain. The latter species is unknown to me, but I can hardly imagine that the new species could be arranged under the *Peristylodeae*, as was done in the 'Monograph der Habenareen' [Monograph of the Habenarias] by Kränzlin in the case of *H. Bäuerlenii* F.v.M. et Krzl.

§ 3. *Acuiferae*

15. *H. Rumphii* Lindl., Gen. et Spec. Orch., p. 320; Schltr., in K. Schum. et Laut., Nachtr. [1905] p. 79.

H. stauroglossa Krzl., in K. Schum., Fl. Kaiser-Wilhelms-Land, p. 35.

H. Dahliana Krzl., in K. Schum., Fl. Neu-Pommern, p. 106.

Kaiser-Wilhelms-Land: On grassy flats between the along on the Ramu [River], alt. c.

100 m—R. Schlechter no. 13855, flowering in Jan. 1902; near Finschhafen.

Neu-Pommern: Grassland on volcanic ground on the Mutter Volcano, alt. c. 700 m—Dahl (no number), flowering in Mar. 1897.

J.J. Smith has described recently a variety of this species, *meraukensis*, from Dutch New Guinea. In colour, this species varies between white, rose-red and red. The white variety appears to be more prevalent.

§ 4. *Chlorinae*

16. *H. torricellensis* Schltr. in K. Schum. et Laut., Nachtr. [1905], p. 70.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 14323, flowering in Apr. 1902.

§ 5. *Salaccenses*

17. *H. trichaete* Schltr., sp. nov.

Terrestris, erecta, simplex; 70–80 cm alta; tuberibus oblongoideis; radicibus elongatis, flexuosis, villosis; caule stricto, tereti, glabro, usque ad medium vaginis 5–7, arcte amplexentibus obsesso, dimidio superiore 7–8-foliato; foliis plus minusve approximatis, ellipticis, acuminatis, glabris, erecto-patentibus, usque ad 18 cm longis, medio fere usque ad 4.5 cm latis; superioribus subito in vaginas bracteiformes abundibus spica cylindrica, dense 15–25-flora, usque ad 13 cm longa, c. 5.5 cm diametiente; bracteis lanceolatis vel elliptico-lanceolatis, acuminatis, ovario aequilongis vel paulo longioribus; floribus erecto-patentibus, mediocribus; sepalis ovato-oblongis, nervo medio apice in aristam 0.4–0.6 cm longam producto, arista exclusa c. 1 cm longis, lateralibus deflexis obliquis; petalis oblique linearibus, subacutis, erectis, antice basi in dentem subulatum, vix 0.2 cm longum productis; labello tripartito, c. 1 cm longo, partitionibus linearibus obtusiusculis, glabris, lateralibus falciculatis intermediae angustioribus et quarta parte fere brevioribus, calcare cylindrico, obtusiusculo infra apicem paululo ampliato, c. 1.7 cm longo; anthera apice obtusa, canalibus porrectis, media longitudine; rostello triangulo, obtuso; processibus stigmatiferis canales antherae bene superantibus; staminodiis rotundatis, brevibus; ovario cylindraceo subclavato, c. 2 cm longo.

Kaiser-Wilhelms-Land: In humus in the primary forests on the Djamu [River], in the district of Umbili, alt. c. 400 m—R. Schlechter no. 16383 (TYPE), flowering in Aug. 1907; in humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17484, flowering in Mar. 1908.

The only species of this section in the Territory in which the superior divisions of the petals are reduced to a small tooth. The flowers are bluish green, with brownish petals, labellum and anthers. Very striking are the tips of the sepals which are extended into long setae.

18. *H. Novae-Hiberniae* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 79.

Kaiser-Wilhelms-Land: In humus in the forests of the Gomadjidji [Mountain] (Waria District), alt. c. 450 m—R. Schlechter no. 19350, flowering in May 1909; in humus in the forests on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19821, flowering in June 1909.

Neu-Mecklenburg: In humus of the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14698, flowering in July 1902.

The specimens from Kaiser-Wilhelms-Land agree perfectly with the Type from Neu-Mecklenburg, but the dorsal sepal is somewhat broader.

19. *H. dracaenifolia* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 77.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14336, flowering in Apr. 1902; in humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17790, flowering in May 1908.

var. *laxa* Schltr., var. nov.

Differt a forma typica racemis laxifloris.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 17946, flowering in July 1908.

This variety, at first, makes a strange impression by the loose inflorescences, but otherwise it is exactly the same in its floral structure as the Type.

20. *H. dryadum* Schltr., in Fedde, Repertor. III, p. 60.

H. epiphylla Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 78 (nec Rodr.).

Kaiser-Wilhelms-Land: In thick shrub-forests on the upper Schumann River, alt. c. 500 m—R. Schlechter no. 14175, flowering in Feb. 1902.

var. *major* Schltr., var. nov.

Differt a forma typica statura validiore, floribus majoribus et calcaribus magis incurvis.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 400 m—R. Schlechter no. 15707 [Ed.—possibly 14707], flowering in March [Ed.—possibly July] 1902.

I think it is better to establish this variety, because this plant does not agree completely with the Type. The Type description of the species was made from no. 14175 only. The plant illustrated by J.J. Smith under this name in 'Nova Guinea' VIII, t.2, p. 1, agrees perfectly with *H. dracaenifolia* Schltr. in the analysis of the flowers and probably should be placed there.

§ 6. *Medusaeformes*

21. *H. notabilis* Schltr., sp. nov.

Terrestris, erecta, valida, simplex, c. 130 cm alta; radicibus elongatis, flexuosis, villosis; caule stricto, valido, basi vaginis obsessa excepta bene foliato, tereti, glabro, c. 1 cm diametiente; foliis erecto-patentibus, lanceolato-lingulatis, acuminatis, glabris, usque ad 30 cm longis, medio fere usque ad 4.5 cm latis, superioribus sensim in bracteis abeuntibus; spica dense multiflora, cylindrica, c. 20 cm longa, 3.5 cm diametiente; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, flores aequantibus; floribus in sectione parvulis, erecto-patentibus, glabris; sepalis ovatis, subacutis, 9.5 mm longis, lateralibus obliquis, deflexis; petalis bipartitis, partitione posteriore falcato-lanceolata, obtusiuscula, sepalis intermedio aequilonga, partitione anteriore decurva, lineari, antice in aristas 3–4 irregulariter fissa, posteriori fere aequilonga; labello usque supra basin tripartito. 1.3 cm longo, partitionibus lateralibus e basi lineari apicem versus dilatatis et in aristas 7–10 inaequilongas irregulariter digitato fissis, c. 1 cm longis, partitione intermedia lineari, obtusiuscula, indivisa, c. 1.2 cm longa, calcare dependente cylindrico, obtuso, c. 1.3 cm longo; anthera apice excisa, canalibus porrectis, media longitudine; rostello transverso, humili, triangulo; processibus stigmatiferis canales antherae subduplo fere superantibus; staminodiis rotundatis irregulariter lobulatis; ovario cylindraceo, glabro, c. 1.6 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18556, flowering in Oct. 1908.

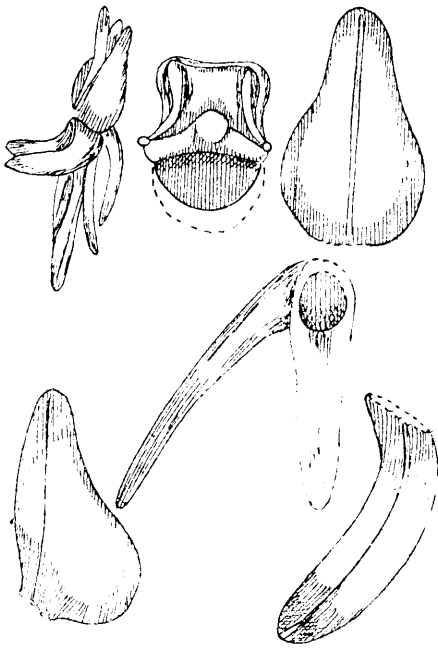
A striking plant. The species with the smallest flowers in the section, by which, in a way, a transition is made to the group *Salaccenses*, since the division of the anterior lobes of the petals and lateral lobes of the lip has not advanced as far as the other species of the section. The flowers are green with yellowish petals and labellum.

22. *H. polychista* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 80.

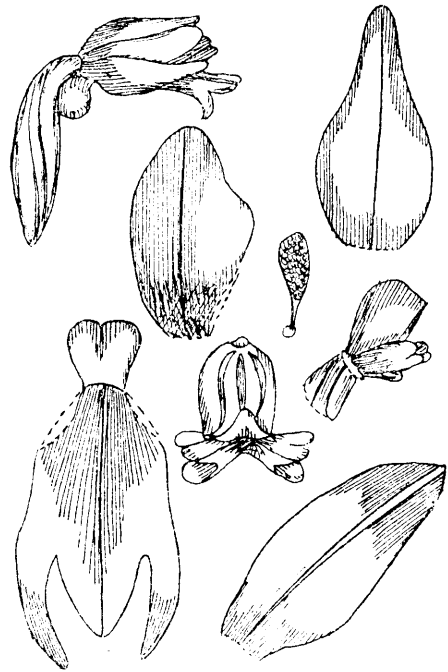
Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 14475, flowering in Apr. 1902; on a large tree in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17046, flowering in Dec. 1907; in humus in the forest on the edge of the Govidjoa [Creek] (Waria District), alt. c. 1000 m—R. Schlechter no. 19739, flowering in June 1909.

The specimens from the Waria District are distinguished from the others by the dilated part of the spur being less sharply truncate at the apex, but otherwise I cannot find sufficient differences to warrant the separation of this form.

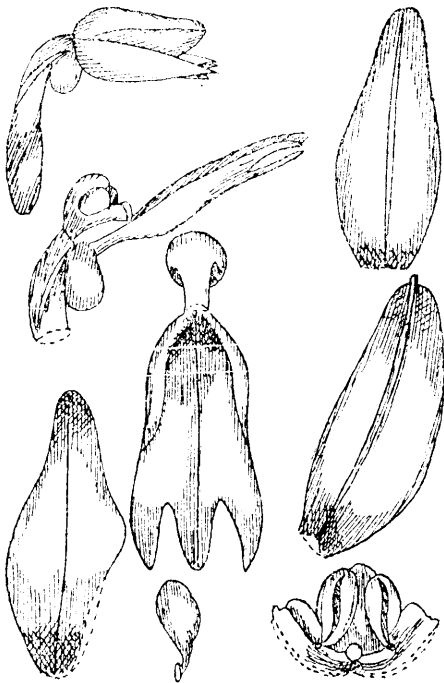
GROUP II *Habenariinae*



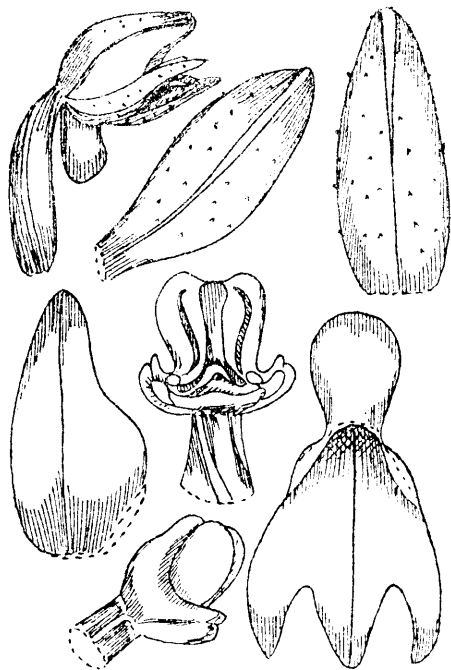
Platanthera papuana Schltr.



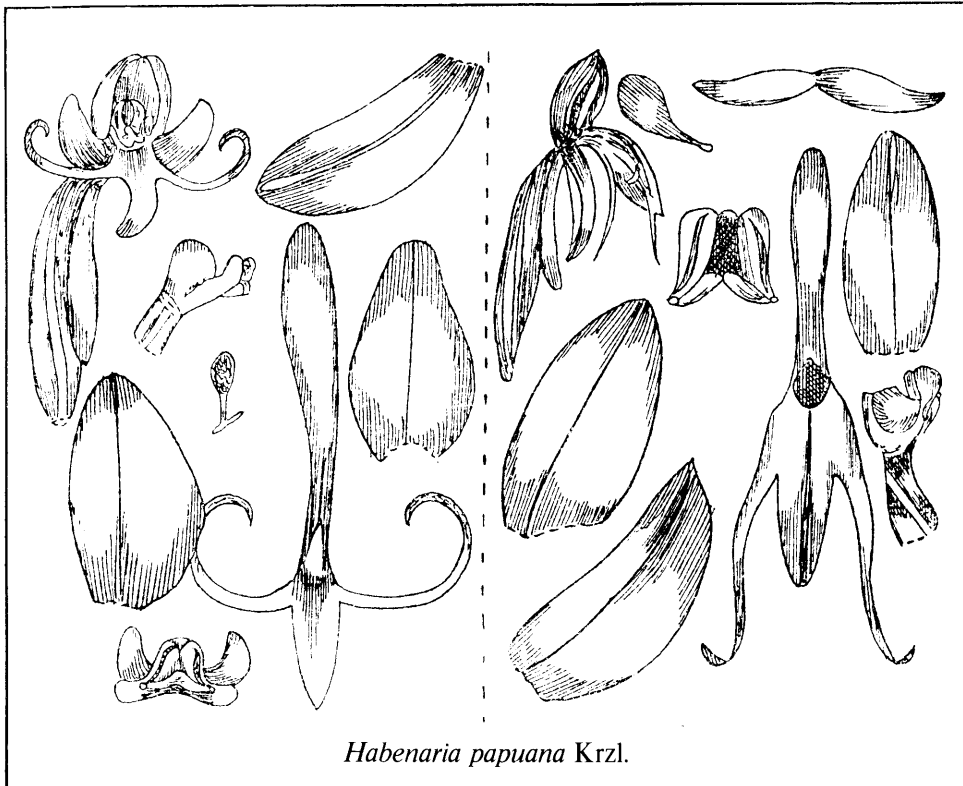
Habenaria goodyeroides Don



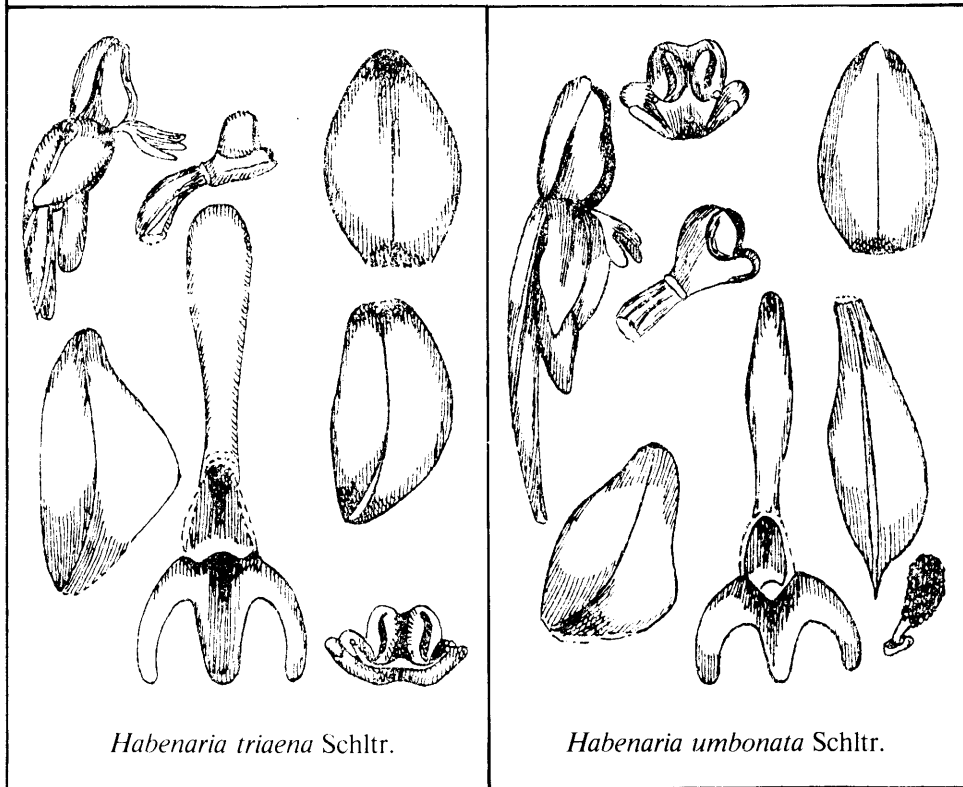
Habenaria dolichocaulon Schltr.



Habenaria silvicola Schltr.

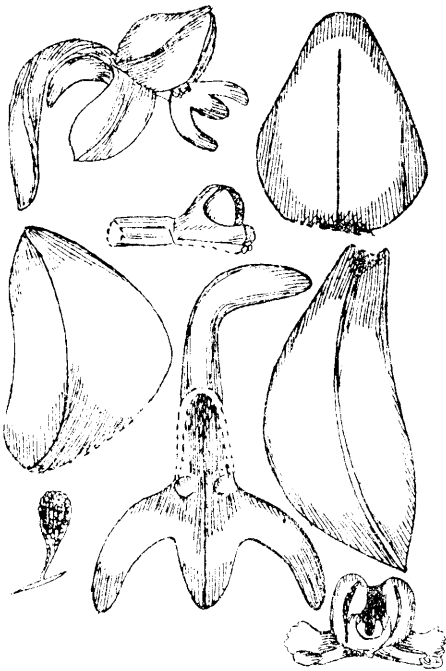


Habenaria papuana Krzl.

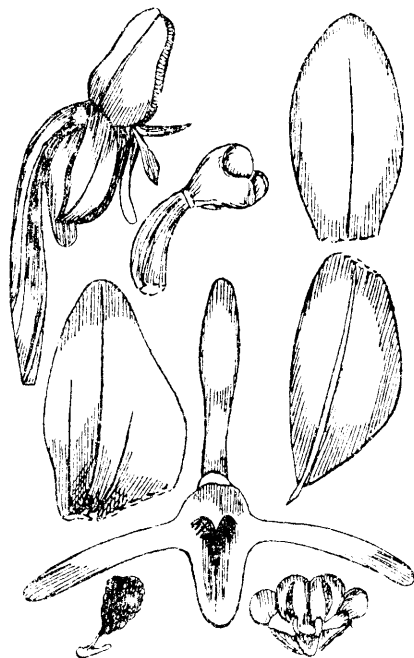


Habenaria triaena Schltr.

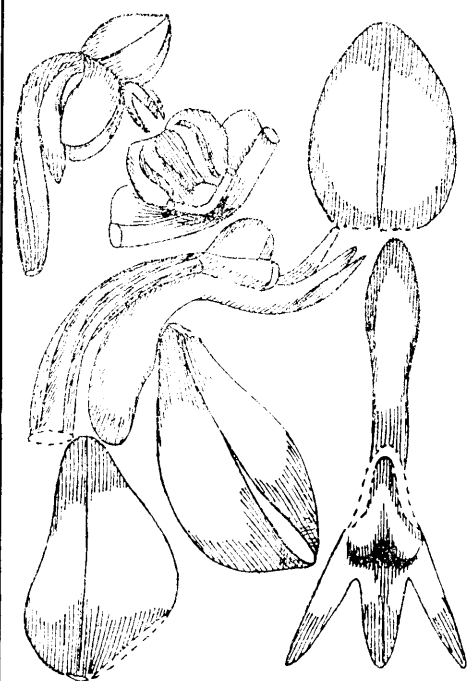
Habenaria umbonata Schltr.



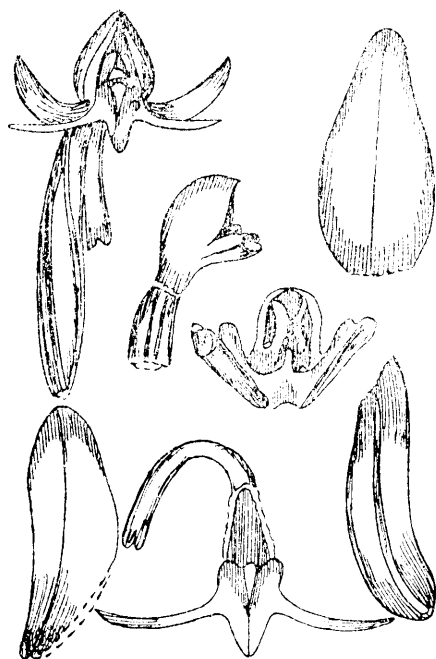
Habenaria macra Schltr.



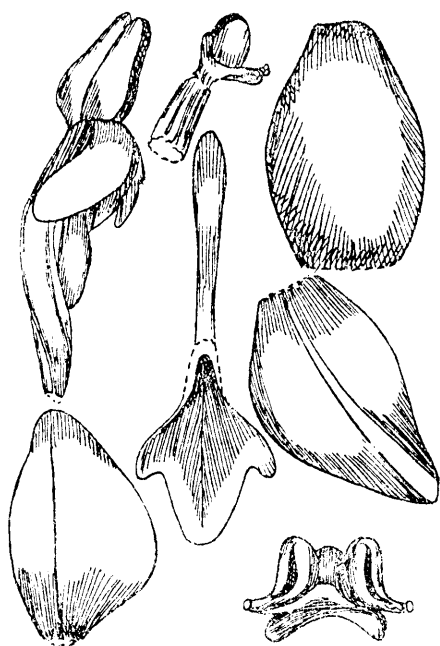
Habenaria listeroides Schltr.



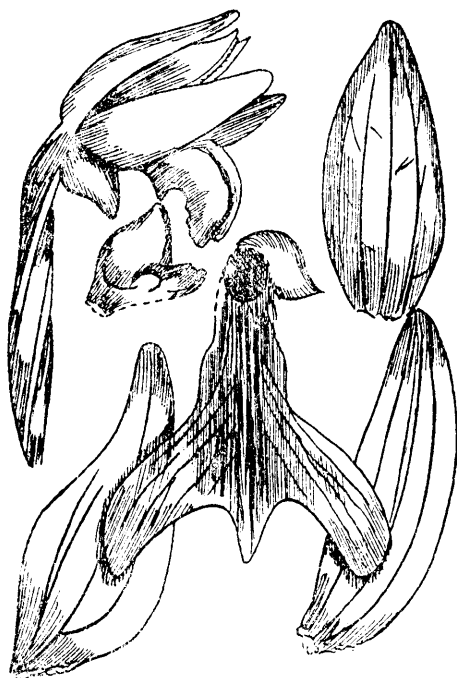
Habenaria bismarckiensis Schltr.



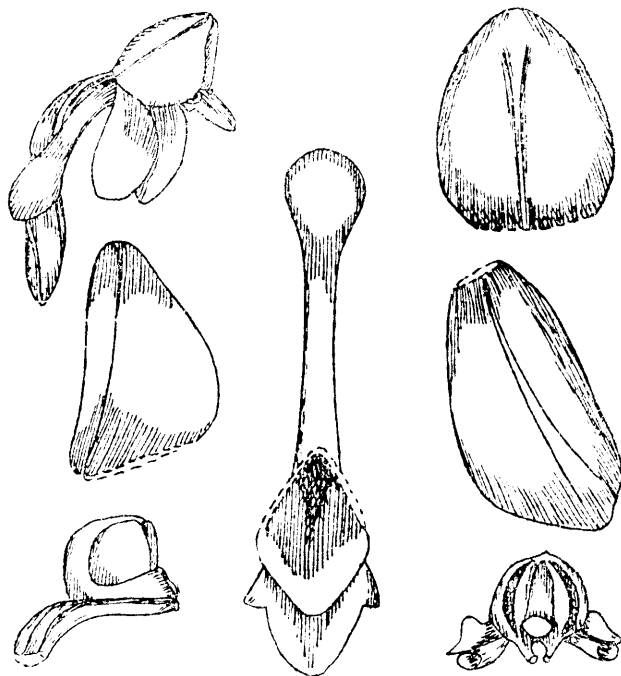
Habenaria nitida Schltr.



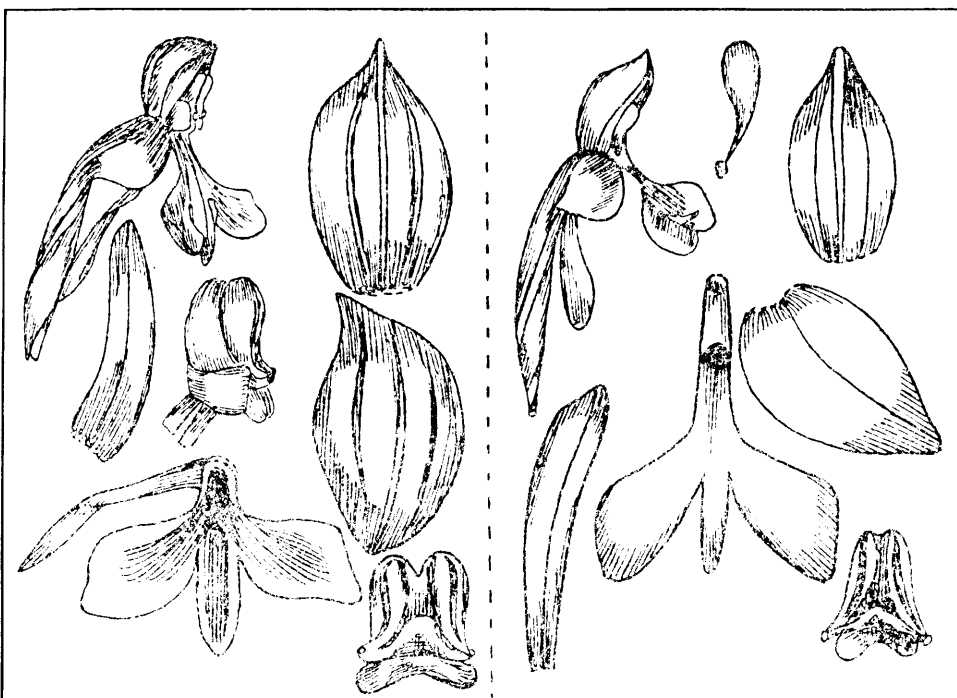
Habenaria nana Schltr.



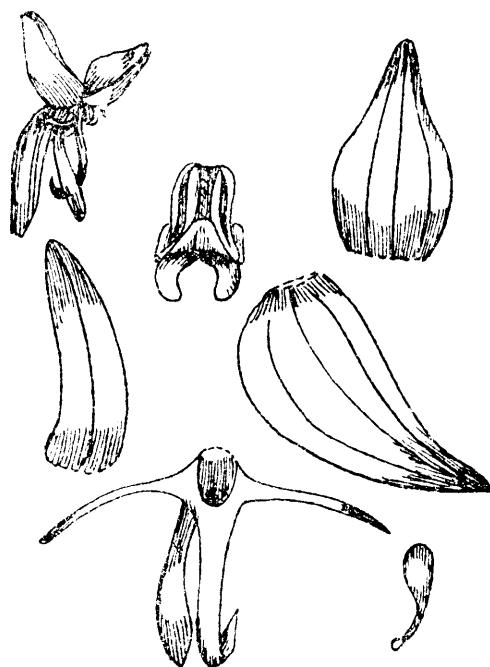
Habenaria Nymaniana Schltr.



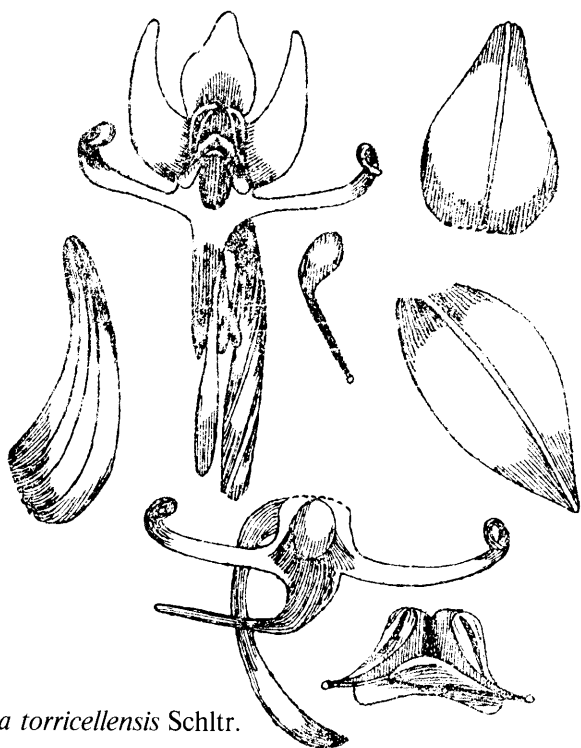
Habenaria pachyneura Schltr.



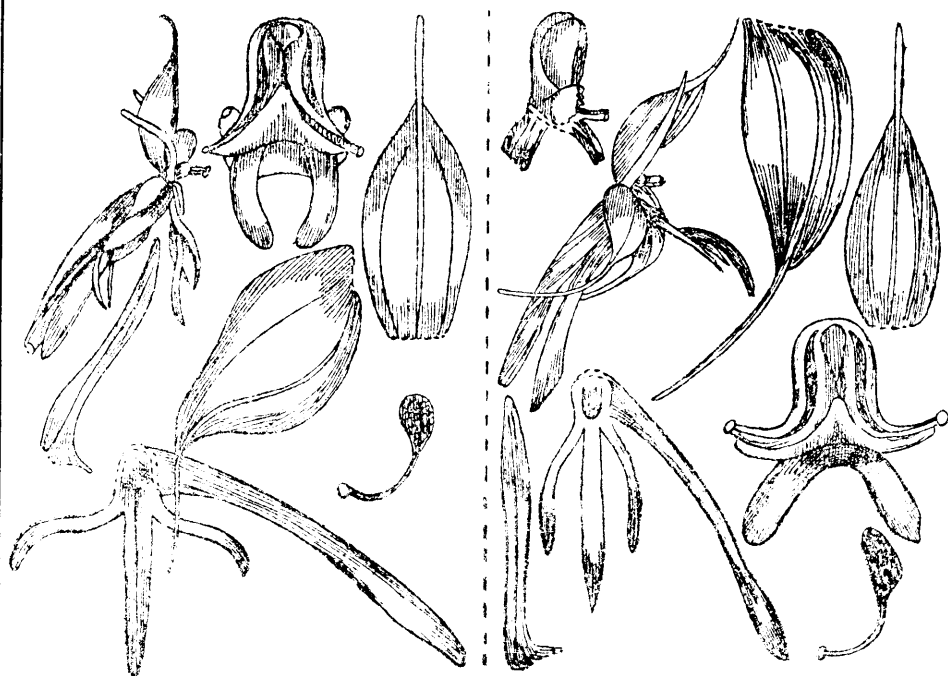
Habenaria chloroleuca Schltr.



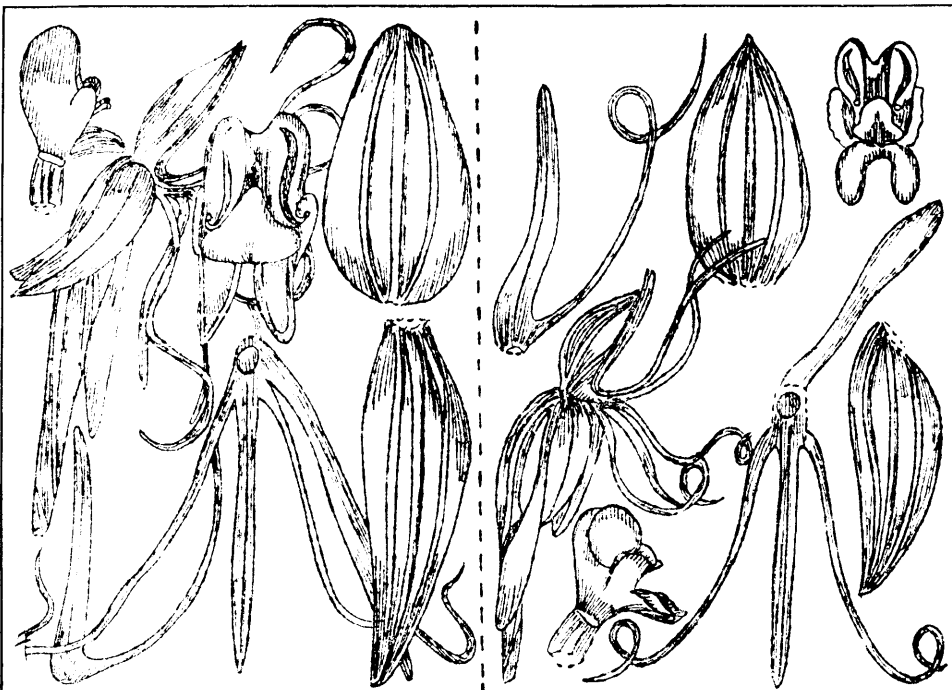
Habenaria Rumphii Lindl.



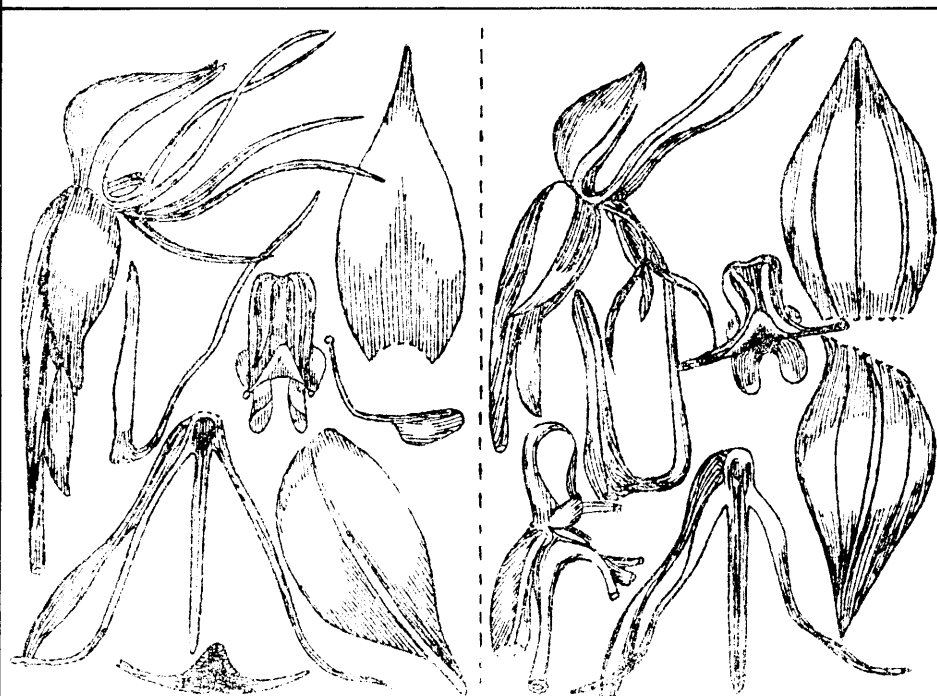
Habenaria torricellensis Schltr.



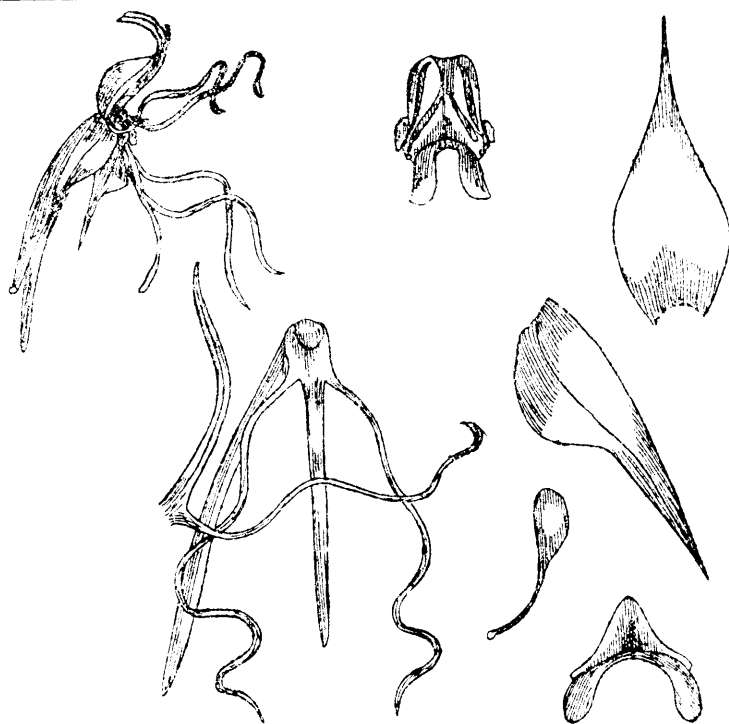
Habenaria trichaete Schltr.



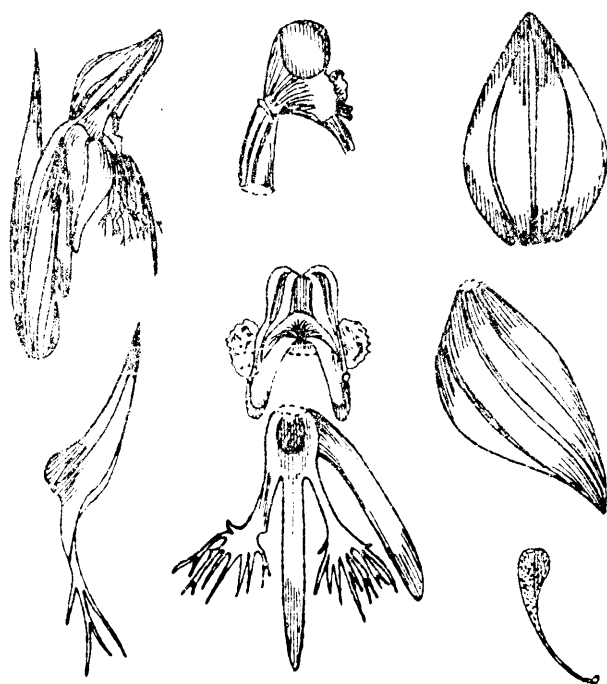
Habenaria Novae-Hiberniae Schltr.



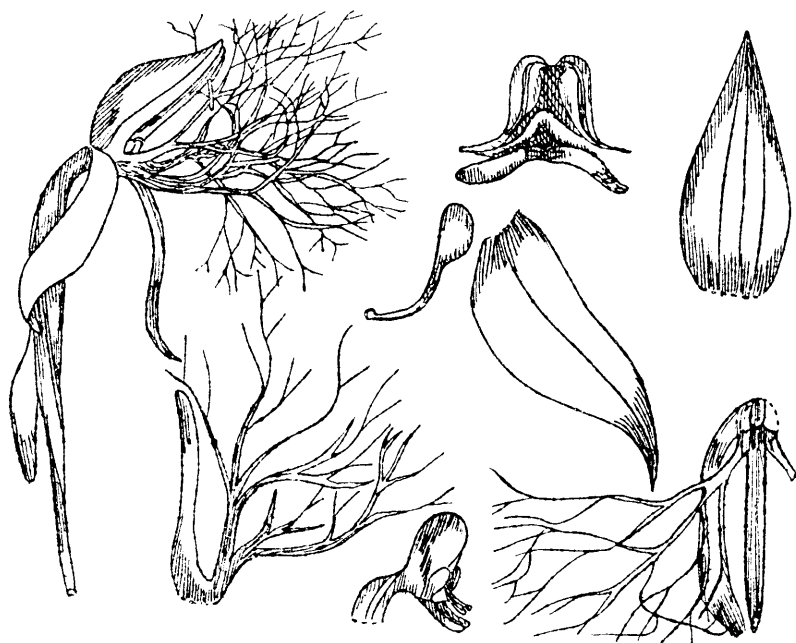
Habenaria dracaenifolia Schltr.



Habenaria dryadum Schltr.



Habenaria notabilis Schltr.



Habenaria polychista Schltr.

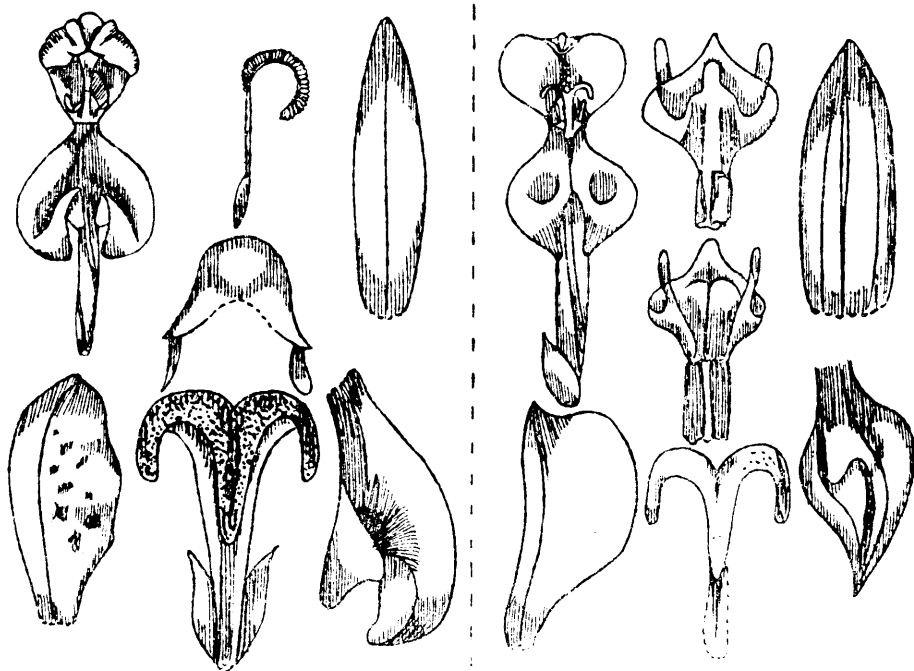
Group III *Disperidinae*

4. *Disperis* Sw.

In the entire group of *Disperidinae*, *Disperis* Sw. is the only representative known outside of the African continent, where the group has experienced a strikingly multiform development, especially in the southern parts. Up to the present, the genus *Disperis* contains about 50 described species, but of these, only about four occur outside of Africa and its adjacent islands. These four species indicate a very interesting distribution of the genus, since only two, viz. *D. zeylanica* Trimen and *D. neilgherrensis* Wight, occur in India, while *D. papuana* Krzl. is known from Timor-Laut (or Tanimbar Island), and *D. rhodoneura* Schltr. represents the extreme location towards the east [Kaiser-Wilhelms-Land]. A fifth (as yet undescribed species) has been discovered recently in the Philippines and will be published shortly as *D. philippinensis* Schltr.

1. *D. rhodoneura* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 81.

Kaiser-Wilhelms-Land: Between moss on shaded rocks in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 14332, flowering in Apr. 1902; between moss in the undergrowth on the ridges of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18221, flowering in Sept. 1908.

GROUP III *Disperidinae*

Disperis rhodoneura Schltr.

SECOND DIVISION

Acrotonae

Series A. *Polychondreae*

Group IV *Acianthinae*

In Engl. Bot. Jahrb. XLV, p. 379, I have dealt in detail with the manner in which this group is circumscribed by me. Of the five genera, *Lyperanthus* R. Br., *Corysanthes* R. Br., *Acianthus* R. Br., *Townsonia* Cheesem. and *Stigmatodactylus* Maxim., no less than four must be considered as typical Australian-Pacific forms. *Stigmatodactylus* is Indo-Malayan. It is probable that all the plants belonging here are semi-saprophytic, with the exception of a few *Lyperanthus* species.

5. *Corysanthes* R. Br.

The occurrence of species of this genus in New Guinea was anticipated long before I found the first traces in the Torricelli Range in 1902. For, apart from Australia and New Zealand which had been regarded previously as the chief centre of dispersal of the genus, scattered representatives had been reported from Samoa and Tahiti, from the Philippines in the north, and from the Himalayas in the north-western direction, apart from a few very localised species from the Malayan region. Thus, there was nothing surprising in the discovery of the genus in New Guinea, but completely unexpected was the profusion of forms found there. Up to the present, only 22 were known, but now 16 species are reported suddenly from New Guinea, viz. three just described by J.J. Smith and the 13 described here. From my knowledge of the Territory, I am certain that a great many more will be discovered there.

One may add a few more words with regard to the mode of occurrence of these species in the Territory. All forms are inhabitants of the mountains, usually commencing at an altitude of about 1000 metres. However, in those mountains, such as the Torricellis, where the mist-forest (or zone) begins lower down, they may be found at an altitude of about 600 metres. Some of the species always grow as epiphytes between moss on tree-trunks, or on the thick branches of trees, while others are found only on the ground. This habit is characteristic and constant for the individual species. It has been observed also that the epiphytic species have short-pedicelled fruits, while the terrestrial ones have their fruit raised high up on a long stem after the flowering is over. The plant is, in this way, better adapted for the dispersal of its seed.

The regeneration of the vegetative organs and reproduction of the individual plants are effected by the development of long thread-like roots, on the tips of which there are formed small bulbs which disengage themselves from the roots and, as separate individuals, produce fresh shoots. Propagation from seed also frequently occurs, as I could establish from many small plants of *C. gastrosiphon* Schltr. growing in colonies.

The species growing in the Territory may be divided into three sections, viz. *Gastrosiphon*, *Calcearia* and *Geosiphon*, as characterised later on. Besides the species described here, three others are reported by J.J. Smith from Dutch New Guinea, viz. *C. callifera* J.J. Sm., *C. ventricosa* J.J. Sm. and *C. triloba* J.J. Sm.

§ 1. *Gastrosiphon*

The tube of the labellum expanded ventricosely in front.

1. *C. gastrosiphon* Schltr., sp. nov.

Epiphytica, pusilla, 2–5 cm alta; radicibus filiformibus, elongatis, flexuosis, glabris; folio ovato vel ovato-elliptico, breviter acuminato vel acuto, basi cordato, amplexicauli, 2.2–5.5 cm longo, 1–3.6 cm lato; flore sessili, erecto, mediocri, glabro; bractea lanceolata, acuminata, ovarium fere duplo superante; sepalo intermedio e basi lineari obovato-spathulato, obtusissimo, concavo, c. 1.5 cm longo, lateralibus adscendentibus lineari-subulatis, acutis, c. 0.8 cm longis, ima basi connatis; petalis sepalis lateralibus simillimis et aequimagnis; labello cuculliformi, antice in limbum suborbicularem, apice leviter excisum, margine minute denticulatum expanso, sepalo intermedio distincte brevior, intus glabro, tubo antice praesertim basin versus ventricosus-inflatus, basi extus carinato, saccis deflexis oblique conicis, parvulis; columna parvula generis; ovario cylindrico, glabro, vix 0.5 cm longo.

Kaiser-Wilhelms-Land: On mossy tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16948, flowering in Dec. 1907; between moss on trees on the ridges of the Ibo Range, alt. c. 1000–1100 m—R. Schlechter no. 17101, flowering Dec. 1907; no. 18991, flowering in Dec. 1908.

This and the two following species are distinguished by the labellar tube which is expanded ventricosely in front. All three species are, therefore, related to *C. ventricosus* J.J. Sm., and *C. fornicata* Bl., and can be combined to form the very natural section: *Gastrosiphon*. The flowers of *C. gastrosiphon* are whitish on the outside, the dorsal sepal is rose-red inside and the labellum has carmine veins inside.

2. *C. gibbiferum* Schltr., sp. nov.

Epiphytica, pusilla, 2–3 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio suborbiculari vel late ovato, apiculato, basi cordato-amplexicauli, 1.2–2 cm longo, medio vel infra medium 0.8–1.8 cm lato, glabro; flore brevissime pedunculato vel subsessili, erecto, glabro; bractea lanceolato-subulata, acuminata, ovario aequilonga; sepalo intermedio e basi ligulato unguiculato obovato-spathulato, obtuso, concavo, dorso leviter carinato, 1.5–2.5 cm longo, lateralibus subulatis, porrectis, minutis, 0.3–0.5 cm longis; petalis lineari-subulatis, acutissimis, adscendentibus, 1–1.3 cm longis; labello e basi cuculliformi in limbum suborbicularem breviter acuminatum, margine serrato-ciliatum expanso, glabro, gibbo conico obtuso in medio ad ostium faucis ornato, sepalo intermedio paulo brevior, tubo antice ventricosus-inflatus et lateraliter valde compresso, saccis parvulis divergentibus, conicis, subacutis; columna parvula, crassiuscula generis, glabra; ovario cylindrico, glabro, 0.4–0.5 cm longo.

Kaiser-Wilhelms-Land: Between moss on tree-trunks in the forests on the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20272, flowering in Sept. 1909.

A species both interesting and conspicuous which is distinguished from all others of the section by the mark of the compressed ventricose part of the lip-tube, the sharp-toothed margins of the lamina and the high conical protuberance at the throat of the tube.

The colour of the flowers of this charming species is strikingly gay; the dorsal sepal being bright pink; the labellum white, with dark purple veins, the belly in front pink, the protuberance pink with a dark margin. The leaves are pale green.

It is conspicuous that the species of this section rarely have coloured-veined leaves.

3. *C. adunca* Schltr., sp. nov.

Epiphyticum, pusillum, c. 2.5–3.5 cm altum; radicibus filiformibus elongatis, flexuosis, puberulis; folio late ovato, breviter acuminato vel apiculato, cordato-amplexicauli, glabro, 2.5–4 cm longo, infra medium 2–3 cm lato; flore erecto, sessili, in genere mediocri; bractea lanceolato-subulata, acuminata, ovarium dimidio fere superante; sepalo intermedio e basi lineari-unguiculato suborbiculari-spathulato, adunco, obtusiusculo, extus verruculosus, c. 1.7 cm longo, lateralibus lanceolato-subulatis, acutissimis, porrectis, c. 0.3 cm longis, glabris; petalis sepalis lateralibus simillimis aequilongisque, erectis; labello e basi alte cuculliformi, apice in limbum suborbicularem, margine integrum, superne verruculosum expanso sepalo intermedio conspicue brevior, tubo antice basin versus ventricosus-inflatus, basi extus

carinato, saccis deflexis, cylindraceo-conicis, obtusiusculis, obliquis, parvulis; columna brevi, crassiuscula generis, glabra; ovario cylindraceo glabro, c. 0.4 cm longo, sessili.

Kaiser-Wilhelms-Land: Between moss on large tree-trunks and branches in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20073, flowering in Sept. 1909.

This species, undoubtedly, is closely related to the two described above. The long, clawed dorsal sepal, the very short lateral sepals and petals, and above all the lip with an entire margin irregularly beset with small warts distinguish this species completely. The ground-colouring of the flowers is whitish; the dorsal sepal, dotted rose-red; the labellum streaked dark carmine on the outside and spotted with red on the inside.

§ 2. *Calcearia*

In this section are included those Malayan species with a distinct foliage-leaf, but in which the tube of the labellum is not expanded ventricosely in front.

4. *C. aristata* Schltr., sp. nov.

Epiphytica, pusilla, 4.5–5 cm alta; radicibus filiformibus, elongatis, flexuosis, glabris; folio late ovato, cordato, aristato-apiculato, margine minute undulato, nervis superne leviter incrassatis, 1–1.3 cm longo, infra medium c. 1 cm lato; pedunculo subnullo; bractea erecta, lanceolata, acuminata, ovario brevior; flore in genere mediocri, erecto; sepalo intermedio lanceolato-ligulato, acuminato et in aristam satis longam (c. 3.5 mm) producto, concavo, margine apicem versus minutissime serrulato, 1.5 cm longo, sepalis lateralibus setaceo-filiformibus, intermedio sublongioribus; petalis sepalis similibus et aequilongis; labello cuculiformi, antice decurvulo, apiculato, callo duplici lineari in medio laminae, glabro, antice margine minutissime serrulato, fauce antice haud inflato, sepalo intermedio brevior, saccis basilaribus divergentibus, conicis, parvulis, obtusis; columna minuta generis; ovario cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2100 m—R. Schlechter no. 18819, flowering in Nov. 1908.

This and the following species are distinguished from the others in the Territory by the dorsal sepal which is extended into an almost 3.5 mm long fine setaceous pouch. The flowers are pale whitish with purple stripes.

5. *C. arachnoidea* Schltr., sp. nov.

Terrestris, pusilla, 3–4 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio patente vel vulgo solo appresso, ovato, cordato, acuminato vel acuminatissimo, 1.3–1.7 cm longo, infra medium 0.7–0.9 cm lato; flore subsessili, erecto, mediocri; bractea lanceolata, acuminata, ovarium breve duplo superante; sepalo intermedio lanceolato-ligulato, acuminato, supra medium paulo dilatato, glabro, c. 1.2 cm longo, lateralibus adscendentibus lineari-filiformibus, acutissimis, 2.3 cm longis; petalis sepalis similibus, erectis, 2.5 cm longis; labello e basi cuculliformi in limbum suborbicularem, antice retusiusculum, apiculatum, margine minute serratum expanso, sepalo intermedio aequilongo, umbone rotundato parvulo in fauce, saccis basilaribus divergentibus conicis, parvulis; columna parvula generis; ovario oblongoideo-cylindraceo, glabro, 2.5 mm longo.

Kaiser-Wilhelms-Land: On mossy clearings in humus in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20276, flowering in Sept. 1909.

A charming small species reminding one of *C. limbata* Hook. f., but it possesses quite a differently shaped dorsal sepal. The flowers are whitish, with a broad red band on the labellum running parallel to the margin.

6. *C. striata* Schltr., sp. nov.

Terrestris, pusilla, 2.5–4.5 cm alta; radicibus filiformibus elongatis, flexuosis, puberulis; folio parvulo suborbiculari vel subreniformi, cordato, breviter acuminato vel apiculato, glabro, 0.7–1.2 cm longo, infra medium 0.8–1.2 cm lato; pedunculo perbrevis, post anthesin sensim elongato; flore erecto, mediocri; bractea ovato-lanceolata, acuminata, glabra, ovario duplo fere brevior; sepalo intermedio obovato-spathulato, obtuso, glabro, concavo, c. 1.3 cm longo, lateralibus adscendentibus lineari-

subulatis, acutissimis, 0.9 cm longis, glabris; petalis subulatis suberectis, sepalis lateralibus plus duplo brevioribus; labello e basi cuculliformi antice in limbum circuitu ovatum, obtusum, margine integrum, superne apicem versus sparsim pilosulum expanso, sepalo intermedio brevior, saccis brevibus divergentibus, conicis, obtusis; columna brevi, crassiuscula, glabra; ovario cylindrico, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On free-standing limestone on open slopes of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18011, flowering in July 1908.

A graceful, small species which differs considerably in its various characteristics from the other species known in the Territory; notably in the length of the ovary and in the shape and degree of hairiness of the labellum. The plant grows in colonies on moss-covered, exposed calcareous rocks, mostly in association with some species of *Liparis* and with *Habenaria nana* Schltr., but always more-or-less in the shelter of shrubs. The leaves of the little plant are fairly dark green. The whitish flowers are striped with carmine, the dorsal sepal carmine-flushed towards the apex.

7. *C. puberula* Schltr., sp. nov.

Terrestris, pusilla, 3–5 cm alta; radicibus filiformibus elongatis, flexuosis, puberulis; folio ovato, acuminato, basi cordato, 1.8–3 cm longo, infra medium 1–1.8 cm lato; flore subsessili, erecto, in genere inter majores; bractea lanceolato-subulata, glabra, ovarium superante; sepalo intermedio e basi unguiculata elliptico-spathulato, adunco, apiculato, glabro, dorso nervis primariis 7 prominulis, 1.8 cm longo, sepalis lateralibus adscendentibus lineari-filiformibus acutissimis, c. 3 cm longis, glabris; petalis sepalis lateralibus simillimis aequilongisque, erectis; labello e basi cylindraco-cuculliformi in limbum circuitu late ovato-oblongum obtusum defractum, superne dense et minutissime papilloso-puberulum, margine minute denticulato-ciliatum, ad ostium faucis medio profundius sulcatum expanso, sepalo intermedio brevior, saccis brevibus falcato-divergentibus, conicis, subacutis; columna brevi, crassiuscula, glabra; ovario cylindraco, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20024, flowering in Sept. 1909.

The only species in the Territory where the lamina of the labellum is covered thickly with short hair in the front. As is the case with various species, this one chiefly occurs as scattered individual specimens. I think it very probable that the plant previously mentioned by me in K. Schum. et Laut., Nachtr. [1905] p. 81 as *Corysanthes* sp. is identical with the species described here. The leaves have equally beautiful white or rose-red veins, as in that specimen, and also agree in shape. The flowers are white, flushed rose-red and marked.

8. *C. speculum* Schltr., sp. nov.

Terrestris, pusilla, 2–3 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio late ovato, acuminato, basi profundius cordato, glabro, 2–3 cm longo, medio fere 1.3–2.2 cm lato; flore sessili, erecto, in genere inter majores; bractea lanceolato-subulata, ovarium superante; sepalo intermedio e basi ligulato-unguiculata elliptico-spathulato, apiculato, adunco, c. 2 cm longo, dorso nervis 5 primariis incrassatis, sepalis lateralibus adscendentibus vel porrectis, lineari-filiformibus, acutissimis, c. 2.3 cm longis glabris, petalis sepalis lateralibus simillimis, adscendentibus, c. 2.5 cm longis; labello e basi cuculliformi in limbum circuitu late ovatum, acuminatum, glabrum, dimidio anteriore praesertim apicem versus gross serratum, amplum, expanso, speculo roseo convexo ovato in medio ad ostium faucis, saccis parvulis falcato-divergentibus, conicis, subacutis; columna brevi, carnosula, glabra; ovario cylindraco, glabro, 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, on the Rin-Tejao [River] alt. c. 800 m—R. Schlechter no. 20131, flowering in Sept. 1909.

A very gay small plant, which differs greatly from the other species in the structure of the flowers. These marvellous creations of nature, the small *Corysanthes* species, really should be cultivated by fanciers, like those of *Goodyera* and *Anoectochilus* and orchids of that kind, because, not only are the leaves often wonderfully coloured, but also the flowers, with their bizarre shapes, show a magnificent mixture of colours. For instance, *C. speculum* Schltr. has pale green, rose-

red-veined leaves and dark purple flowers, which in the centre of the labellum have a rose-red-coloured mirror and at the margin on each side a rose-red-coloured spot.

9. *C. torricellensis* Schltr., sp. nov.

Terrestris, pusilla, 3-4 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio ovato, acuminato, profundius cordato, glabro 1.5-2.5 cm longo, infra medium 0.7-1.5 cm lato; flore subsessili, erecto, in genere inter majores; bractea lanceolato-subulata, ovarium plus duplo superante; sepalo intermedio e basi breviter unguiculata obovato-spathulata, obtuso, dorso nervo medio incrassato, c. 2 cm longo, sepalis lateralibus arcuato-decurvis, lineari-subulatis, acutissimis, glabris, c. 2 cm longis; petalis sepalis lateralibus simillimis aequilongisque, adscendentibus; labello e basi cuculliformi in limbum circuitu suborbicularem, apiculatum, margine minute et dense serrulatum, amplum, glabrum-expanso, bucculis 2 rotundatis juxta ostium faucis, in medio ad ostium faucis bene sulcato, saccis brevibus falcato-divergentibus, conicis obtusiusculis; columna brevi, carnosula, glabra; ovario cylindraceo, glabro, 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, in mossy places, alt. c. 800 m—R. Schlechter no. 20227, flowering in Sept. 1909.

Likewise, a very typical species, which also possesses characteristic marks, above all the labellum is provided with two cheek-like swellings. The leaves are dark red, the flowers whitish, the dorsal sepal flushed with red, the labellum beautifully marked with black-brown.

10. *C. leucotyle* Schltr., sp. nov.

Terrestris, pusilla, 2-3.5 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio late ovato, acuminato, basi profunde cordato, 2-2.8 cm longo, infra medium 1.4-2 cm lato; flore subsessili, erecto, in genere inter majores; bractea lanceolato-subulata, ovario fere aequilonga, glabra; sepalo intermedio e basi ligulato-unguiculata obovato-spathulato, obtusissimo, concavo, nervis 5 primariis dimidio superiore incrassatis, 1.7 cm longo, sepalis lateralibus lineari-subulatis, acutissimis, glabris, porrectis, c. 0.9 cm longis; petalis sepalis lateralibus simillimis, suberectis, 2.2 cm longis, glabris, apicem versus tortis; labello e basi cuculliformi in limbum amplum, circuitu reniformem, apiculatum, margine dense serratum expanso, medio toro niveo ornato, saccis perbrevibus divergentibus, conicis, obtusiusculis; columna, brevi, crassiuscula, glabra; ovario cylindraceo, glabro, vix 0.3 cm longo.

Kaiser-Wilhelms-Land: Between moss on large rocks on the banks of the Govidjoa [Creek], on the border of the primary forest (Waria District), alt. c. 1200 m—R. Schlechter no. 19814, flowering in June 1909.

One of the most charming species of the genus. The leaves are dark velvet green, with bright rose-red veins. The flowers again are very gay. The dorsal sepal is green on the outside and dark purple inside as in the case of the whole flower, but the labellum is decorated with a bright white cushion. In the shape of the floral parts, this species differs considerably from all others. The lamina is strikingly large. I found this species also on steep, shady, clay ridges close to the edge of the creek, but in such positions it seemed to flower rarely.

11. *C. umbonata* Schltr., sp. nov.

Terrestris, pusilla, 2-4 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio late-ovato vel suborbiculari, acuminato, basi profunde cordato, glabro, 1.5-4.2 cm longo, infra medium 1-3.5 cm lato; flore subsessili, erecto, in genere mediocri; bractea lanceolato-subulata, ovario paulo longiore; sepalo intermedio e basi ligulato obovato-spathulato, obtuso, glabro, 1.1 cm longo, sepalis lateralibus lineari-subulatis acutissimis decurvis, c. 2.5 mm longis, glabris, petalis porrecto-adscendentibus lineari-subulatis, acutissimis, glabris, 1.5 cm longis, glabris; labello e basi cuculliformi in limbum peramplum, circuitu reniformem antice retusum, margine antice grosse serratum dilatato, sepalo intermedio longiore, callo obovato-oblongo in medio ante ostium faucis, glabro; saccis perbrevibus, conicis, obtusiusculis; columna brevi, crassiuscula, glabra; ovario cylindraceo, glabro, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Ibo Range, in mossy, shady places, alt. c. 900 m—R. Schlechter no. 17077, flowering in Dec. 1907.

Amongst the species of the Territory, this possesses the largest lamina relative to the size of the dorsal sepal. Also it is distinguished by the shape of the labellum and by

the peculiar tubercles in front of the throat. The colour of the flowers is white marked with dark red inside, with pink tubercles on the labellum. The dark green leaves have bright pink veins.

12. *C. calophylla* Schltr., sp. nov.

Terrestris, pusilla 3–4 cm alta; radicibus filiformibus, elongatis, flexuosis, puberulis; folio late ovato vel suborbiculari, breviter acuminato, basi profundius cordato, glabro, margine vulgo minute crispato-undulato, 1.8–3 cm longo, infra medium 1.5–3 cm lato; flore subsessili, erecto, in genere inter majores; bractea lanceolato-subulata, ovario paulo longiore, glabra; sepalo intermedio e basi angustata obovato-cucullato, obtusius culo, glabro, c. 1.7 cm longo, sepalis lateralibus lineari-subulatis, acutissimis, glabris, porrecto-decurvulis, 2.5 mm longis; petalis sepalis lateralibus simillimis aequilongisque, porrecto-decurvulis, glabris; labello e basi cuculliformi in limbum circuitu suborbicularem, dorso cucullato-incurvum, antice retusum, margine minute denticulatum expanso, medio antice profunde foveato et in fovea gibbo brevi canico ornato, glaberrimo, sepalo intermedio brevior, saccis decurvis, conicis, subacutis, conspicuis, sepalis lateralibus paulo longioribus; columna brevi, crassiuscula, glabra; ovario cylindraceo, glabro, vix 0.5 cm longo.

Kaiser-Wilhelms-Land: In humus under bushes on the ridges of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 18184, flowering in Sept. 1908.

var. *sepalina* var. nov.

Differt a forma *typica* sepalis petalisque longioribus, calcaribus plus duplo superantibus.

Kaiser-Wilhelms-Land: In humus under bushes on the ridges of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 18251, flowering in Sept. 1908.

Amongst the species of the section *Calcearia* this one is especially conspicuous, with the dorsal sepal bent helmet-like over the opening of the throat of the lip which would be closed almost completely, were it not for a deep furrow on the front of the lamina by which the fertilising insects are able to gain access to the flower. The leaves on the upper side are dusky brown-green with yellow, white or rose-red coloured veins; and underneath dark purple-violet. The flowers are dark red, the dorsum of the helmet with darker stripes; the labellum green and white with red margins and dark red veins at the base and dark red spurs.

§ 3. *Geosiphon*

At present, this section is represented by a single, pale, leafless saprophyte, with striking large red flowers, but otherwise possessing the characteristics of the [preceding] section *Calcearia*.

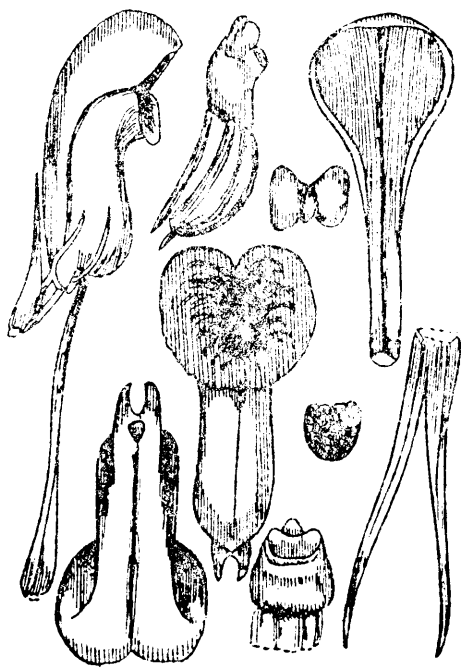
13. *C. saprophytica* Schltr., sp. nov.

Terrestris, erecta, c. 5 cm alta; caule ad apicem squama foliacea, ovato-lanceolata, acuminata, patente, 1.2–1.5 cm longa donato; flore in genere permagno, erecto, sessili; bractea lanceolata, acuminata, glabra, ovarium plus duplo superante; sepalo intermedio e basi ligulata obovato-spathulato, apiculato, cucullato-adunco, glabro, c. 2.3 cm longo, dorso carinato, sepalis lateralibus porrecto-patentibus, linearibus, acutis, glabris, c. 4.5 cm longis; petalis sepalis lateralibus simillimis aequilongisque, adscendentibus, glabris; labello e basi cuculliformi in limbum amplum circuitu reniformem, obtusissimum expanso, margine serrato-ciliato, in medio ad ostium faucis umbone magno semiorbiculari ornato, glabro, saccis divergentibus, conicis, obtusis, parvis; ovario cylindrico, glabro, c. 0.5 cm longo.

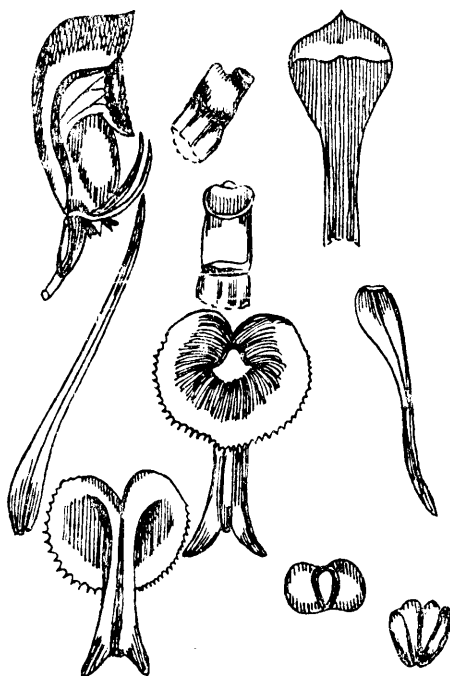
Kaiser-Wilhelms-Land: In humus of the primary forests on the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19875, flowering in June 1909.

It is not necessary to say more about the relationship of this plant to the other species of this genus. It grows in the shade of the deep forest under shrubs or alongside rocks in deep humus soil. I found it in association with other saprophytes such as *Cotylanthera*, *Salomonina* and *Sciaphila*. The flowers are flushed with red on the outside, pale purple-red inside. The labellum has a large white spot.

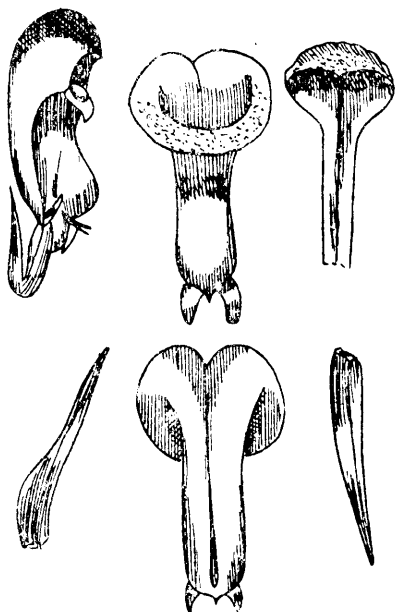
GROUP IV *Acianthinae*



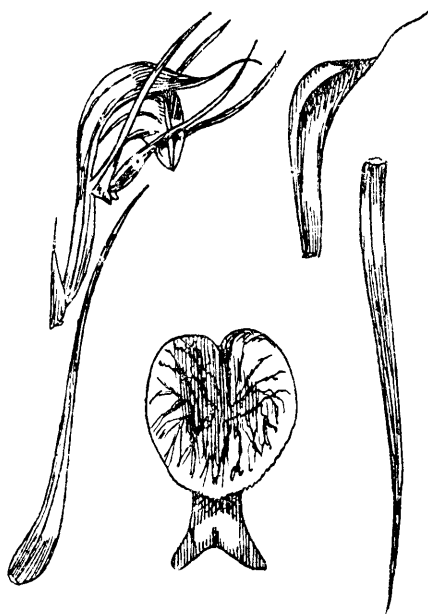
Corysanthes gastrosiphon Schltr.



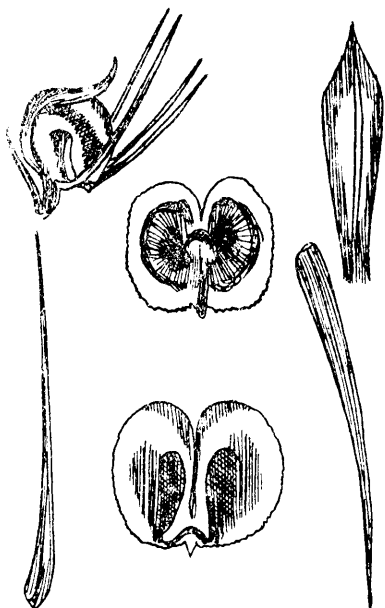
Corysanthes gibbiferum Schltr.



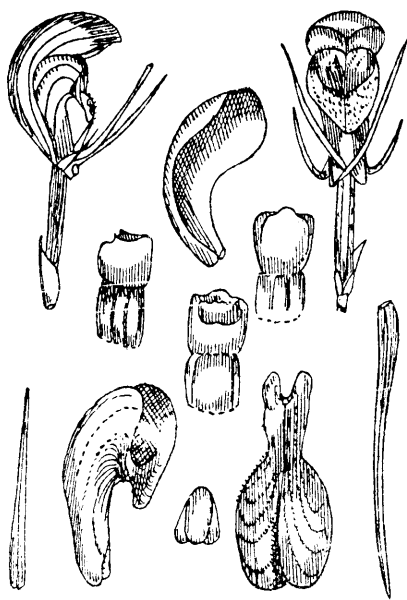
Corysanthes adunca Schltr.



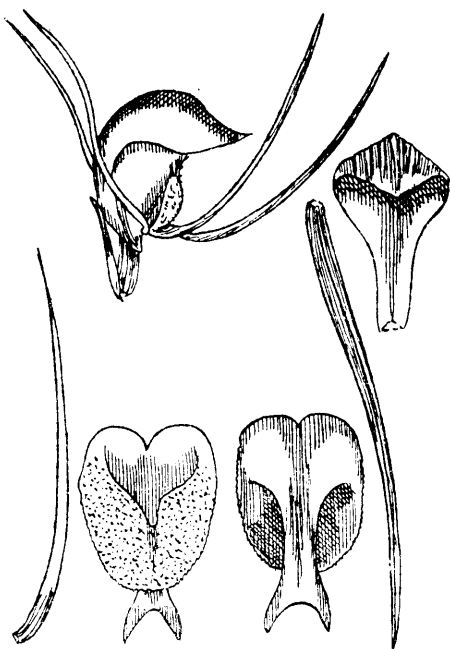
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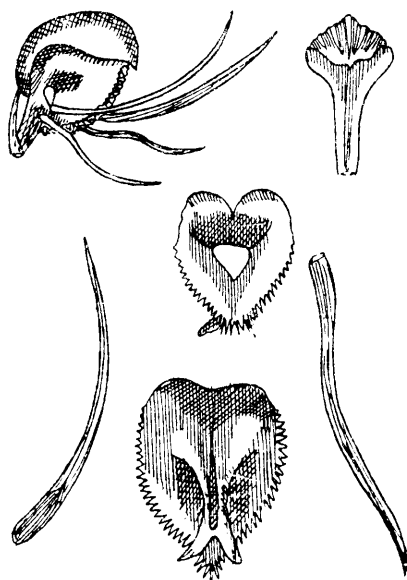
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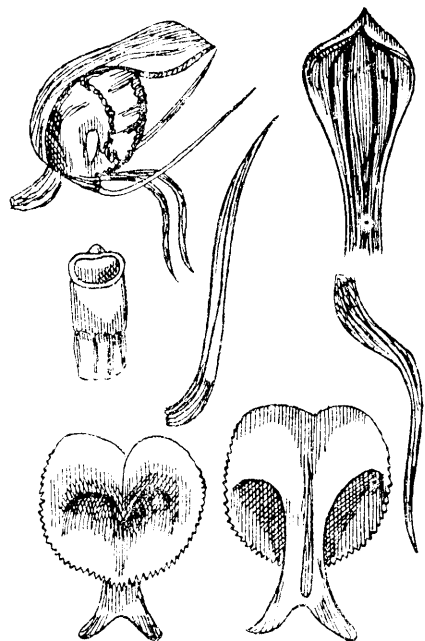
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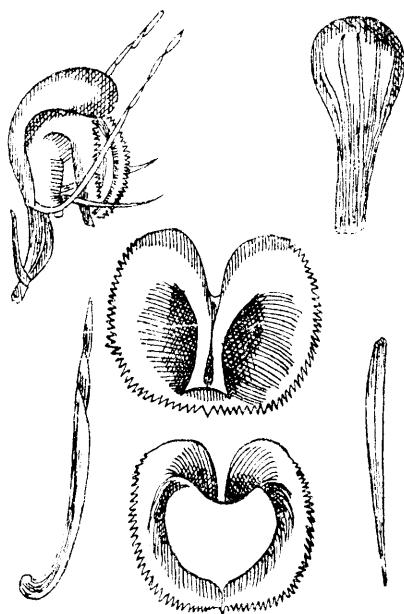
Corysanthes puberula Schltr.



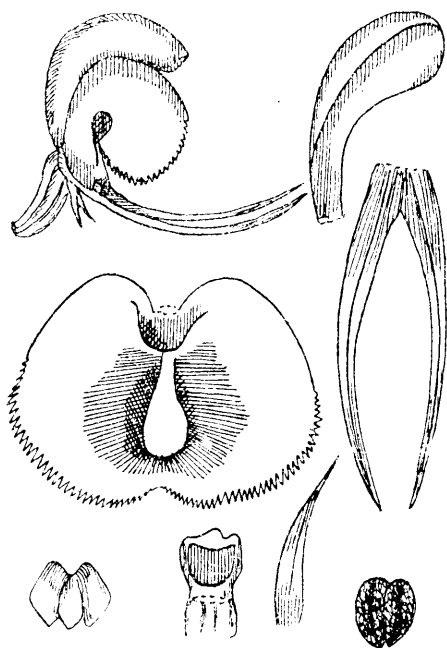
Corysanthes speculum Schltr.



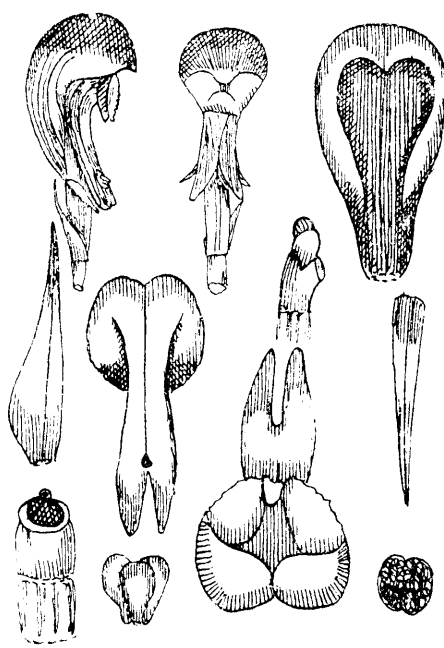
Corysanthes torricellensis Schltr.



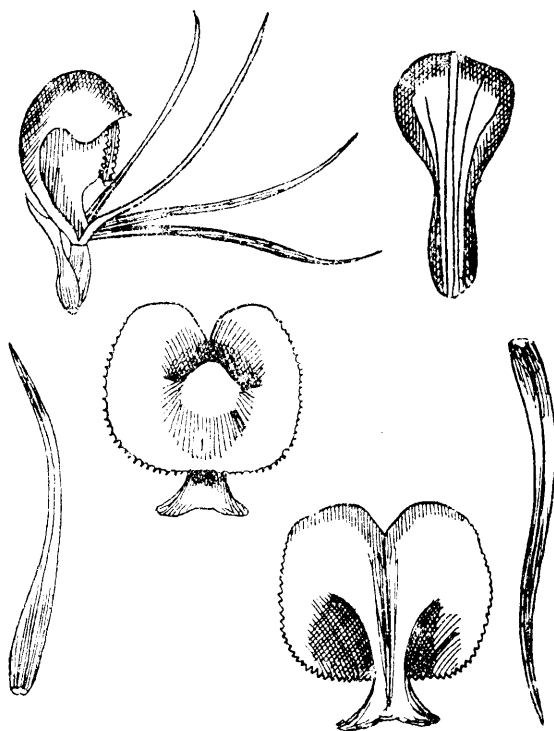
Corysanthes leucotyle Schltr.



Corysanthes umbonata Schltr.



Corysanthes calophylla Schltr.



Corysanthes saprophytica Schltr.

Group V *Cryptostylidinae*

Of the four genera in this group, three are confined to New Caledonia, and, therefore, it could hardly be expected that, besides the genus *Cryptostylis* R. Br., further new forms would be expected in the Territory. Very interesting, however, was the rediscovery of the pelorial form of *Cryptostylis* which was described originally by Blume as a separate genus *Chlorosa*. This discovery proved the correctness of the view expressed earlier by J.J. Smith, that *Chlorosa* could not be maintained as a genus.

6. *Cryptostylis* R. Br.

Regarding the geographical distribution of the nine or ten *Cryptostylis* species known at present, I recently have published some remarks in 'Engl. Bot. Jahrb.' XLV, p. 385 and will, therefore, give some details regarding the locality conditions of the forms in the Territory. The plants are typical mountain inhabitants, but in some regions, such as by the Waria, they reach down to an altitude of about 400 metres, whilst disappearing again not far above the 1000 metre level, which leads one to the conclusion that persistent moisture conditions do not agree with them. The soil in which they grow by preference confirms this impression, since it consists of extremely loose leaf-mould, bound together by densely plaited roots, the whole material forming a peaty moss of a very loose consistency with both large and small cavities.

This root-peat is able to preserve a certain degree of moisture for a long time, but the water in it never stagnates.

1. *C. fulva* Schltr., sp. nov.

Terrestris, erecta, 35–50 cm alta; radicibus crassiusculis, flexuosis, villosis; foliis petiolatis erectis, oblique ovato-ellipticis, acuminatis, basi rotundatis, glabris, lamina 8–14 cm longa, infra medium 4–5 cm lata, petiolo superne sulcato, 3.5–6 cm longo; scapis erectis, gracilibus, strictis vel substrictis, teretibus, glabris, vaginis 3–4, alte vaginantibus, apiculatis, dissitis obsessis; racemo laxo 7–14-floro, erecto, usque ad 16 cm longo; bracteis erectis, lanceolatis, longe acuminatis, inferioribus ovarium aequantibus, superioribus paulo minoribus; floribus erectis, illis *C. arachnites* Ldl. similibus, paulo majoribus, inversis; sepalis lineari-lanceolatis, acutis; 1.8 cm longis, glabris, lateralibus paulo obliquis, patentibus; petalis lineari-lanceolatis, acutis, glabris, deflexis, 0.9 cm longis; labello erecto, circuitu oblongo, subacuto, infra medium paululo dilatato, subrhombeo, basi foveato, intus dense papilloso, 1.8 cm longo, infra medium c. 0.9 cm lato; columna brevi, auriculis oblique rhombeis, irregulariter crenulatis; stigmatibus depresso; rostello antice exciso, humili; anthera ovato-cuculiata, breviter apiculata; pollinibus oblique clavatis, paribus glandulae singulae, semiorbiculari, minutae affixis; ovario sub-clavato-cylindrico, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20090, flowering in Sept. 1909; in humus in the forests of the Gomadjidji [Mountain], alt. c. 450 m—R. Schlechter no. 19386, flowering in May 1909; in humus in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19546 (TYPE), flowering in May 1909.

This species certainly is related closely to *C. arachnites* Bl., but is regarded better as a distinct species on account of its loose inflorescence, truncate narrow lip, the large auricles to the column and the narrower stigma. The lip is bright yellow-brown with darker spots. The dark green leaves are marked with black-green transverse veins.

var. *subregularis* Schltr., var. nov.

Differt a forma typica labello lanceolato, laevi, sepalo intermedio simili, virescente.

Kaiser-Wilhelms-Land: In humus in the forests of the Dischore [Range], alt. c. 1000 m—R. Schlechter no. 19655, flowering in June 1909.

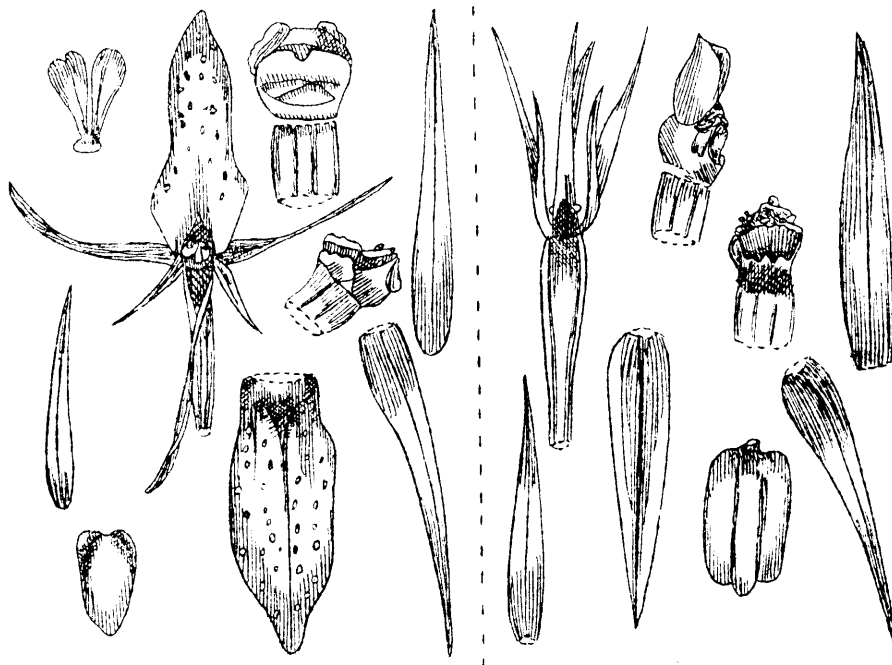
The pelorial form described here has a much narrower lip than the pelory of *Cryptostylis arachnites* Bl., described by Blume as *Chlorosa latifolia*. This proves, moreover, that *C. arachnites* Bl. is different from *C. fulva* Schltr.

2. *C. papuana* Schltr., in K. Schum. et Laut., Nachtr. [1905] p. 82.

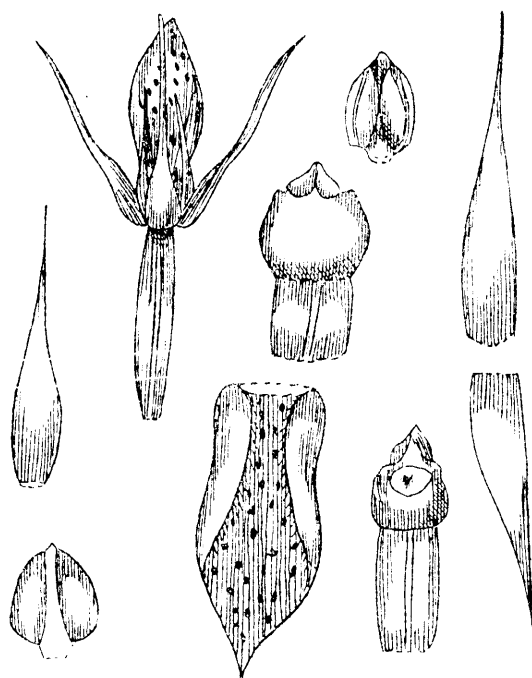
Neu-Mecklenburg: In humus in the mountain-forests of Punam, in shady places, alt. c. 600 m—R. Schlechter no. 13763, flowering in Nov. 1901.

This species differs from the previous one in the differently shaped, distinctly pointed labellum and, in general, appreciably smaller flowers.

GROUP V *Cryptostylidinae*



Cryptostylis fulva Schltr.



Cryptostylis papuana Schltr.

Group VI *Vanillinæ*

The only representative of this group known in the Territory at present, is a plant which I found in the Torricelli Range in 1902 and at the time named '*Lecanorchis javanica* Bl.' The collections from my last expedition proved that the group comprises a series of genera and not less than about a dozen species. Several more species certainly may be expected from the Territory, especially if larger collections become available from the Bismarck Archipelago.

7. *Galeola* Lour.

The species of this genus described here belong to the section *Eu-Galeola*, although during my travels in New Guinea I have on two occasions found specimens of a species belonging to the section *Cyrtosia* and also have sketched the flowers from living material. Unfortunately, the description of these species had to be abandoned, since the dried material was lost subsequently in Europe. Very interesting is the occurrence in the Territory of a leafy *Galeola* related to the Australian *G. foliata* F.v.M. The two other species also show an approach to the Australian *G. cassythoides* Rchb. f.

All three species are inhabitants of the forest, and often climb to the tops of the smaller trees, 15 metres high, by stems as broad as a lead-pencil and reminding one of *Smilax*. *G. gracilis* Schltr. occurs in the forests of the low-lands; the other two were found in the mist-forests of the mountains.

The species of the section *Cyrtosia*, already mentioned, were seen by me in January 1902 in the Bismarck Range and in April 1902 in the Torricelli Range.

1. *G. gracilis* Schltr., sp. nov.

Saprophytica, alte scandens, usque ad 10 m alta; radicibus elongatis, filiformibus, flexuosis, glabris; caule ramoso, tereti, glabro, c. 0.5–0.7 cm diametiente, aphylo, squamis late ovatis, obtusiuscule acuminatis, c. 1 cm longis, glabris, rigidulis, 7–8 cm distantibus obsesso; panícula ramosissima, versus apices ramulorum dense 5–15 floris; floribus in genere inter minores, patentibus; bracteis minutis, deltoideis, glabris; sepalis ligulatis obtusis, glabris, 1.6 cm longis, c. 0.4 cm latis, lateralibus paulo obliquis, basin versus paulo angustatis; petalis sepalis lateralibus similibus, tamem paulo angustioribus et textura tenuioribus, nervo medio intus incrassato, apice obtusis, utrinque glabris; labello obovato-cuneato, antice rotundato, subretuso, margine dimidio anteriore undulato, intus carunculis et dimidio anteriore verucis numerosis asperato, carina lineari, fasciiformi, antice tridentata, glabra, e basi labelli usque ad quartam partem apicalem decurrente 1.5 cm longo, supra medium 0.9 cm lato; columna gracili, ima basi tantum basi labelli adnata, glabra, 1.1 cm longa, apice dilatata, clinandrio minute denticulata; anthera altigaleata glabra, dorso trilobulata, antice rotundata; ovario cylindrico, glabro, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: In the forests in the environs of Eitape, alt. c. 30 m—R. Schlechter no. 19966, flowering in Aug. 1909.

As already mentioned, this species is related to *G. cassythoides* Rchb. f., but is more robust in growth, has shorter bracts and somewhat larger flowers which are well separated by their floral parts from those of *G. cassythoides*. The flowers are pale yellow, the labellum with golden yellow warts in its anterior half and reddish brown warts in its posterior half.

2. *G. montigena* Schltr., sp. nov.

Saprophytica, alte scandens, ramosa; radicibus filiformibus, elongatis, flexuosis, glabris; caule flexuoso, aphylo, tereti, glabro, usque ad 0.7 cm diametiente, vaginis oblongis obtusis, usque ad 1.3 cm longis, c. 15 cm distantibus, rigidiusculis obsesso; panícula permagna, laxa multiflora, ramulis ad apices dense 10–15-floris, rhachi paululo incrassata; bracteis deltoideis, obtusis, minutis; floribus in genere inter mediocribus erecto-patentibus; sepalis oblongo-ligulatis, obtusis, nervo medio extus paulo incrassato, 2.2 cm longis, medio fere 0.7 cm latis, lateralibus obliquis; petalis anguste falcato-ligulatis obtusis, glabris, sepalis aequilongis, 0.4 cm medio latis; labello late obovato, ima basi columnae adnato, antice leviter exciso cum apiculo, dimidio anteriore valde undulato, carunculis et dimidio

antere verrucis numerosis intus densius obsesso, carina lineari, supra medium paulo ampliata, glabra, e basi labelli usque ad apicem decurrente, labello toto 2.2 cm longo, supra medium 1.7 cm lato; columna semitereti, glabra, apicem versus sensim paulo ampliata, glabra, 1.8 cm longa, clinandrio integro; anthera alticucullata, dorso bilobulata, glabra, antice retusa; ovario cylindrico, glabro, 1.2 cm longo.

Kaiser-Wilhelms-Land: In the forests of the Torricelli Range, in humus, alt. c. 800 m—R. Schlechter no. 20167, flowering in Sept. 1909.

This species may well be considered as most closely related to *G. gracilis* Schltr., but in many respects different in the floral parts and their relative sizes. In contrast to *G. gracilis*, which grows on the plains, this species seems to be a true inhabitant of the mountains. The flowers are yellow; the labellum is orange-red, white in front and entirely covered with yellow-pointed tubercles.

3. *G. vanilloides* Schltr., sp. nov.

Terrestris (saprophytica?), alte scandens; radicibus filiformibus, elongatis, flexuosis, glabris; caule flexuoso, tereti, glabro, usque ad 0.9 cm diametiente, laxe foliato; foliis ellipticis, acutis vel subacutis, glabris, carnosulis, margine plus minusve undulatis, usque ad 8 cm longis, medio fere usque ad 2.5 cm latis; panícula magna, multiramosa, laxa; ramulis apice dense 4–8-floris, rhachi paulo incrassata; bracteis minutis deltoideis; floribus illis *G. foliatae* F.v.M. similibus et fere aequimagnis; sepalis oblongo-ligulatis, obtusis, glabris, 2.6 cm longis, medio fere 0.6 cm latis, lateralibus obliquis; petalis anguste subfalcato-ligulatis, obtusiusculis, glabris, nervo medio extus incrassato, sepalis aequilongis 0.4 cm medio fere latis; labello circuitu late elliptico, ungue brevi columnae adnato, antice obscure trilobato, margine undulato, lobis lateralibus abbreviato-rotundatis, intermedio semiorbiculari subexiso, carina duplici antice ampliata, acuta, e basi usque ad medium labelli decurrente, labello intus carunculis et dimidio anteriore verrucis satis longis obtusis tecto, 2.1 cm longo, medio fere 1.6 cm lato; columna semitereti, gracili, apicem versus sensim paululo dilatata, glabra, 1 cm longa, clinandrio subcrenulato; anthera subquadrato-cucullata glabra, antice subretusa; ovario cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18504, flowering in Oct. 1908; in humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 19035, flowering in Dec. 1908.

The species, undoubtedly, is related closely to the Australian *G. foliata* F.v.M., but is distinguished by its broader petals and shorter lip-keel. There are some fruits on the specimens from the Kani Range, which are not yet ripe and fully developed. They are already about 20 cm long and 0.5 cm wide. The flowers are white with a pink-veined labellum and turn pale yellow after flowering.

8. *Vanilla* Sw.

Hitherto, no species of this genus was known east of Borneo (including of course New Guinea) although it was probable that in the Moluccas and New Guinea, owing to the relationship of their flora with that of Malaya, some endemic species would be found. Therefore I was not surprised greatly when, in March 1908, I was able to produce the first definite evidence of the genus from the Waria Region in Kaiser-Wilhelms-Land. Shortly afterwards I managed to find two species in the central part of Kaiser-Wilhelms-Land. It is peculiar that neither from British Papua nor Dutch New Guinea has any material been submitted.

All three species of the Territory are inhabitants of the mountains, but apparently do [not] reach the mist-forest zone, since the excessive moisture and frequent cold mists are unfavourable to their growth. Specimens of *V. kaniensis* Schltr., which I have attempted repeatedly to cultivate at our Kani Base at about 1000 metres altitude (i.e. in the mist-forest zone) always rotted away in a short time, while cuttings grew without difficulty at 500–700 metres (i.e. below the mist-forest zone).

The specimens very often are covered abundantly with fruit, which leads to the

conclusion that there must be insects in New Guinea, by means of which fertilization of *Vanilla* is possible.

1. *V. wariensis* Schltr., sp. nov.

Volubilis, alte scandens, ramosa; radicibus filiformibus, elongatis, flexuosis, glabris; caule tereti, glabro, carnosus, c. 1 cm diametiente, internodiis 12–17 cm longis; foliis elliptico-lanceolatis, acuminatis, glabris, carnosus, 27–35 longis, medio fere 5–6.5 cm latis, petiolo carnosus brevis, 1.5–2 cm longo; racemis fere usque ad basin floriferis, elongatis, usque ad 30 cm longis, multifloris, rachis paulo incrassata; bracteis patentibus oblongis, obtusiusculis, parvulis; floribus mediocribus, erecto-patentibus; sepalis oblongis, obtusiusculis, glabris, 4.5 cm longis, medio fere 1.7 cm latis, lateralibus obliquis; petalis sepalis similibus, obtuse apiculatis, glabris, nervo medio extus incrassato, sepalis aequimagnis; labello late cuneato, usque ad medium fere columnae adnato, antice marginibus undulato-crenatis, trilobo, lobis lateralibus rotundatis, intermedio longiore, circuito semiorbiculari, c. 0.5 cm longo, apiculato, margine crispato, laseculo amplo quadrato squamellarum cristato-laceratarum in medio labelli, fasciculo altero verrucarum subulatarum ad basiu lobi intermedii, nerviis incrassatis 5 medianis, in dimidio anteriore labelli glabri, c. 3.5 cm longi, supra medium 2.5 cm lati; columna semitereti glabra, 2.5 cm longa, ad basi, clinandrii utrinque auriculo parvulo instructa; anthera quadrato-rhomboidea, cucullata, glabra, dorso emarginata; ovario glabro, 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Jaduna (Waria District), alt. c. 300 m—R. Schlechter no. 19928, flowering in July 1909; on tree-trunks in the forests of the Gomadjidji [Mountain] (Waria District), alt. c. 350 m—R. Schlechter no. 17472, without flowers in Mar. 1909. [Ed.-possibly 1908.]

A species with strikingly long, large leaves and very long inflorescences. The flowers in the raceme expand one after the other, as is usual in most of the other *Vanilla* species, until the inflorescence is exhausted.

2. *V. kaniensis* Schltr., sp. nov.

Volubilis, alte scandens, ramosa; radicibus filiformibus, elongatis, flexuosis, glabris; caule tereti, glabro, carnosulo, c. 0.8 cm diametro, bene foliato; foliis anguste ellipticis, acuminatis, glabris, carnosus, c. 7–8 cm distantibus, 20–25 cm longis, medio fere 4.7–7 cm latis, petiolo carnosus, c. 1.5 cm longo; racemis patulis, subdense 12–17-floris, pedunculo c. 3 cm longo; bracteis patulis, oblongis, obtusis, concavulis, parvulis; floribus in genere mediocribus, patentibus; sepalis oblongis, obtusis, glabris, 3.3 cm longis, c. 0.8 cm medio fere latis, lateralibus paulo obliquis; petalis sepalis similibus, obliquis, apiculatis, nervi medio extus incrassato, basin versus paulo angustatis, sepalis fere aequilongis, sed paululo angustioribus; labello late cuneato-flabellato, margine undulato, obscure trilobato, antice emarginato, usque infra medium marginibus columnae adnato, medio excavato fasciculo amplo squamellarum cristato-laceratarum ornato, apice papillis subulatis, approximatis donato, c. 2.5 cm longo, medio fere, 2.5 cm lato; columna semitereti, glabra, ad basin clinandrii utrinque unidentata, c. 2 cm longa; anthera subquadrato-cucullata, glabra, dorso umbone minuto donata; ovario cylindrico, glabro, c. 4 cm longo.

Kaiser-Wilhelms-Land: Climbing on trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17634, flowering in Apr. 1908.

Related to the former, this species is distinguished easily by its smaller leaves, shorter inflorescences, longer ovaries, and scarcely divided labellum. The flowers are green-yellow with a white, rose-red-veined labellum.

3. *V. Kempteriana* Schltr., sp. nov.

Volubilis, alte scandens, ramosa; radicibus filiformibus, elongatis, flexuosis, glabris, caule tereti, glabro, carnosus, c. 1 cm diametiente, internodiis 6–7 cm longis; foliis ellipticis, acuminatis, glabris, carnosus, 25–30 cm longis, medio fere 9–11 cm latis, petiolo lato, vix 1 cm longitudine excedente; racemis usque supra basin floriferis, foliis multo brevioribus, 6–10 cm longis, dense plurifloris, rachis incrassata; bracteis patulis, semiorbicularibus, concavis, parvulis; floribus mediocribus, erecto-patentibus; sepalis oblongo-ellipticis, obtusis, glabris, c. 3 cm longis, medio fere 1.2 cm latis, lateralibus paulo obliquis; petalis sepalis similibus, aequimagnisque, nervo medio incrassato, apice apiculatis; labello late cuneato-flabellato, antice undulato, hinc inde inciso, apiculato, medio excavato, fasciculo amplo squamellarum cristato-laceratarum ornato, intus infra apicem papillis pluribus subulatis approximatis donato, glabro, 2.7 cm longo, infra apicem c. 3 cm lato; columna semitereti, glabra, 2.2 cm longa, clinandrio anguste auriculato; anthera oblongo-cucullata, glabra, dorso umbone humili donata; ovario cylindrico, glabro, 2.5 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Finisterre Range, alt. c. 600 m—R. Schlechter no. 18045, flowering in July 1908.

Also related closely to *V. wariensis* Schltr., but characterised by the broad persistent leaves, the short racemes, the non-trilobate labellum, and the smaller size of the flowers. The flowers are also green-yellow, the labellum white with rose-red and brown stripes in front.

It is a great pleasure to dedicate this species to my travel companion A. Kempter, who, for nearly two years, shared with me the hardships of jungle life in New Guinea.

9. *Lecanorchis* Bl.

It appears as though the species of this interesting saprophytic genus have been rather confused in recent years, although it possesses a series of species which are well distinguished from one another.

It was established originally by Blume in 1856 in 'Mus. Lugd.-Bat. II, p. 188', and two species, one from Java and one from Japan (viz. *L. javanica* Bl. and *L. japonica* Bl. respectively) were then described by him, and when illustrations of the two plants appeared in his beautiful work 'Flora Javae, Orchideae', this represented for a long time all that was known of this interesting genus. It claimed special attention morphologically owing to the formation of a toothed external calyx, a feature only known at that time in the American genus *Epistephium* Kunth. About 37 years later, something further became known about this genus when H.N. Ridley, the celebrated explorer of the flora of the Malay Peninsula and the island of Singapore, described and sketched another species, *L. malaccensis* Ridl. In 1902 I reported from New Guinea a species which I believed to be *L. javanica* Bl., in consequence of insufficient material and also of my ignorance of the chief characters of that species. A fourth species, *L. triloba* J.J. Sm., was published by J.J. Smith in 1908, but withdrawn in 1909 in 'Nova Guinea', p. 136 on the grounds that Blume had illustrated incorrectly flowers of his living material from Java and that the species from New Guinea was identical to that from Java. Blume had described and illustrated an undivided labellum for his Type, which J.J. Smith was unable to find in other Javanese specimens of *Lecanorchis*. I have seen specimens recently from Borneo with an undivided labellum; should it not then be possible that two species occur in Java, which outwardly resemble each other, just as happens in the case of the two species from New Guinea which are described here and about which there is no question of doubt concerning their specific differences? I am still the more of this opinion because Ridley (in 'Trans. Linn. Soc. Bot.' ser., 2, vol. III, part 9, p. 377, t. 61), describes and illustrates *L. malaccensis* with an undivided labellum. Might this not be identical with the true *L. javanica* Bl.?

In the company of Ridley on the Bukit-Timah [Mount.] at Singapore, I collected a plant which he determined as *L. malaccensis* Ridl. It could not be this species, however, since it had a trilobate labellum covered in front with long clubbed hairs. I will describe this species more fully later under the name of *L. Ridleyana* Schltr.

For all the above reasons, I am obliged to regard *L. triloba* J.J. Sm. as a separate species. As such it evidently is related to *L. papuana* Schltr. (described below) whilst *L. neglecta* Schltr. closely approaches *L. Ridleyana* Schltr.

The species of this genus obviously are mountain plants, which generally grow in places where the humus layer is comparatively thin, so that their long fleshy roots easily penetrate into the underlying sandy loamy soil, which is essential for their growth. I have found both species in the Territory always on mountain ridges of at least 800 metres altitude.

1. *L. neglecta* Schltr., sp. nov.

Lecanorchis javanica Schltr., in K. Schum. et Laut., Nachtr. [1905] p. 83 (nec. Bl).

Terrestris, erecta, vulgo simplex, saprophytica, 25–40 cm alta; rhizomate erecto, lignescens; radicibus filiformibus, elongatis, flexuosis, puberulis; caule rigido, distanter vaginulis squamiformibus, ovatis, subacutis obsesso, tereti, glabro; racemo abbreviato, 2–5-floro, erecto; bracteis ovato-deltoides, acutis, minutis; floribus erectis vel suberectis, violaceis; sepalis ligulatis obtusis, glabris, 1.8 cm longis, lateralibus paulo obliquis; petalis sepalis similibus sed paulo angustioribus et paulo brevioribus, obliquis; labello tertia parte basilari columnae adnato, e basi cuneata quinta parte anteriore trilobo, margine supra medium denticulato, 1.8 cm longo, inter apices loborum lateralium 0.7 cm lato, lobis lateralibus ovato-triangularibus obtusis, columnam longe superantibus, intermedio duplo majore, semiorbiculari, margine sinuato-denticulato, pulvino oblongo, amplo pillarum subulatarum per totum labellum ex apice usque ad ungum puberulam; columna gracili, glabra, c. 1 cm longa, clinandrio amplo, dorso tridenticulato; anthera cucullato-quadrata leviter 5-umbonata; ovario cylindrico, glabro, c. 1.5 cm longo, calyculo brevi, minute 6 lobulato.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 14355, flowering in Apr. 1902; no. 20058, flowering in Sept. 1908. [Ed.—probably 1909.]

This is the plant which I regarded previously, in error, as *L. javanica* Bl., but now appears completely different in the labellum. The differences from *L. papuana* Schltr., I will consider later. The flowers are pale violet.

2. *L. papuana* Schltr., sp. nov.

Terrestris, erecta, simplex vel parum ramosa, saprophytica, 25–50 cm alta; rhizomate erecto vel suberecto, lignescens; radicibus crassis, cylindricis, flexuosis, puberulis; caule stricto vel substricto, rigido, vaginulis dissitis, squamiformibus, ovatis, acutis vel subacutis, obsesso, tereti, glabro, saepius parum ramoso; racemis erectis, subdense 4–15-floris; bracteis patentibus, ovato-deltoides, apiculatis, concavulis, minutis; floribus erectis vel suberectis; sepalis ligulatis, dimidio superiore paululo dilatatis, subacutis, glabris, 1.3 cm longis, supra medium 0.3 cm latis, lateralibus obliquis; petalis sepalis similibus et fere aequilongis, dimidio superiore tamen paulo latioribus, obliquis, glabris; labello usque infra medium marginibus columnae adnato, e basi concava infra medium paululo angustato, supra medium trilobo, lobis lateralibus erectis, rotundatis, brevibus, intermedio multoties majore, subunguiculato, suborbiculari, obtusiusculo, medio pilis numerosis longis, flexuosis barbatulo, margine minute undulato, fasciis 2 haud bene conspicuis incrassatis e medio labelli usque infra basin lobi intermedii, labello toto 1.3 cm longo, inter apices loborum lateralium 0.5 cm lato, lobo intermedio, 0.6 cm longo, medio fere 0.5 cm lato, lobis lateralibus columnam haud superantibus; columna gracili, erecta, glabra, usque ad medium marginibus labelli adnata, 0.8 cm longa, apice paulo ampliata, anthera subquadrato-cucullata, umbonata; ovario cylindrico glabro, c. 1.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16952, flowering in Dec. 1907; in humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17808, flowering in May 1908; in humus in the mountain forests on the upper Waube [Creek] (Waria District), alt. c. 800 m—R. Schlechter no. 19458, flowering in May 1909.

This species differs considerably in all its parts from *L. neglecta* Schltr., the roots being disproportionately thicker, the stem violet-black instead of brown. The flowers are not violet, but brown on the outside, white inside and the labellum quite a different shape. It may come closer to *L. triloba* J.J. Sm., but in the latter the dorsal lobe of the labellum differs considerably. The two roundish calli in the centre of the labellum also are absent in *L. papuana* Schltr. and here are replaced by two long, oblique, indistinctly thickened bands. The plant has, evidently, a wide distribution in Kaiser-Wilhelms-Land.

10. *Aphyllorchis* Bl.

The only species belonging to this genus described from New Guinea at present, viz. *A. Odoardi* Rchb. f., may well be placed next to *A. pallida* Bl. Another species with the same relationship is now described here under the name of *A. torricellensis* Schltr. For New Guinea quite a new form of the genus is present in *A. elata* Schltr.; it is probably

best arranged alongside *A. borneensis* Schltr. and *A. striata* (Ridl.) Schltr.

For the most part these saprophytes occur individually at places in forests where deep humus has formed. *A. elata* is anchored by its rhizomes buried so deeply in the soil that it took me a long time to dig up a specimen with the rhizome attached. These plants require, for their successful development, a very regular amount of moisture in soil and atmosphere.

1. *A. torricellensis* Schltr., sp. nov.

Saprophytica, erecta, gracilis, 25–40 cm alta; rhizomate abbreviato, erecto; radicibus crassiusculis, elongatis, flexuosis, puberulis; caule stricto vel substricto, tereti, glabro, vaginis 7–9, alte amplexantibus, obtusis, basi excepta dissitis obsesso; racemo laxe 6–12-floro, quaquaverso; bracteis patulis oblongis vel ellipticis, obtusis, glabris, ovario duplo fere brevioribus; floribus erecto-patentibus, illis *A. pallidae* Bl. simillimis et fere aequimagnis; sepalis oblongo-ligulatis, obtusiusculis, glabris, c. 3.5 mm longis, lateralibus subfalcato-obliquis; petalis subfalcato-obliquis, oblongo-ligulatis obtusis, sepalis paululo brevioribus; labello articulado, hypochilio concavulo, intus obscure tricalloso, lobis lateralibus semiorbicularibus, parvulis, epichilio (i.e. lobo intermedio trilobo, lobis lateralibus semiquadratis, intermedio longiore subquadrato, marginibus apice cucullato-incurvulis, obtuso apiculato, labello toto 0.3 cm longo, hypochilio 0.1 cm longo, lobis lateralibus explanatis 1.5 mm lato, epichilio 0.2 cm longo, inter lobos laterales 0.2 cm lato), columna leviter incurva, glabra, labello duplo fere brevior, clinandrio ampliato, dorso tridentato; rostello triangulo porrecto; anthera subreniformi-cucullata, dorso umbonata; ovario pedicellato, clavato, glabro, pedicello incluso 0.6 cm longo; capsula oblongoidea, pendula, c. 1 cm longa.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20057, flowering in Sept. 1909.

This species should be arranged beside *A. pallida* Bl., to which it has a striking external resemblance, but the petals of the former are broader and differently shaped, and the labellum shows substantial differences. Like *A. pallida* the whole plant is pale, almost whitish with violet streaks.

The Type of *A. Odoardi* Rchb. f. is at present in my possession and seems to be related more closely to *A. pallida* Bl. than to this species.

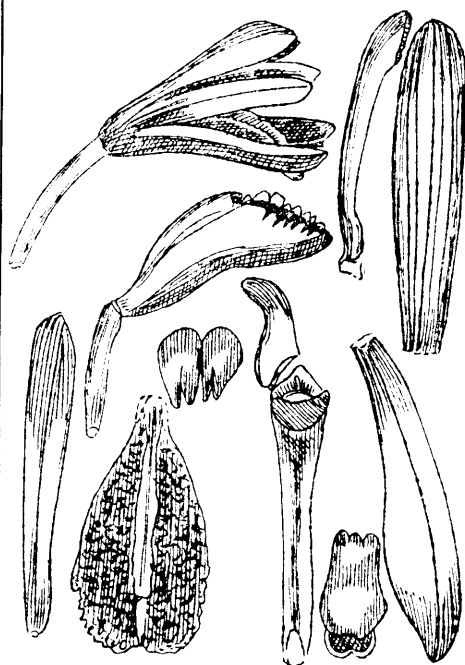
2. *A. elata* Schltr., sp. nov.

Terrestris, elata, simplex, 50–150 cm alta; rhizomate erecto, vel suberecto, squamis oblecto, sublignescens; radicibus crassiusculis, flexuosis, puberulis; caule stricto vel substricto, vaginis amplexantibus, dissitis, 5–8, apiculatis obsesso, tereti, glabro; spica sublaxe multiflora, elongata, subsecunda, usque ad 40 cm longa; bracteis patulis, lanceolatis, acutis, ovario fere aequilongis, glabris; floribus illis *A. borneensis* Schltr. similibus aequimagnisque, suberectis; sepalis lanceolatis subacutis, glabris, 1.2 cm longis, lateralibus paulo obliquis; petalis sepalis similibus, oblique lanceolatis, obtusiusculis, glabris, sepalis paulo minoribus; labelli hypochilio brevi, lobis lateralibus oblique semiorbicularibus obtusissimis, glabris, epichilio (lobo intermedio) e basi breviter unguiculata lanceolato, obtuso, concavulo, basi lineis 3 medianis paulo incrassatis, labello toto c. 1 cm longo, hypochilio c. 0.2 cm longo, inter apices loborum lateralium 0.3 cm lato, epichilio 0.8 cm longo, infra medium 0.3 cm lato; columna semitereti, glabra, c. 0.5 cm longo, clinandrio dorso trilobato, lobis lateralibus majoribus, rotundatis, glabro; anthera oblongoideo-cucullata; ovario cylindrico, glabro, pedicello incluso, c. 1.7 cm longo.

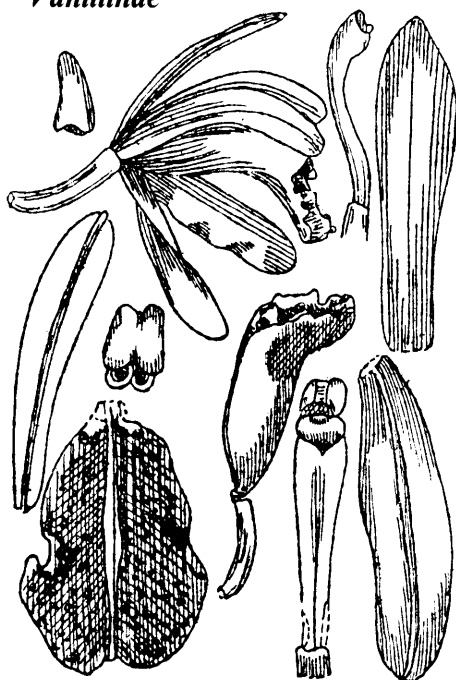
Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17752, flowering in May 1908; in humus in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 18041, in fruit in July 1908; in humus in the mountain forests near Jaduna in the Waria Valley, alt. c. 300 m—R. Schlechter no. 19279, flowering in Apr. 1909; in humus in the forests of the Gomadjidji [Mountain] alt. c. 450 m—R. Schlechter no. 19373, flowering in May 1909.

This species is the tallest of all members of this genus. By the labellum it is distinguished, especially from the related *A. borneensis* Schltr. and *A. striata* (Ridl.) Schltr. The colour of the whole plant, like that of the flowers, is white with violet streaks, as in *A. striata* (Ridl.) Schltr.

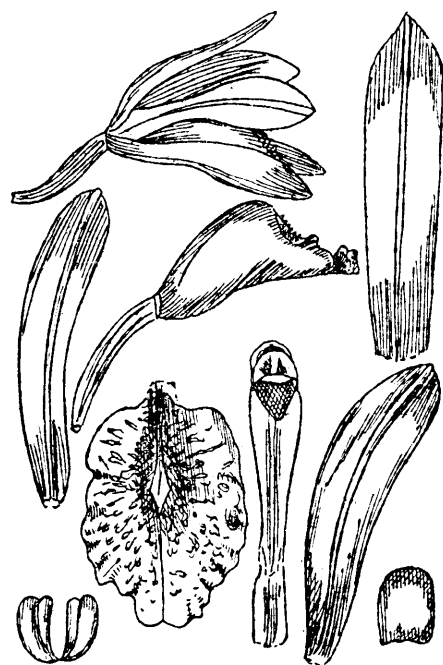
GROUP VI *Vanillinae*



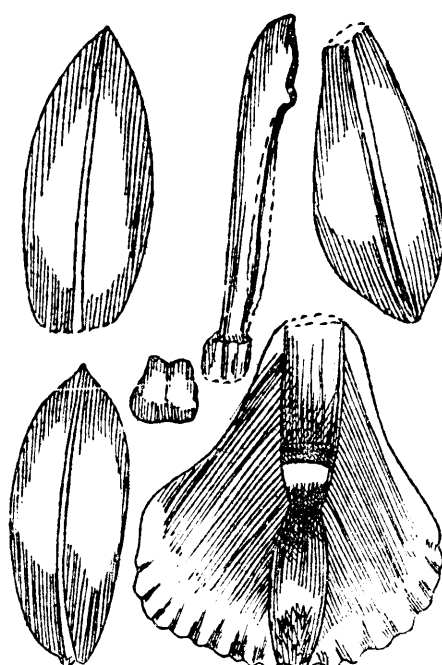
Galeola gracilis Schltr.



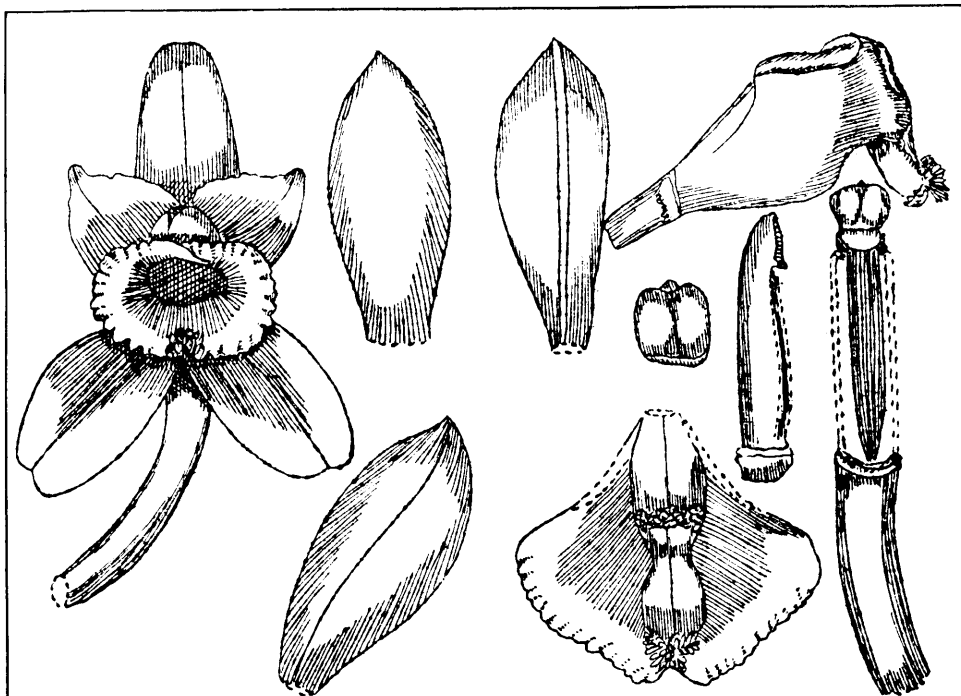
Galeola montigena Schltr.



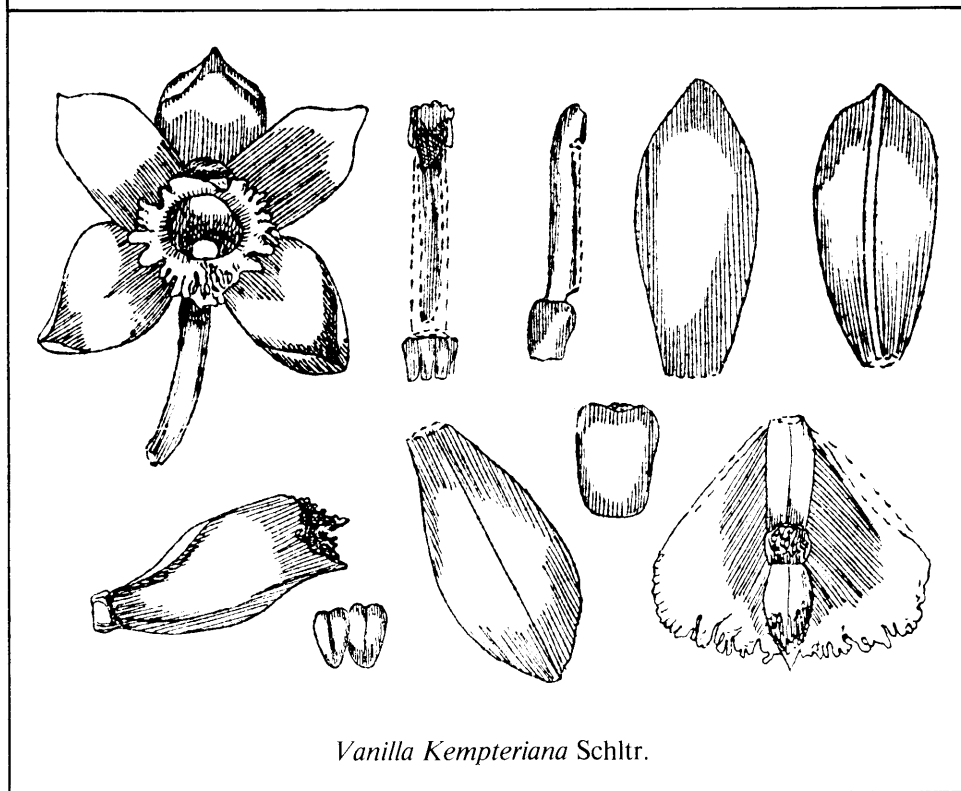
Galeola vanilloides Schltr.



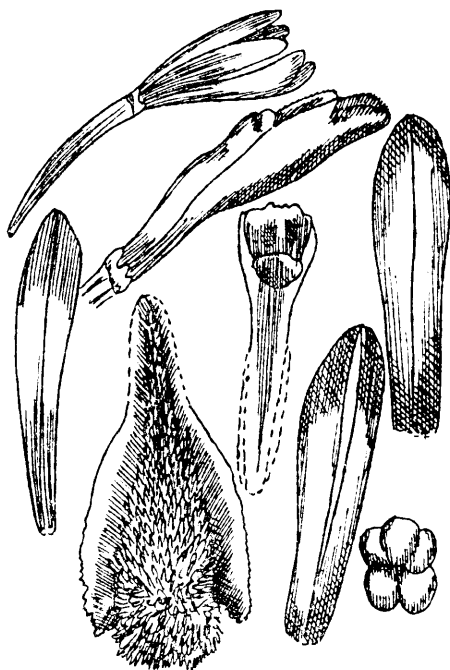
Vanilla wariensis Schltr.



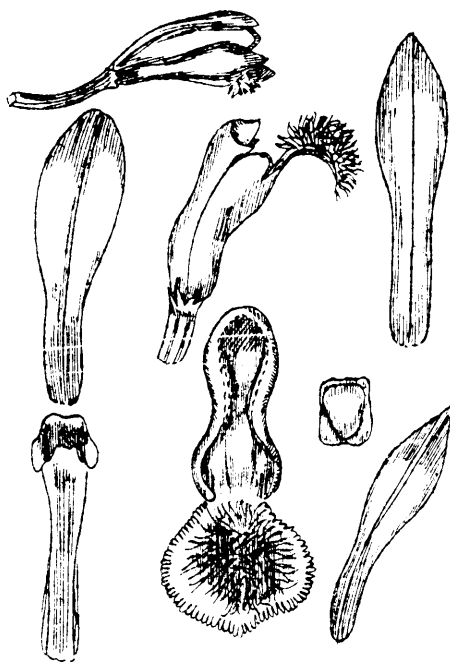
Vanilla kaniensis Schltr.



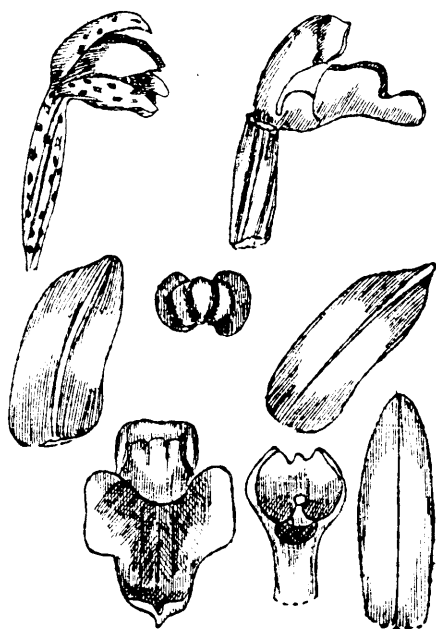
Vanilla kempteriana Schltr.



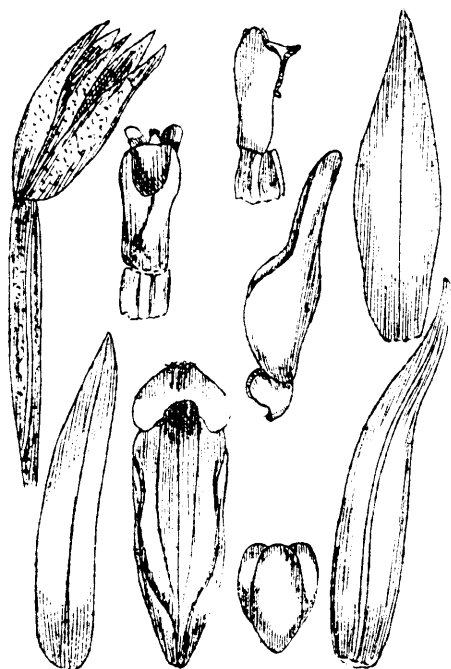
Lecanorchis neglecta Schltr.



Lecanorchis papuana Schltr.



Aphyllorchis torricellensis Schltr.



Aphyllorchis elata Schltr.

Group VII *Gastrodiinae*

Only recently I explained how I circumscribe this group and what genera are included in it. From German New Guinea, the genus *Nervilia* Commers. has, so far, been its only representative and none are recorded from other parts of the region. Below, its flora will be enriched by three genera, viz. *Epipogum* Gmel., *Didymoplexis* Griff. and *Gastrodia* [R. Br.] Bl. Several new species have been added also to the genus *Nervilia* Commers.

11. *Epipogum* Gmel.

The species which occurs in the Territory is the widely distributed *E. nutans* (Bl.) Rchb. f. which can be traced through nearly every floral region from India to New Caledonia. The species from Africa, identified by Reichenbach fil. and also by Rolfe as *E. nutans* (Bl.) Rchb. f., has proved to be a separate species, which is distinguished by its elongated column. It has, therefore, been separated by me as *E. africanus* Schltr. Under the synonymy of *E. nutans* (Bl.) Rchb. f. in 'Engl. Bot. Jahrb.' XLV., p. 398, I also enumerated, as identical with it, *E. japonicus* Makino, but after seeing the material of the latter species, I prefer to keep it separate. The genus, therefore, now consists of four species.

E. nutans grows in the dense shade and constant moisture of the lowland forests and, above all, in deep humus soil. It does not appear to ascend high into the mountains.

1. *E. nutans* (Bl.) Rchb. f., in Bonplandia (1857), p. 36.

Kaiser-Wilhelms-Land: In humus in the forests on the Minjem [River], alt. c. 150 m—R. Schlechter no. 16142, flowering in June 1907; in humus in the forests on the Keneja [River] alt. c. 150 m—R. Schlechter no. 18389, flowering in Dec. [Ed.—possibly Oct.] 1908; in humus in the forests at the foot of the Bismarck Range, alt. c. 350 m—R. Schlechter no. 18854, flowering in Nov. 1908; in humus in the mountain forests near Jaduna, alt. c. 300 m—R. Schlechter no. 19257, flowering in Apr. 1909.

The flowers are usually yellowish white, but the labellum is occasionally stippled red.

12. *Nervilia* Commers.

It is noticeable in what numerous forms this genus occurs in the relatively small Territory of German New Guinea, when one considers that, up to the present, only about 40 species have been recorded, and now no less than nine are referred to below, six of which are species not described previously. Two species were described by J.J. Smith in 1908 and placed under *Pogonia*, viz. *P. (Nervilia) acuminata*, and *P. (Nervilia) campestris*. Altogether, seven endemic species are known from New Guinea.

The species grow under rather different conditions. Some, e.g. *N. imperatetorum* Schltr. and *N. porphyrophylla* Schltr., are found on the hot, sunny alang-plains, where they are exposed often to great dryness of the surrounding soil and to grass fires almost every year. *N. acuminata* (J.J. Sm.) Schltr. is found in the primary forests of the plains as well as at an altitude of 1500 metres in humus soil in the mountains. *N. macrophylla* Schltr. also seems to be confined to the humus of the primary forests. The other species are found principally in the loamy soil of the secondary forests, especially *N. Aragoana* Gaud. and *N. crispata* (Bl.) Schltr. These two species, however, occasionally occur in the alang-plains or in the primary forests. The tubers can stand rather prolonged drought, especially those species growing in the alang-plains.

§ 1. *Linervia*

1. *N. crispata* (Bl.) Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 82, (in adnot.) and in Engl. Bot. Jahrb. XLV, p. 402.

N. fimbriata Schltr., in K. Schum. et Laut., Nachtr., p. 82.

Kaiser-Wilhelms-Land: In the forests near Erimahafen, alt. c. 20 m—R. Schlechter [Ed.—no number cited], flowering in Dec. 1901; in alang-fields near Constantinhafen—K. Lauterbach no. 1452, flowering in Dec. 1890; in humus in the forests on the Djamu [River] alt. c. 300 m—R. Schlechter no. 16824, flowering in Nov. 1907; on the alang-fields on the Kenejia [River], at the forest borders, alt. c. 150 m—R. Schlechter no. 18304, flowering in Sept. 1908, in loamy soil in the forests on the Malia [River], alt. c. 150 m—R. Schlechter no. 18372, flowering in Oct. 1908; in the forests on the Ngoye [Creek], near Ambo (Finisterre Range), alt. c. 500 m—R. Schlechter no. 19044 [Ed.—no date cited, possibly Jan. 1909].

I am convinced that my *N. fimbriata* does not vary sufficiently from the original *N. crispata* (Bl.) Schltr., only known from Java. I have, therefore, withdrawn it.

2. *N. imperatetorum* Schltr., sp. nov.

Terrestris, pusilla, 5–10 cm alta; tubere subgloboso; scapo tereti, glabro, vaginulis basilaribus 2–3 tecto; medio vagina alte amplexente, acuta obsesso, unifloro; bractea erecta, lanceolata, acuminata, glabra, pedicellum ovarii paulo superante; floribus in genere inter minores, patulis; sepalis patentibus lanceolato-ligulatis, acutis, glabris, 1.3 cm longis, lateralibus paulo obliquis; petalis patentibus sepalis valde similibus et fere aequimagnis, obliquis; labello e basi oblonga, e medio trilobo, glabro, superne laevi, 1.2 cm longo, inter apices loborum lateralium 0.8 cm lato, lobis lateralibus oblique oblongo-triangularibus obtusis, intermedio multo majore e basi angustata ovali, obtuso, 0.6 cm longo, infra medium 0.4 cm lato; columna gracili, semitereti, facie puberula, 6.5 mm longa, clinandrio parvulo; anthera late cordato-ovata, obtusa, superne umbonata; ovario clavato, sexcostato, glabro, pedicello incluso 0.4 cm longo.

Kaiser-Wilhelms-Land: On the alang-fields near the Kenejia Base, alt. c. 150 m—R. Schlechter no. 18336, flowering in Oct. 1908; in alang near 'Wittens Store' near Dschischungari (Waria District), alt. c. 600 m—R. Schlechter no. 19601, flowering in May 1909.

A species related to *N. dilatata* (Bl.) Schltr. It is distinguished by the shape of the lip, the column hairy in front and the anther provided with a tubercle. According to my enumeration of the species of the genus (in 'Engl. Bot. Jahrb.' XLV, p. 400) this species would have to be inserted between numbers 7 and 8. The sepals and petals are whitish, streaked with brown-violet; the mid-lobe of the labellum is red with a white centre.

3. *N. maliana* Schltr., sp. nov.

Terrestris, erecta, pusilla, 10–18 cm alta; tubere globoso; folio petiolato, lamina circuitu reniformi, obscure 5–7-angulata, acuta, utrinque glabra, 4–6.5 cm longa, infra medium 5–8.5 cm lata, petiolo glabro, 5–8 cm longo; scapo vaginis 4–5 dissitis, acuminatis, arcte amplexentibus obsesso, tereti, glabro, unifloro; bractea erecta, elliptico-ligulata, subacuta, pedicellum ovarii paulo superante; floribus mox nutantibus, in genere mediocribus; sepalis lanceolatis, acutis, glabris, 1.2 cm longis, lateralibus paulo obliquis; petalis sepalis similibus, paulo brevioribus, basin versus paulo angustatis, acutis, glabris, obliquis; labello e basi oblongo-cuneata, e medio trilobo, 1 cm longo, inter apices loborum lateralium 0.5 cm lato, lobis lateralibus subdivergentibus, triangularibus, subacutis, intermedio e basi angustata suborbiculari, obtusissimo, margine undulato, 0.5 cm longo, medio fere 0.4 cm lato, carina duplici basi attenuata, in medio labelli confluyente, puberula e basi labelli usque ad medium lobi intermedi; columna brevi, antice minutissime puberula, 0.3 cm longa; ovario clavato, leviter 6-costato, glabro, pedicello incluso c. 0.6 cm longo.

Kaiser-Wilhelms-Land: In the secondary forests on the Malia [River], in loamy soil, alt. c. 150 m—R. Schlechter no. 18365, flowering in Oct. 1908.

A near relative of *N. punctata* (Bl.) Schltr. and *N. pallidiflora* Schltr. (described

below) and distinguished from both by its large leaves and round middle lobe of the labellum. The flowers are greenish white, closely spotted and streaked with violet-red. Like all species of the section the plant extends its shaft considerably when developing fruit and, during this time, a slight elongation of the sepals and petals takes place, which then also become completely green.

4. *N. pallidiflora* Schltr., sp. nov.

Terrestris, erecta, pusilla, 8–16 cm alta; tubere globoso; folio petiolato, lamina reniformi-cordata, apiculata, vix angulata, utrinque glabra, 2.5–3.5 cm longa, infra medium 3.2–4 cm lata, petiolo superne sulcato, 2–3 cm longo; scapo stricto vel substricto, tereti, glabro, vaginis 3 dissitis, alte vaginantibus, obtusiusculis vel apiculatis obsesso, unifloro; bractea erecta, lanceolata, acuminata, glabra, sub anthesi ovario aequilonga vel paulo longiore; floribus patulis, illis *N. punctatae* (Bl.) Schltr. similibus et fere aequimagnis; sepalis lanceolato-ligulatis, acutis, glabris, 1.5 cm longis, lateralibus obliquis; petalis sepalis similibus, basi paulo angustatis, obtusiusculis, 1.4 cm longis, obliquis; labello e basi oblonga e medio fere trilobo, 1.4 cm longo, inter apices loborum lateralium 0.4 cm lato, lobis lateralibus subporrectis, dentiformi-triangularis, subacutis, intermedio multoties majore, lanceolato-rhombeo, subacuto, 0.8 cm longo, medio fere 3.5 mm lato, carinis 2 basi attenuatis, in medio lobi intermedii confluentibus, puberulis, e basi usque ad apicem labelli decurrentibus; columna parvula, semitereti, medio subattenuato, facie minutissime puberula, 0.5 cm longa; anthera subreniformi-culcullata, glabra; ovario clavato, leviter 6-costato, glabro, cum pedicello 0.7 cm longo.

Kaiser-Wilhelms-Land: In damp forests at the foot of the Bismarck Range, alt. c. 250 m—R. Schlechter no. 18473, flowering in Oct. 1908.

This species, together with *N. maliana* Schltr., must be inserted in my enumeration of the species of *Nervilia* directly beside *N. punctata* (Bl.) Schltr., as numbers 11 a. and b. respectively. It has a narrower labellum than *N. punctata* (Bl.) Schltr. with differently shaped dorsal lobe and hairy ridges extending to the apex of the latter. The flowers are greenish white with a white labellum.

5. *N. acuminata* (J.J. Sm.) Schltr., in Engl. Bot. Jahrb. XLV, p. 402.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20070, flowering in Sept. 1909; in humus in the forests near Wengi, alt. c. 400 m—R. Schlechter no. 16126, leaves only in May 1907; in humus in the primary forests near Wobbe, alt. c. 250 m—R. Schlechter no. 16484, flowering in Sept. 1907; in humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18274, flowering in Sept. 1908; in humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17811, flowering in May 1908; in the gallery forests on the Kenejia [River] alt. c. 150 m—R. Schlechter no. 18325, flowering in Oct. 1908; in humus in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 18677, flowering in Nov. 1908; in humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18257, flowering in Sept. 1908; in humus in the forests on the Waria [River] near Gobi, alt. c. 350 m—R. Schlechter no. 19847, flowering in Sept. [Ed.—possibly June] 1909.

This characteristic species agrees well with the illustration published by J.J. Smith ('Nova Guinea' VIII, t. 3) except that all my specimens have not two round red spots at the base of the white lip, but two irregular spots closer to the centre of the column.

§ 2. *Vinerlia*

6. *N. apiculata* Schltr., sp. nov.

Terrestris, erecta, gracilis, c. 25 cm alta; tubere subgloboso; folio humistrato, breviter petiolato, lamina reniformi-cordata, acutiuscula vel apiculata, superne puberula, nervis c. 12 superne praesertim basin versus carinato-incrassatis, ciliato-puberulis, 5–8 cm longa, infra medium 6–8.5 cm lata, petiolo sulcato, glabrato, 2–4 cm longo, scapo vaginis paucis dissitis, alte vaginantibus obsesso, tereti, glabro, bifloro; bracteis erectis, lanceolatis, acutis, sub anthesi ovarium excedentibus, glabris; floribus in

genere inter majores, patulis; sepalis lanceolato-ligulatis, acutis, supra medium paulo dilatatis, glabris, 2.6 cm longis, lateralibus obliquis; petalis sepalis similibus, sed paulo brevioribus, glabris, obliquis, acutis; labello oblongo, antice rotundato cum apiculo, basi marginibus incurvis paulo angustato, c. 2.4 cm longo, supra medium c. 0.8 cm lato, glabro, ecarinato; columna gracili, 1 cm longa, glabra; ovario clavato, leviter 6-costato, glabro, pedicello incluso c. 1 cm longo.

Kaiser-Wilhelms-Land: In the forests at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 200 m—R. Schlechter no. 18502, flowering in Oct. 1908.

This species might well be arranged next to *N. Dallachyana* (F.v.M.) Schltr. The shape of the lip, with the conspicuous apicula, distinguishes it from the related species. My specimen is a little advanced in fruiting. The flower was yellow-green with a white labellum, the green leaves with brown spots on the upper surface.

7. *N. porphyrophylla* Schltr., sp. nov.

Terrestris, erecta, gracilis, 16–32 cm alta; tubere globoso; foliis breviter petiolatis, late ovatis vel subreniformibus, cordatis, obtusiusculis, superne puberulis, nervis c. 12 superne carinato-incrasatis et puberulis, 2.5–4.5 cm longis, infra medium 2.7–5 cm latis, petiolo sulcato, 1–2 cm longo; scapo stricto vel substricto, tereti, glabro, infra medium vaginis 3, alte amplexantibus, obtusiusculis vel apiculatis oblecto, tereti, glabro, apice bifloro (rarissime trifloro); bracteis patulis, lanceolatis, subacutis, glabris, vulgo pedicello aequilongis; floribus in genere inter majores patulis; sepalis ligulatis, acutis, dimidio superiore paulo dilatatis, glabris, 3.2 cm longis, lateralibus obliquis; petalis sepalis valde similibus, acutis, glabris, obliquis, 3 cm longis; labello e basi angustata circuitu late ovato-quadrato, apice bilobato-exciso, glabro et nudo, 2 cm longo, infra medium 1.5 cm lato; columna gracili, apicem versus dilatata, glabra, 1.2 cm longa; anthera rhomboideo-cucullata, glabra; ovario 6-costato, glabro, clavato, cum pedicello 0.9 cm longo.

Kaiser-Wilhelms-Land: Between along in the plain near the Kenejia Base—alt. c. 150 m—R. Schlechter no. 18299, flowering in Sept. 1908; at the borders of the forests near the Saugueti Base, alt. c. 200 m—R. Schlechter no. 18467, flowering in Nov. [Ed.—possibly Oct.] 1908.

This pretty species reminds one at first glance of *N. velutina* (Par. et Rchb. f.) Schltr., but is well characterised by the labellum. The leaves are coloured dark red which induced me to give this plant the above name. The sepals and petals are generally brown, more rarely yellowish. The labellum is rose-red, darker towards the front, with a yellow streak along the centre. This streak is so convex that it is easily mistaken for a ridge; in the flattened labellum it disappears altogether. The form with yellow sepals generally has a white labellum.

§ 3. *Eu-Nervilia*

8. *N. macrophylla* Schltr., sp. nov.

Terrestris, erecta, 35–55 cm alta; tubere globoso; folio longipetiolato, lamina reniformi-cordata, breviter acuminata, vix angulata, 8–12 cm longa, infra medium 12–15 cm lata, utrinque glabra, petiolo sulcato, 12–20 cm alto; scapo stricto vel substricto, vaginis 3–4 alte amplexantibus, subacutis, dissitis vulgo infra medium obsessis, tereti, glabro; racemo laxo 4–7-floro, secundo, erecto; bracteis pendulis, lanceolato-ellipticis, ovarium pedicellatum plus minusve superantibus; floribus in sectione inter majores, patulis; sepalis lanceolato-ligulatis, acuminatis, basin versus paululo angustatis, glabris, 2.8 cm longis, lateralibus obliquis; petalis sepalis simillimis, paulo brevioribus; labello circuitu late ovali, e medio trilobato, intus sparsim et breviter puberulo, medium versus piloso, ecarinato, 2 cm longo, inter apices loborum lateralium 1.8 cm lato, lobis lateralibus subdivergentibus, ovato-triangulis, subacutis, lobo intermedio multoties majore, semiorbiculari, apiculato, margine ciliato-dentato, undulato, c. 0.9 cm longo, basi 1.4 cm lato; columna gracili, apicem versus paulo dilatata, facie dimidio inferiore puberula, 1.2 cm longa, clinandrio dorso trilobulato; anthera semigloboso-cucullata, antice bidentata, glabra; ovario cum pedicello clavato, glabro, 6-costato, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests near Wobbe, alt. c. 300 m—R. Schlechter no. 16476, flowering in Sept. [Ed.—possibly Aug.] 1907; in humus in the forests on the Maijen [River], alt. c. 100 m—R. Schlechter no. 18078, flowering in July 1908.

To this species belongs, almost certainly, a leaf which I collected in the forest near Damum and kept in my herbarium under No. 16137. In consequence of its knee-less labellum, this species is related closely to *N. carinata* (Roxb.) Schltr., but it has considerably larger flowers, and quite a differently shaped leaf. Amongst the species of this Territory it comes closest to *N. Aragoana* Gaud. and its flowers are coloured similarly, but considerably larger. The sepals and petals are yellow-green, the labellum white with violet veins.

9. *N. Aragoana* Gaud., in Freyc., Voy. Bot., p. 422, t. 35.

Kaiser-Wilhelms-Land: In humus of the forests near Erimahafen, alt. c. 20 m—R. Schlechter no. 13795, flowering in Oct. [Ed.—possibly Nov.] 1901; in humus of the forests near the Minjem Gorge, alt. c. 170 m—R. Schlechter no. 16572, flowering in Sept. 1907; at the forest borders near the Kenejia Base, alt. c. 150 m—R. Schlechter no. 18305, flowering in Sept. 1908; near Finschhafen—O. Warburg; in forest near Bussum—Hellwig no. 499, in Apr. 1899.

Neu-Pommern: In grassland on the island of Vatom, alt. c. 200 m—Dahl, flowering in Nov. 1896.

This species seems to extend to Samoa; according to the material which came from there, it may at least be assumed that we are dealing with *N. Aragoana* Gaud. Really good material of these south-seas *Nervilias* would be most desirable, since it is probable that a whole series of new species might yet be found there.

13. *Didymoplexis* Falk. [Ed.—Griff.]

The occurrence of this genus in New Guinea was to be expected since species had been recorded from the Malayan Archipelago, as well as from New Caledonia, Samoa and Fiji. The two species described here are related closely to the Malayan forms and those from New Caledonia and Samoa.

The species of this genus are all quite typical saprophytes and their occurrence is therefore restricted to the humus layers in the primary forests. *D. papuana* Schltr. is an inhabitant of the lowland forests; *D. torricellensis* Schltr. appears to be confined to the forests of the Torricelli Range.

1. *D. papuana* Schltr., sp. nov.

Saprophytica, erecta, pusilla, 8–15 cm alta; tubere fusiformi, horizontali; caule stricto vel substricto, vaginulis squamiformibus, paucis, dissitis obsesso, tereti, glabro; racemo 4–8-floro, sublaxo, erecto; bracteis squamiformibus, ovatis, obtusis, patentibus, glabris, parvulis; floribus illis *D. pallentis* Griff. fere aequimagnis similibusque, erectis; sepalis intermedio anguste oblongo-ligulato, obtuso, apice concavo, 0.8 cm longo, tertia vel quarta parte basilari cum sepalis lateralibus connatis, glabris, 0.6 cm longis; petalis lineari-ligulatis, obtusis, apice subfalcatis, margine posteriore usque infra apicem sepalis intermedio, margine anteriore tertia parte basilari sepalis laterali adnatis, glabris, 0.7 cm longis; labello e basi subunguiculato cuneato, antice subtruncato, trilobulato, 0.7 cm longo, antice 0.3 cm lato, lobis abbreviatis, lateralibus alte fissis, intermedio haud longiore, antice dentato, fasciis 3 parallelis papillarum antice conjunctis e quinta parte basilari usque infra apicem superne decurrentibus; columna gracili semitereti, glabra, subapoda, apicem versus distincte amplilata, 0.6 cm longa; anthera suborbiculati-cucullata, glabra, dorso obtuse bigibbosa; ovario cylindrico, glabro, c. 0.8 cm longo; capsula fusiformi, c. 2.3 cm longa, medio fere 0.6 cm diametiente, matura cum pedicello elongato usque ad 19 cm longo.

Kaiser-Wilhelms-Land: In humus of the forests near Peso, not far from Eitape, alt. c. 30 m—R. Schlechter no. 19974, flowering and fruiting in Aug. 1909; in humus in the forests on the Garup [River], alt. c. 150 m—R. Schlechter no. 20359, flowering in Sept. 1909; in humus in the forests of Wobbe, alt. c. 200 m—R. Schlechter no. 16578, flowering in Sept. 1907; in humus of the forests above the Giagoro [River], alt. c. 400 m—R. Schlechter no. 18106, flowering and fruiting in Aug. 1908; in humus of the

forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18413, flowering in Oct. 1908.

Undoubtedly, closely related to *D. minor* J. J. Sm., *D. neocaledonica* Schltr. and *D. samoensis* Schltr. The deeply divided side lobes of the lip distinguish it from these three species.

The flowers are white, sometimes with a pale rose-red tinge.

2. *D. torricellensis* Schltr., sp. nov.

Pusilla, erecta, saprophytica, 6–15 cm alta; caule plus minusve flexuoso vel substricto, vaginulis paucis, dissitis, squamiformibus, obtusis obsesso, tereti, glabro; racemo sublaxe 3–8 floro, erecto; bracteis minutis, squamiformibus, obtusis; floribus illis *D. striati* J. J. Sm. similibus, erectis; sepalo intermedio oblongo-ligulato, obtuso, dorso carina apicem versus verruculosa donato, glabro, 0.8 cm longo, tertia parte basilari cum petalis connato, lateralibus oblique oblongis, obtusis, carina apicem versus verruculosa extus ornatis, basi concava mentum obtusum, breve formantibus, 0.7 cm longis, usque supra medium connatis, quarta parte basilari margine exteriori cum petalis connatis; petalis oblique ligulatis, obtusiusculis, dorso carina apicem versus verruculosa ornatis, sepalo intermedio fere aequilongis; labello e basi breviter unguiculata cuneato, antice breviter trilobato, glabro, 6.5 mm longo, 0.4 cm antice lato, carinis 3 parallelis apicem versus dilatatis e basi, intermedia usque infra basin lobi intermediarii decurrente, lateralibus paulo brevioribus, lobis lateralibus rotundatis, margine subdenticulato-irregularibus, lobo intermedio parvulo, laterales paulo superante, triangulo, obtuso; columna gracili, semitereti, glabra, 0.4 cm longa, apicem versus paulo dilatata, pede distincto; anthera semigloboso-cucullata, glabra; ovario cylindrico, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20309, flowering in Sept. 1909.

In habit and shape of the flower, this species strongly reminds one of *D. striata* J. J. Sm., but the shape of the labellum and keels on it are quite different. The stems are black-violet, the flowers white with a grey outer keel on each of the petals and sepals.

The three combs on the snow-white labellum are golden yellow.

14. *Gastrodia* Bl. [Ed.—R. Br.]

G. papuana Schltr., described below, is the first species belonging to this genus reported from New Guinea, although its occurrence there was not unexpected. It belongs to the section *Codonanthus* in which most of the species from the monsoon-region are placed. It is an inhabitant of the mountains, and, as in the case of *Didymoplexis* species, grows there as a saprophyte in the humus of the primary forests. The specimens occur mostly scattered and are difficult to discover, since they are usually hidden under shrubs.

1. *G. papuana* Schltr., sp. nov.

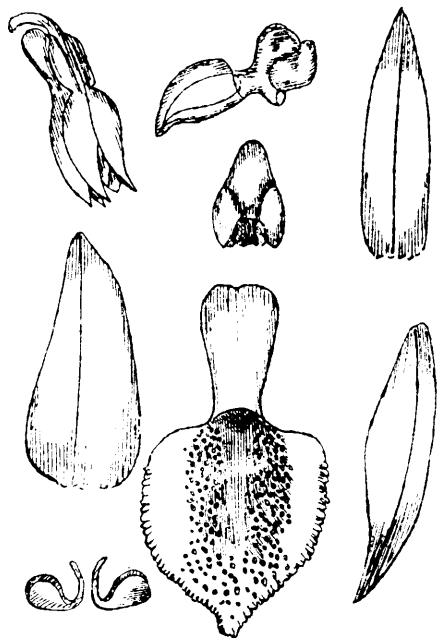
Gracilis, erecta, saprophytica, 12–25 cm alta; rhizomate oblongoideo, horizontali; caule plus minusve flexuoso vel substricto, vaginulis paucis, parvulis, dissitis, arcte amplexantibus obsesso, tereti, glabro, laxo 2–4 floro; bracteis ovatis, obtusis, glabris, pedicello multo brevioribus; floribus erectis, oblique campanulatis; sepalis oblongis, obtusis usque ad quartam partem apicalem connatis, glabris, c. 1 cm longis, lateralibus basi concava mentum obtusissimum, breve formantibus; petalis oblique lineariligulatis, obtusis, usque supra medium tubo sepalorum adnatis, sepalis distincte brevioribus, c. 0.8 cm longis; labello elliptico-lanceolato, obtuso, glabro, basi glandulis 2 amplis, suborbicularibus ornato, 0.6 cm longo, infra medium c. 0.2 cm lato; columna erecta, glabra, labello breviori, steliidiis erectis, oblique lanceolatis, acutis, amplis; stigmatibus usque supra basin columnae decurrente; ovario pedicellato, clavato, glabro, 0.9 cm longo, pedicello post anthesin valde elongato.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—Schlechter no. 20148, flowering in Sept. 1909; in humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18036, flowering in July 1908.

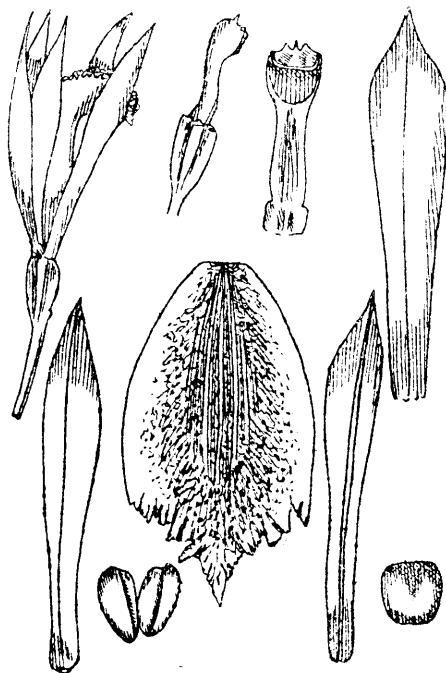
This species should be placed in my enumeration of the species of the genus (in 'Engl. Bot. Jahrb.' XLV, p. 409), after *G. verrucosa* Bl.

It is well characterised by the labellum on which (with the exception of the two round basal calli) all undulations are absent. The white flowers are flushed pale brownish with darker petals and a pure white labellum.

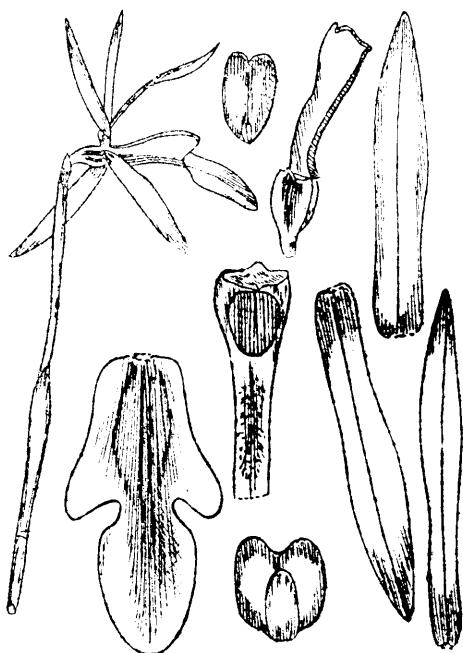
GROUP VII *Gastrodiinae*



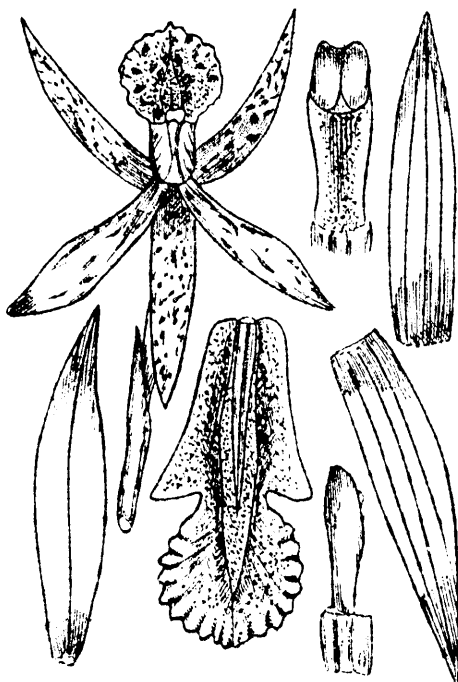
Epipogum nutans (Bl.) Rehb.f.



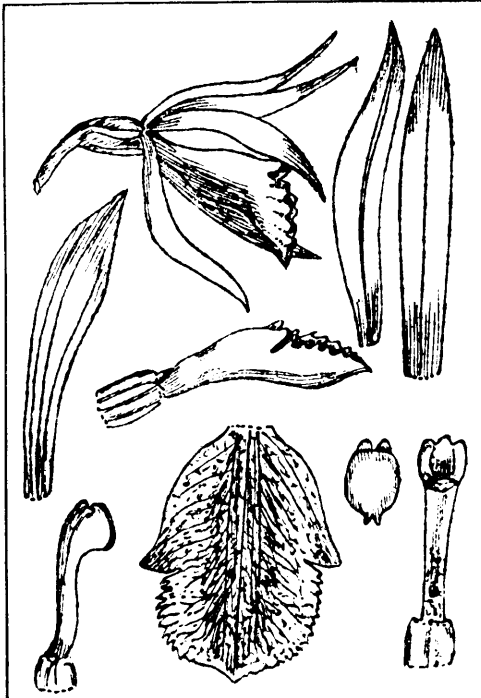
Nervilia crispata (Bl.) Schltr.



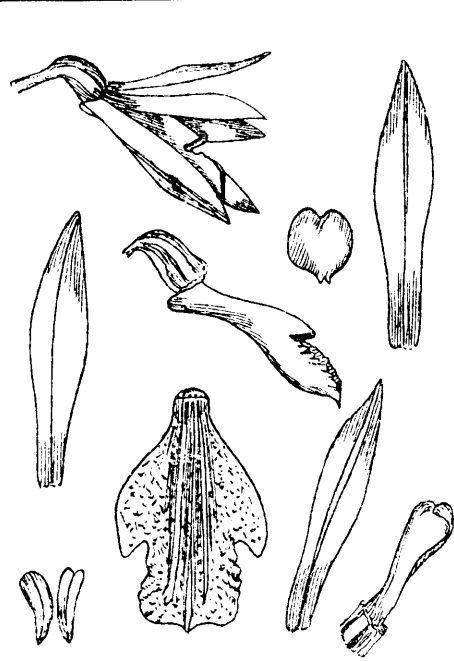
Nervilia imperatetorum Schltr.



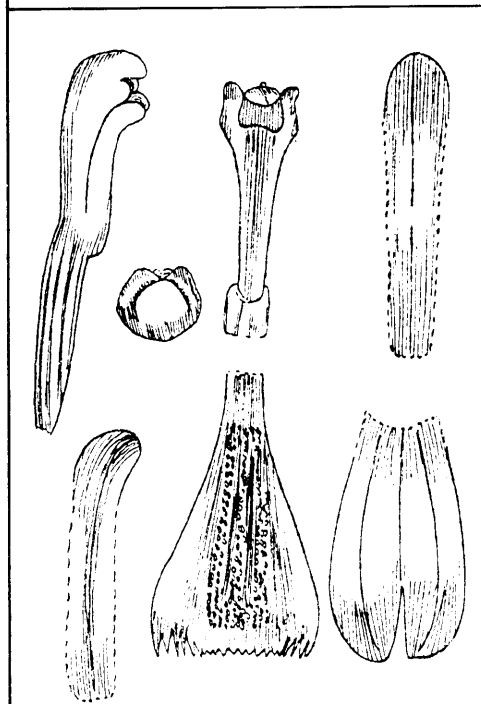
Nervilia maliana Schltr.



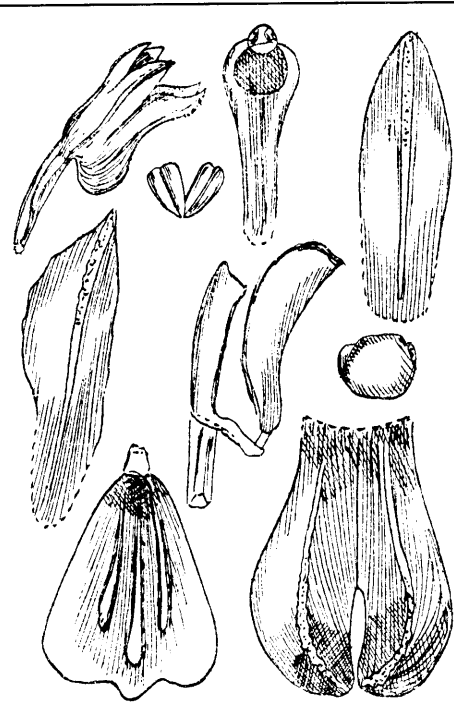
Nervilia macrophylla Schltr.



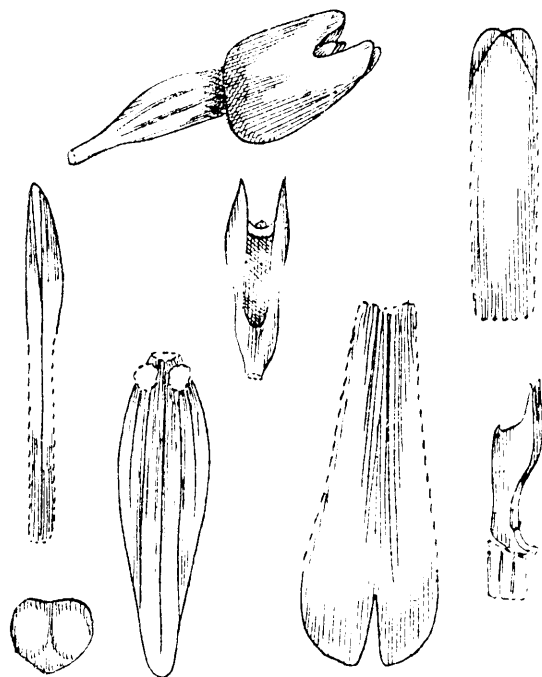
Nervilia Aragoana Gaud.



Didymoplexis papuana Schltr.



Didymoplexis torricellensis Schltr.



Gastrodia papuana Schltr.

Group VIII *Spiranthinae*

The only Old World genus in this group is *Spiranthes* L.C. Rich., the other two genera belonging here, *Pelexia* L.C. Rich. and *Baskervilla* Lindl., being found only in tropical America. As already stated, the group is distinguished by its bunchy, thick, fleshy roots from the group *Physurinae* which follows it.

15. *Spiranthes* L.C. Rich.

Of this large genus containing about 180 species, only eight were known from the whole of the Old World. These are the two European species *S. autumnalis* L.C. Rich., *S. aestivalis* L.C. Rich., as well as *S. chinensis* (Pers.) Ames, *S. exigua* Rolfe, *S. gemmipara* Lindl., *S. neocaledonica* Schltr., *S. Novae-Zelandiae* Hook. f. and *S. obliqua* J.J. Sm. In addition, a series of species was established both by Blume and Lindley but these were re-united with *S. sinensis* (Pers.) Ames by Reichenbach fil., and subsequently by most of the new authors. The justification for this must be established by a careful examination of each case. It is certain, in any case, that many different forms have been placed under the latter species, and that a critical examination of the material found under this collective name in the large herbaria of Asia, Australia and the Malayan Archipelago, together with the study of the living material, will show that it consists of several species which are similar only externally. I have, already, made several such examinations and found my surmise thoroughly justified by comparisons on living material.

1. *S. papuana* Schltr., sp. nov.

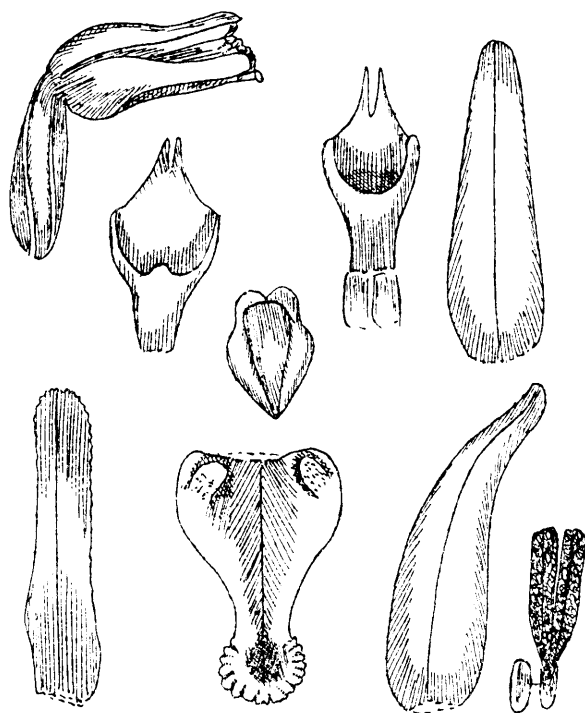
Terrestris, erecta, pusilla, 11–20 cm alta; radicibus crassiusculis, teretibus, puberulis; foliis basilaribus 3–4, erectis vel erecto-patentibus, linearibus, obtusiusculis vel subacutis, glabris, basin versus paulo angustatis, vagina dilatata scapum amplexantibus, 4–8.5 cm longis, medio fere 2–5 mm latis; scapo stricto vel substricto, vaginis 2–3, erectis, amplexantibus, acuminatis, dissitis obsesso, tereti, glabro; spica dense multiflora, elongata, spirali, usque ad 9 cm longa; bracteis erectis, lanceolatis, acuminatis, ovario aequilongis vel paulo longioribus, glabris; floribus in genere inter minimos; sepalo intermedio lanceolato, obtuso, glabro, 0.3 cm longo, lateralibus oblique lanceolatis, obtusiusculis, glabris, intermedio aequilongis; petalis oblique ligulatis, obtusis, glabris, apicem versus margine subdenticulato irregularibus, sepalo intermedio subaequilongis; labello e basi dilatata, concava ovato, apicem versus conspicue angustato et in lobum suborbicularem, margine undulatum, parvulum, vix latiore excurrente, squamis 2 parvulis, puberulis supra basin, caeterum glabro, 0.3 cm longo, basi 0.2 cm lato, lobo apicali 0.1 cm lato; columna brevi, glabra, labello triplo fere brevior; anthera rhombo-ovata, acuta, cucullata, glabra, basi cordata, dorso umbonata; pollinibus bipartitis, longe clavatis, glandulae oblongae, fere 3-plo breviori sine stipite affixis; ovario cylindraceo, glabro, torto, basi apiceque attenuato, 0.2 cm longo.

Kaiser-Wilhelms-Land: On alang flats near the Kenejia Base, alt. c. 150 m—R. Schlechter no. 18338 (TYPE), flowering in Oct. 1908; in more open, steep slopes of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 10916 [Ed.—number invalid], flowering in Jan. 1909; on more open, steep slopes of the Dischore [Range], alt. c. 1100 m—R. Schlechter no. 19689, flowering in June 1909.

Neu-Pommern: In grassland, with volcanic soil on the slopes of the volcano Mutter, alt. c. 700 m—Dahl, flowering in Mar. 1897.

This species is characterised by the very small and completely glabrous flowers; by the labellum, very narrow towards the front with two hairy scales at the base, and the anther with long clavate pollinia. The flowers are white with rose-red tips, or rose-red; the anther is green.

Specimens from the Finisterre Range have slightly larger flowers. The occurrence in the Kenejia plains is remarkable, since only a single little specimen was found of the plant, which generally grows in colonies; this leads me to believe that the specimen must have been washed down from the mountains.

GROUP VIII *Spiranthinae*

Spiranthes papuana Schltr.

Group IX *Physurinae*

In the entire division of *Polychondrae* this group has developed more numerous forms than any other. For this reason we find in it the greatest number of genera. Not only have we to employ the perianth characters for the division and limitation of these genera, but likewise of the gynostegium to a much greater extent than in the case of related groups. The species of this large group may possibly exceed 300 in number, and to these must now be added about 40 more new species.

The Malay Archipelago and the hinterland of India probably form the centre of geographical dispersion. Towards the east and the west the number of species soon decreases, although a series of interesting forms has developed in the islands of the Pacific. An enumeration of the 26 genera included in the *Physurinae* has been published by me in 'Engl. Bot. Jahrb.' XLV, p. 391.

16. *Goodyera* R. Br.

This genus may be divided into two natural sections, which are distinguished easily from one another, at least regarding the species of our Territory, and are as follows:

§ 1. *Otosepalum*

Species with widely spreading lateral sepals.

§ 2. *Eu-Goodyera*

Species in which the lateral sepals are parallel or nearly parallel.

Transition forms between these two sections are unknown to me. Certainly in *Otosepalum*, the sepals approach each other after flowering, but during flowering they form a marked contrast to those species belonging to *Eu-Goodyera*.

It is known that this genus is distributed in both temperate and tropical zones. The tropical species are all inhabitants of the rich humus of the forests in which they find a uniform humidity in both atmosphere and soil.

Those of the first section are distinguished partly by the strong development of their stems, while the species of *Eu-Goodyera* have, often, beautifully marked leaves. They are found usually in the mountains between the moss and rotten foliage of the primary forests, especially where the thick undergrowth or shrubs provide complete protection from the direct rays of the sun. Some of them always grow quite hidden at the base of dense, overhanging small shrubs amongst *Selaginella* and ferns, where they can be discovered only when they send up their inflorescences. All species coming from the higher mountains (i.e. 800 metres altitude approximately and above) are very sensitive to excessive heat and require much moisture for their development.

§ 1. *Otosepalum*

1. *G. papuana* Ridl., in Journ. Bot., 1886, p. 335; Schltr., K. Schum. et Laut., Nachtr. [1905], p. 94.

Kaiser-Wilhelms-Land: In the forests near Erimahafen, alt. c. 20 m—R. Schlechter no. 13679, flowering in Oct. 1901; in humus in the forests on the Schumann River, alt. c. 300 m—R. Schlechter no. 13844, [Ed.—no date cited, possibly Jan. 1902]; in the forests at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18633, flowering in Nov. 1908.

It is doubtful whether the specimen from Neu-Mecklenburg (cf. Schltr., l.c., p. 94.) belongs here, since the material was inadequate. The species altogether differs, as I have now established, from *G. Waitziana* Bl. and *G. rubicunda* Lindl. in the conspicuous wings on both sides of the column.

2. *G. rubicunda* Lindl., Bot. Reg., 1839, p. 92.

Terrestris, erecta, valida, c. 60–80 cm alta; rhizomate cauliformi, decumbente; radicibus elongatis, flexuosis, villosis; caule dimidio inferiore bene foliato, tereti, glabro, inflorescentiam versus glanduloso-puberulo, supra medium vaginis distantibus, lanceolatis, acuminatis obsesso; foliis erecto-patentibus, oblique ellipticis, acuminatis, basi cuneatis, utrinque glabris, lamina 10–15 cm longa, medio fere 3.5–5 cm lata, petiolo basi valde dilatata caulem cucullato-amplexente, 4–6 cm longo; spica dense multiflora, elongata, usque ad 20 cm longa, 1.5 cm diametiente; bracteis erecto-patentibus, lanceolatis, acuminatis, glanduloso-puberulis, floribus vulgo paulo brevioribus, rarius paulo longioribus; floribus erecto-patentibus, illis *G. papuanae* Ridl., fere aequimagnis; sepalis intermedio ovato-lanceolato, obtuso, concavo, extus glanduloso-puberulo, 0.7 cm longo, lateralibus patentibus, e basi ovato-oblonga angustatis, falcatis, obtusiusculis, extus glanduloso-puberulis, sepalis intermedio aequilongis; petalis e basi lineari-unguiculata anguste rhombeo-lanceolatis, subfalcato-obliquis, obtusiusculis, supra medium antice paulo dilatatis, glabris, sepalis intermedio margine intus adhaerentibus, sub-aquilongis; labello erecto, apice deflexo, cucullato, explanato suborbiculari, antice in lobum ligulatum, obtusum productum, intus usque supra medium dense appendicibus filiformibus obsesso, omnino 0.7 cm longo, infra medium 0.5 cm lato, lobo apicali 0.2 cm longo; columna gracili 0.6 cm longa, antice obtuse carinata, lateribus exalata, glabra; anthera oblongoideo-cucullata, breviter acuminata, basi cordata; ovario subcylindrico, dense pilis recurvis glanduloso-puberulo, c. 1.1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20159, flowering in Sept. 1909; in humus in the mountain forests of Albo, alt. c. 500 m—R. Schlechter no. 16125, flowering in May 1907; in humus in the mountain forests on the Kaulo [River], alt. c. 500 m—R. Schlechter no. 16873, flowering in Nov. 1907; in humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18280, flowering in Sept. 1908.

The species differs in the slender long column from *G. papuana* Ridl. The sepals are brown, the labellum white. I have described the plant again here since it is related closely to *G. papuana* Ridl. and might be confused easily with the latter.

3. *G. erythrodoides* Schltr., sp. nov.

Terrestris, erecta, 25–50 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule stricto vel substricto, usque ad medium dense foliato, supra medium vaginis paucis, dissitis, lanceolatis, acuminatis, arctius appressis obsesso, tereti, glabro, inflorescentiam versus glanduloso-puberulo; foliis erecto-patentibus patentibusve, petiolatis, lamina oblique lanceolata, acuta vel subacuta, utrinque glabra, 6–10 cm longa, infra medium 1.2–2.7 cm lata, petiolo basi bene dilatata caulem amplectente, 2–3 cm longo; spica longipedunculata, erecta, dense 8–15-flora, elongata, usque ad 8 cm longa; bracteis erecto patentibus, lanceolatis, acuminatis, vulgo ovario fere aequilongis; floribus illis *G. rubicundae* Lindl. fere aequimagnis similibusque, sub-erectis; sepalis ovato-lanceolatis, pilis reversis glanduloso-puberulis, obtusis, 0.5 cm longis, lateralibus, obliquis, subfalcatis; petalis e basi lineari-unguiculata oblique rhombeis, obtusis, glabris, sepalis intermedio aequilongis, intus adhaerentibus; labello erecto, circuitu oblongo, cucullato-concavo, dorso basi exciso, antice in lobum rotundatum productum, decurvo, sepalis subaequilongis, medio fere (haud explanato) 0.3 cm longo, intus fascia mediana laevi excepta usque supra medium dense papillis subulatis obsesso; columna gracili, antice obtuse carinata, lateribus exalata, rostello erecto; anthera cordata, ovata, acuta vel subacuta; ovario cylindrico pilis reversis dense glanduloso-puberulo, 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17748, flowering in May 1908; in the range forests of Albo, alt. c. 400 m—R. Schlechter no. 16293, flowering in July 1907; in humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17981, flowering in July 1908.

In the structure of the flowers, this species most closely resembles *G. angustifolia* Schltr., but is distinguished easily by its broader leaves. The flowers also are not unlike those of *G. rubicunda* Lindl. and are about the same size. The sepals are reddish brown, the labellum and petals white; the usual colour of the flowers in this genus.

4. *G. angustifolia* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 92.

Kaiser-Wilhelms-Land: In humus in the forests near Peso, not far from Eitape, in

damp places, alt. c. 40 m—R. Schlechter no. 19980, flowering in Aug. 1909; in humus in the forests near Alexishafen, alt. c. 50 m—R. Schlechter no. 19202, flowering in Mar. 1909; in humus in the forests on the Warapussa [River] on the edge of a large sago swamp, alt. c. 150 m—R. Schlechter no. 13892, flowering in Jan. 1902.

The present material is more complete than that of the Type, which was very damaged; hence some additions and corrections to the old description are necessary. The flower spike is fairly dense with about 20 flowers, and up to 15 cm long; the petals obliquely rhomboidal, wider in their upper half and blunt at the apex. The labellum is very like that of *G. erythrodoides* Schltr. also denticulated at the sac-like base, therefore slightly bipartite, but on the outside covered up to and past the centre with small warts. I found the plant, as may be seen from the above-mentioned locations, always on moist, sometimes even on wet places in the forest, where the water is often stagnant for weeks. The soil is quite muddy during this period. Some plants were standing in such puddles up to their leaves and thereby seemed to thrive well. The sepals here are also brownish, the petals and labellum white.

5. *G. brachiorrhynchos* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 93.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14476, flowering in Apr. 1902; in humus in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18703, flowering in Nov. 1908; in humus in the forests above Dschischungari, alt. c. 1200 m—R. Schlechter no. 19598, flowering in May 1909.

This species, together with *G. cordata* Rchb. f and *G. viridiflora* Bl., should perhaps, better be separated as a distinct genus, which would be characterised by the high margins of the stigma. Unfortunately, some of the Asiatic species are not yet sufficiently known to me to decide this question definitely.

§ 2. *Eu-Goodyera*

6. *G. lamprotaenia* Schltr., sp. nov.

Terrestris, erecta, c. 20 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule stricto vel substricto, usque ad apicem laxo 6-foliato, tereti, glabro; foliis petiolatis, erecto-patentibus patentibusve, lamina oblique ovato-lanceolata, acuta vel acuminata, glabra, 3–5.5 cm longa, infra medium 1.3–1.9 cm lata, petiolo basi dilatata caulem vaginante, 1.3–2 cm longo; spica dense multiflora, cylindrica, c. 3 cm longa, 1.5 cm diametiente; bracteis lanceolatis, acutis, erecto-patentibus, flores superantibus, superioribus sensim minoribus; floribus in genere inter minimos, erecto-patentibus, glabris; sepalis oblongo-ligulatis obtusis, apicem versus extus minute verruculosus, 2.5 mm longis, lateralibus obliquis; petalis oblique ligulatis, subacutis, supra medium margine anteriore paulo dilatatis, sepalis subaequilongis; labello circuitu ovato, apicem versus angustato, obtuso, basi subcucullato-concavo, intus usque ad medium fere appendicibus sparsis, subulato-dentiformibus ornato, petalis subaequilongo; columna brevior, antice subcostata, glabra; ovario cylindrico, glabro, 3.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18683, flowering in Nov. 1908.

The penduncle is covered to the top by leaves and the flower spike is very dense in this species, which may be placed best beside *G. reticulata* Bl. The leaves of this dainty plant are dark green with a pale central stripe; the flowers are white with a pale brown anther. Very cold mists rise daily in the afternoon, nearly the whole year through, at localities where the species is found.

7. *G. stenopetala* Schltr., sp. nov.

Terrestris, erecta, pusilla, c. 12 cm alta; caule tereti, glabro, tertia parte basilari tantum foliato, inflorescentiam versus puberulo, vaginula supra medium obsesso; foliis c. 3, erecto-patentibus

patentibusve, petio-latis, lamina oblique ovata, acuta, basi rotundata, 2–2.5 cm longa, infra medium 1–1.5 cm lata, glabra, petiolo basi dilatata caulem vaginante, 0.7–0.9 cm longo; spica dense pluri-(c. 7-)flora, erecta; bracteis ovato-lanceolatis, acutis, floribus brevioribus; floribus parvulis, erecto-patentibus; sepalis ovato-lanceolatis, subacutis, glabris, 0.3 cm longis, lateralibus obliquis, nervo medio apicem versus dorso subincrassato; petalis subfalcato-linearibus, obtusiusculis, apicem versus sensim paululo angustatis, glabris, sepalis aequilongis; labello circuitu ovato-oblongo, basi concavo-subcucullato, intus appendicibus sparsis, falcatis ornato, 0.3 cm longo, apice minute trilobulato, lobulis lateralibus rotundatis abbreviatis, intermedio triangulo, apiculiformi; columna brevior, rostello amplo bifido; anthera ovato-cucullata, longius acuminata, basi cordata; ovario cylindraceo, pilis reversis sparsis obsesso, 0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20275, flowering in Sept. 1909.

This small charming species is distinguished by the magnificence of its leaves which are dark velvet green interlaced by a fine net of rose-red veins. In the structure of the flowers, the remarkably narrow falcate petals are noteworthy. The plant grows in moist dark places in the humus beneath the scrub; often surrounded by dense pads of moss. Unfortunately, I found only a single plant in flower, and even this one was fruiting.

8. *G. venusta* Schltr., sp. nov.

Terrestris, erecta, pusilla, 13–23 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, glabris; caule usque supra medium bene foliato, tereti, glabro, inflorescentiam versus vaginis pluribus, acuminatis obsesso, glanduloso-puberulo; foliis 3–5, patentibus, petiolatis, lamina lanceolata, acuta, basi plus minusve oblique rotundata, 3.5–6 cm longa, infra medium 1.3–2.3 cm lata, petiolo basi dilatata caulem vaginante, 1–1.5 cm longo; spica dense multiflora, elongata, subsecunda, usque ad 7 cm longa; bracteis lanceolatis, acuminatis, erecto-patentibus, flores aequantibus vel paulo brevioribus; floribus parvulis, erecto-patentibus erectisve; sepalis oblongis, obtusis, extus glanduloso-puberulis, 0.3 cm longis, lateralibus obliquis, basi margine anteriore paulo ampliatis; petalis oblique obovata-spathulatis, obtusis, glabris, sepalis subaequilongis; labello e basi ovata, cucullata-concava apicem versus angustato, apice ipsa subtrilobulata, obtusa, intus dimidio inferiore processibus sparsis subulato-dentiformibus obsesso, glabro, petalis aequi-longo; columna brevior, glabra, rostello amplo, peralte exciso, anthera oblongo-subquadrata, cucullata, glabra, antice obtusissima, dorso umbone lanceolato, antice in apiculum producto ornata; polliniis oblique clavatis, glandula perampla, oblanceolata; ovario cylindraceo, glanduloso-puberulo, 0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17692, flowering in May 1908; in humus in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 17813, flowering in May 1908.

In its appearance this species reminds one very much of the Javanese *G. reticulata* Bl., but possesses quite differently shaped floral parts and has strikingly broad petals. The very large, deep, excised rostellum results from the large viscid disc. The leaves in this species are also very beautifully coloured, they are velvet green with silver-white reticulated veins, generally becoming fainter towards the margins.

17. *Platylepis* A. Rich.

The geographical distribution of this small genus is very peculiar. At present eight species have been described, five of which are restricted to Africa, Madagascar and the adjacent islands, whilst three have been reported from the Pacific Islands, viz. from the New Hebrides, Samoa and Tahiti. No species have been recorded from the Asiatic continent nor the Malay Archipelago, so that the question arises whether we are not really dealing with two separate genera. The material available is, unfortunately, insufficient, apart from the two African species, so that, so far as I am concerned, a decision on this question is impossible at present. Should the eastern species constitute a separate genus, the name given to the Samoan species by Fleischmann and Rechanger, viz. *Coralliocypnos*, should be used again.

No representatives from New Guinea are known, except the two species described

here. Both grow in the mountains in the rainforest zone, and are found in humus in the shade of forest trees.

1. *P. lamellata* Schltr., sp. nov.

Terrestris, adscendens, usque ad 30 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule stricto vel subflexuoso, basi foliato, glabro, tereti, supra basin vaginis paucis, dissitis, amplexantibus obsesso, inflorescentiam versus glanduloso-puberulo; foliis 3–5, subrosulato-approximatis, erecto-patentibus, petiolatis, lamina late ovata, acuminata, basi rotundata, utrinque glabra 4–7 cm longa, infra medium 3–4.5 cm lata, petiolo basi dilatata caulem vaginante, glabro, 1.7–2.5 cm longo; spica erecta, subaxe 6–12 flora, subsecunda, usque ad 8 cm longa; bracteis erecto-patentibus, elliptico-lanceolatis, acuminatis, ovario vulgo subduplo brevioribus; floribus erecto-patentibus vel suberectis; sepalis oblongis, obtusis, glabris, concavis, 0.9 cm longis lateralibus obliquis; petalis e basi ligulato-unguiculata oblique rhombeis, obtusis, glabris, sepalo intermedio intus agglutinatis, 0.8 cm longis; labello e basi vesicato-cucullata in tertia parte basilabii subito valde constricto iterumque in laminam cucullato-ovoideam, antice in lobum subquadratum, obtusissimum, parvulum productum, petalis aequilongum, medio fere 3.5 mm lato, lobo apicali c. 0.2 cm longo, globulis 2 verrucosis in basi ornato, lamellis 2 e basi usque ad medium parallelis medio aucto; columna gracili, antice bialata; rostello erecto, acuto, majore, bifido; anthera lanceolato-cucullata, basi cordata, glabra; ovario cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18028, flowering in July 1908.

This species is distinguished by its habit which is almost that of a *Cystorchis*, but with pale green, darker-veined leaves. The flowers are green, the labellum is brownish yellow with a white middle lobe.

2. *P. zeuxinoides* Schltr., sp. nov.

Terrestris, erecta, usque ad 50 cm alta; rhizomate cauliformi, decumbente; radicibus elongatis, flexuosis, villosis; caule tereti, glabro, usque ad medium fere foliato, supra medium vaginis paucis, alte amplexantibus, acuminatis obsesso; foliis c. 5–7, erecto-patentibus, ovato-lanceolatis, acuminatis, utrinque glabris, basi nunc rotundatis, nunc cuneatis, lamina 4–7.5 cm longa, infra medium 2–3.2 cm lata, petiolo basi dilatata caulem amplexante, 2–3 cm longo; spica dense multiflora, elongato, subsecunda, usque ad 13 cm longa; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario fere aequilongis; floribus erecto-patentibus, glabris; sepalis oblongo-ligulatis, obtusis, 0.9 cm longis, lateralibus obliquis; petalis e basi unguiculata oblique rhombeo-oblancoatis, obtusis, margine exteriori tertia parte superiore irregulariter denticulatis, sepalo intermedio intus agglutinatis, 0.8 cm longis; labello e basi globoso-inflata contracto iterumque sensim in laminam cucullato-obovatam dilatato, antice in lobum parvulum, suborbicularem productum, intus basi fasciculis 2 papillarum subulatarum, nunc ramosarum ornato, 0.9 cm longo, haud explanato supra basin 2.5 mm lato, supra medium 3 mm lato, lobo apicali c. 1.5 mm longo et lato; columna gracili, glabra, antice exalata, rostello amplo, bifido; anthera lanceolato-cucullata, obtusiuscula, glabra, basi cordata; ovario cylindraceo, glabro, 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18709, flowering in Nov. 1908.

The tall stems of this species are fairly equally leafy up to the middle, and remind one in habit of certain *Zeuxine* species. The individual floral parts, in particular the labellum and the column, are quite different from those of *P. lamellata* Schltr.

18. *Lepidogyne* Bl.

Previously the only representative of this genus, *L. longifolia* Bl., was confined to Java and the mountains of the Malacca Peninsula, until the Dutch expedition brought specimens from New Guinea. This material, which showed a somewhat pelorial development, was considered by J.J. Smith to represent *L. longifolia* Bl.

As may be seen from the locality records mentioned below, I have often had the opportunity of examining fresh material of the plants, and have come to the conclusion that the New Guinea plants (at all events those specimens found by me) represent two separate species. How far this applies to the specimen described by J.J. Smith, as to

whether that is also different from *L. longifolia* Bl., I cannot judge, since I have not examined his material.

L. sceptrum Schltr., described here, is a beautiful plant, exceeding the height of a man. It grows in peaty soil on the summits of mountains in the dense shade of the forest, or amongst shrubs in an exceedingly moist atmosphere, which is continuous almost throughout the year and which drops during the night down to 10°C. The inflorescences, which grow to 75 cm long, and are dense, quite straight, orange-red in colour, would well repay the trouble of cultivation in Europe. *L. minor* Schltr., although a somewhat smaller plant, is also worthy of cultivation.

1. *L. sceptrum* Schltr., sp. nov.

Terrestris, erecta, valida, usque ad 2 m alta; rhizomate abbreviato, cauliformi; radicibus flexuosis, villosis, cylindraceis; caule usque infra medium dense foliato, basi 1.5–2 cm diametiente, tereti, glabro, supra vaginis lanceolatis, acuminatis, sensim in bracteis abeuntibus obsesso, inflorescentiam versus glanduloso-puberulo; foliis 8–5, erecto-patentibus, anguste lanceolata-ligulatis, acutis vel acutissimis, basin versus paulo angustatis, usque ad 50 cm longis, medio fere usque ad 5.5 cm latis; spicis usque ad 75 cm longis, c. 4 cm diametientibus, cylindraceis, dense multifloris, elongatis; bracteis erecto-patentibus, lanceolatis, acuminatis, margine ciliolatis, inferioribus flores plus-duplo superantibus, superioribus sensim paulo brevioribus; floribus erecto-patentibus vel sub-erectis, illis *L. longifoliae* Bl. subaequimagnis; sepalo intermedio oblongo-ligulato, obtuso, extus glanduloso-puberulo, 0.8 cm longo, lateralibus oblique ovatis, apicem versus angustatis, obtusiusculis, glanduloso-puberulis, intermedio aequilongis; petalis sepalo intermedio intus agglutinatis, e basi breviter unguiculata oblique ovato-rhombeis, obtusiuscule apiculatis, dimidio exteriore sparsim papilloso-puberulis, margine anteriore dimidio superiore leviter undulatis, sepalo intermedio subaequilongis, glabris; labello e basi cucullato-globosa, intus 6-callosa sensim attenuato, antice in lobum linearem, obtusum, decurvum producto, infra medium utrinque auriculo dentiformi obtuso donato, 0.7 cm longo, supra basin (haud explanato) 0.4 cm lato; columna erecta, brevi, glabra, antice lamella duplici carnosula apice supra stigma incurvula ornato; rostello ovato-lanceolato, usque supra medium bifido; stigmatibus marginibus antice incrassatis; anthera lanceolato-cucullata acuta, alte cordata; ovario-cylindraceo, dense pilis brevibus reflexis glanduloso-puberulo, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17842, flowering in June 1908; in more open places between undergrowth in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18026, flowering in July 1908; in humus in the forests of the Finisterre Range, alt. c. 1200 m—up to 1300 m—R. Schlechter no. 18179, flowering in Sept. 1908; no. 19166, flowering in Jan. 1909.

This species is distinguished from *L. longifolia* Bl. by the non-tapering sepals, the appreciably smaller, blunter auricles on the labellum, the shorter front lobes, the much shorter and less-deeply divided rostellum and the shorter anther. The whole inflorescence, including the rachis and bracts, is of a brownish orange-red colour, but the petals are rose-red and the labellum whitish.

2. *L. minor* Schltr., sp. nov.

Terrestris, erecta, valida, 50–75 cm alta; rhizomate abbreviato, cauliforme; radicibus cylindricis, flexuosis, villosis; caule basi c. 10-foliato, tereti, glabro, supra vaginis lanceolatis, acuminatis, sensim in bracteis abeuntibus obsesso, inflorescentiam versus glanduloso-puberulo, basi 1 cm diametiente; foliis erecto-patentibus, lanceolato-ligulatis, acutissimis, basin versus subpetiolato-angustatis, utrinque glabris, 30–40 cm longis, medio fere usque ad 4 cm latis; spica erecta, stricta vel substricta, dense multiflora, cylindrica, elongata, c. 15–20 cm longa, c. 2.5 cm diametiente; bracteis erecto patentibus, lanceolatis, acutis, inferioribus flores dimidio superantibus, superioribus sensim decrescentibus; floribus erecto-patentibus, illis *L. sceptrum* Schltr. fere aequimagnis; sepalis extus glanduloso-puberulis, 0.8 cm longis, intermedio oblongo-ligulato, obtusiusculo, lateralibus oblique ovatis, apicem versus angustatis, obtusiusculis; petalis sepalis subaequilongis, intus sepalo dorsali agglutinatis, e basi subunguiculata oblique ovato-ellipticis, apiculatis, margine anteriore dimidio superiore leviter undulatis; labello e basi cucullato-concava trilobato, lobis lateralibus erectis, obtusis, triangulis, intermedio e basi triangula lanceolato, in ligulam linearem subacutam producto, labello toto glabro, sepalis subaequilongis, intus supra basin dentibus 6 ornato; columna brevi, rostello lanceolato, usque

ad medium bifido, lamella duplici apice subalato-ampliata, supra stigma incurvula; anthera lanceolato-cucullata, acuta, basi breviter cordata; ovario gracili, pilis brevibus reversis glanduloso-puberulo, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna, alt. c. 500 m—R. Schlechter no. 19930, flowering in June 1909.

This species is, certainly, related closely to *L. sceptrum* Schltr., but differs in the shape of the labellum, the longer rostellum, the tips of the lamellae of the column which, to the front, are expanded like wings, and the anther. The ovaries also are shorter and more slender. The whole plant is smaller and the flower spike is much shorter and narrower. The flowers and bracts are a pale brownish ochre, almost orange.

19. *Hylophila* Lindl.

The occurrence of this genus, only previously known from Sumatra and the Malay Peninsula, is very interesting to plant-geographers. The genus does not appear to be represented in Java or Borneo. *Dicerostylis* Bl. was united by Miquel and later by Bentham and Hooker f. with *Hylophila*, but the latter is very different and belongs to an entirely different relationship. *H. rubra* Ames, recently described from the Philippines, belongs to *Dicerostylis* and I have, therefore, transferred it to this genus.

The two *Hylophila* species endemic in New Guinea are related to each other and also to *H. mollis* Lindl., and accordingly may be regarded by some authors as varieties of that species. After the examination of a plentiful supply of living material, I have thought it desirable to treat them as separate species, since they are quite constant in their points of difference. The species grow on low hills, in mossy places, and especially on the edges of clearings, where they are not exposed to the direct rays of the sun, but have still as much light as they seem to require.

1. *H. gracilis* Schltr., sp. nov.

Terrestris, erecta, 45–60 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule stricto vel substricto, usque ad medium fere 7–10-foliato, tereti, glabro, supra vaginis paucis dissitis obsesso, inflorescentiam versus glanduloso-puberulo; foliis erectopatentibus, petiolatis, lamina oblique elliptico-lanceolata, acuta, utrinque glabra, 7–14 cm longa, medio fere 1.8–2.8 cm lata, petiolo basi valde dilatata caulem amplectente, 3–4 cm longo; spica dense multiflora, elongata, cylindrica, c. 12–16 cm longa, c. 1.2 cm diametiente; bracteis erecto-patentibus, lanceolatis, acuminatis, ovarium paulo superantibus vel aequantibus; floribus erecto-patentibus, illis *H. mollis* Lindl. paululo minoribus; sepalo intermedio circuitu ovato-lanceolato, obtusiusculo, dorso cucullato-concavo, subporrecto, c. 0.3 cm longo, sparsim glanduloso-piloso, lateralibus oblique ovatis, obtusis, sparsim glanduloso-pilosis, intermedio paululo longioribus; petalis sepalo intermedio intus agglutinatis, e basi breviter unguiculato-angustata oblique oblongis, obtusis, apicem versus margine anteriore subangulatis, dilatatis, glabris, sepalo intermedio fere aequilongis; labello porrecto, cucullato-saccato, obtusissimo, sacco antrorsum spectante, antice in lobulum triangularem, obtusum, parvulum, porrectum producto, marginibus incurvis, intus infra medium marginem versus utrinque appendicibus 2 corniformibus instructo, glabro, c. 0.3 cm longo; columna brevi, rostellum bifido, subadscedenti-porrecto, labello subaequilongo; anthera lanceolato-cucullata, acuta, basi leviter cordata; stigmatibus haud incrassatis; ovario cylindrico, glanduloso-puberulo, 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the Rin-Jemur [River], at the foot of the Torricelli Range, alt. c. 50 m—R. Schlechter no. 20005, flowering in Sept. 1909.

This species is related very closely to *H. mollis*, but the flowers are smaller, the petals are almost clawed and narrow towards the base, the clinandrium is smaller and the front lobe of the lip is considerably smaller. The flowers are green with white tips to the sepals.

2. *H. orientalis* Schltr., sp. nov.

Terrestris, erecta, 35–55 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caulo stricto, usque infra medium foliato, tereti, glabro, supra vaginulis acuminatis, dissitis

obesso, inflorescentiam versus glanduloso-puberulo; foliis erecto-patentibus, 8–10, approximatis, petiolatis, lamina oblique lanceolato-elliptica, acuta vel acuminata, utrinque glabra, 6–16 cm longa, medio fere 1.5–3 cm lata, petiolo basi valde dilatata caulem amplectente, 1.5–3 cm longo; spica dense multiflora, elongata, cylindrica, usque ad 17 cm longa, c. 1 cm diametiente; bracteis erecto-patentibus, lanceolatis, acuminatis, ovarium vulgo plus minusve superantibus, sparsim glanduloso puberulis; floribus erecto-patentibus, illis *H. gracilis* Schltr. vix minoribus; sepalis intermedio porrecto, circuito ovato, obtuso, dorso cucullato-concavo, extus glanduloso-puberulo, vix 0.3 cm longo, lateralibus intermedio paululo longioribus, oblique ovatis, obtusis, glanduloso-puberulis; petalis sepalis intermedio subaequilongis, intus margine agglutinalis, oblique oblongis, obtusis, basi vix angustatis; labello porrecto, e basi cucullato-saccata subglobosa apice marginibus incurvis in apicem lobuliformem, obtusam producto, petalis fere aequilongis, sacco vix antrorsum spectante, intus marginem versus infra medium cornubus binis utrinque ornato, columna brevi, antice bicostata, rostello porrecto, ovario distincte brevioris; stigmatibus incrassatis; anthera lanceolato-cucullata, acuta, glabra, basi subcordata; ovario cylindrato, glanduloso-puberulo, 0.5–0.6 cm longo.

Kaiser-Wilhelms-Land: In humis in the forests of [Mount] Goromia, on the Waria [River], alt. c. 300 m—R. Schlechter no. 17393, flowering in Mar. 1908; in humis in the mountain forests on the Waube [Creek], alt. c. 600 m—R. Schlechter no. 19453, flowering in May 1909.

The above locations, both situated in the Waria District, are the most easterly in which this species is so far known.

The species itself is related closely to *H. gracilis* Schltr., but, in my opinion, is better kept separate, because of the differences in the petals and the labellum, as well as in the column. The flowers are green with paler petals.

20. *Erythroides* Bl.

In my last treatment of the orchids of German New Guinea (in K. Schum. et Laut., Nachtr.) I drew attention to the necessity of separating the genus *Erythroides* Bl. from *Physurus* L.C. Rich. of the New World. At the time I described and sketched two species; now I can describe some more species which I collected during my last travels to New Guinea. Apparently, most of the species of this genus have their habitat in the mountains, but a few, e.g. *E. bicarinata* Schltr., also descend to the plains. All are found in the shady primary forests, and mostly as inhabitants of the humus soil. Only once did I find, in the Bismarck Range at heights with excessive humidity, a species growing on a tree-trunk. Unfortunately, I was unable to determine the species, since it was too far past flowering. Some species occasionally occur on rocks, when these are covered with a layer of humus.

1. *E. papuana* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 897, t. IV, A.

Kaiser-Wilhelms-Land: In humis in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 14335, flowering in Apr. 1902; in humis in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17018, flowering in Dec. 1907; on rocks, between moss, in the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 13994, flowering in Jan. 1902; in humis in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 18671, flowering in Nov. 1908; in humis in the forests of the Finisterre Range, alt. c. 1100–1200 m—R. Schlechter no. 18020, flowering in July 1908; no. 19174, flowering in Jan. 1909.

The better material which I now possess of this species shows that it is distinguished, especially from the other Papuan [Papuasian] species, by the bipartite spur, which is lightly curved towards the apex. Of all the species of the Territory this is the most common and has a wider distribution than any of the other species.

2. *E. torricellensis* Schltr., sp. nov.

Terrestris, erecta, 25–30 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule quarta vel tertia parte basilari foliato, tereti, glabro, supra vaginulis paucis, dissitis,

acuminatis obsesso, inflorescentiam versus glanduloso-puberulo; foliis c. 5. erecto-patentibus, petiolatis, oblique lanceolato-ellipticis, acuminatis vel acutis, glabris, lamina 5–6.5 cm longa, infra medium 1.7–2.4 cm lata, petiolo basi dilatata caulem amplexante, 2–2.5 cm longo; spica subdense 8–12-flora, subsecunda, usque ad 9 cm longa; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario fere aequilongis; floribus illis *E. Blumei* (Ldl.) Schltr. fere aequimagnis, erecto-patentibus vel suberectis; sepalis oblongo-lanceolatis, obtusiusculis, extus sparsim glanduloso-puberulis, 0.6 cm longis, lateralibus obliquis, extus minute apiculatis; petalis sepalo intermedio intus margine agglutinatis, e basi unguiculata oblique oblanceolato-spathulatis, obtusis, glabris, margine exteriori apicem versus subdenticulato-irregularibus, sepalo intermedio paululo brevioribus; labello petalis aequilongo, oblongo-cucullato, antice in lobum suborbicularem, obtusum dilatato, calcare, vel potius sacco, breviter bifido, brevi; columna brevi, glabra, gracili; anthera lanceolato-cucullata, valde acuta; ovario cylindraceo, glanduloso-puberulo, 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20053, flowering in Sept. 1909.

This species has smaller flowers and leaves than *E. papuana* Schltr. but is larger than the following species. The flowers are occasionally slightly flushed with red.

3. *E. forcipata* Schltr., sp. nov.

Terrestris, erecta, 20–28 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule tertia vel quarta parte basi foliato, tereti, glabro, supra vaginis paucis, dissitis, lanceolatis, acuminatis obsesso, inflorescentiam versus glanduloso-puberulo; foliis c. 6–7, erecto-patentibus, petiolatis, lamina oblique lanceolato-elliptica, acuta vel subacuminata, glabra, 3.5–6 cm longa, medio fere 1.3–2.7 cm lata; spica dense 10–15-flora, subsecunda, usque ad 6 cm longa; bracteis lanceolatis, acuminatis, ovarium vulgo superantibus; floribus in genere inter minores, erecto-patentibus erectisve; sepalis ligulatis, obtusis, extus sparsim glanduloso-puberulis, vix 4.5 mm longis, lateralibus obliquis, intermedio basin versus paulo latioribus; petalis e basi subunguiculata oblique rhombeo-oblanceolatis, obtusis, sepalo intermedio subaequilongis, intus margine agglutinatis; labello anguste oblongo-cucullato, antice in lobum perlate ovatum vel suborbicularem, obtusum dilatato, glabro, petalis aequilongo, sacco usque supra medium bifido, forcipato, 2.5 mm longo; columna brevi, facie medio subincrassata, rostello amplo; anthera lanceolato-cucullata, basi cordata; ovario cylindraceo, glanduloso-puberulo, vix. 0.6 cm longo.

Kaiser-Wilhelms-Land: In the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20339, flowering in Sept. 1909.

The species is smaller in all its parts than in those enumerated above. It is characterised excellently by the deeply bipartite sac of the labellum. The flowers are brownish with a white front lobe to the lip.

4. *E. glaucescens* Schltr., sp. nov.

Terrestris, erecta, pusilla, c. 20 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule usque ad medium foliato, tereti, glabro, supra vaginulis paucis, dissitis, bracteiformibus obsesso, inflorescentiam versus glanduloso-puberulo; foliis erecto-patentibus patentibusve, petiolatis, lamina oblique lanceolata vel elliptico-lanceolata, acuta, glabra, 2.5–5 cm longa, infra medium 1–1.7 cm lata, petiolo basi dilatata caulem amplexante, 1–1.5 cm longo; spica subdense 6–10-flora, secunda, erecta, usque ad 6 cm longa; bracteis erecto-patentibus, lanceolatis, acuminatis, ovarium vix superantibus; floribus in genere inter minores, erecto-patentibus; sepalis oblongis, obtusis, extus sparsim glanduloso-puberulis, 4.5 mm longis, lateralibus obliquis, basi paulo dilatatis; petalis sepalo intermedio intus margini agglutinatis, subaequilongis, e basi unguiculata oblique ovato-rhombis, subacutis, glabris; labello oblongo-cucullato, antice in lobum reniformem, obtusum, paulo latiore dilatato, glabro, sacco subquadrato, tertia parte bifido, 2.5 mm longo; columna brevi antice medio incrassata, rostello amplo; anthera lanceolato-cucullata, valde acuta; ovario cylindraceo, glanduloso-puberulo, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17177, flowering in Jan. 1908; in humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18016, flowering in July 1908; no. 19084, flowering in Jan. 1909.

The bluish grey colour of the leaves has induced me to give the above name to the species. The colour of the leaves is similar to *E. bicarinata* Schltr., a species of the forests

of the plains, which has a differently-formed column and broader anther. The flowers are whitish flushed with reddish brown.

5. *E. bicarinata* Schltr., sp. nov.

Terrestris, erecta, pusilla, 20–25 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule stricto, usque ad medium fere foliato, tereti, glabro, supra vaginulis paucis, bractei-formibus, dissitis obsesso, inflorescentiam versus glanduloso-puberulo; foliis vulgo patentibus, petiolatis, lamina oblique lanceolata vel elliptico-lanceolata, acuta, glabra, 4–5.5 cm longa, infra medium 1.3–1.5 cm lata, petiolo 1–1.5 cm longo, basi dilatata caulem amplectente; spica erecta, subdense 5–7-flora, usque ad 5 cm longa; bracteis erectis, lanceolatis, acuminatis, ovarium paulo superantibus; floribus in genere inter minores, suberectis; sepalis oblongo-ligulatis, obtusis, extus sparsim glanduloso-pilosis, 4.5 mm longis, lateralibus obliquis, basi paulo dilatatis; petalis oblique rhombeo-oblancoelatis, obtusis, glabris, sepalo intermedio paulo brevioribus, intus margini agglutinatis; labello oblongo-cucullato, antice in laminam subreniformem, obtusam, distincte latiore dilato, petalis aequilongo, sacco subquadrato, usque ad medium fere bifido, 0.2 cm longo; columna brevi, facie infra stigma carina vel lamella duplici ornata, glabra, rostello amplo; anthera ovato-oblonga, cucullata, acuminata; ovario cylindraco, glanduloso-puberulo, 0.6 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the Garup [River], alt. c. 50 m—R. Schlechter no. 20012, flowering in Sept. 1909.

As already mentioned, this species resembles *E. glaucescens* Schltr., but differs in the shape of the petals, in the broader front lobe of the labellum, the column provided in the front with two wing-like ridges, and the shorter and broader anther. The flowers are reddish brown or green, the labellum and petals white. As in *E. glaucescens* Schltr., the leaves are of a bluish grey colour. This colouring occurs also in some *Zeuxine* species.

6. *E. purpurascens* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 88, t. IV. B.

Kaiser-Wilhelms-Land: In humus in the forests near the village of Paub, alt. c. 40 m—R. Schlechter no. 14616, fruiting in May 1902 [Ed.—probably Apr.—no collections recorded for May 1902].

This small-flowered species characterised by its reddish tinged leaves, I have never found again. The front lobe of the lip is smaller than in any other species.

7. *E. praemorsa* Schltr., sp. nov.

Terrestris, erecta, 30–35 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule stricto vel substricto, usque infra medium foliato, tereti, glabro, supra vaginis paucis, distantibus, bractei-formibus, acuminatis obsesso; foliis erecto-patentibus, petiolatis, lamina oblique ovato-lanceolata, acuta vel acuminata, utrinque glabra, 4.7–7.5 cm longa, infra medium 1.8–3 cm lata, petiolo basi dilatata caulem amplectente, 2–3 cm longo; spica dense 15–20-flora, erecta, subsecunda, usque ad 9 cm longa; bracteis erectis lanceolatis, acuminatis, ovario paulo brevioribus; floribus illis *E. Blumei* (Lindl.) Schltr. fere aequimagnis, suberectis; sepalis oblongis, obtusis, 0.6 cm longis, extus sparsim glanduloso-puberulis, lateralibus basin versus paulo dilatatis; petalis e basi unguiculata oblique rhombeo-oblancoelatis, obtusis, glabris, sepalo intermedio aequilongo margine agglutinatis; labello oblongo-cucullato, antice in lobum aequilatum, apice truncato-praemorsum, acute angulatum terminato, sacco circuitu quadrato, usque supra medium bipartito, 2.5 mm longo, columna brevi, glabra, facie carina bicruri ornata, rostello erecto, amplo; anthera ovato-cordata, rostrato-acuminata, cucullata; ovario cylindraco, glanduloso-puberulo, 0.9 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20023, flowering in Sept. 1909.

The species is unique in the shape of the front lobe of the labellum, which is abruptly truncate, as though it had been eaten off, and forms two sharp edges. The sepals are brown with white margins, the petals and labellum paler, the latter with the lamina white in front.

21. *Eurycentrum* Schltr.

When I established this genus in 1905, I was able to describe two species. Since then our knowledge of the flora of New Guinea has been extended considerably, so that it is

now possible to discuss five different species. These include the two species previously described, as well as the two new species dealt with here. The fifth species is *E. Smithianum* Schltr. (in 'Engl. Bot. Jahrb.' XLV, p. 393) a plant which has been illustrated by J.J. Smith as *E. obscurum* (Bl.) Schltr. from which, however, it is specifically different. I have seen a species, quite similar to that sketched by J.J. Smith, in the mountains near the Waria [River], but have, unfortunately, lost the specimen. J.J. Smith has written to say that, in case his plant is different from mine, my *E. obscurum* will have to be re-named. But there is not the least occasion for this, for of *Cystorchis obscura* Bl., with which at that time I identified my plant, only one illustration is known and, with this, my *E. obscurum* agrees so perfectly, that at present there is no reason to suppose that Blume's illustration could represent another species. Besides, *E. obscurum* (Bl.) Schltr. is, evidently, a species widely distributed in New Guinea and was probably in evidence when the Type of Blume's *Cystorchis obscura* was established. It is impossible to re-name a plant without sufficient reason, just because it was the only *Eurycentrum* species illustrated by J.J. Smith from Dutch New Guinea, which botanically at the time was almost unexplored.

The *Eurycentrum* species are typical shade plants of the primary forests of New Guinea and all are found only in humus soil. *E. obscurum* (Bl.) Schltr. is distributed very widely in the Territory and is to be found at altitudes of from 300 up to 1000 metres and over, on hills and mountains. The mist-forest zone apparently agrees with them equally as well as the drier lower forests. This species seems to grow, by preference, at the base of old, large trees where the layer of humus is deepest; the two other species are found only in the mountains. In habit, all three species are strikingly similar, although they display considerable differences in their floral characters. All have dark greenish brown leaves, reddish below. Occasionally, paler spots appear on the upper side with *E. obscurum* (Bl.) Schltr. but the flowers of these plants are otherwise identical with the other form.

1. *E. salomonense* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 90, t. V.B.

Solomon Islands: Without location details—Guppy no. G. 78 [Ed.—no date cited].

I introduce this species here, although it is uncertain whether this species comes from German or British Territory, probably from the latter.

2. *E. obscurum* (Bl.) Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 89, t. V.A.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20255, flowering in Sept. 1909; in humus in the forests on the upper Djamu [River], alt. c. 350 m—R. Schlechter no. 16621, flowering in Oct. 1907; in humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17980, flowering in July 1908.

As mentioned above, I consider this species quite different from the one illustrated under this name by J.J. Smith, provided of course that the illustration is accurate. I have sketched this plant again from living material and can only state that, apart from individual differences, my examination on this occasion corresponds with the first one. Blume's sketch of *Cystorchis obscura* also agrees very well, as far as species characters can be distinguished in it. I have, also in my copious series, specimens which have a pointed spur and others where it is quite blunt.

3. *E. monticola* Schltr., sp. nov.

Terrestre, gracile, erectum, 12–23 cm altum; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule basi foliato, tereti, glabro, caeterum vaginis paucis, distantibus, bracteiformibus obsesso, glanduloso-puberulo; foliis subrosulatis, patentibus, breviter petiolatis, ovatis vel ovato-ellipticis, acutis, utrinque glabris, 1.8–3.5 cm longis, medio vel infra medium 1.2–2 cm latis;

petiolo basi dilatata caulem vaginante, 0.6–1 cm longo; spica laxa 5–8-flora, secunda, usque ad 7 cm longa; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario vulgo aequilongis; floribus mediocribus in tribu, erecto-patentibus; sepalo intermedio elliptico, apicem versus angustato, obtuso, dimidio inferiore sparsim pilis reversis puberulo, 0.6 cm longo, lateralibus oblique oblongo-ligulatis, obtusiusculis, basi dilatata decurrentibus, sepalo intermedio sequilongis, pilis sparsis, reversis dimidio inferiore puberulis; petalis lanceolato-ligulatis, falcatis, obtusis, glabris, sepalo intermedio subaequilongis, et margini intus agglutinatis; labello e basi ovato-saccata oblongo-cucullato, antice in lobum transverse oblongum, apiculatum expanso, sepala paulo superante, intus callis 2, globosis, brevissime stipitatis ornato, lobo apicali 0.2 cm longo, 0.4 cm lato, sacco obtuso, vix 0.4 cm longo; columna brevi, marginibus stigmatis alato-ampliatis, basi in lobos 2 obtusos productis; anthera suborbiculari-cucullata, dorso gibbo magno donata; polliniis oblique clavatis, brevibus, glandula ampla, rotundata; ovario pilis reversis puberulo, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18555, flowering in Oct. 1908.

This species, and *E. fragrans* Schltr., are distinguished from the other species of the genus by the large front lobe of the lip. Both are related closely, but their floral characteristics are well separated. The flowers are reddish brown on the outside, the petals and labellum pure white and, while the flowers of *E. fragrans* Schltr. are very perfumed, those of *E. monticola* Schltr. are devoid of smell.

4. *E. fragrans* Schltr., sp. nov.

Terrestre, erectum, gracile, 20–25 cm altum; rhizomate cauliforme, decumbente; radicibus elongatis, flexuosis, villosis; caule basi foliato, (interdum usque ad quartam partem), tereti, glabro, caeterum vaginulis paucis, distantibus, bracteiformibus obsesso, inflorescentiam versus glanduloso-puberulo; foliis nunc approximatis, nunc plus minusve distantibus, 4–6, patentibus, petiolatis, lamina ovata, acuta vel subacuta, utrinque glabra, 2–3 cm longa, infra medium 1.2–1.7 cm lata, petiolo basi dilatata caulem amplexante, c. 1 cm longo; spica laxa 4–7-flora, usque ad 7 cm longa, secunda; bracteis lanceolatis, acuminatis, nunc ovario aequilongis, nunc paulo brevioribus; floribus erecto-patentibus, illis *E. monticola* Schltr. similibus et fere aequimagnis; sepalo intermedio lanceolato-elliptico, obtuso, dimidio inferiore sparsim pilis reversis puberulo, 0.7 cm longo, lateralibus obliquis, lanceolatis, obtusiusculis, basi dilatata decurrentibus, intermedio aequilongis, dimidio inferiore pilis sparsis, reversis puberulis; petalis oblique elliptico-ligulatis, apiculatis, basi distincte angustatis, haud falcatis, sepalo intermedio subaequilongis, margine agglutinatis; labello e basi subovoideo-saccata marginibus incurvis, incrassatis, oblongo-cucullato, antice in lobum transverse oblongum, leviter emarginatum, minute apiculatum expanso, petalis fere aequilongum, lobo apicali 3.5 cm lato, 1.5 mm longo, sacco subacuto, intus callis 2 globosis, verruculosus, sessilibus ornato, 0.5 cm longo; columna brevi, marginibus stigmatis basi in lobos 2 decurvos, aliformes productis; anthera subquadrato-cucullata, callo reniformi, amplo in dorso; polliniis oblique clavatis, glandula ampla, margine superiore trilobulata; ovario cylindraceo, pilis reversis puberulo, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18759, flowering in Nov. 1908.

A graceful species which is distinguished by the agreeable perfume of its flowers. The leaves are dark velvet brown with a fine whitish margin; the flowers white, and the sepals with a brownish flush. Although closely related to *E. monticola* Schltr., the species shows differences in its flowers which distinguish it well from the latter. The differences are found in the petals, the lip and not least in the column, anther and pollinia.

22. *Cystorchis* Bl.

Since the Chinese *Cystorchis nebulorum* Hance has been declared by R.A. Rolfe to be a *Goodyera*, and the Javanese plants have also proved to be forms of a species, only two species of this genus are known with certainty. From New Guinea I can now add three species, but one of these is a rather doubtful member. In addition I have two further new species, one from the Celebes and the other from Sumatra, both of which are distinguished from the other *Cystorchis* species by the narrow labellum, which ends in front in a distinctly raised plate. Of these two, *C. celebica* Schltr. has a short

rostellum, while the Sumatran species *C. stenoglossa* Schltr. has a fairly long one. Both of these species will be described soon in more detail. Including all these additions, the genus, up to the present, contains seven species, the distribution area of which extends from the hinterland of India and Sumatra across Borneo and the Celebes to New Guinea.

Although I had the opportunity of collecting the four western species in their native habitat, I do not propose to discuss here the conditions under which they occur, but shall confine my remarks to the three species from New Guinea.

The two species, *C. dentifera* Schltr. and *C. orphnophylla* Schltr., which are related to *C. variegata* Bl., I found in dense undergrowth in the mountain forests and so covered by *Selaginella* and ferns, that my attention was attracted only by their comparatively pale-coloured flowers. Both species grow in a region where they are subjected to heavy downpours of rain and cold mists throughout the year. *C. peliocaulos* Schltr. I found growing, on the other hand, as a saprophyte on fairly steep, at times very dry, hills in the open forests of the Waria District.

1. *C. dentifera* Schltr., sp. nov.

Terrestris, erecta, 20–30 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule basi foliato, caeterum vaginulis 2–3, dissitis, alte amplexantibus, acuminatis obsesso, glanduloso-puberulo; foliis 4–6, rosulato-approximatis, erecto-patentibus, petiolatis, lamina ovata vel late oblonga, obtusa vel obtusiuscula, 3.5–6.5 cm longa, medio vel infra 2–4 cm lata, petiolo basi dilatata caulem vaginante, 1–2 cm longo; spica dense 6–12-flora, usque ad 3.5 cm longa; bracteis erecto-patentibus, lanceolatis, acuminatis, puberulis, ovarium vulgo subduplo superantibus; floribus erecto-patentibus, illis *C. variegatae* Bl. similibus; sepalis extus glanduloso-puberulis, 0.6 cm longis, intermedio lanceolato-oblongo, obtuso, lateralibus oblique oblongis, obtusis, basi margine anteriore in lobum suborbicularem, concavum dilatatis; petalis sepalo intermedio subaequilongis, margini intus agglutinatis, anguste oblongo-ligulatis, obtusis, falcatis, apicem versus margine posteriore semirhombeo-dilatatis, dimidio superiore utrinque et margine papillis parvulis obtectis; labello e basi globosa, bivesicata, contracta trilobo, lobis lateralibus minutis, lineari-dentiformibus, acutis, intermedio marginibus incurvis ligulato-cucullato, extus superne papilloso, antice in lobulum apiculiformem, obtusum, concavum exeunte, sepalis fere aequilongo, versicis subtus oblongoideis, glabris, intus latere callo rotundato ornatis, calcare parvulo, cylindrico, obtuso, glabro, vesicis subduplo brevioribus; columna brevi, marginibus stigmatibus hyalinis, incurvulis, rostello brevi, exciso; anthera suborbiculari-cucullata, cuspidata, basi subcordata, umbone transverso, semilunato ornata; pollinibus oblique clavatis, stipite bipartito, oblanceolato, glandula oblonga, parvula; ovario cylindraceo, glanduloso-puberulo, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humis in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17358, flowering in Feb. 1908.

Closely related to *C. variegata* Bl., but easily recognised by the presence of the small tooth-shaped lateral lobes of the labellum, by larger vesicles, as well as other characters. The leaves are uniformly dark purple-brown, the flowers white, with sepals brownish in the middle and the lip yellow at the tip.

2. *C. orphnophylla* Schltr., sp. nov.

Terrestris, erecta, c. 25 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule basi foliato, caeterum vaginulis appressis, paucis, distantibus obsesso, tereti, glanduloso-puberulo; foliis patentibus, subrosulato-approximatis, petiolatis, lamina ovata, acuta vel subacuta, utrinque glabra, 2.3–4 cm longa, infra medium 1.7–2 cm lata, petiolo basi dilatata caulem vaginante, 0.7–1 cm longo; spica subdense pauciflora (in specimine typico triflora); bracteis lanceolatis, acuminatis, ovario aequilongis, puberulis; floribus illis *C. variegatae* Bl. similibus, erecto-patentibus; sepalis sparsim glanduloso-puberulis, obtusis, intermedio lanceolato-ligulato, 0.6 cm longo, lateralibus oblique oblongis, 0.7 cm longis, basi margine anteriore in lobum suborbicularem, concavum dilatatis; petalis falcato-ligulatis, obtusis, dimidio superiore antice minute papilloso et margine anteriore papilloso ciliatis; labello e basi subreniformi-globosa, bivesicata contracto, in laminam marginibus incurvis oblanceolatam, apicem versus distincte dilatatam, apice rotundatam producto, apice ipsa in lobulum minutum, apiculiformem, concavum exeunte, sepalis fere aequilongo, medio extus superne minute verruculoso, vesicis subtus obovoideis, intus callo rotundato ornatis, calcare oblique conico,

obtusum, lateraliter paulo compresso, glabro, vesicis fere aequilongo; columna brevi, stigmate basi anguste hyalino-marginata, rostello brevi; anthera circuitu ovata, cucullata, alticordata, acuminata, umbone transverso, semilunato donata; pollinibus oblique clavatis, glandula majore, oblonga; ovario cylindraceo, glanduloso-puberulo, 0.7 cm longo.

Kaiser-Wilhelms-Land: In humis in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20182, flowering in Sept. 1909.

Undoubtedly, very closely related to *C. dentifera* Schltr., but differs so much in its various floral characteristics that I do not hesitate to regard it as a distinct species, even though I have found only a solitary specimen. The leaves, likewise, are dark reddish brown, and the flowers are coloured like those of *C. dentifera* Schltr.

3. *C. peliocaulos* Schltr., sp. nov.

Saprophytica erecta, pusilla, c. 8–13 cm alta; rhizomate abbreviato, decumbente, cauliformi; radicibus valde abbreviatis, villosulis; caule stricto vel substricto, tereti, glabro, aphylo, vaginis pluribus (usque ad 6) plus minusve distantibus, amplexantibus, acutis vel subacutis obsesso; spica erecta, dense 4–8-flora, usque ad 3 cm longa; bracteis ovatis, acuminatis, glabris, erectis, ovarium vulgo paulo superantibus; floribus in genere parvis, erectis vel suberectis; sepalis lanceolatis, obtusis, glabris, 0.5 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata decurrentibus; petalis oblique lanceolato-ligulatis, obtusiusculis, glabris, margine irregularibus, sepalo fere aequilongo, intus margine agglutinatis; labello circuitu lanceolato, obtuso, e basi ampliata, concava marginibus incurvis medio lobulo parvulo, rotundato auctis, antice conniventibus, leviter undulatis, petalis aequilongo; columna brevi, rostello brevi, apice breviter exciso; anthera late ovato-cucullata, acuta, brevi, dorso umbone magno donata; ovario cylindraceo, glabro, 0.6 cm longo.

Kaiser-Wilhelms-Land: In humis at the borders of the hill-forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 17271 [Ed.— number possibly 19271], flowering in Apr. 1909.

I have included this plant in the genus despite its different labellum, since the colour of the flowers, the short column, the anther and the pollinia all seem to belong here, rather than to any other genus. Evidently, we are dealing with one of the simple forms saprophytism often produces. In habit this plant is strongly reminiscent of *C. aphylla* Ridl. The stem and the sheaths, as well as the bracts, are a pallid yellowish white, the flowers pale brownish with white tips.

23. *Cystopus* Bl.

Lately, owing to the better exploration of the Papuan-Pacific Archipelago, the number of species of this small genus has been enlarged considerably, and their character is now, therefore, better recognised. It would appear, accordingly, that the largest number of species is to be expected from the Papuan-Pacific region, whereas previously the genus was considered to be predominantly Javanese. From German New Guinea I can now record four species, three of which are new, the fourth has been described only lately from Dutch New Guinea. No other species are, as yet, known from this giant island, but are to be expected with certainty. It would appear that all species enumerated here only occur fairly high up in the mountains, I have not found any below the 1000 m level, which indicates that they all require high humidity. I have observed them inhabiting only the humus soil in very shady parts of the primary forest, but J.J. Smith mentions, regarding his *C. fimbriatus*, that a plant was found by Dr. Versteeg growing on a tree about half a metre above the ground.

1. *C. coerulescens* Schltr., sp. nov.

Terrestris, pusillus, 5–10 cm altus; rhizomate longe decumbente, cauliformi; radicibus brevibus, villosulis; caule tereti, glabro, alte foliato; foliis 4–6, patentibus, petiolatis, lamina ovata vel ovato-lanceolata, acuta vel breviter acuminata, utrinque glabra, 1.5–3 cm longa, infra medium 0.9–1.5 cm lata, petiolo basi dilatata caulem vaginante, 0.7–1 cm longo; inflorescentia brevi, erecta, 2–4-flora,

bracteis, lanceolatis, acuminatis, glabris, ovarium vulgo excedentibus; floribus erecto-patentibus, in genere mediocribus, coerulescentibus; sepalis porrectis oblongo-ligulatis, obtusis, glabris, tertia parte basilaris connatis, c. 1.3 cm longis, lateralibus obliquis, basi margine anteriore lobato-dilatata in saccum brevem obtusum connatis; petalis oblique lineari-ligulatis, obtusis, glabris, sepalis subaequilongis; labello e basi ovato-cucullata marginibus incurvis in unguem linearem, apice margine undulatum producto, antice in lobum ellipticum ungui paulo tantum latiore expanso, c. 1.5 cm longo, basi 0.4 cm lato, lobo apicali 0.3 cm lato, 4.5 mm longo; columna brevi, antice bialata, glabra, rostello lanceolato, bifido; anthera lanceolata, acuta; ovario cylindraceo, 0.8 cm longo, glabro.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18191, flowering in Sept. 1908.

In this species the colour of the flowers is conspicuous; it is bluish white, thus quite uncommon in the division *Polychondreae*. The species is characterised well by the almost entirely margined claw of the lip, the leaves are dark green with a pale green central band.

2. *C. fimbriatus* J.J. Sm., in Bull. Agr. Dep. Ind. Néerl., X, p.3.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17482, flowering in March 1908; in humus in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18563, flowering in Oct. 1908; in humus in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19067, flowering in Jan. 1909.

In general my drawings agree with those of J.J. Smith; the lamina of the lip, however, is a little more truncate and the teeth on the claw are not directed backwards, but stand erect. In size, specimens of this species vary considerably. The flowers are white.

3. *C. pectiniferus* Schltr., sp. nov.

Terrestris, adscendens, pusillus, c. 7 cm altus; rhizomate decumbente, cauliformi; radicibus brevibus, flexuosis, puberulis; caule tereti, glabro, usque ad basin inflorescentiae foliato; foliis erecto-patentibus, c. 4, petiolatis, ovato-lanceolatis, acutis vel acuminatis, glabris, lamina 2.8–3.2 cm longa, infra medium 1–1.3 cm lata, petiolo basi dilatata caulem amplexente, 0.7–1 cm longo; inflorescentia abbreviata, pauciflora; bracteis lanceolatis, acuminatis, margine ciliato-fissis, ovario fere aequilongis; floribus in genere inter majores, albidis, suberectis; sepalis porrectis, lanceolatis, acutis, quarta parte basilaris connatis, sparsim pilis reversis puberulis, 1.7 cm longis, lateralibus obliquis, basi lobato-dilatata in saccum brevem obtusum connatis; petalis oblique lineari-ligulatis, acutis, glabris, tertia parte basilaris tubo sepalorum adnatis, c. 1.5 cm longis; labello e basi ovato-cucullata, intus bisquamata, marginibus incurvis in unguem linearem, margine dense pectinatum producto antice in lobum rotundatum, acuminatum expanso, glabro, 2 cm longo, sacco 0.5 cm longo, supra basin 0.3 cm lato, ungue 0.9 cm longo, medio 0.4 cm lato, lamina apicali 0.6 cm longa, medio 0.5 cm lata; columna brevi, facie bialata, rostello lanceolato-elongato, breviter bifido; anthera basi ovato-cucullata, cordata, elongato-rostrata; ovario cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20199, flowering in Sept. 1909.

This species is related closely to *C. fimbriatus* J.J. Sm., but easily recognised by the smaller flowers, which are hairy on the outside near the base, and the broader, comb-like, split claw and broader lamina.

The leaves are dark green, the flowers white. Unfortunately, I found only a single specimen of this species in flower.

4. *C. puberulus* Schltr., sp. nov.

Terrestris, pusilla, c. 5 cm alta; rhizomate longe decumbente, cauliformi; radicibus brevibus, flexuosis, puberulis; caule adscendente, tereti, glabro, apicem versus puberulo, usque infra inflorescentiam foliato; foliis patentibus, petiolatis, lamina ovato-lanceolata, acuta, utrinque glabra, 1.5–1.7 cm longa, infra medium 0.7–0.8 cm lata, petiolo basi dilatata caulem amplexente, 0.7–1 cm longo; floribus in genere mediocribus, erecto-patentibus, 2–3, virescenti-albidis; sepalis porrectis, oblongis, obtusis, extus sparsim puberulis, basi tertia parte connatis, intermedio apicem versus paulo angustato, 0.9 cm longo,

lateralibus obliquis, paulo longioribus, basi margine anteriore lobato-dilatata in saccum brevem, obtusum connatis; petalis sepalo intermedio fere aequilongis et intus margini agglutinatis, oblique ligulatis, obtusis, margine anteriore medio paulo dilatatis, glabris; labello e basi suborbiculari-cucullata, intus bisquamata, marginibus inflexis in unguem margine pectinatum producto, antice in lobum transverse oblongum, apiculatum expanso, 1.3 cm longo, ungue 0.7 cm longo, infra medium 0.3 cm lato, lamina apicali 2.5 mm longa, medio 0.6 cm lata; columna brevi, glabra, facie alis 2 leviter crenulatis ornata rostello lanceolato, amplo, apice bifido; anthera e basi ovato-cucullata, cordata rostrato, acuminato; ovario cylindraceo, puberulo, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18760, flowering in Nov. 1908.

A compact species which is distinguished from others in the Territory by the sepals covered with hair almost to the tips, and by the broad lamina of the labellum. The leaves are very dark green with a fine, pale margin. The flowers are whitish green with a white labellum.

24. *Macodes* Bl.

This genus has been known for a long time in orchid collections in Europe, where different species have been cultivated on account of their beautiful, coloured leaves. These species are, usually, called *Anoectochilus*, although the two genera are absolutely different in the structure of their flowers. The species most commonly found are *M. petola* Bl., *M. Sanderiana* Rolfe and *M. Rollinsoni* Schltr., (*Anoectochilus Rollinsoni* Hort.). Besides these, several varieties are cultivated under common names, nearly all belonging to one or other of the above species.

I have recorded four species from German New Guinea, three of which proved to be new and are unlikely to be found in cultivation in Europe. It would be worthwhile, especially for the sake of *M. pulcherrima* Schltr., to despatch a special expedition with instructions to bring live material to Europe, for among the 'leaf-orchids', this species undoubtedly surpasses all others with which we are acquainted.

The species of the Territory grow under very different conditions. *M. Sanderiana* Rolfe is the most common; it is encountered at low altitudes, growing, by preference, on humus-covered rocks or in rock-crevices along the banks of creeks in the valleys of the hills and mountains, but also may be found in similar localities up to altitudes of 800 to 900 metres. It mostly grows in the more shady places, although I have seen specimens thriving well on the banks of creeks on rocks in the open sunlight and showing intensely coloured leaves.

M. pulcherrima Schltr. occurs on the ridges of high mountains subjected daily to cold mists, where it may be found on fairly steep, chalky precipices, hidden in the shrubbery. The two other species, *M. obscura* Schltr. and *M. dendrophila* Schltr., I have seen only as epiphytes in the forks or branch-holes of old primary mist-forest trees. I have found the latter, in particular, always at such windy locations. Its thick, fleshy roots penetrate so securely into cracks of the bark that an undamaged specimen can be detached only with difficulty. It may be of interest to mention here that in the northern Celebes under similar conditions I found a species which was, evidently, related closely. Unfortunately, I was unable to collect flowering specimens, so that it was impossible to determine the species.

1. *M. Sanderiana* (Krzl.) Rolfe, in Kew Bull., 1896, p. 47. *Anoectochilus Sanderianus* Krzl., in Gardn. Chron. XVIII, (1895), p. 484.

Dossinia marmorata Krzl., in K. Schum. et Laut., Fl. Deutsch. Schutzg. Süds., [1905] p. 241 (nec Moor).

Anoectochilus spec. ex. aff. *A. Roxburghii* et *A. Sanderiani* Krzl. in K. Schum. et Laut., l.c., p. 240.

Kaiser-Wilhelms-Land: In humus on rocks on the Djamu [River], alt. c. 350 m—R. Schlechter no. 16819, flowering in Nov. 1907; between broken rocks in the forests of the Finisterre Range, above Meireka, alt. c. 500 m—R. Schlechter no. 17941, flowering in July 1908; in humus on rocks in the forests on the Govidjoa [Creek], alt. c. 800 m—R. Schlechter no. 19819, flowering in June 1909.

This species is related very closely to *M. petola* Bl. My specimens agree perfectly with cultivated material that I received as *Anoectochilus Sanderianus* Krztl., but, of course, the species has nothing in common with *Anoectochilus*. The specimens which were collected on the Sattelberg by Hellwig under no. 600a, and which were named *Dossinia marmorata* Moor, by Kränzlin, also those designated by him as *Anoectochilus* sp. ex aff. *Roxburghii* and *Sanderiani*, and which Lauterbach collected under no. 2153 from the Oertzen Range in May 1896, undoubtedly belong here.

2. *M. pulcherrima* Schltr., sp. nov.

Terrestris, erecta, gracilis, 35–45 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule basi foliato, caeterum vaginis paucis, appressis, distantibus, bracteiformibus obresso, tereti, glanduloso-puberulo; foliis erecto-patentibus, 2–4, subrosulato-approximatis, petiolatis, lamina late elliptico-ovata, acuta vel subacuminata, glabra, 3.5–6.5 cm longa, infra medium 2.3–4 cm lata, petiolo basi dilatata caulem vaginante, 1.5–2.5 cm longo; spica cylindracea, subaxe 10–20-flora, erecta; usque ad 12 cm longa; bracteis lanceolatis, acuminatis, glanduloso-puberulis, ovario vulgo duplo fere brevioribus; floribus erecto-patentibus, illis *M. petola* Bl. fere aequimagnis, inversis; sepalis ovatis, obtusis, extus glanduloso-puberulis, 0.5 cm longis, lateralibus paulo obliquis; petalis subfalcato-linearibus, obtusis, margine anteriore dimidio inferiore leviter dilatatis, glabris, sepalo intermedio margini agglutinatis et fere aequilongis; labello e basi oblique obovato-cucullata, intus bicallosa trilobo, lobis lateralibus rotundatis, subcucullatis, inaequilongis, intermedio oblongo-spathulato, obtuso, plus duplo longiore, labello toto 0.5 cm longo, lobo intermedio 0.2 cm longo; columna glabra, leviter torta, infra stigma alis 2, brevibus, truncatis ornato; anthera oblique lanceolato-cucullata, subrostrata; ovario cylindraceo, glanduloso-puberulo, 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus under bushes [and] on trees of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18254, flowering in Sept. 1908.

This is the most magnificent leaf-orchid which I have ever encountered. The leaves are velvet-like, dark green-brown, with a striking, much-branched, rose-red design. The flowers are brown with a white labellum and column. The species differs from the previous one in the design on the leaves, the more slender peduncles and the differently formed petals and column.

3. *M. obscura* Schltr., sp. nov.

Epiphytica, erecta, 25–45 cm alta, validiuscula; rhizomate abbreviato, cauliformi; radicibus crassis, cylindraceis, flexuosis, villosis; caule basi foliato, caeterum vaginulis paucis, distantibus, appressis donato, tereti, glanduloso-puberulo; foliis 3–5, subrosulato-approximatis, erecto-patentibus, petiolatis, lamina late elliptica vel elliptico-ovata, acuta cum apiculo minuto, utrinque glabra, 5–7.5 cm longa, medio fere vel infra medium 2.8–4 cm lata, petiolo basi dilatata vaginante, 1.5–2.5 cm longo, spica dense multiflora, cylindrica, usque ad 19 cm longa, c. 3 cm diametiente; bracteis ovato-lanceolatis, acuminatis, ovario plus duplo brevioribus, glanduloso-puberulis; floribus erecto-patentibus, illis *M. petola* Bl. paulo majoribus; sepalis late ovatis, obtusis, glanduloso-puberulis, 0.8 cm longis, lateralibus obliquis; petalis sepalo intermedio subaequilongis et margini intus agglutinatis, subfalcatis, lineari-ligulatis, obtusis, supra basin margine anteriore paululo dilatatis, glabris, labello e basi circuito oblongo-quadrata, cucullata, intus bisquamata antice trilobato, lobis lateralibus brevibus, rotundatis, cucullato-concavis, inaequilongis, intermedio e basi breviter unguiculata perlate rhombeo-spathulato, apiculato, 0.4 cm longo, infra apicem 2.5 mm lato, labello toto sepalis aequilongo; columna glabra, leviter torta, alis 2 infra stigma quadratis, amplis, antice truncatis, lobulatis; anthera oblique ovato-lanceolata, acuminata; ovario breviter pedicellato, clavato, glanduloso-puberulo, c. 1.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Mountain, alt. c. 1200 m—R. Schlechter no. 19619, flowering in May 1909.

An extremely robust species with very dark-velvet-green leaves and white margins. It is related most closely to *M. dendrophila* Schltr., but well distinguished by

the shape of the leaves, the petals and labellum. Very characteristic is the broad front lobe of the labellum.

4. *M. dendrophila* Schltr., sp. nov.

Epiphytica, erecta, validiuscula, 25–40 cm alta; rhizomate vulgo abbreviato, cauliformi; radicibus crassis, cylindraceis, flexuosis, villosis; caule basi foliato, caeterum vaginulis paucis, distantibus, appressis obsesso, tereti, glanduloso-puberulo; foliis 4–6, subrosulatis, erecto-patentibus, ellipticis, acuminatis, basi cuneata sensim in petiolum angustatis, utrinque glabris, lamina 6.5–11 cm longa, medio fere 3–5 cm lata, petiolo basi dilatata caulem vaginante, 2.5–4 cm longo; spica dense pluri-vel multiflora, cylindrica, usque ad 15 cm longa, c. 3.5 cm diametiente; bracteis ovatis, acutis vel acuminatis, glanduloso-puberulis, ovario plus duplo brevioribus; floribus illis *M. obscurae* Schltr. similibus et fere aequimagnis; sepalis extus glanduloso-puberulis, intermedio late ovato, obtusiusculo, 0.6 cm longo, lateralibus oblique et late ovalibus, obtusis, 0.7 cm longis; petalis sepalo intermedio subaequilongis et intus margini agglutinatis, lineari-ligulatis, subfalcatis, obtusis, glabris; labello e basi subquadrato-cucullata, intus bisquamata antice trilobato, lobis lateralibus rotundato-cucullatis, brevibus, inaequilongis, intermedio longiore, obovato spathulato, obtuso, labello toto sepalis aequilongo, glabro; columna glabra, alis 2 infra stigma amplis, quadratis, antice truncatis; anthera ovato cucullata, acuminata, glabra; ovario breviter pedicellato clavato, glanduloso-puberulo, c. 1.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17088, flowering in Dec. 1909 [Ed.—probably 1907] on trees in the forests of the Finisterre Range, alt. c. 1000–1200 m—R. Schlechter no. 18019, flowering in July 1908; no. 18210, flowering in Sept. 1908; no. 19165, flowering in Jan. 1909.

This species may be distinguished from *M. obscura* by the keel-shaped leaves passing gradually into the petiole at the base, moreover, the flowers provide good characteristics in the petals and labellum. The leaves are greyish green with thin, silvery, longitudinal veins crossed by a few more-or-less interrupted transverse veins. The flowers are brown, the column and labellum white in front.

25. *Cheirostylis* Bl.

The only New Guinea representative of this interesting genus, known up to the present, is *C. grandiflora* Bl., which was discovered by Zippelius in Dutch New Guinea. The plant which I found in German New Guinea seems, on the whole, to be related rather closely to this species of which, unfortunately, I have seen no Type specimens, however, it possesses considerably smaller flowers.

The species is an epiphyte, which grows in the forks of branches of tall trees in places where some humus has collected. The internodes of the root-stock, due to the absorption of water, often swell to such an extent that regular constrictions occur between the swellings. The roots of the plant are very short; their chief purpose appears to be for holding it to the substratum. Evidently, the species does not extend far into the mountains; I found it usually in association with species of *Myrmecodia* and *Hydnophytum*, growing on trees overhanging the banks of creeks and rivers.

1. *C. dendrophila* Schltr., sp. nov.

Epiphytica, erecta, 7–20 cm alta; rhizomate incrassato, ad nodos vulgo paulo constricto, decumbente; radicibus subnullis; caule basi paucifoliato, supra vaginis paucis, amplexantibus obsesso, tereti, glanduloso-puberulo; foliis 2–4, erecto-patentibus, petiolatis, lamina ovata vel ovato-lanceolata, acuta vel acuminata, basi subrotundata, utrinque glabra, 1.6–3.4 cm longa, infra medium 1–1.6 cm lata, petiolo basi dilatata caulem vaginante, 0.7–1.3 cm longo; racemo abbreviato, dense 2–7-floro; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario vulgo paulo brevioribus; floribus in genere inter mediocres, erecto-patentibus; sepalis oblongis, obtusis, usque ad medium fere in tubum connatis, extus pilis sparsis glanduliferis ornatis, 0.6 cm longis, lateralibus obliquis, nunc subacuminatis, basi paulo decurrentibus; petalis falcato-ligulatis, obtusis, glabris, sepalo intermedio intus margini agglutinatis et fere aequilongis; labello e basi concava in unguem brevem contracto, antice in lobum bipartitum

expanso, partitionibus divergentibus, oblongo-quadratis, antice irregulariter lobulato-incisis, minute papillois, c. 3.5 mm longis, labello toto 0.6 cm longo, basi intus appendicibus subulatis, paucis, biseriatis, ornato; columna perbrevis, rostello alte bipartito, appendicibus lateralibus rostello similibus et aequilongis; anthera ovato-cordata, acuminata, glabra; ovario clavato pilis recurvis glanduloso-puberulo, cum pedicello c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Kelel, alt. 500 m—R. Schlechter no. 16419, flowering in Aug. 1907; on trees in the forests on Wabe [River], alt. c. 250 m—R. Schlechter no. 18077, flowering in July 1908; on trees in the forests of the Finisterre Range, above Ambo, alt. c. 600 m—R. Schlechter no. 18130, flowering in Aug. 1908.

This species is distinguished from *C. grandiflora* Bl. by the smaller flowers and the labellum. The petals are also more falcate.

var. *lancilabris* Schltr., var. nov.

Differt a forma typica labello lanceolato, obtuso, plano.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 400 m—R. Schlechter no. 18085, flowering in Aug. 1908.

The variety is, evidently, the result of a tendency to pelorial formation. Apart from minor modification to the column, the plant is, otherwise, not changed in floral parts. The flowers are white, both in the Type and in the variety.

26. *Eucosia* Bl.

It is difficult to decide what should be done with this genus of Blume. The specimen on which he established it evidently was not normal in its floral structure, as can be seen by the absence of the rostellum. I have now before me two quite similarly constructed species, which, undoubtedly, are related very closely and can be distinguished from the Type of *Eucosia* Bl. only by a perfectly developed rostellum; the whole flower giving the impression of being quite normal. One of these plants I recently described as *Goodyera subregularis*, but I overlooked that it differs from *Goodyera* by the presence of two distinct stigmas, thus possessing a character by which *Eucosia* is separated from *Goodyera*. Now such a plant has been recorded also from German New Guinea, so that after much consideration, I think it best to place both under *Eucosia* Bl. Should it be established, however, that this genus is an abnormal form of *Goodyera*, the above two species must be established as an independent genus. At present, I regard them as belonging to a normal genus, *Eucosia* Bl. *E. papuana* Schltr., described here, previously referred to by me (Engl. Bot. Jahrb. XLV, p. 394) is an inhabitant of the mountain forests. It appears to occur sporadically; I have found it only in central New Guinea, growing in humus in very shady places. It attracts attention quickly, owing to its beautifully marked leaves.

1. *E. papuana* Schltr., sp. nov.

Terrestris, pusilla, c. 15 cm alta; rhizomate decumbente, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule usque ad medium fere foliato, tereti, glabro, supra vaginulis paucis, distantibus, bracteiformibus obsesso, inflorescentiam versus glanduloso-puberulo; foliis c. 6, patentibus, petiolatis, lamina ovata vel late ovata, acuta, utrinque glabra, 2.3–3.5 cm longa, infra medium 1.8–2.5 cm lata, petiolo basi dilatata vaginante, 0.8–1.3 cm longo; spica laxa pauciflora (in specimine typico 3-flora), erecta; bracteis erecto-patentibus, ellipticis, acuminatis, glanduloso-puberulis, ovarii dimidium excedentibus; floribus illis *E. subregularis* Schltr. simillimis et fere aequimagnis; sepalis ovatis, acuminatis, extus glanduloso-puberulis, 1.1 cm longis, lateralibus obliquis, intermedio paulo angustioribus; petalis sepalo intermedio aequilongo intus margini agglutinatis, oblique lanceolato-ligulatis acutis, basi antice lobato-rotundatis, glabris; labello lanceolato-elliptico acuto, glabro, intus nervo medio paulo incrassato, glabro, sepalis aequilongo, medio fere 0.4 cm lato; columna brevi, antice bicostata, glabra, rostello erecto, satis longo, ligulato, apice breviter exciso; anthera e basi late ovato-cucullata, profunde cordata, longius acuminata, dorso umbone lanceolato donata, glabra; ovario subfusiformi-cylindraco, glanduloso-puberulo, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17361, flowering in Feb. 1908.

Very closely related to *E. subregularis* Schltr., and perhaps, later, to be regarded merely as a variety, but differing in the shape of petals and column. In both species the leaves are dark brown-green with rose-red veins. The sepals of *E. papuana* Schltr. are brown-red; the petals and labellum white with brown-red tips. In *E. subregularis* Schltr. the sepals are pale brown, the petals and sepals flushed with pink. The rose-red venation of the leaves, in the species here described, is more conspicuous and a little broader than in the New Caledonian species.

27. *Zeuxine* Lindl.

Three species of this genus have been reported from German New Guinea, the descriptions of which I published in 1905. A few have been reported also from Dutch and British New Guinea, viz. *Z. amboinensis* J.J. Sm., according to the author also in Dutch New Guinea, and *Z. Chalmersii* Schltr. from the Fly River in British New Guinea. To these, seven new species have to be added, so there are now no less than 12 species known from this island.

These may be divided into three well separated sections of the whole genus, viz.

§ [1] *Eu-Zeuxine*. Characterised by narrow leaves without a lamina. It includes *Z. strateumatica* (L.) Schltr., *Z. cochlearis* Schltr., *Z. africana* Rchb. f., and also the species described below, *Z. wariana* Schltr.

§ [2] *Monochilus*. This section includes the bulk of the species, characterised by petiolate leaves with a distinct truncate lamina, and a labellum broadened in front into two lobes.

§ [3] *Hetaeriopsis*. Likewise with leaves petiolate and a distinct truncate lamina, but the labellum provided in front with a small plicate lamina. A whole series of species, previously placed, in part, under *Hetaeria* is now better placed here, viz. *Z. falcatula* (J.J. Sm.) Schltr. and *Z. torricellensis* Schltr., both from New Guinea, as well as *Z. cristata* (Bl.) Schltr. (*Hetaeria cristata* Bl.), for example, from Java. I restrict the genus *Hetaeria* Bl. to species with reversed flowers and a column with peculiar, more-or-less warty appendages at the top.

The species of the genus occur in the Territory under rather varying conditions: *Z. wariana* Schltr. grows on the edges of forests in open places on the plains. Furthermore, several species of the section *Monochilus* occur in forests of the plains, but only in places with humus and uniform humidity, thus, in particular, the two widely distributed species, *Z. Erimae* Schltr. and *Z. argentea* Schltr. The former always grows in colonies, the latter always sporadically. Most of the other species are found in mountain forests, in rich humus soil, where, for instance, *Z. alticola* Schltr. is still seen at an altitude of 2300 metres.

§ 1. *Eu-Zeuxine*

1. *Z. wariana* Schltr., sp. nov.

Terrestris, erecta, pusilla, 13–20 cm alta; rhizomate adscendente, cauliformi; radicibus flexuosis, puberulis; caule usque ad apicem fere foliato, tereti, glabro; foliis erectis vel suberectis, linearibus vel lanceolato-linearibus, vulgo marginibus revolutis, glabris, usque ad 5 cm longis, infra medium 0.3–0.4 cm latis, basi dilatata caulem amplexantibus; spica dense multiflora, cylindrica, usque ad 5 cm longa; bracteis erecto-patentibus, ovato-lanceolatis, acuminatis, ovarium plus minusve superantibus, glabris; floribus illis *Z. strateumaticae* (L.) Schltr. similibus, erecto-patentibus; sepalis ovatis, obtusis, glabris, 3.5 mm longis, lateralibus obliquis; petalis e basi brevissime unguiculata oblique lanceolato-ligulatis, obtusis, glabris, basi margine anteriore in lobum rotundatum dilatatis, sepalo intermedio paulo brevioribus et margini intus agglutinatis; labello e basi oblongo-cucullata marginibus inflexis, in

unguem paulo angustiore productis, antice laminam subreniformem, antice excisam dilatato, superne ad basin unguis dense verruculoso, intus basi squamis 2 interdum lobulatis ornato, petalis aequilongo, ungue decurvo, 1.5 mm longo, lamina apicali 1 mm longa, c. 1.5 mm lata; columna brevi, rostello forcipato, erecto; anthera ovato-cordata, obtusiuscula; pollinis oblique clavatis, stipite oblanceolato-ligulato, polliniis longiore, glandula oblonga, minuta; ovario cylindraceo, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: At forest borders near Siu on the Waria [River], alt. c. 100 m—R. Schlechter no. 19216, flowering in Apr. 1909.

This species is, externally, strikingly like *Z. strateumatica* (L.) Schltr., but is best kept separate on account of its floral characteristics. I very much suspect it to be semi-saprophytic. Its flowers are reddish white, the labellum is golden yellow.

§ 2. *Monochilus*

2. *Z. leucoptera* Schltr., sp. nov.

Terrestris, gracilis, 17–30 cm alta; rhizomate decumbente, cauliformi: radicibus brevibus, villosis; caule usque infra medium foliato, tereti, glabro, supra vaginulis, paucis, distantibus, bracteiformibus obsesso, glanduloso-puberulo; foliis 5–7, erecto-patentibus, petiolatis, oblique lanceolato-ellipticis, acutis vel subacutis, utrinque glabris, 2.7–4.5 cm longis, infra medium 1–1.5 cm latis, petiolo basi dilatata vaginante, 1.2–1.5 cm longo; spica laxa 3–5-flora, secunda, usque ad 5 cm longa; bracteis ovatis, acuminatis, ovario subduplo brevioribus; floribus in genere inter majores, suberectis; sepalis anguste ovatis, obtusis, dimidio inferiore extus puberulis, intermedio 0.8 cm longo, lateralibus obliquis, paulo minoribus; petalis e basi oblique ovata angustatis, obtusis, glabris, sepalo intermedio intus margini agglutinatis, paululo brevioribus; labello e basi ovato-cucullata, marginibus inflexis in unguem oblongum attenuato, antice in laminam bilobatam, apiculatam expanso, lobis divergentibus, oblique oblongis, margine leviter undulatis, toto glabro, petalis aequilongo, supra basin 0.3 cm lato, ungue 0.3 cm longo, lamina apicali 2.5 mm longa, inter apices loborum c. 1 cm lata; columna brevi, glabra, rostello triangulo, bifido; anthera rhombeo-ovata, cucullata, valde acuminata, glabra; polliniis oblique pyriformibus, stipite obovato, amplo, glandula parvula rotundata; ovario cylindraceo, puberulo, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20087, flowering in Sept. 1909.

The largest-flowered species among the Papuan [Papuasian] ones. It is best placed in the vicinity of *Z. longilabris* Benth. and *Z. regia* Benth. The sepals are pale brownish, the petals and labellum white, the latter with a golden yellow claw. The plant grows mostly under shrubs or at the foot of large rocks.

3. *Z. montana* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 91.

Neu-Mecklenburg: In humus in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14696, flowering in July 1902.

This species, together with the two following, is related to *Z. amboinensis* J.J. Sm. In this group *Z. montana* Schltr. is distinguished by its larger flowers.

4. *Z. elatior* Schltr., sp. nov.

Terrestris, erecta, elatior, c. 45 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, puberulis; caule infra medium foliato, tereti, glabro, supra vaginulis paucis, distantibus, bracteiformibus obsesso, glanduloso-puberulo; foliis erecto-patentibus, petiolatis, infra medium caulis approximatis, c. 5, lamina oblique ovato-elliptica, acuminata, basi rotundata, utrinque glabra, 6.5–10 cm longa, infra medium 3.2 bis 4.5 cm lata, petiolo basi dilatata vaginante, 3–4 cm longo; spica subdense multiflora, angusta, c. 12 cm longa; bracteis lanceolatis, acuminatis, ovario brevioribus, glanduloso-puberulis; floribus illis *Z. montanae* Schltr. similibus et fere aequimagnis, erecto-patentibus; sepalis extus glanduloso-puberulis, intermedio e basi ovata angustato, obtusiusculo, 0.7 cm longo, lateralibus oblique oblongis, obtusis, 0.6 cm longis; petalis e basi obliqua, oblongo-ovata margine anteriore dilatatis, apicem versus conspicue angustatis, obtusiusculis, glabris, sepalo intermedio aequilongis et intus margini agglutinatis; labello e basi subgloboso-cucullata, intus squamis 2 falcatis ornata, marginibus inflexis in unguem late ligulatum attenuato, antice in lobum transverse falcato-oblongum, antice retusum cum apiculo dilatato, glabro, petalis aequilongo, ungue 2.5 mm

longo, lobo apicali 1.5 cm longo, 0.5 cm lato; columna brevi, subglobosa, facie carinis 2 aliformibus donata, glabra, rostello triangulo-forcipato; anthera suborbiculari-cucullata, cordata, antice rostrata; polliniis oblique clavatis, stipite obovato, triangulo, amplo, glandula parvula rotundata; ovario cylindraceo, glanduloso-puberulo, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19931, flowering in June 1909.

A very large, robust species with flowers almost the same size as the previous species, but in its floral parts it resembles more the smaller *Z. argentea* Schltr. The sepals are greenish, the labellum and petals white.

5. *Z. argentea* Schltr., sp. nov.

Terrestris, erecta, gracilis, 30–40 cm alta; rhizomate plus minusve flexuoso, cauliforme, decumbente; radicibus flexuosis, elongatis, villosulis; caule tereti, glabro, basi denudato, vaginis mox decadentibus obresso, supra medium 3–4-foliato, supra vaginulis paucis distantibus, bracteiformibus obresso, glanduloso-puberulo; foliis supra medium caulis approximatis, erecto-patentibus, petiolatis, lamina oblique elliptica, acuminata, basi rotundata, glabra, 6–8.5 cm longa, medio fere 2.5–3.5 cm lata, petiolo basi dilatata vaginante, 1.8–3 cm longo; spica subdense 10–15-flora, oblonga, usque ad 5 cm longa, subsecunda; bracteis lanceolatis, acuminatis, glanduloso-puberulis, ovario aequilongis vel paulo brevioribus; floribus in genere mediocribus, erecto-patentibus; sepalis dimidio inferiore puberulis, intermedio ovato, c. 0.5 cm longo, lateralibus obliquis angustioribusque, paulo brevioribus; petalis oblique ovato-oblongis, apicem versus conspicue angustatis, obtusis, basi margine anteriore ampliatis, glabris, sepalo intermedio subaequilongis; labello e basi ovato-cucullata, intus bisquamata marginibus inflexis in ungum brevem sensim angustato, antice in laminam transverse falcato-oblongam, antice retusam cum apiculo dilatato, glabro, petalis aequilongo, lobo apicali c. 0.1 cm longo c. 0.3 cm lato; columna brevi, subglobosa, facie carinis 2 triangulato-alatis praedita, glabra, rostello triangulo, bifido; anthera subreniformi-cucullata, breviter cordata, acuminata; polliniis oblique clavatis, stipite permagno, ligulato, glandula parvula, rotundata, ovario cylindraceo, glanduloso-puberulo, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests near the Djamu Gorge, alt. c. 300 m—R. Schlechter no. 16622, flowering in Oct. 1907; in humus in the forests near the Saugueti Base, alt. c. 250 m—R. Schlechter no. 18920, flowering in Dec. 1908.

This species is, certainly, related very closely to *Z. amboinensis* J.J. Sm., perhaps even identical with the variety *argentea* J.J. Sm. My plant, however, is certainly specifically different from the Type of *Z. amboinensis* J.J. Sm. by its more slender habit; by the sepals which are only hairy at the base; by petals glabrous and wider below; labellum narrow at base, with shorter front lobes. The leaves are greyish silver-green or bluish grey above. The flowers are greenish with white petals and labellum.

6. *Z. Erimae* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 90.

Kaiser-Wilhelms-Land: In humus in the forests near Erimahafen, alt. c. 20 m—R. Schlechter no. 13677, flowering in Oct. 1901; in humus in the forests near Jawer, on the Minjem [River], alt. c. 100 m—R. Schlechter no. 16574, flowering in Sept. 1907; in humus in the forests on the Malia [River], near the Saugueti Base, alt. c. 150 m—R. Schlechter no. 18374, flowering in Oct. 1908; in humus in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17918, flowering in July 1908; in humus in the forests at the mouth of the Waria [River], alt. c. 10 m—R. Schlechter no. 19946, flowering in July 1909.

It is surprising that this common and widely distributed orchid has not been collected by others previously.

§ 3. *Hetaeriopsis*

7. *Z. alticola* Schltr., sp. nov.

Terrestris, erecta, 30–50 cm alta; rhizomate decumbente, cauliformi; radicibus flexuosis, villosis; caule usque infra medium foliato, tereti, glabro, supra vaginis paucis, dissitis, lanceolatis, acuminatis obresso; foliis 3–5, erecto-patentibus vel suberectis, petiolatis, lamina oblique elliptica, acuminata, basi

rotundata, glabra, 5–10 cm longa, medio vel infra medium 2.2–4 cm lata, petiolo basi dilatata vaginante, 2.5–4.5 cm longo; spica subaxe multiflora, elongata, cylindrica, usque ad 17 cm longa, 2–2.3 cm diametiente; bracteis ovato-lanceolatis, acuminatis, ovario vulgo paulo brevioribus; floribus erecto-patentibus, illis *Z. torricellensis* Schltr. similibus, sed paulo majoribus; sepalo intermedio ovato, obtusiuscule acuminato, glabrato, 0.6 cm longo, lateralibus oblique oblongis, obtusiusculis, glabratis, intermedio fere sequilongis; petalis oblique ellipticis, apiculatis, margine anteriore bene ampliatis, glabris, sepalo intermedio subaequilongis et margini intus agglutinatis; labello e basi oblongo-cucullata marginibus inflexis sensim in unguem apicem versus paululo angustatum producto, antice in lobum reniformem, apiculatum, conduplicatum, parvulum dilatato, glabro, 0.7 cm longo, lobo apicali 1.5 mm longo, c. 0.2 cm lato, squamis 2 in basi labelli oblongo-falcatis, amplis; columna globosa, facie lamellis 2 curvatis ornata, glabra, rostello brevi, forcipato-bidentato; anthera reniformi-cucullata, cordata, breviter acuminata, glabra; polliniis oblique clavatis, glandula ampla rotundata; ovario cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18721, flowering in Nov. 1908.

A species related to *Z. cristata* (Bl.) Schltr. (*Hetaeria cristata* Bl.) but of more robust growth with a narrower labellum and broader lamina. The leaves are dark green above with a silver-white middle band; dark red below, as are also the stem and the leaf sheaths. The flowers are red-brown outside with white petals and labellum.

8. *Z. torricellensis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 92.

Kaiser-Wilhelms-Land: In humus in the mountain forests of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14435. [Ed.—no date cited, possibly Apr. 1902.]

Having now been able to collect abundant material of the species of this relationship from the most varied locations, it appears that we are dealing with a series of closely related species. *Z. torricellensis* Schltr. must, thus, be reduced to this one particular Type, after the exclusion of the species from Neu-Mecklenburg. The differences between the species (apart from the characteristics in the shape and colour of the leaf and the inflorescence) lie chiefly in the labellum, which, when spread out, shows very interesting characters. *Z. torricellensis*, for instance, is distinguished by the elongated lateral lobes of the lip, by their two spatulate large basal scales and the two semi-linear lamellae beyond the middle. The species has dark purple-brown leaves with a silver-white mid-rib. The flowers are brownish with white petals and labellum.

9. *Z. atrorubens* Schltr., sp. nov.

Terrestis, erecta, gracilis, 19–25 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, puberulis; caule usque infra medium foliato, tereti, glabro, supra vaginulis paucis, bracteiformibus, distantibus obesso, sparsim glanduloso-puberulo; foliis erecto-patentibus, petiolatis, 3–5, lamina oblique ovato-lanceolata, acuta cum apiculo minuto, 3–5 cm longa, infra medium 1.4–2.3 cm lata, petiolo basi dilatata vaginante, 1–2 cm longo; inflorescentia laxa 4–8-flora, erecta, usque ad 7 cm longa; bracteis ovato-lanceolatis, acuminatis, margine ciliatis, ovario fere duplo brevioribus; floribus illis *Z. torricellensis* Schltr. valde similibus, erecto-patentibus, glabris; sepalo intermedio late ovato, acuminato, 0.4 cm longo, lateralibus oblique ovatis, acuminatis, paululo longioribus; petalis semiovato-falcatis, breviter acuminatis, margine exteriori medio bene ampliatis, sepalo intermedio subaequilongis et margini intus agglutinatis; labello circuitu ovoideo-cucullato, petalis aequilongo, explanato subquadrato, antice subito contracto et in lobum parvulum, late ellipticum, apiculatum expanso, intus basis quamulis 2 obovatis, substipitatis ornato, linea media paulo incrassata, supra medium utrinque lamellula parvula humili aucta; columna suborbiculari, glabra, rostello parvulo forcipato-bicuspidato, fascie alis 2 amplis ornata; ovario cylindraceo, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18053, flowering in July 1908.

As previously mentioned, the individual species of this relationship differ chiefly in the labellum. *Z. atrorubens* Schltr. has dark purple-brown leaves, cherry-red below, broader than those of *Z. torricellensis* Schltr. The lateral lobes of the labellum are truncate and on the inside above the centre are two smaller scale-shaped lamellae. The

sepals are brown-red, the petals and labellum of a translucent salmon colour, the latter with white lamina in front.

10. *Z. Novae-Hiberniae* Schltr., sp. nov.

Terrestris, erecta, gracilis, 15–20 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosulis; caule tereti, glabro, basi denudato, vaginis mox caducis obsesso, medio 4–6-foliato, supra vaginulis paucis, bracteiformibus, distantibus donato, glanduloso-puberulo; foliis patentibus, petiolatis, lamina oblique lanceolata vel elliptico-lanceolata, acuta vel acuminata, utrinque glabra, 3–5.5 cm longa, infra medium 0.7–1.3 cm lata, petiolo basi dilatata vaginante, 1–2 cm longo; spica subaxe 6–15-flora, usque ad 7 cm longa; bracteis ovato-lanceolatis, acuminatis, extus paulo puberulis, margine sparsim ciliatis, ovarii dimidium plus minusve superantibus; floribus illis *Z. torricellensis* Schltr. similibus et fere aequimagnis, glabris; sepalo intermedio late ovato, acuminato, 0.5 cm longo, lateralibus oblique ovatis, breviter acuminatis, intermedio paululo longioribus; petalis semiovatis, breviter acuminatis, glabris, sepalo intermedio subaequilongis et margini intus agglutinatis; labello circuitu ovato-cucullato, petalis aequilongo, explanato subquadrato, antice subito contracto et in laminam parvulam, reniformem, apiculatam explanato, intus basi squamis 2 falcato-ligulatis, apice inaequaliter denticulatis ornato, linea media incrassata, supra medium callo brevi verruculoso ornata; columna subglobosa, lamellis in facie 2 aliformibus, leviter subcrenulatis; ovario cylindraceo, glabrato, c. 0.8 cm longo.

Neu-Mecklenburg: In humus in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14695, flowering in July 1902.

I previously arranged this plant with *Z. torricellensis* Schltr., although its description was made from the specimen from the Torricelli Range. The shape of the labellum with the warty callus down the middle readily distinguishes this species; moreover the inflorescence is less loosely flowered and the leaves above are simply dark purple without a white rib. The plant grows, apparently, in colonies so that abundant material was available.

11. *Z. dipera* Schltr., sp. nov.

Terrestris, erecta, c. 17–25 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule basi mox denudato, medio 3–5-foliato, tereti, glabro, supra vaginulis paucis, dissitis, bracteiformibus obsesso, glanduloso-puberulo; foliis versus medium caulis approximatis, erecto-patentibus, petiolatis, lamina oblique lanceolata vel ovato-lanceolata, acuta, glabra, 4–8 cm longa, infra medium 1.8–3 cm lata, petiolo basi dilatata vaginante, 1.5–2.5 cm longo; racemo subdense 7–12-floro, erecto, usque ad 6 cm longo; bracteis ovato-lanceolatis, acuminatis, margine ciliatis, extus sparsim puberulis, ovario aequilongis; floribus illis *Z. torricellensis* Schltr. similibus, sed paululo majoribus, glabris; sepalo intermedio late ovato, breviter acuminato, c. 0.4 cm longo, lateralibus oblique ovatis, acuminatis, intermedio paulo longioribus; petalis oblique subfalcato-semiovatis, breviter acuminatis, glabris, sepalo intermedio fere aequilongis et margini intus agglutinatis; labello circuitu ovato-cucullato, latere utrinque ruga sacculiformi donato, petalis aequilongo, explanato quadrato, subito antice truncato et in laminam late ligulatam, parvulam, subtus apiculatam producto, intus basi squamis 2 oblongis, leviter bilobatis praedito, nervo medio sublamellato-incrassato; columna subglobosa, facie carinis 2 aliformibus ornata, glabra, rostello parvulo; ovario cylindraceo, glabro, c. 0.6–0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. 600 m—R. Schlechter no. 20055, flowering in Nov. 1905 [Ed.—possibly Sept. 1909]; in humus in the forests of the Kani Range, alt. c. 100 m—R. Schlechter no. 17700, flowering in May 1908.

This species also is related closely to *Z. torricellensis* Schltr., but is distinguished by the closer inflorescence, larger flowers, shape of labellum, shorter basal scales and the lamella-like thickened centre line. The leaves are velvet green with a white middle vein. The flowers are greenish flushed with brown, the petals and labellum white.

var. *laxa* Schltr., var. nov.

Differt a forma typica habitu graciliore, inflorescentia laxa et floribus minoribus, labello minore intus lineis 3 leviter incrassatis ornato, squamis basilaribus linearibus longioribus.

Kaiser-Wilhelms-Land: In humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17811, flowering in May 1908.

I consider it probable that this variety also will prove to be a species.

28. *Vrydagzenia* Bl.

This genus appears to have its centre of dispersion in New Guinea, for of the 20 species which, up to the present, are known, 12-14 species occur there. Besides the nine species enumerated below, there are still *V. papuana* Rchb. f., *V. elongata* Bl., *V. paludosa* J.J. Sm., and one or two as yet undescribed species from British New Guinea.

The majority of species occur in the lowlands where they usually grow at the edges of swamps, or in muddy alluvial soil at the edges of rivers and creeks. *V. rivularis* Schltr. even grows, usually, in rock crevices in creeks, or on the edge of slate embankments, where in floods it is submerged repeatedly. *V. albostrata* Schltr. and *V. Schumanniana* Krzl. grow in areas of humus in the primary forests, but I have found the latter often in close proximity to water.

1. *V. salomonensis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 86.

Solomon Islands: Without location details—Dr. Guppy, no. 975. [Ed.—no date cited.]

I have included this characteristic species here, although it is possible that the plant was collected in the British Solomons.

2. *V. pachyceras* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 84.

V. elongata Schltr., l.c., p. 84, p.p. (nec Bl.).

Kaiser-Wilhelms-Land: In damp locations in the forests near Erimahafen, alt. c. 20 m—R. Schlechter no. 13680, flowering in Oct. 1901; in damp locations in the forests on the Minjem [River] near Wobbe, alt. c. 180 m—R. Schlechter no. 16420, flowering in Aug. 1907; at creek edges in the Bismarck Range, alt. c. 500 m—R. Schlechter no. 14039, flowering in Jan. 1902.

The form which I previously regarded as *V. elongata* Bl. is better placed here. The altitude given was incorrect due to a misprint for specimen no. 14039, it should read 500 metres instead of 1500 metres. The species is distinguished from others in the Territory by its strikingly small flowers.

3. *V. nova-guineensis* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 39 (in nota).

V. papuana Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 85 (nec Rchb. f.).

Kaiser-Wilhelms-Land: In humus in the forests of the Kaulo Base, alt. c. 300 m—R. Schlechter no. 17188, flowering in Jan. 1908; between rocks in the forests of the Bismarck Range, alt. c. 700 m—R. Schlechter no. 13941, flowering in Jan. 1902.

When I previously named this plant *V. papuana* I unfortunately overlooked that this name had been used already by Reichenbach fil. In the structure of the flowers, the species is closest to *V. pachyceras* Schltr.

4. *V. rivularis* Schltr., sp. nov.

V. elongata Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 84 p.p. (nec Bl.).

Terrestris, pusilla, 7-25 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosis; caule plus minusve flexuoso, tereti, glabro, usque ad medium fere foliato, supra vaginulis paucis, distantibus obpresso; foliis erecto-patentibus, 4-5, petiolatis, lanceolatis, acutis, basi cuneatis, utrinque glabris, lamina 2.5-4.5 cm longa, infra medium 0.7-1.3 cm lata, petiolo basi dilatata caulem vaginante, 0.7-1 cm longo; spica dense pauci-vel pluri-(5-20)-flora, 1-4 cm longa; bracteis erecto-patentibus, ovato-lanceolatis, acutis vel acuminate, glabris, ovario nunc aequilongis, nunc paulo

longioribus; floribus in genere mediocribus, erecto-patentibus vel suberectis, glabris; sepalo intermedio ovato-lanceolato, apice verruculoso-incrassato, vix 0.5 cm longo, lateralibus oblique oblongo-ligulatis, antice verruculoso-carnosis, intermedio fere aequilongis; petalis oblique oblongis, obtusiusculis, sepalo intermedio intus margini agglutinatis, 0.4 cm longis; labello circuito late rhombico, marginibus incurvis, medio auriculato-incurvulis et in laminam cariniformiter decurrentibus, antice concavo, lamina medio paulo incrassata, petalis fere aequilonga; calcare praesertim apicem versus lateraliter conspicue compresso, a latere oblique ovoideo, medio dilatato, apicem versus attenuato, obtusiusculo vel subacuto, leviter curvato, c. 0.5 cm longo, appendicibus in medio fere breviter stipitatis, incurvulis; columna generis, crassiuscula, processibus frontalibus ligulatis, rostello aequilongis; anthera cordata, obtusiuscula, umbone cordata ornata; ovario cylindraceo, glabro, 0.5–0.6 cm longo.

Kaiser-Wilhelms-Land: On creek edges at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14592, flowering in Apr. 1902; in the primary forests of Wobbe, alongside the watercourses, alt. c. 300 m—R. Schlechter no. 16335, flowering in July 1907; in the lower Moyo Valley—Dr. Werner no. 44, flowering in June 1907; on moist rocks in the bed of the Njonge [Creek] near Ambo, alt. c. 500–600 m—R. Schlechter no. 18126, flowering in Aug. 1908; no. 19043, flowering in Jan. 1909; in humus in the forests of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 19083, flowering in Jan. 1909.

This species is characterised by the narrow leaves, and by the almost pointed spur, which is much compressed laterally and dilated in the middle. The sepals and petals of most species are thickened at the apices, but in no other species in the Territory to such an extent as here. The specimen no. 14592, which I regarded earlier as *V. elongata* Bl., owing to the scarcity of the flowers, now, with the better material available, is proved as belonging here.

5. *V. neo-hibernica* Schltr., sp. nov.

Terrestris, erecta, 15–20 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosulis; caulibus alte foliatis, teretibus, glabris; foliis erecto-patentibus patentibusve, 6–10, petiolatis, lamina oblique ovato-vel elliptico-lanceolata, acuta, utrinque glabra, 3–6 cm longa, infra medium 1.2–1.5 cm lata, petiolo basi conspicue dilatata caulem vaginante; spica folia excedente, dense 8–20-flora, cylindrica, usque ad 4 cm longa, c. 1.3 cm diametiente; bracteis ovato-lanceolatis, acuminatis, inferioribus, ovaria vulgo excedentibus, superioribus sensim minoribus; floribus illis *V. rivularis* Schltr. similibus sed paulo minoribus, glabris; sepalo intermedio ovato-lanceolato, apicem versus angustato, apice verruculoso-incrassato, 3.5 mm longo, lateralibus oblique oblongis, obtusis, apicem versus verruculoso-incrassatis, intermedio aequilongis, basi margine anteriore decurrentibus; petalis oblique oblongis obtusis, apice leviter verruculosus, sepalo intermedio paulo brevioribus; labello suborbiculari-rhombico, marginibus incurvis, intus carinis 2 parallelis usque supra medium disci decurrentibus ornato, 0.3 cm longo medio intus paululo incrassato, calcare lateraliter paulo compresso, subconico, medio ampliato, subacuto, 0.6 cm longitudine subattingente; columna crassiuscula, processibus frontalibus rostello subaequilongis, apice truncatis; anthera ovato-lanceolata; acuta, basi-cordata, cucullata, dorso umbone lanceolato ornata; ovario cylindraceo, glabro, c. 0.6 cm longo.

Neu-Mecklenburg: In humus in the range-forests near Punam, alt. c. 600 m—R. Schlechter no. 14694a, flowering in July 1902.

I found this species, as several specimens, amongst my duplicates of *V. albostrata* Schltr. and fear that I have distributed some of them under this wrong determination from the above locality. It is inexplicable that I have not noticed this mistake earlier. The plant probably is related closely to *V. rivularis* Schltr. in the structure of the flowers, but in habit more closely resembles *V. Schumanniana* Krzl., differing in the spur and labellum, which is not trilobate.

6. *V. Schumanniana* Krzl., in K. Schum. et Laut., Nachtr. [1905], p. 86.

V. triloba J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 39.

Kaiser-Wilhelms-Land: On boulders of the upper Bubui [River], near Finschhafen—Dr. Weinland no. 252, flowering in June 1890; in humus in the hill

forests near Jaduna, on the Waria (also in damp locations), alt. c. 100-200 m—R. Schlechter no. 17381, flowering in Mar. 1908; no. 19235, flowering in Apr. 1909.

My specimens, which agree perfectly with Kränzlin's Type in the Berlin Herbarium, likewise do not differ from a Type specimen of *V. triloba* J.J. Sm., for which I have to thank J.J. Smith. Of course, some of the measurements in Kränzlin's description, especially leaf breadth, are not quite correct. *V. triloba* J.J. Sm., however, is to be regarded as a synonym of the above species. The flowers are brownish green with white, thickened tips to the sepals and petals. Although the species has a wide distribution it seems to occur in Kaiser-Wilhelms-Land only in the more eastern parts.

7. *V. albostrata* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 83.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Albo, alt. c. 600 m—R. Schlechter no. 16345, flowering in Aug. 1907; in humus in the forests on the Schumann River, alt. c. 200 m—R. Schlechter no. 13835, flowering in Jan. 1902; in humus in the forests on the Maijen [River] alt. c. 100 m—R. Schlechter no. 19039. [Ed.—no date cited, possibly Jan. 1909.]

Neu-Mecklenburg: In humus in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14694, flowering in July 1902.

This species seems to be distributed widely in the Territory and I have observed it in other parts of Kaiser-Wilhelms-Land, but I have neglected to collect material. The species is recognisable readily by its rigid, upright stem which is bifoliated up to the inflorescence with dark green leaves with a white stripe in their middle and by the narrow hairy flowers. The stem is generally of a reddish colour, but individuals with a green stem also occur.

8. *V. truncicola* Schltr., sp. nov.

Epiphytica adscendens, 10–18 cm longa; rhizomate cauliformi; radicibus brevibus, flexuosis villosulis; caule tereti, glabro, usque ad medium vel supra bene foliato, supra vaginulis paucis, bracteiformibus obsesso, puberulo; foliis erecto-patentibus, 6–8, petiolatis, ellipticis vel lanceolato-ellipticis, acutis, utrinque glabris, 2.2–3.7 cm longis, medio vel infra medium 1–1.2 cm latis, petiolo basi dilatata caulem vaginante, 1.5–2 cm longo; spica subaxe 4–7-flora, erecta, usque ad 4 cm longa; bracteis lanceolatis, acuminatis, ciliatis, ovario fere aequilongis; floribus in genere inter majores, erecto-patentibus; sepalo intermedio oblongo-lanceolato, apice angustato, obtuso, paulo incrassato, subverruculoso, glabro, 0.5 cm longo, lateralibus oblique oblongis, glabris, apice angustatis, obtusis, paulo incrassatis, subverruculosis, intermedio paululo longioribus; petalis e basi brevissime unguiculata oblique oblongis, obtusis, margine posteriore infra apicem auriculato-incurvis, margine anteriore basi lobulato-rotundatis, glabris, sepalo intermedio paululo brevioribus; labello ovato obscure subtrilobato, marginibus basi erectis, apice decurvulo, obtuso, glabro, petalis fere aequilongo, calcare oblongoideo-saccato, obtuso, ovario subduplo brevior; columna crassiuscula, processibus frontalibus V-formiter divergentibus, rostello brevi fere aequilongis; anthera subreniformi, apiculata, glabra; ovario cylindraco, minute puberulo, c. 1 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter, no. 18686, flowering in Nov. 1908.

A most interesting novelty which is not related to any species previously described. It is almost isolated in the genus, like *V. argyrotaenia* Schltr. The plant has a peculiar olive-green colour; the flowers are yellowish with a spur brownish in front.

9. *V. argyrotaenia* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 84.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800–1100 m—R. Schlechter no. 14477, flowering in Apr. 1902, no. 20217, flowering in Sept. 1909.

This interesting, pretty-leaved species was known to me previously in Kaiser-Wilhelms-Land only from the Torricelli Range, where it seems to be common in the forests on the mountain ridges, but, like many and most of the bright-leaved

Polychondreae, it never occurs in large numbers, only sparsely. Whether the plant illustrated under this name by J.J. Smith (in 'Nova Guinea' VIII, t. IV, p. 10) is identical with my species will be determined only by careful comparison of the specimens.

29. *Hetaeria* Bl.

In my remarks above on the genus *Zeuxine* Lindl., I have explained that I circumscribe the genus *Hetaeria* Bl. more closely than has been customary in recent years. I include here only species which are related closely to *H. oblongifolia* Bl., the Type of this genus, and which are distinguished by inverted flowers, the labellum lying above the column. The column is short and provided in front with two small warty appendages, usually near the top, which are more-or-less twisted once. These appendages frequently have been called stigmata, which, however, they do not seem to represent, because I always have found distinct fertile stigmatic surfaces at their side.

The two species occurring in the Territory are conspicuous by their striking similarity in habit and are to be distinguished only by a close inspection of their flowers.

In the shape of the labellum, the genus most closely approaches *Goodyera* R. Br., but differs entirely in the formation of the column, which reminds one somewhat of *Vrydagzenia* Bl. and the section *Hetaeriopsis* of the genus *Zeuxine* Lindl. But, in the latter, on the front of the column, broad, thin, wing-shaped lamellae are present instead of the thick fleshy appendages of *Hetaeria*. The genus *Hetaeria* is distributed from India across the Malay Archipelago and Papuaasia to Fiji. The species are all inhabitants of the primary forests and are found preferably in the lowland forests or on hills, where they grow in loose, not very damp, humus soil.

H. falcatula J.J. Sm. is, as I have stated already, a species of *Zeuxine*, belonging to the section *Hetaeriopsis*. *H. oblongifolia* Bl. var. *papuana* J.J. Sm. from Dutch New Guinea is, evidently, a separate species and is perhaps identical with *H. latipetala* Schltr. *H. connata* Krzl. is a 'nomen-nudum' since 1901, and has, therefore, not received consideration here, all the more since no specimen of the plant is known to me.

1. *H. Erimae* Schltr., in Fedde, Repertor. IX (1910), p. 89, (in not.).

Goodyera Erimae Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 93.

Kaiser-Wilhelms-Land: In humus in the forests near Erimahafen, alt. c. 20 m—R. Schlechter no. 13676, flowering in Oct. 1901; in humus in the forests near Albo, alt. c. 300 m—R. Schlechter no. 16343, flowering in Aug. 1907; in humus in the forests on the Kenejia [River] alt. c. 150 m—R. Schlechter no. 18381, flowering in Oct. 1908; in forest on the bank of the Ramu [River]—C. Lauterbach no. 1038, flowering in Nov. 1890; in humus in the forest on the Majen [River], alt. c. 50 m—R. Schlechter no. 17912, flowering in July 1908; in humus in the forests at the mouth of the Waria, alt. c. 30 m—R. Schlechter no. 19945, flowering in July 1909; in humus in the forests of [Mount] Mimi, alt. c. 700 m—R. Schlechter no. 19472, flowering in May 1909.

Widely distributed in the Territory and can be considered most closely related to *H. ovalifolia* Bl. It is distinguished by the narrow petals which are narrower towards the tips, sometimes being almost acuminate.

2. *H. latipetala* Schltr., sp. nov.

Terrestris, erecta, 45–60 cm alta; rhizomate decumbente, cauliformi; radicibus elongatis, flexuosis, villosulis; caule e basi denudata foliato, tereti, glabro, supra vaginis pluribus dissitis, sensim in bracteis abeuntibus obsesso, glanduloso-puberulo; foliis erecto-patentibus, petiolatis, oblique ellipticis, acuminatis, basi cuneatis; utrinque glabris, 7–12 cm longis, medio fere 2.5–4.5 cm latis, petiolo basi

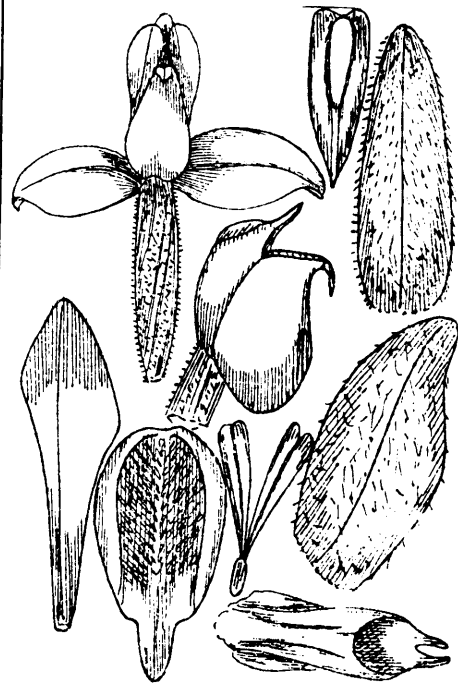
dilatata caulem vaginante, 3–4.5 cm longo; spica dense multiflora, elongata, usque ad 20 cm longa, c. 0.8–0.9 cm diametiente; bracteis lanceolatis, acuminatis, glanduloso-puberulis, ovario aequilongis vel paulo longioribus; floribus, illis *H. oblongifoliae* Bl. paulo majoribus, suberectis; sepalo intermedio ovato obtuso, extus glanduloso-puberulo, 3.5 mm longo, lateralibus oblique oblongis, obtusis, extus glanduloso-puberulis, intermedio paulo longioribus; petalis e basi angustata oblique et late rhombeis, obtusis, glabris, sepalis lateralibus subaequilongis; labello circuito ovato-lanceolato, cucullato, antice in acumen vel lobulum obtusum parvulum producto, marginibus incurvis, intus basi papillis sparsis falcato-subulatis ornato, petalis aequilongo; columna suborbiculari; anthera ovato-cucullata, basi cordata, acuminata; ovario glanduloso-puberulo, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the Garup [River], alt. c. 150 m—R. Schlechter no. 20349, flowering in Sept. 1909; in humus in the forests of Kelel, alt. c. 400 m—R. Schlechter no. 16499 (TYPE), flowering in Sept. 1907.

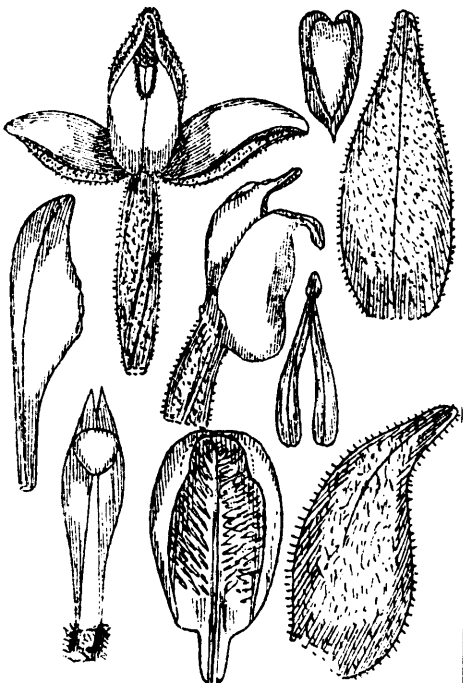
The plant resembles *H. Erimae* Schltr. strikingly but is distinguished by much broader petals and a narrower labellum; the flowers also are larger.

Earlier, I believed in the necessity of including more species, however, in introducing a certain variability I think it better to accept only these two species.

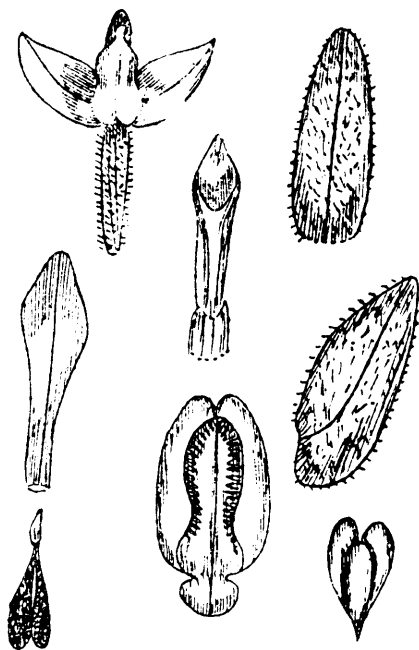
GROUP IX. *Physurinae*



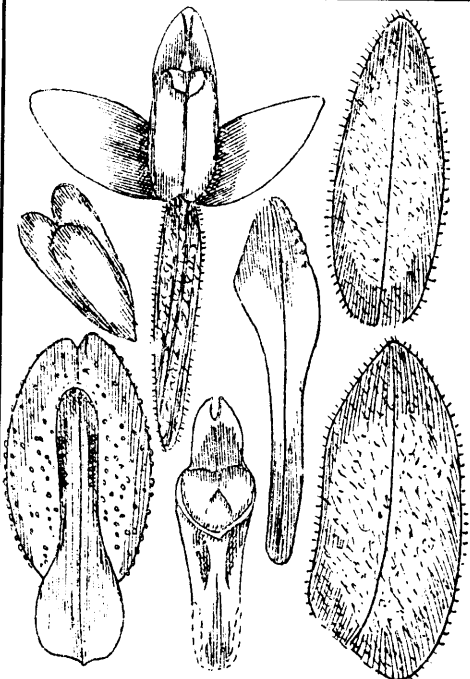
Goodyera papuana Ridl.



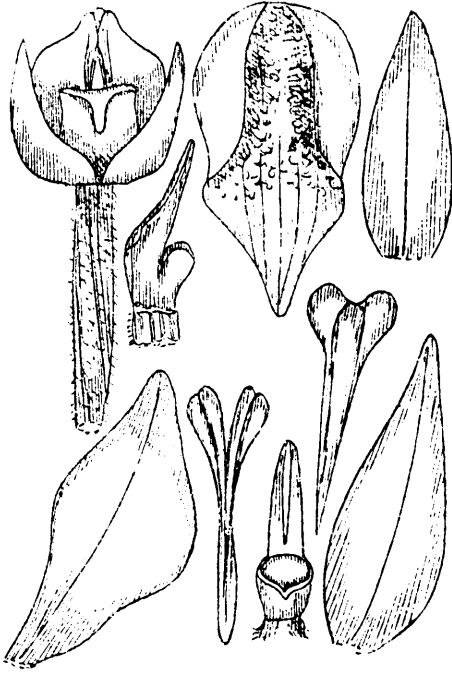
Goodyera rubicunda Lindl.



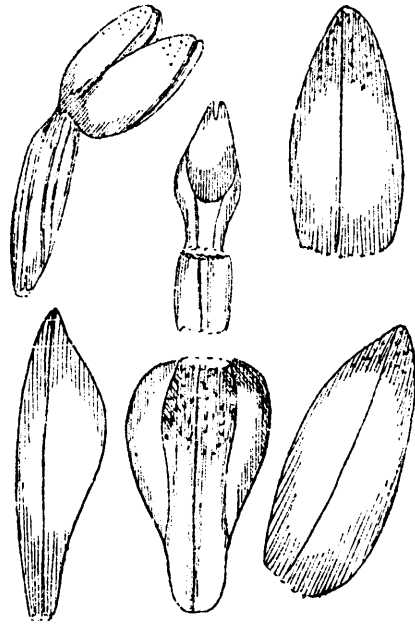
Goodyera erythrodoides Schltr.



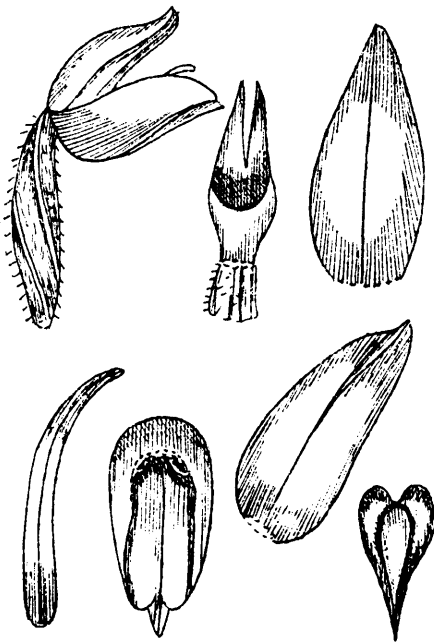
Goodyera angustifolia Schltr.



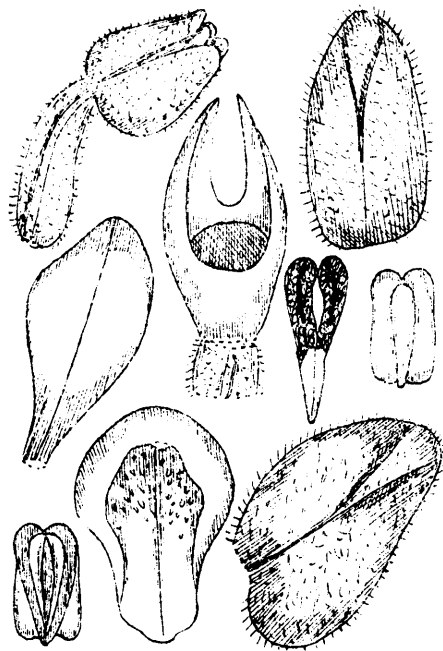
Goodyera brachiorrhynchos Schltr.



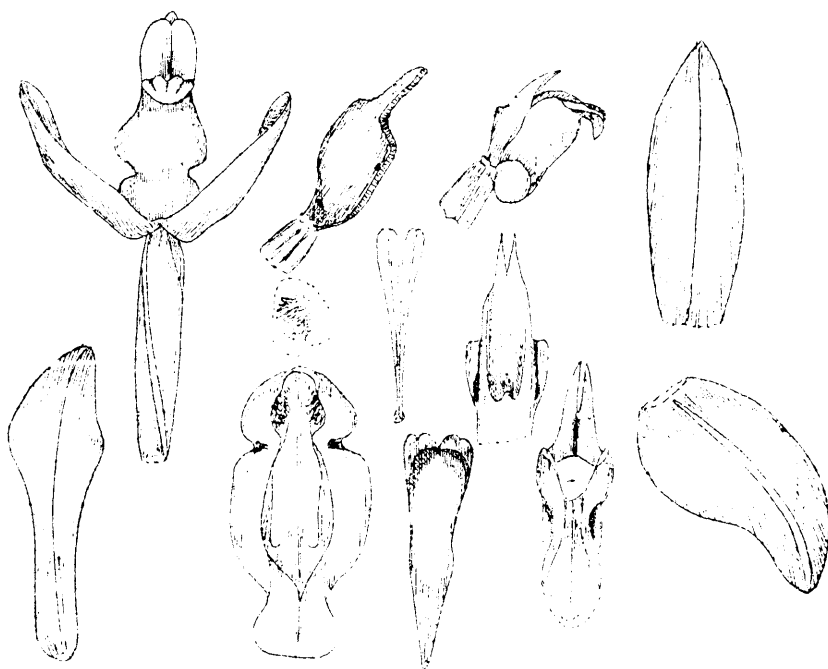
Goodyera lamprotaenia Schltr.



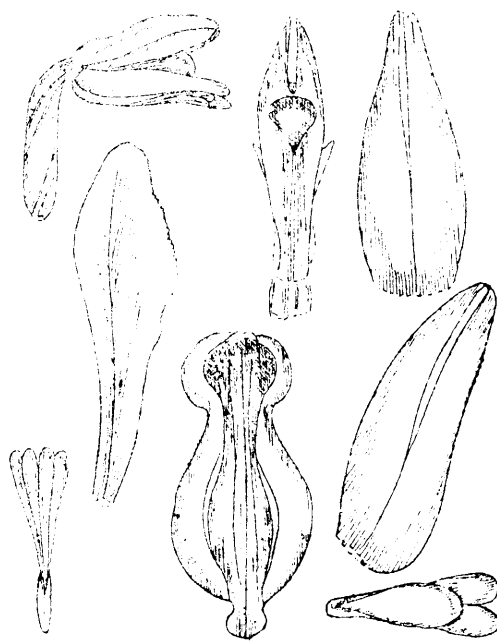
Goodyera stenopetala Schltr.



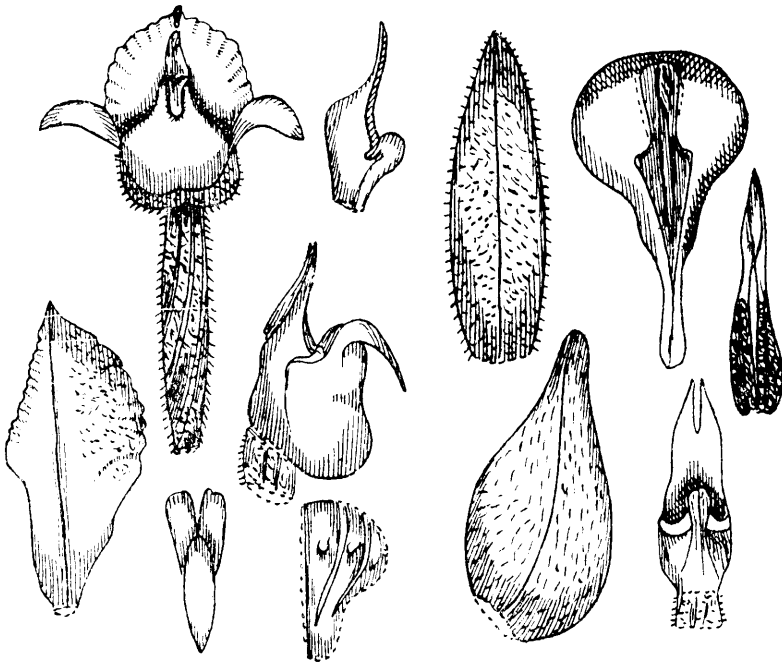
Goodyera venusta Schltr.



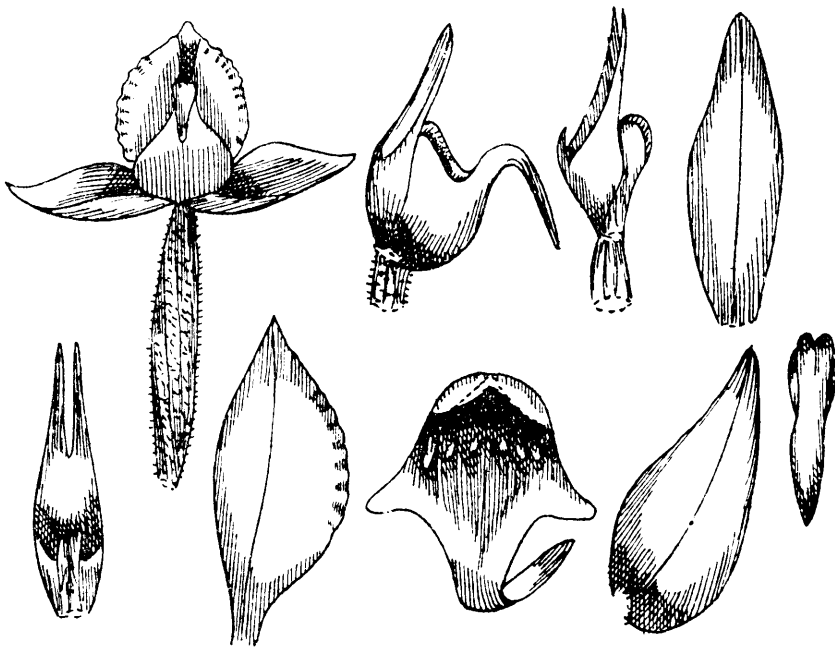
Platylepis lamellata Schltr.



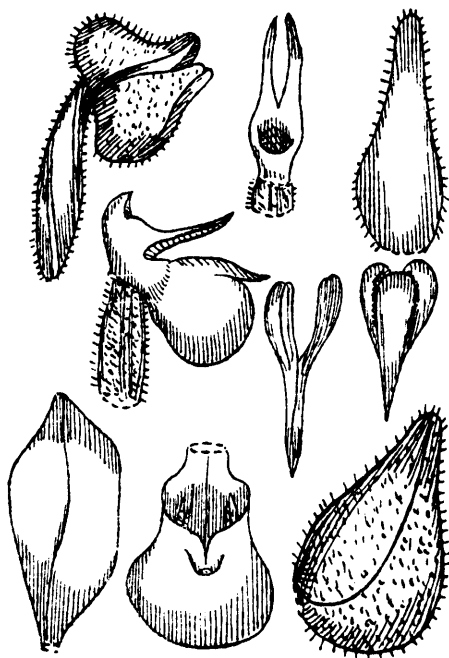
Platylepis zeuxinoides Schltr.



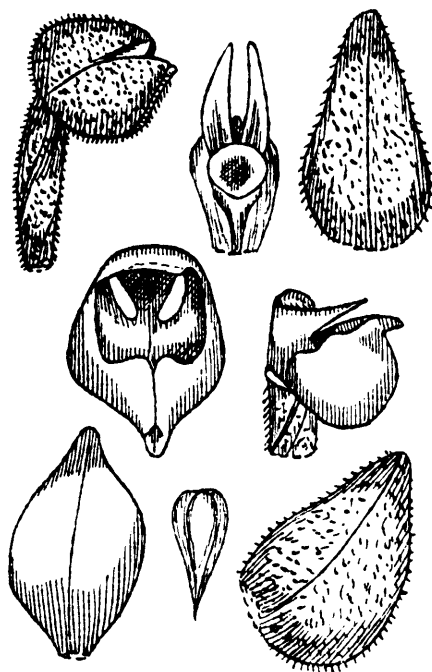
Lepidogyne sceptrum Schltr.



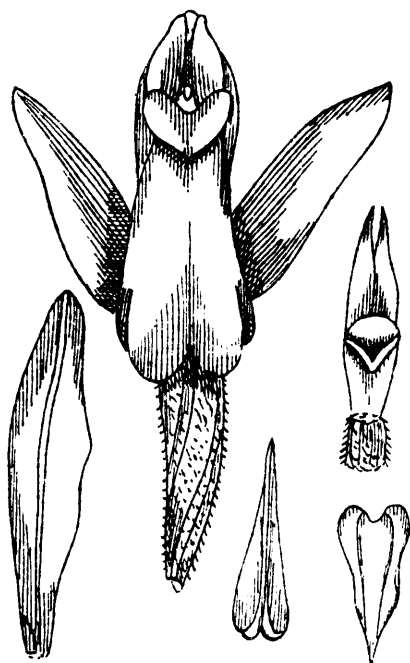
Lepidogyne minor Schltr.



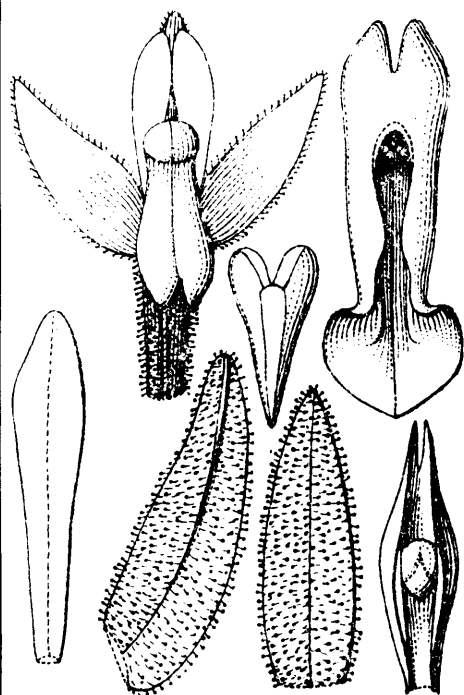
Hylophila gracilis Schltr.



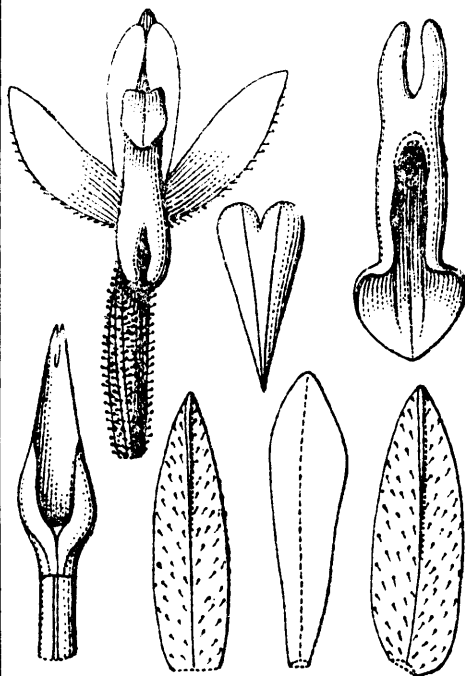
Hylophila orientalis Schltr.



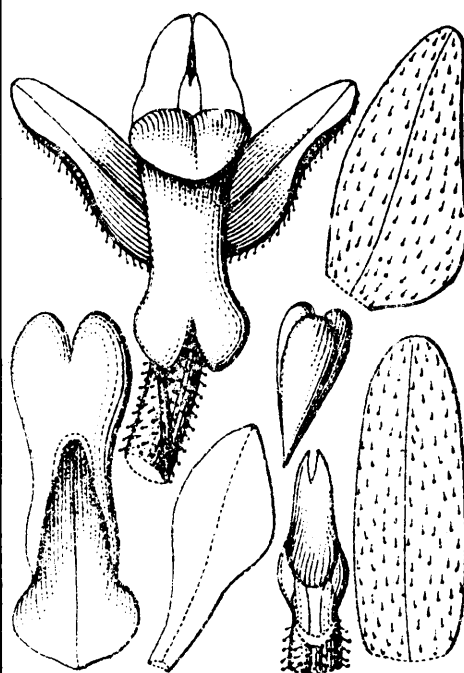
Erythroides papuana Schltr.



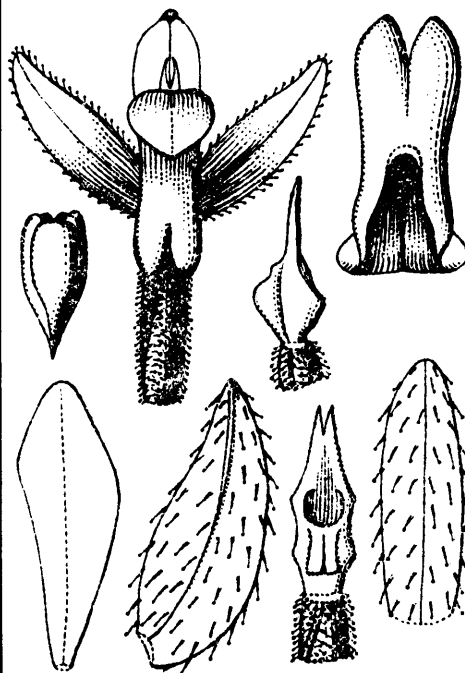
Erythrodes torricellensis Schltr.



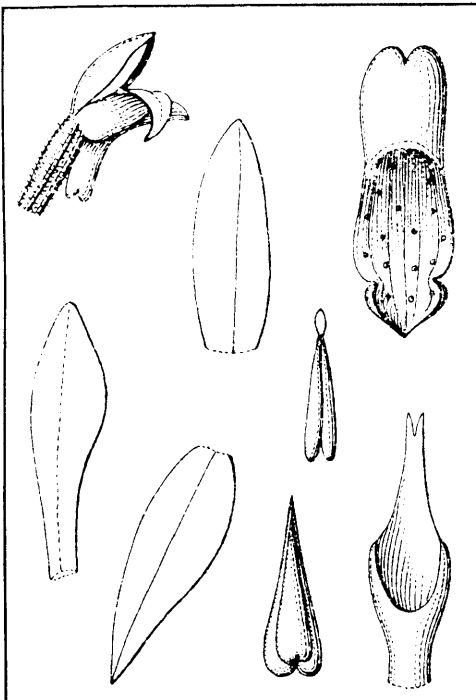
Erythrodes forcipata Schltr.



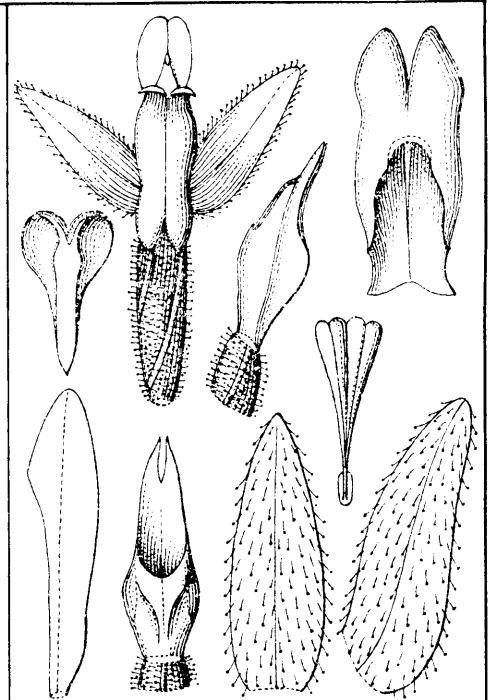
Erythrodes glaucescens Schltr.



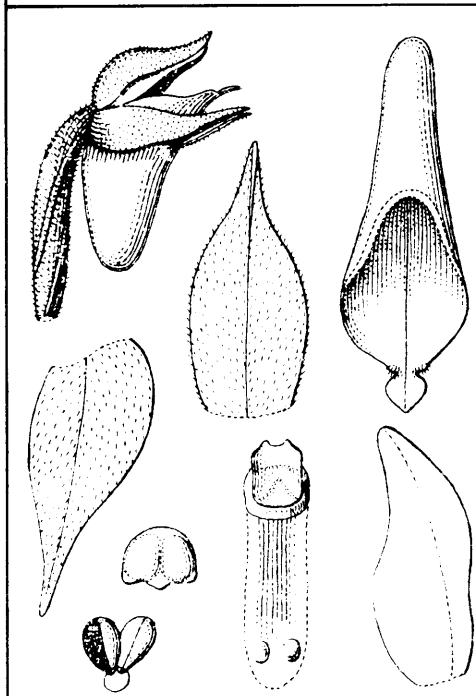
Erythrodes bicarinata Schltr.



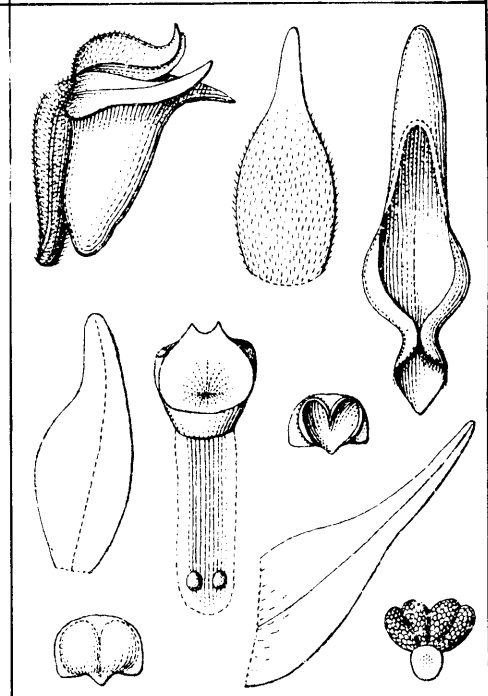
Erythroides purpurascens Schltr.



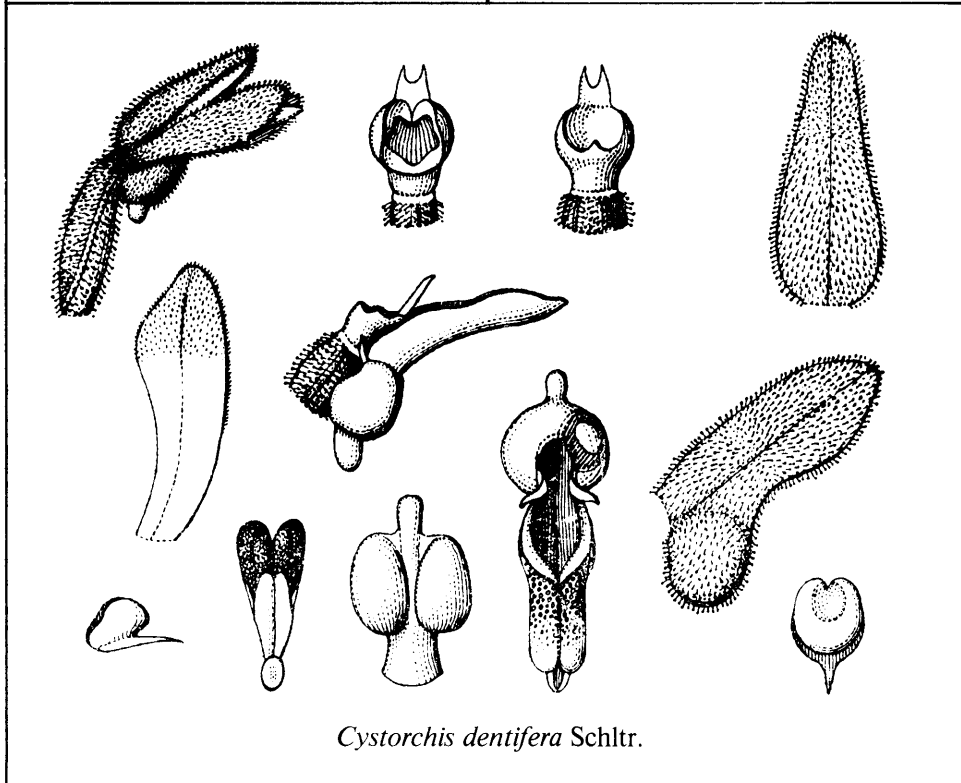
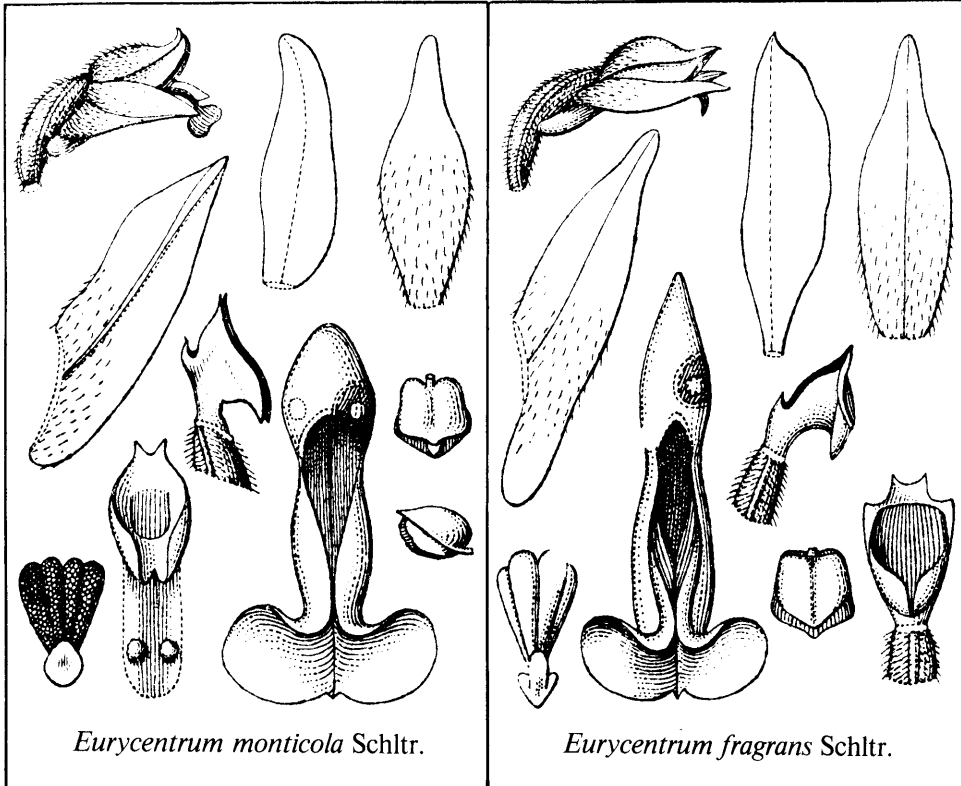
Erythroides praemorsa Schltr.

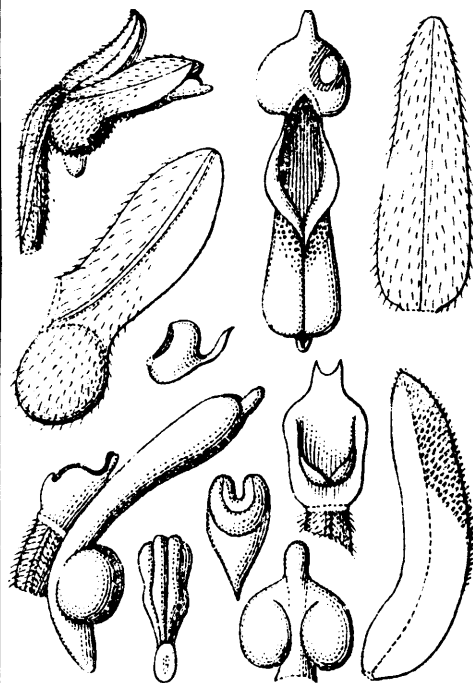


Eurycentrum salomonense Schltr.

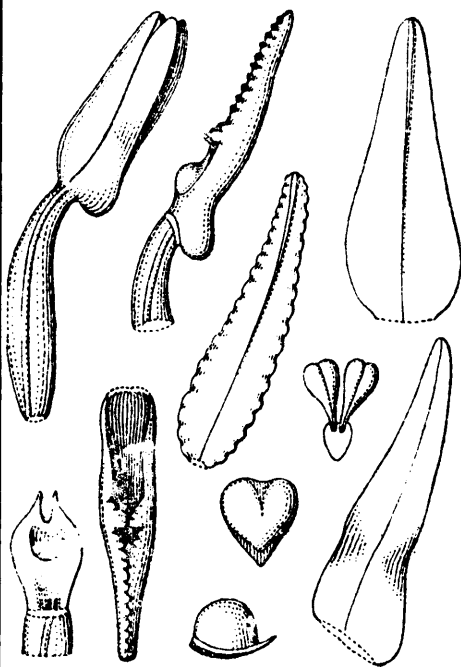


Eurycentrum obscurum (Bl.) Schltr.

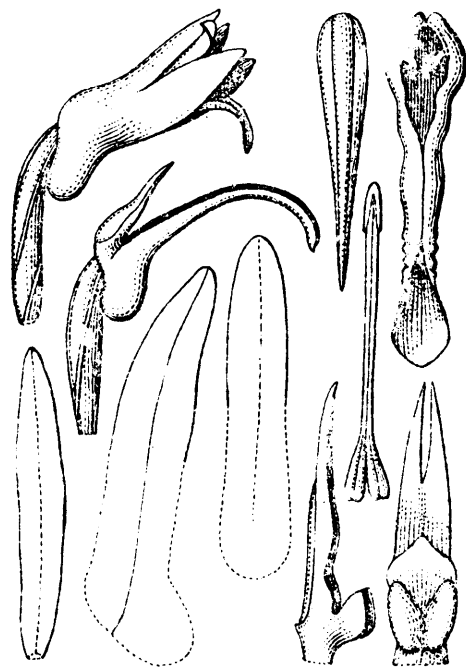




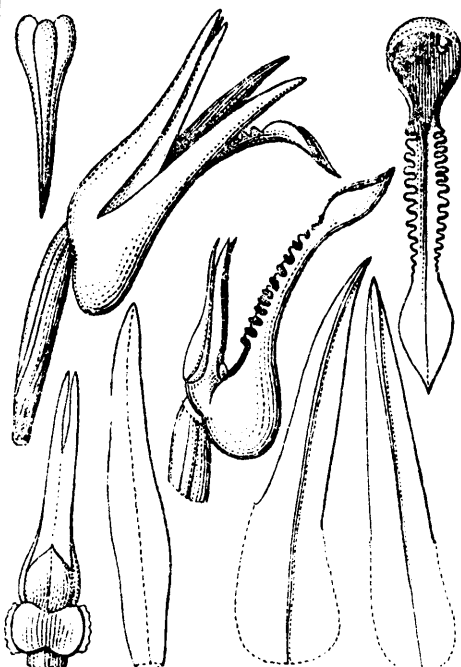
Cystorchis orphnophylla Schltr.



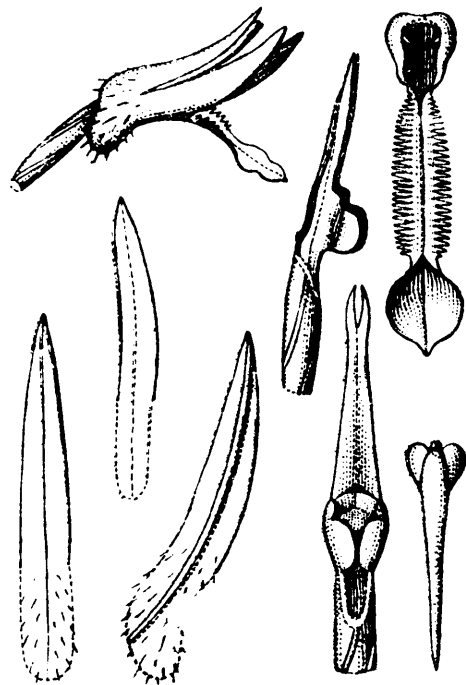
Cystorchis peliocalos Schltr.



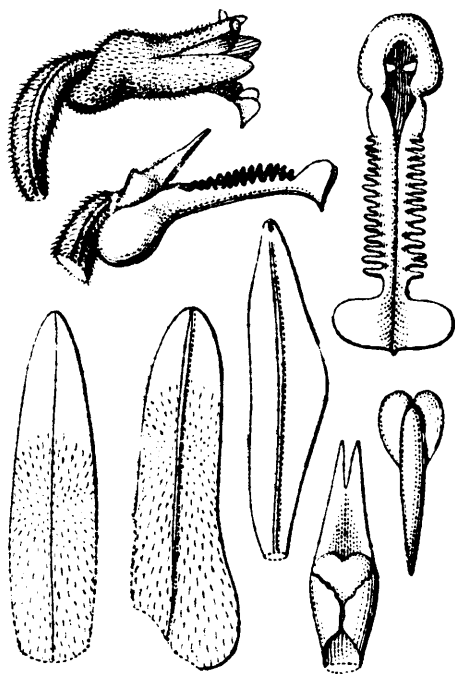
Cystopus coeruleus Schltr.



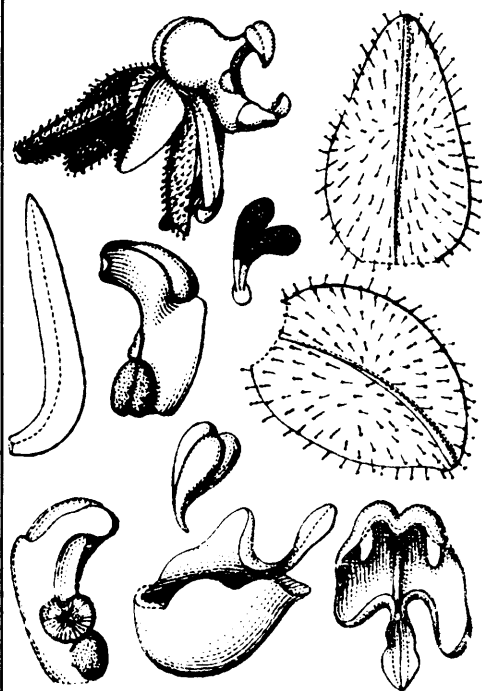
Cystopus fimbriatus J.J. Sm.



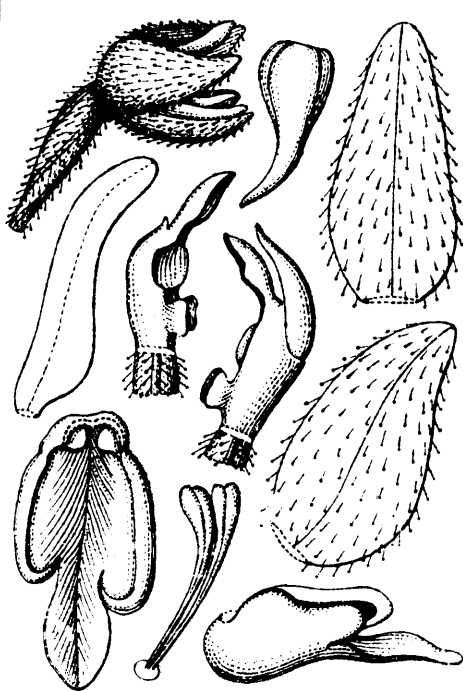
Cystopus pectiniferus Schltr.



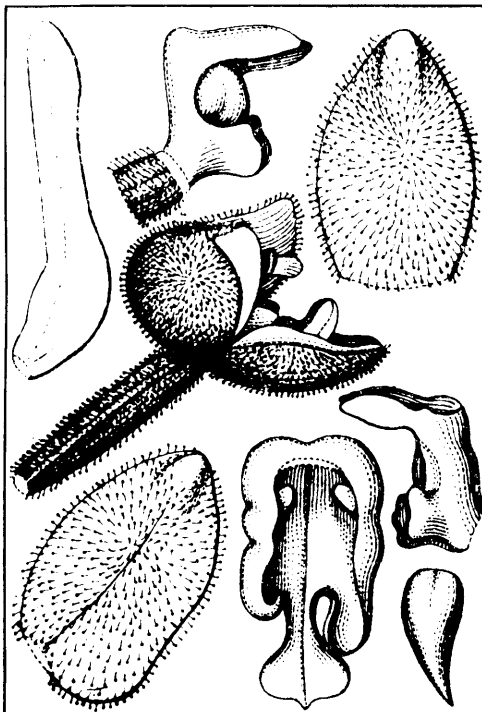
Cystopus puberulus Schltr.



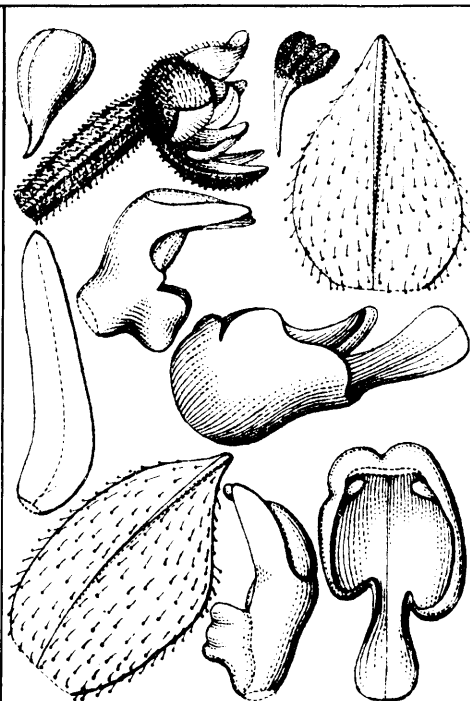
Macodes Sanderiana (Krzl.) Rolfe



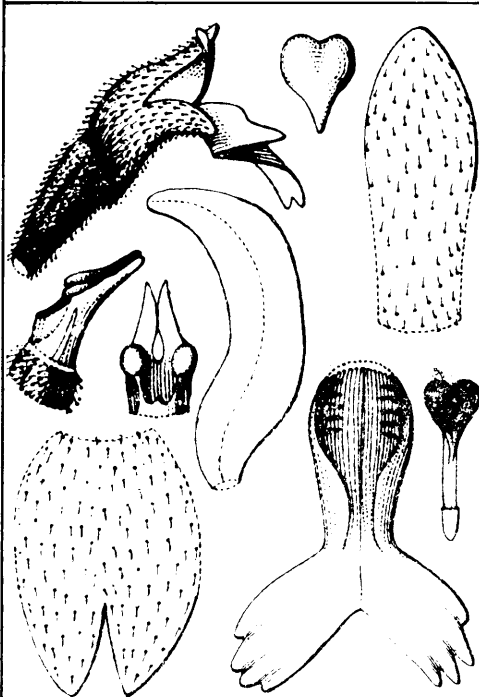
Macodes pulcherrima Schltr.



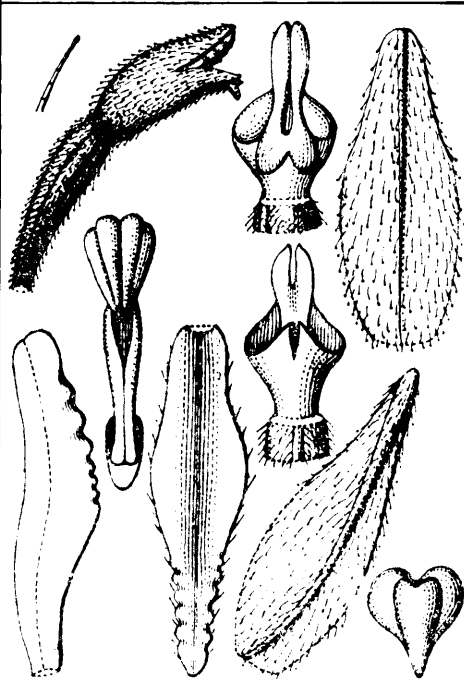
Macodes obscura Schltr.



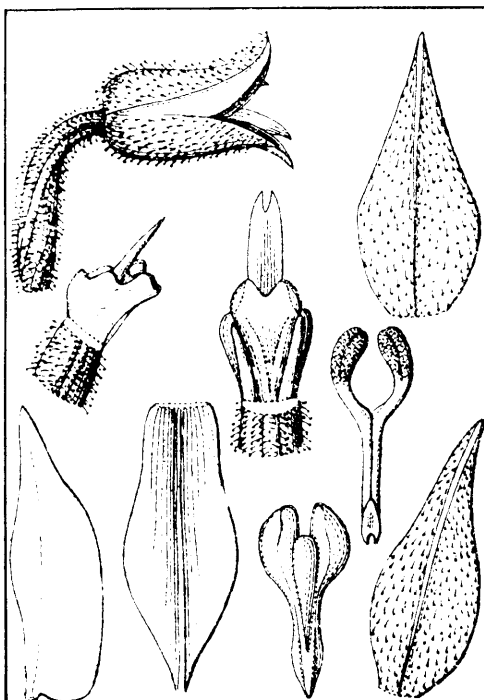
Macodes dendrophila Schltr.



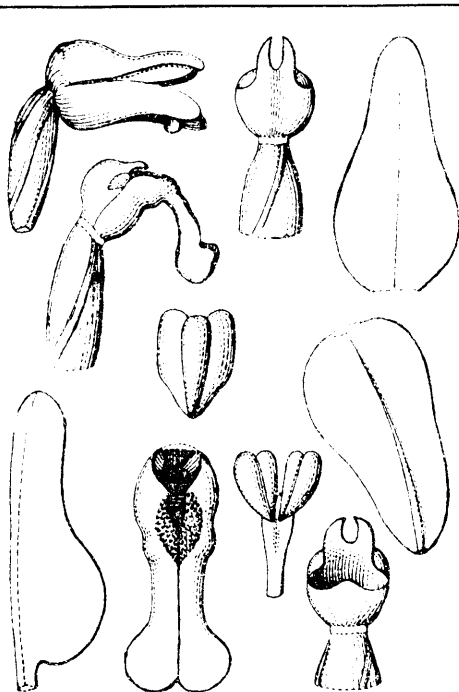
Cheirostylis dendrophila Schltr.



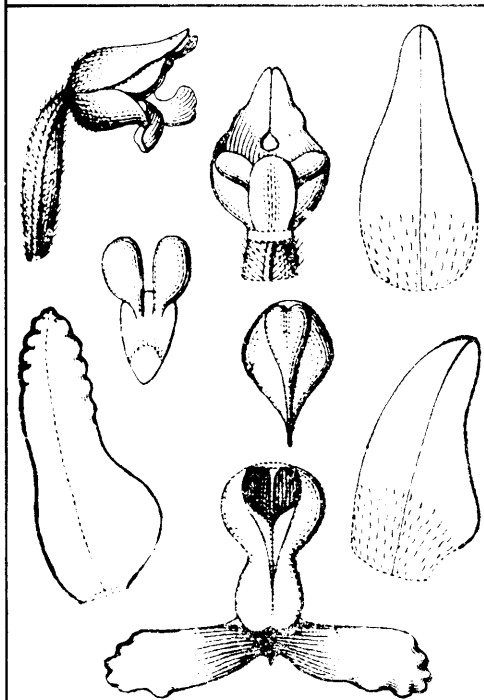
Cheirostylis dendrophila Schltr.
var. *lancilabris* Schltr.



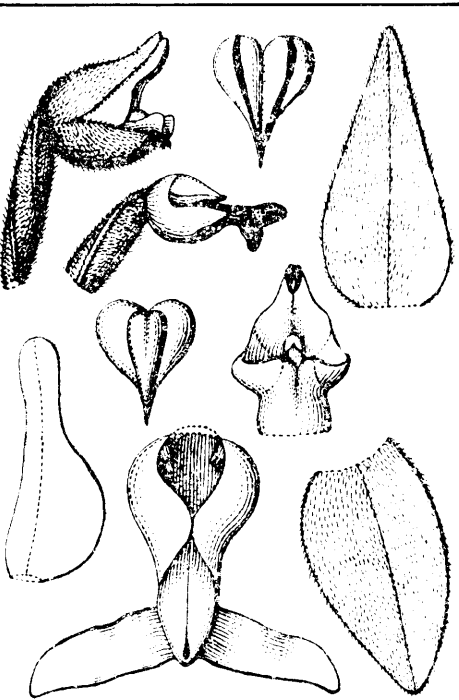
Eucosia papuana Schltr.



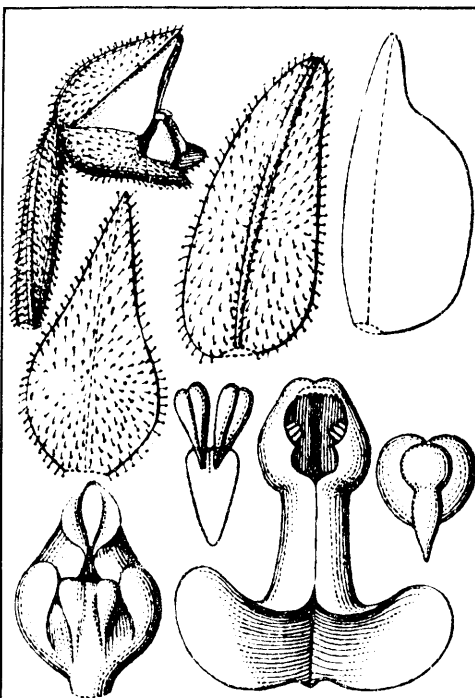
Zeuxine wariana Schltr.



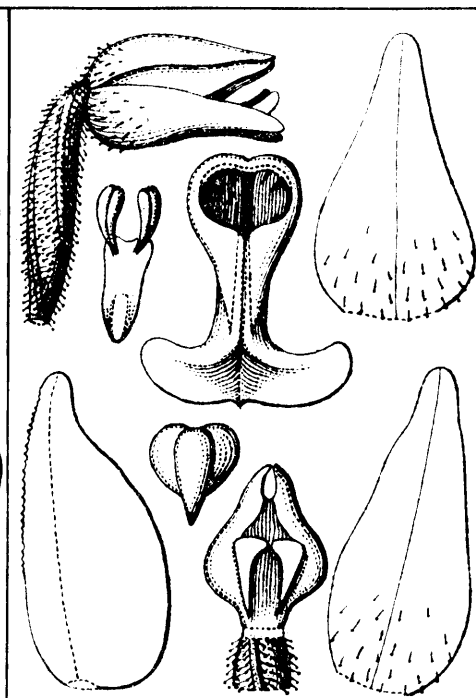
Zeuxine leucoptera Schltr.



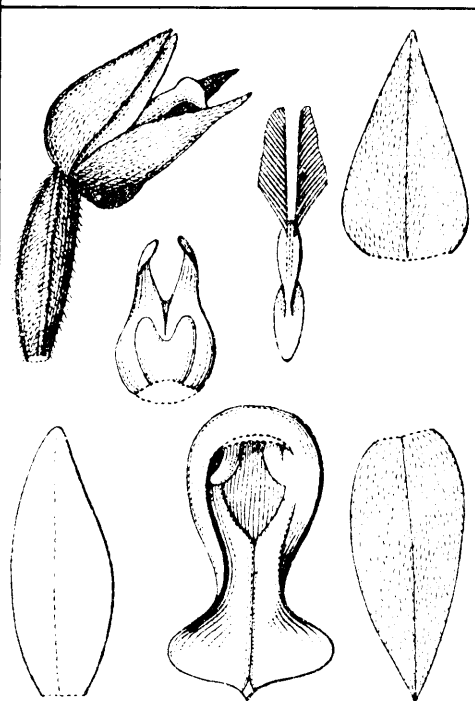
Zeuxine montana Schltr.



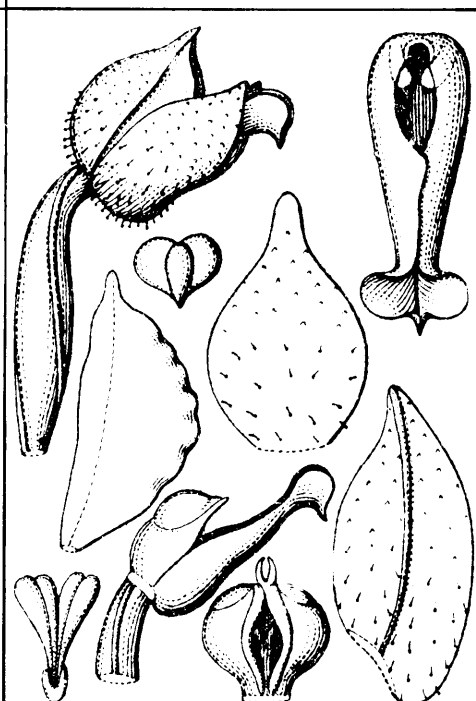
Zeuxine elatior Schltr.



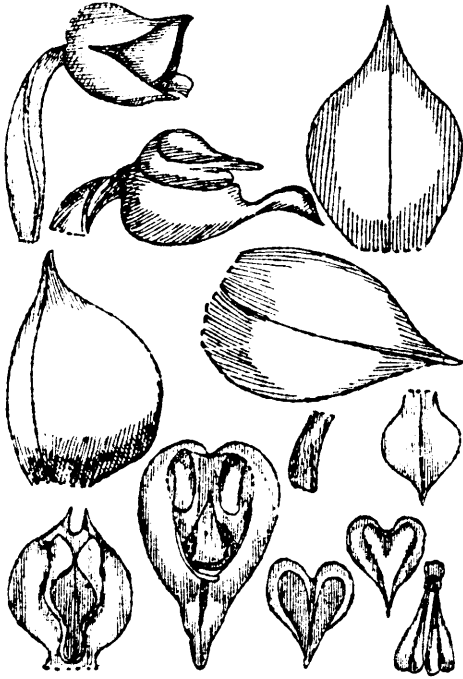
Zeuxine argentea Schltr.



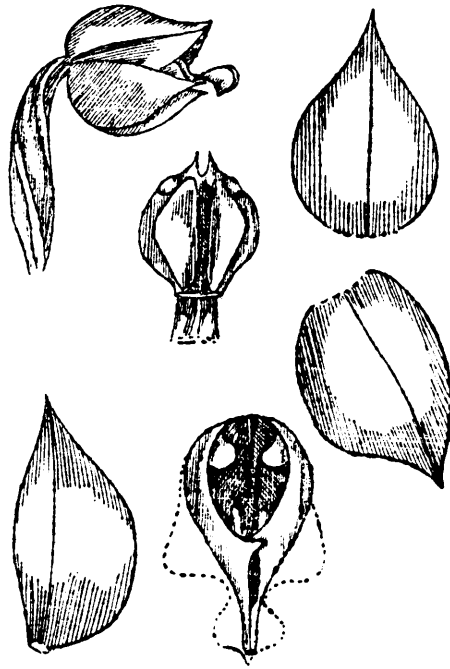
Zeuxine Erimae Schltr.



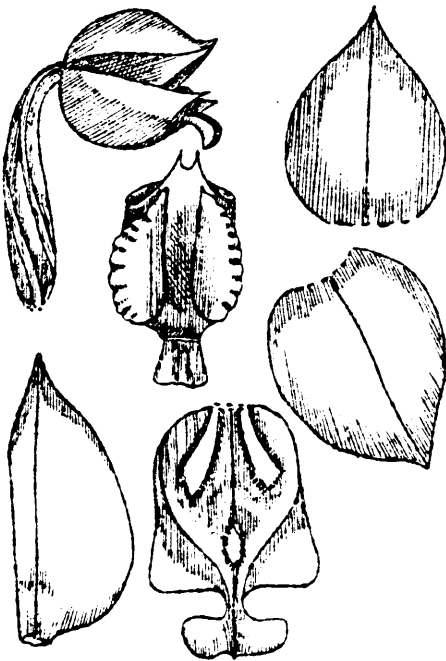
Zeuxine alticola Schltr.



Zeuxine torricellensis Schltr.



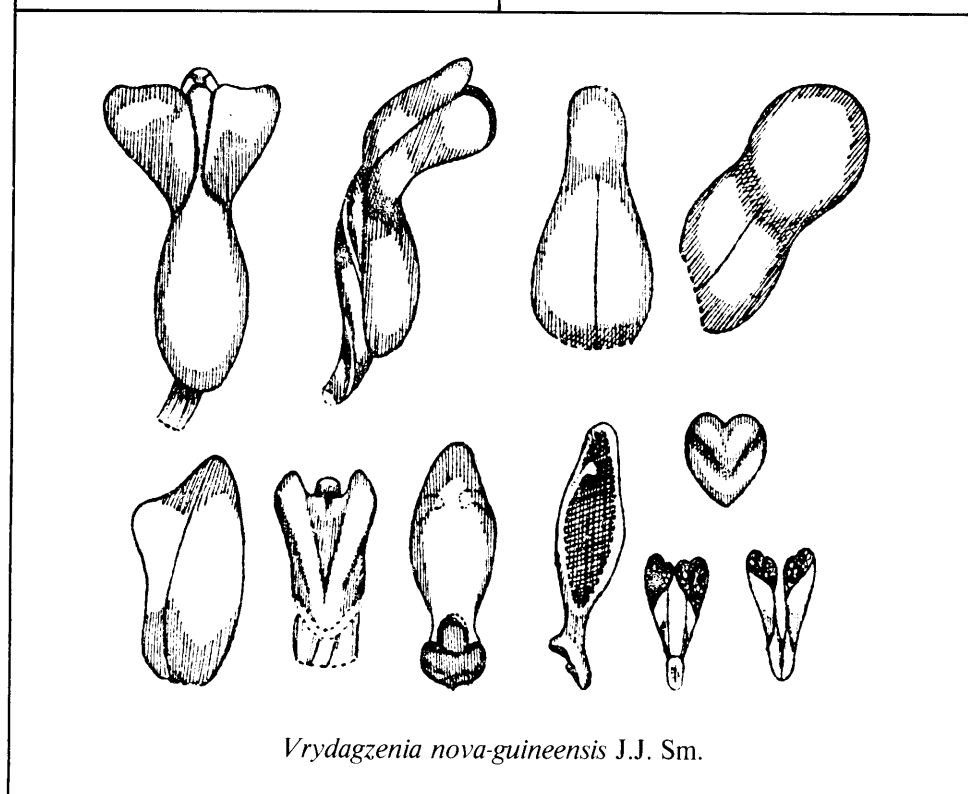
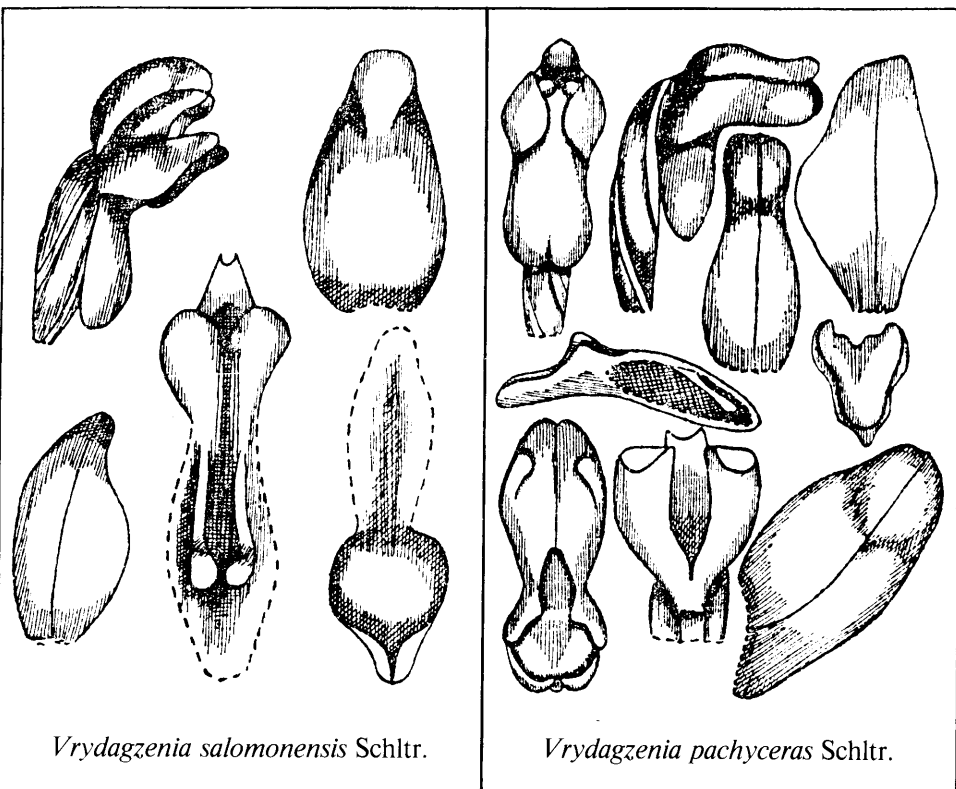
Zeuxine atrorubens Schltr.

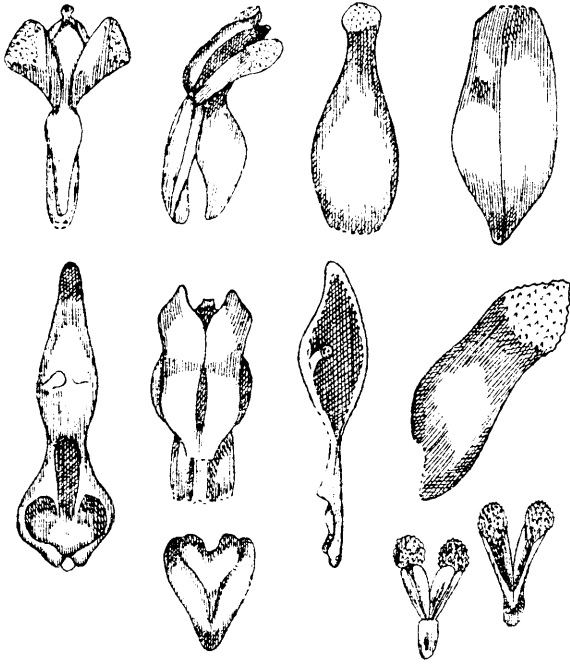


Zeuxine Novae-Hiberniae Schltr.

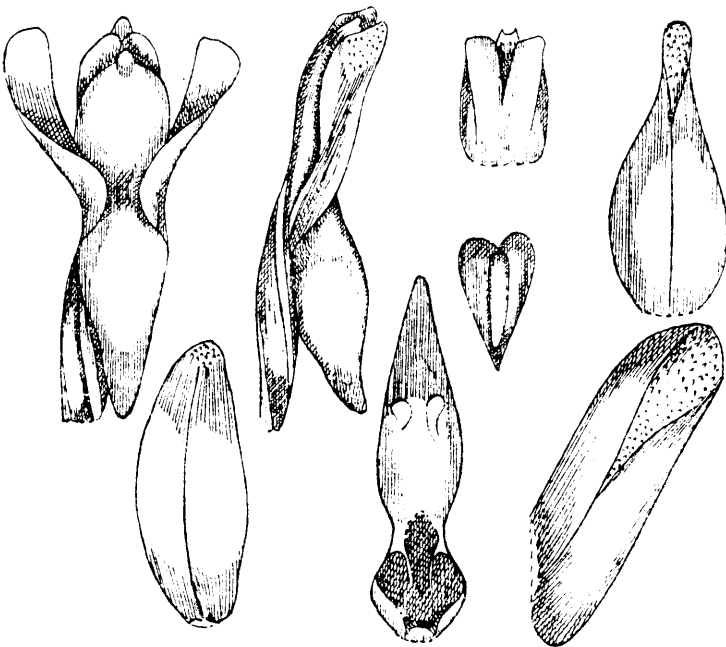


Zeuxine dipera Schltr.

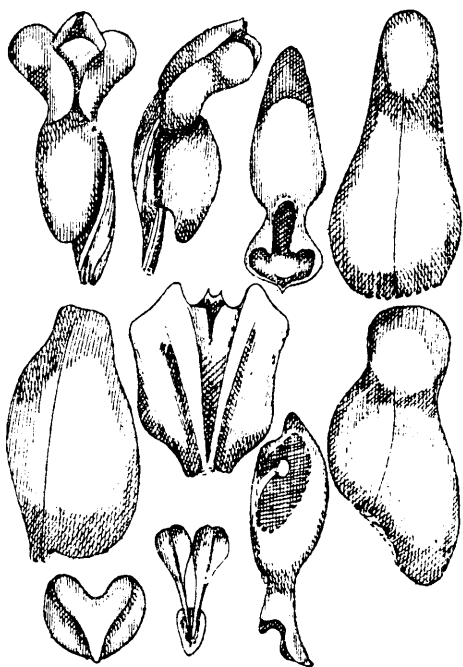




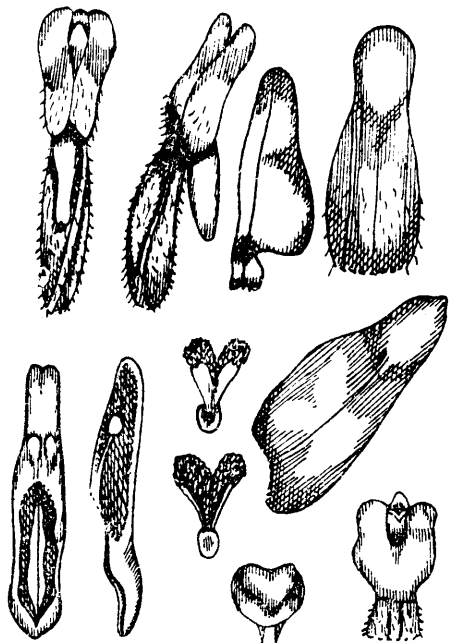
Vrydagzenia rivularis Schltr.



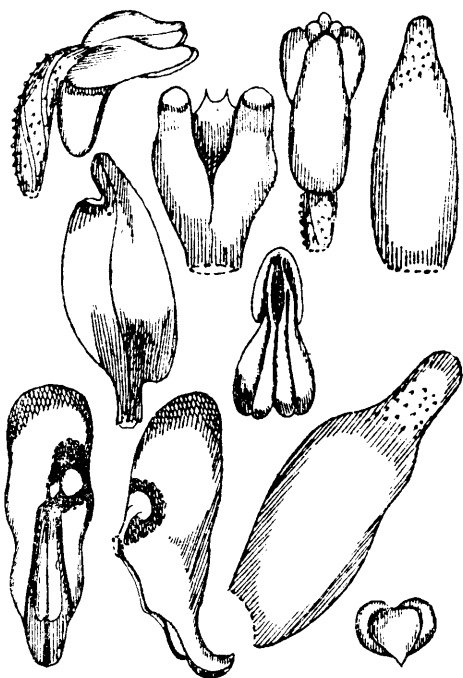
Vrydagzenia neo-hibernica Schltr.



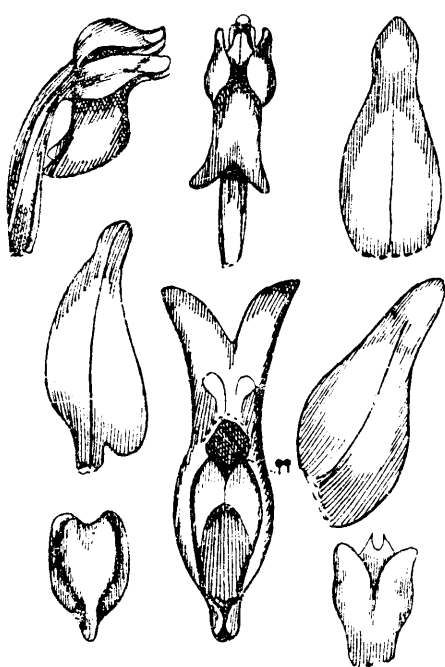
Vrydagzenia Schumanniana Krzl.



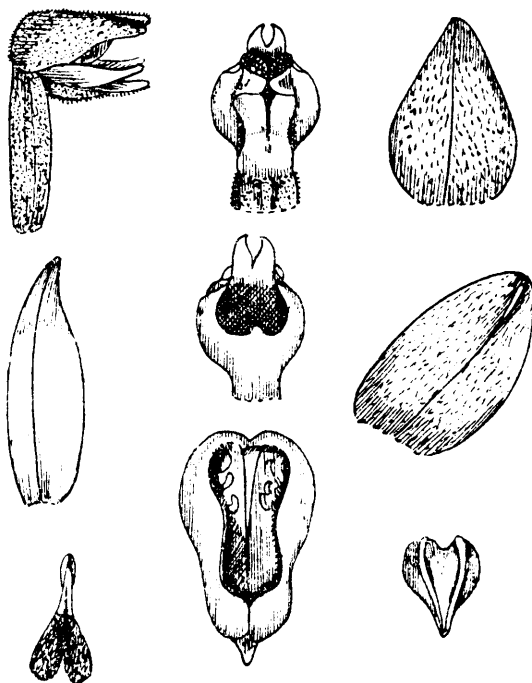
Vrydagzenia albostrata Schltr.



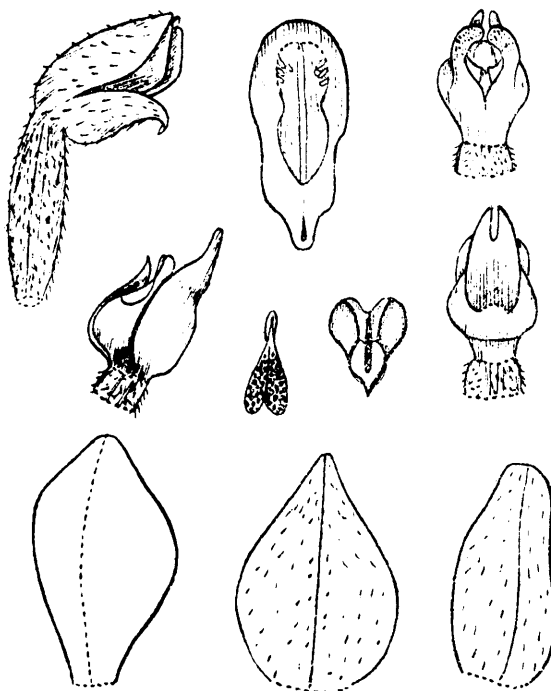
Vrydagzenia truncicola Schltr.



Vrydagzenia argyrotaenia Schltr.



Hetaeria Erimae Schltr.



Hetaeria latipetala Schltr.

Group X *Tropidiinae*

This group consists of three genera: *Tropidia* Bl., *Rolfea* Zahlbr. and *Corymbis* Thou., which are related closely to each other, but form a well-defined group by themselves, in both habit and floral structure. The species belong chiefly to the Old World, but in the New World a separate form has developed in *Rolfea* Zahlbr., which is placed alongside the two *Tropidias*: *T. decumbens* (Lindl.) Schltr. and *T. polystachya* (Sw.) Ames. *T. decumbens* (Lindl.) Schltr. provides, in a way, a transition to *Corymbis* Thou., a plant which seems to belong entirely to the Old World.

30. *Tropidia* Bl.

In this genus there is now abundant material from New Guinea, and yet I wish to say that this is still insufficient to make a sharp delimitation of the species in every case. For instance, I often had the impression, when collecting *T. disticha* Schltr., that I could see differences from the Type of the species, although this could not be substantiated by analysis of the flower. To clarify the matter we must depend upon long and careful study in the native habitats of the plants. All species belonging to this genus are inhabitants of the primary forests where they always grow in the shade of tall trees or shrubs; sometimes, as in the case of *T. gracilis* Schltr., as shrublets, but sometimes as shrubs upwards of a metre in height and bearing very little resemblance to an orchid.

1. *T. disticha* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 94.

Kaiser-Wilhelms-Land: In the forests at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14585, flowering in Apr. 1902; in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17357, flowering in Feb. 1908; in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13890, flowering in Jan. 1902; in the forests at the foot of the Bismarck Range, alt. c. 200 m—R. Schlechter no. 14090, flowering in Jan. 1902; in humus in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 18676, flowering in Nov. 1908; in the forests near Constantinhafen, alt. c. 30 m—R. Schlechter no. 14298, flowering in Mar. 1902; in humus in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17915, flowering in July 1908; in humus in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 19191, flowering in Jan. 1909; in the mountain forests near Jaduna, alt. c. 300 m—R. Schlechter no. 19299, flowering in Apr. 1909; in humus in the forests near Pema, alt. c. 200 m—R. Schlechter no. 17461, flowering in Mar. 1908; in humus in the mountain forests near the Waube Creek, alt. c. 400 m—R. Schlechter no. 19433, flowering in May 1909.

Neu-Mecklenburg: In the mountain forests near Punam, alt. c. 500 m—R. Schlechter no. 14701, flowering in July 1902.

As may be seen from the above enumeration of localities this species, at least as far as I have felt compelled to circumscribe it, is distributed widely in the Territory. Whether *T. triloba* J.J. Sm. should really be separated from it specifically, I am rather doubtful; it will be necessary to compare living material. In other respects the species is related closely to *T. effusa* Rehb. f.

2. *T. multinervis* Schltr., sp. nov.

Terrestris, erecta, 7–20 cm alta, e basi pauci-ramosa; rhizomate erecto, abbreviato; radicibus filiformibus, elongatis, flexuosis, sparsim puberulis vel glabratibus; caulibus paucis simplicibus usque ad apicem fere foliatis, omnino vaginis foliorum angulato-plicatis, alte amplexentibus obtectis; foliis patentibus, 4–8, ellipticis, acuminatis, plicatis, multinerviis, 3.5–8.5 cm longis, medio vel infra medium 1.5–3 cm latis, internodiis bene longioribus; spica brevi, pedunculata, erecta vel arcuata, interdum basi

ramulo singulo aucta, disticha, usque ad 20-flora et 3 cm longa; bracteis bifariis, conduplicatis, patentibus vel divaricatis, late ovatis, acuminatis, ovarium superantibus; floribus ut videtur in genere inter minores, erecto-patentibus, extus squamulis brunneis adpressis puberulis; sepalis lanceolato-ligulatis, 0.4 cm longis, lateralibus falcato-obtusis, extus nervo medio carinato-incrassatis; petalis oblique lanceolatis, obtusiusculis, nervo medio extus incrassato puberulo excepto glabris, sepalis paulo brevioribus; labello circuitu ovato, concavo, basi subsacculato, antice marginibus incurvulis deflexo, subacuto, intus basi nervo medio incrassato, petalis fere aequilongo; columna gracili mediocri; stigmatibus antice hyalino-marginato; anthera ovato-cordata, cucullata, dorso umbone lanceolato donata; ovario cylindraceo, sparsim nigro-squamuloso, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests at the mouth of the Waria, alt. c. 20 m—R. Schlechter no. 19937, withered flowers in July 1909; in humus in the forests near Kamadu on the Waria [River] alt. c. 100 m—R. Schlechter no. 19230, in bud in Apr. 1909.

I have never been fortunate enough to find this species in flower. The description of the floral parts, therefore, had to be done from the buds and the size relationships from a faded flower. The species, however, is so different from *T. disticha* Schltr. with its multi-veined, markedly folded leaves and the small flowers, that I did not hesitate to describe it from the aforementioned material. The flowers are clearly white-yellow.

3. *T. gracilis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 95.

Kaiser-Wilhelms-Land: In the forests on the upper Ramu [River], near the Goldfield Station, alt. c. 100 m—R. Schlechter no. 13869, flowering in Jan. 1902.

I have observed this, or a similar species, also in 1908 in the forests on the Minjem [River] and at the foot of the Bismarck Range near the Saugueti Base, but without flowers.

4. *T. acuminata* Schltr., sp. nov.

Terrestris, erecta, fruticosa, 50–70 cm alta; rhizomate valde abbreviato; radicibus elongatis, flexuosis, rigidulis; caulibus gracilibus, simplicibus vel parum ramosis, rigidis, basi excepta bene foliatis, vaginis foliorum alte amplexantibus striato-nervosis omnino obtectis; foliis erecto-patentibus patentibusve, ellipticis, acuminatis, basi angustatis, glabris, subtus nervis primariis 7 donatis, usque ad 21 cm longis, medio fere usque ad 5.5 cm latis; spicis terminalibus, dense plurifloris, abbreviatis, pedunculo flexuoso, vaginulis paucis, lanceolatis, obesso, 1.5–2.5 cm longo; bracteis patentibus, lanceolatis, acutis, inferioribus flores vulgo superantibus, superioribus sensim brevioribus; floribus mediocribus erecto-patentibus, inversis, ochroleucis; sepalis lanceolatis, acuminatis, basi extus squamulis minutis nigro-puberulis, 0.9 cm longis, lateralibus obliquis, tertia parte basilari inter se connatis, apicibus subfalcato-incurvulis; petalis oblique lineari-lanceolatis, acuminatis, sepalis paululo brevioribus, nervo medio extus incrassato, glabris; labello e basi cucullato-concava ovato, acuminato, supra medium marginem versus intus utrinque lamella mox evanida ornato, glabro, 0.8 cm longo, supra basin 0.4 cm lato, supra medium 0.3 cm lato, nervo medio intus paulo incrassato; columna teretiuscula, gracili, glabra, c. 0.4 cm longa, rostello erecto, parvulo; stigmatibus anguste hyalino-marginato; ovario cylindraceo nigro-puberulo, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna, alt. c. 250 m—R. Schlechter no. 19333, flowering in Apr. 1909.

This species is, evidently, related to *T. ramosa* J.J. Sm. It is distinguished by the acuminate sepals and petals of which the two lateral sepals are connate at the base for at least one third of their length. To this [species] probably belongs also a plant which I collected in the Waria District on the heights at Udu, in young buds, under no. 17447; it had narrower leaves than the Type.

5. *T. similis* Schltr., sp. nov.

T. squamata Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 95 (nec Bl.).

Erecta, fruticosa, usque ad 100 cm alta, pluricaulis; rhizomate valde abbreviato; caulibus vulgo simplicibus, basi excepta usque ad apicem bene foliatis, vaginis foliorum arcissime et alte vaginantibus omnino obtectis; foliis erecto-patentibus, elliptico-lanceolatis, apice subcaudato-attenuatis, apice ipsa obtusiusculis, utrinque glabris, subtus 5-nerviis, usque ad 25 cm longis, medio

fere usque ad 3.2 cm latis; spicis sub-sessilibus vel brevissime pedunculatis, lateralibus, (interdum una caulem terminante) valde abbreviatis, paucifloris; bracteis ovatis, apiculatis, bifaris, imbricantibus, nervosis, glabris, floribus brevioribus; floribus in genere inter majores, ochroleucis, extus squamellis nigro-puberulis; sepalis lanceolatis, acutis vel acuminatis, 1.3 cm longis, lateralibus obliquis, subfalcatis; petalis lanceolato-ligulatis, acutis, falcatis, nervo medio extus incrassato nigro-puberulo excepto glabris, sepalis subaequilongis; labello e basi ovato-cucullata ovato-lanceolato, apice recurvo, acuto, glabro, intus medio marginem versus utrinque toro lanceolato donato, petalis aequilongo, supra basin 0.3 cm longo, supra medium aequilato; columna teretiuscula, c. 0.6 cm longa, glabra, supra medium utrinque subcarinato dilatata, rostello parvulo; anthera ovato-lanceolata, rostrata, apice breviter excisa; ovario nigro-puberulo, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 14426, flowering in Apr. 1902.

This is the plant which I presented in K. Schum. et Laut., Nachtr. [1905], p. 95 as *T. squamata* Bl., but I am now convinced that it is better regarded as a separate species distinguished by the elongated tail of the drop-like apex, larger flowers and the labellum. I did not find the plant again during my last expedition, although I visited the same location. Many *Tropidias* of this relationship flower only for a short time during the year, unlike the relatives of *T. disticha* Schltr. which flower all the year round.

31. *Corymbis* Thou.

In spite of the abundant material sent during the last 10 years by different collectors from Africa, Asia and the whole monsoon region, no sharp distinctions are known for the separation of the species of this genus, so that we are compelled to be satisfied with the characteristics offered in size relationships. The species look so different from each other in the living state, that it is difficult to understand why so few separating characteristics are found in herbarium material. For elucidation of this genus a critical examination of living material is necessary. During my last journeys to New Guinea and the Celebes I got to know four different species and am convinced that two of the plants of *C. veratrifolia* (Bl.) Reichb. f., occurring in New Guinea, are really different species. The third I regard, for the present, as *C. veratrifolia* even though I would like to doubt somewhat its identity with the Javanese species.

Like *Tropidia*, the species of this genus grow as shrubs in the humus of the forests but they are not found much above an altitude of 1000 metres.

1. *C. Lauterbachii* Schltr., sp. nov.

Terrestris, erecta, usque ad 1.30 m alta, pluricaulis; rhizomate abbreviato; radicibus rigidulis, flexuosis, demum glabratibus; caulibus simplicibus, usque ad apicem bene foliatis, vaginis foliorum arete amplectentibus omnino obtectis; foliis erecto-patentibus, linearibus vel lineari-lanceolatis, acutis, usque ad 40 cm longis, medio fere usque ad 1.5 cm latis; inflorescentiis erecto-patentibus, paniculatis, breviter pedunculatis, laxe multifloris, ramis alternantim bifariis; bracteis lanceolatis, acuminatis, ovario aequilongis vel paulo longioribus; floribus in genere inter minores, erectis, pallide flavidis, glabris sepalis lanceolato-ligulatis, acutiusculis, 1.5 cm longis, lateralibus obliquis, tertia parte apicali paulo dilatatis; petalis longius unguiculatis, lamina oblique lanceolato-elliptica, apiculata, margine leviter undulata, glabris, sepalis fere aequilongis; labello e basi ligulato-unguiculata antice in laminam suborbicularem, apiculatam, margine undulato-plicatam dilatato, carinis 2 e basi parallelis usque ad basin laminae decurrentibus, apice falcato-divergentibus; columna gracili, teretiuscula, rostello mediocri, 1.3 cm longa, glabra; ovario cylindrico, glabro, c. 1 cm longo; capsula cylindracea, 6-costata, costis leviter undulatis, c. 2.5 cm longa.

Kaiser-Wilhelms-Land: On the route from the Ramu [River] to the coast, alt. c. 300 m—R. Schlechter no. 15719 [Ed.—number invalid], flowering in Feb. 1902; on the Gogol River—C. Lauterbach no. 929, no. 1074, no. 1117, flowering in Nov. 1890; in humus in the forests of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 17944, fruiting in Aug. [Ed.—possibly July] 1908.

I have described this species since it has been known in literature for 10 years as a

'nomen nudum'. It is distinguished strikingly from all the other *Corymbis* species by the very narrow leaves.

2. *C. minor* Schltr., sp. nov.

Terrestris, gracilis, erecta, 40–50 cm alta; caule basi denudata excepta bene foliato, vaginis foliorum arcte et alte amplexantibus omnino oblecto; foliis erecto-patentibus, ellipticis, acuminatis, basi sensim sub-petiolato-angustatis, utrinque glabris, 15–20 cm longis, medio fere 3.5–4.3 cm latis; inflorescentiis erecto-patentibus, pauci-ramosis, breviter pedunculatis, 5–10-floris; bracteis ovato-lanceolatis, acutis, ovario vulgo paulo longioribus; floribus in genere inter minores, erectis, pallide flavis sepalis lanceolato-ligulatis, acutis, glabris, tertia parte apicali paulo dilatatis, 1.5 cm longis, lateralibus paulo obliquis, apice subfalcatis; petalis e basi ligulata in laminam oblique lanceolato-ellipticam, apiculatam, margine undulatam dilatatis, sepalis fere aequilongis; labello e basi ligulato unguiculata in laminam suborbicularem, apiculatam, margine plicato-undulatam dilatato, glabro, carinis 2 carnosus e basi parallelis usque in basin laminae decurrentibus, apice falcato-divergentibus, petalis aequilongo, lamina c. 0.7 cm diametiente; columna gracili, glabra, c. 1 cm longa, rostello mediocri, triangulo, bifido; anthera ovato-lanceolata, subacuta; pollinibus clavatis, stipiti breviori, gracillimo affixis, glandula magna ovata; ovario cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In the forest near Bulu, alt. c. 20 m—R. Schlechter no. 16073, flowering in May 1907.

This species has a striking similarity to *C. Lauterbachii* Schltr. in its flowers and their size, and yet no one can regard them as identical. It may, thus, be seen that we have to consider the vegetative conditions in judging the *Corymbis* species. From *C. veratrifolia* (Bl.) Rchb. f. the species differs in its much smaller yellowish flowers.

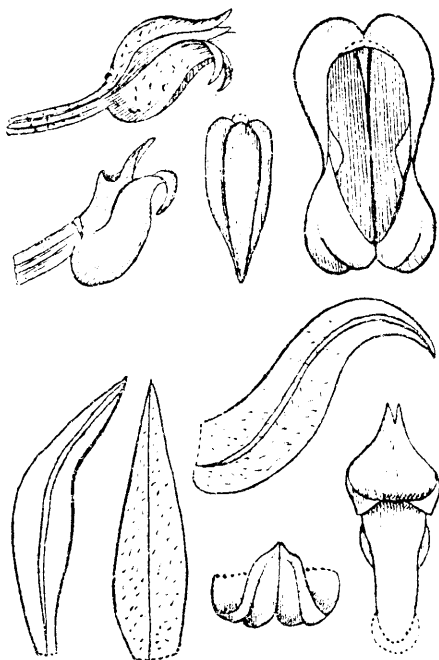
3. *C. veratrifolia* (Bl.) Rchb. f., in Flora XLVIII, p. 184.

C. Thouarsii Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds., p. 241 (nec Rchb. f.).

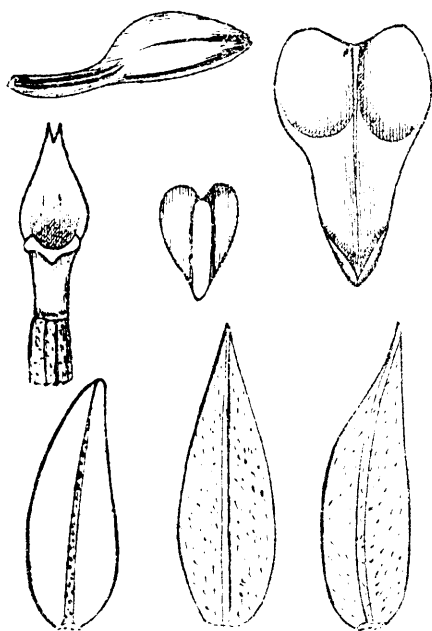
Kaiser-Wilhelms-Land: On the middle Gogol River, in forest—C. Lauterbach no. 983, flowering in 1890; in humus in the forests on the Kaulo [River], alt. c. 300 m—R. Schlechter no. 16778, flowering in Nov. 1907; in humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18976, flowering in Dec. 1908; in the forests between the Ramu and the watershed, alt. c. 100 m—R. Schlechter no. 14154, flowering in Jan. 1902.

As previously mentioned I am not yet sure whether this plant should be included under this name. It is distinguishable by its more compact growth, and rather smaller flowers. It will be necessary to compare both species as living specimens or with good dry material, but specimens of the Javanese plant are not available at present.

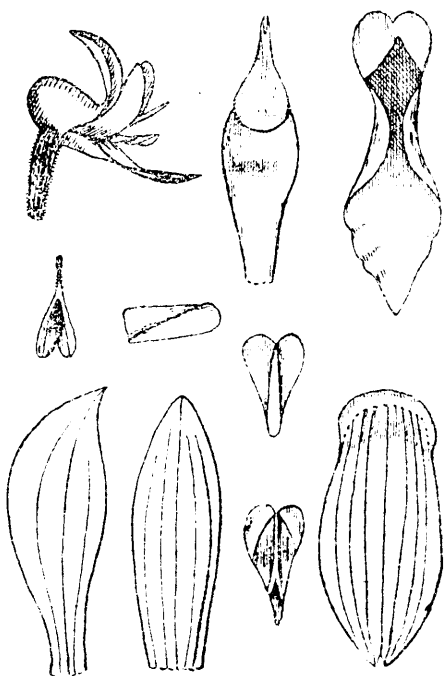
GROUP X *Tropidiinae*



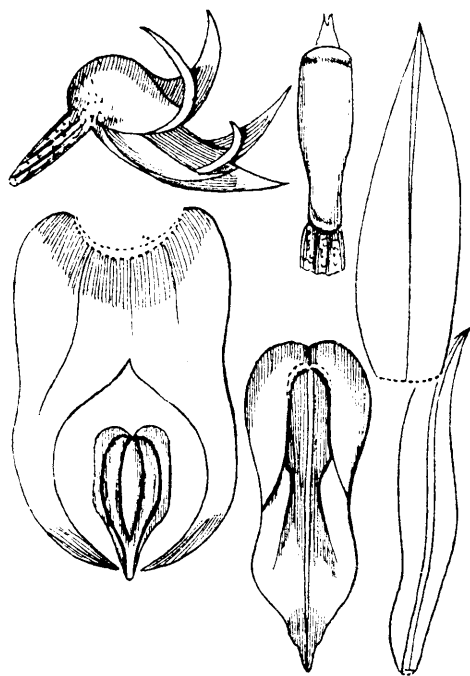
Tropidia disticha Schltr.



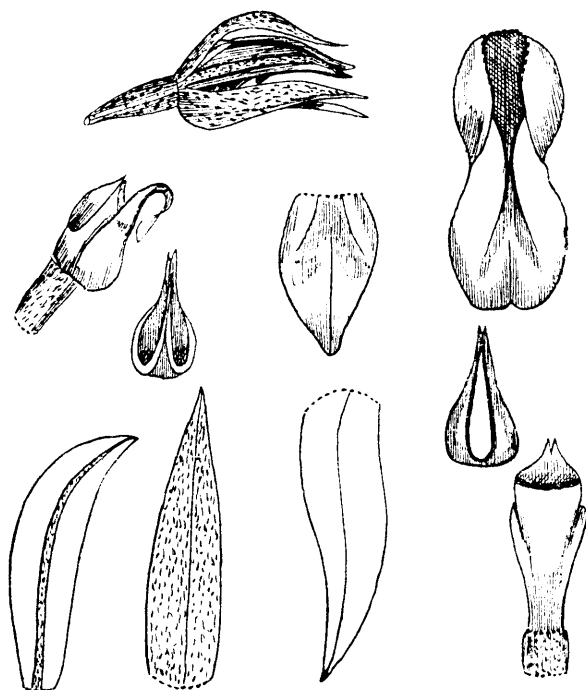
Tropidia multinervis Schltr.



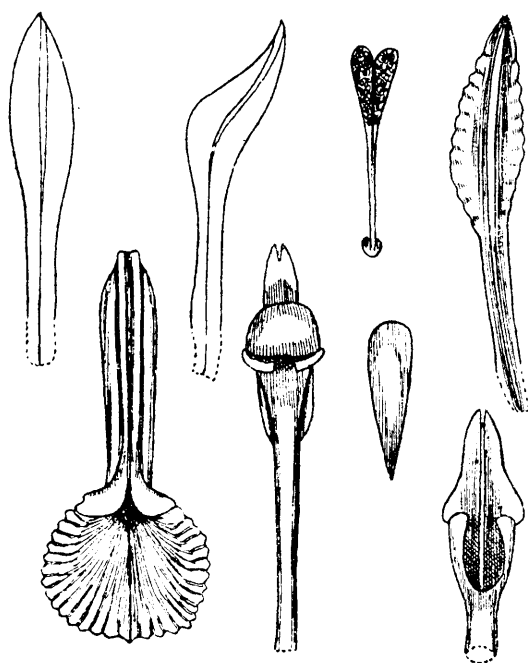
Tropidia gracilis Schltr.



Tropidia acuminata Schltr.



Tropidia similis Schltr.



Corymbis veratrifolia (Bl.) Reichb. f.

Series B. *Kerosphaereae*

In contrast to *Polychondreae* [Ed.—*Acrotonae* with granular or powdery pollinia] I include all the other groups of *Acrotonae*, all with waxy pollinia, under *Kerosphaereae* (from the combination of the Greek words 'wax' and 'sphere').

However, with regard to the position of *Sobraliinae* alone, I am not quite clear, since my investigations are not yet complete. I am inclined to think that this group would be better joined under the *Polychondreae* and very likely placed in proximity to *Vanillinae*.

Group XI *Collabiinae*

This interesting group is represented in the Territory by four genera, which, with the exception of *Chrysoglossum* Bl., are each known by only a single species. These genera are *Chrysoglossum* Bl., *Collabium* Bl., *Mischobulbum* Schltr. and *Tainia* Bl.

The vegetative characteristics of *Collabiinae* have been dealt with thoroughly by Pfitzer, and their importance has been appreciated fully in the separation of this very characteristic group. The distribution of *Collabiinae* extends from Ceylon and the Himalayas (where *T. atropurpurea* Ridl. represents one of the most western species) to the Fiji Islands, where *Collabium vesicatum* (Rchb. f.) Schltr. (*Chrysoglossum vesicatum* Rchb. f.) represents the most eastern species.

32. *Chrysoglossum* Bl.

One of the two species known from the Territory is a plant which is related closely to *C. ornatum* Bl., and has been described by some authors as identical with it. The reasons which lead me to separate it, nevertheless, are mentioned below.

In the Territory, the plant has its home in the mountain forests, and like the other *Collabiinae*, is an inhabitant of shady places in rich humus soil, where it is often hidden amongst the shrubs. The second species (which, so long as I have no better floral material, I must determine as *C. villosum* Bl.) also grows under very similar conditions.

1. *C. cyrtopetalum* Schltr., sp. nov.

Terrestre, erectum, elatum, usque ad 65 cm altum; rhizomate decumbente, crasso, depresso, laxe pseudobulbis et scapis obsesso, vaginis mox in fibros solutis oblecto; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceis, cum petiolum arctissime connatis, c. 2 cm altis, supra basin 0.4 cm diametentibus, unifoliatis; folio erecto, longipetiolato, lamina elliptica, acuminata, basi cuneata, glabra, 18–24 cm longa, medio 6–7.5 cm lata, petiolo superne sulcato, gracili, 10–14 cm longo; scapo gracili, basi incrassata vaginis oblecto, tereti, glabro, medio vulgo vaginula arcte amplectente obsesso; racemo laxo multifloro, elongato, usque ad 25 cm longo; bracteis lanceolatis, acuminatis, ovario gracili multo brevioribus; floribus erecto-patentibus, defloratis deflexis, illis *C. ornati* Bl. paulo minoribus; sepalis anguste oblongo-ligulatis, glabris, 1.8 cm longis, intermedio obtuso, lateralibus falcatis, apiculatis; petalis sepalis paulo minoribus, valde falcatis, ligulatis, acutiusculis, sepalis paulo angustioribus; labello e basi marginibus utrinque auriculato-incurvis late cuneato, e medio trilobo, lobis lateralibus erectis, subfalcato-oblongis, obtusis, lobo medio majore, obovato-oblongo, obtuso, 4.5 mm longo, supra medium 0.3 cm lato, labello toto glabro, 0.9 cm longo, inter apices loborum lateralium 7.5 mm lato, lamellis 2, e basi tenuibus, medio ampliatis, supra medium leviter flexuosis, usque in medium lobi intermediarii decurrentibus, linea intermedia subevanida, tenui, usque ad medium labelli interposita; columna leviter arcuata, semitereti, 0.8 cm longa, medio utrinque stelidio triangulo obtuso ornata, glabra, clinandrio parvulo, sacco basi perbrevis vix conspicuo; anthera transversa, medio breviter cuspidata; ovario cylindraceo, glabro, pedicello incluso c. 1.9 cm longo; fructibus deflexis.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18584, flowering in Nov. 1908.

In my opinion this species is well distinguished from *C. ornatum* Bl. by its longer petioles; considerably narrower, very falcate petals; the different lamellae on the

labellum; and the shorter column-foot spur. The colour of the flowers is also rather different; the sepals and petals being yellow, the labellum white.

2. *C. villosum* Bl. (?) Bijdr. (1825), p. 338.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 14405, in bud in Apr. 1902; in humus in the forests of the Bismarck Range, alt. c. 900 m—R. Schlechter no. 14078, only in leaf, in Jan. 1902.

It will be decided whether we are dealing only with this, or some other species, when the flowers are known. I think it probable that the species will prove to be different from *C. villosum* Bl.

3. *Chrysoglossum* sp.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18809, fruiting in Nov. 1908.

Unfortunately the subject plant is in fruit. Apparently the species is related to *C. cyrtopetalum* Schltr., but has leaves with shorter petioles and which are covered completely with pale yellow spots.

33. *Collabium* Bl.

I cannot altogether agree with J.J. Smith in uniting this genus with *Chrysoglossum* Bl. I likewise regard the slight twist in the column in *Collabium* as an insufficient reason for such union, whereas the absence of the lateral column-arms in that genus and the presence of the fairly long lip-claw, should suffice to keep the two genera separate. There are also certain structural differences in the lip of the two genera (e.g. the presence of the two basal lamellae) which indicate the desirability of their separation.

1. *C. papuanum* Schltr., [Ed.—comb. nov.]

Nephelaphyllum papuanum Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 96.

Chrysoglossum papuanum J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XXXIX (1910), p. 7.

Neu-Mecklenburg: In humus in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14630, flowering in July 1902.

According to J.J. Smith, this species also occurs on the foothills of the Hellwig Range in Dutch New Guinea. It is related closely to *C. vesicatum* (Rchb. f.) Schltr. (*Chrysoglossum vesicatum* Rchb. f.) from the Fiji Islands. I have not found it again during my recent expedition, but I found specimens of a related species in fruit on the Torricelli Mountains.

34. *Mischobulbum* Schltr.

I find it necessary to describe as a new genus, a form which has been regarded repeatedly by botanists as different from *Tainia* Bl. and whose species have been described generally under *Tainia* Bl. or *Nephelaphyllum* Bl.

This new genus includes, in addition to the species described here, four others, three being closely related to each other and exhibiting exactly the same vegetative characters, viz., *M. grandiflorum* (Hook. f.) Schltr. (*Nephelaphyllum grandiflorum* Hook f.), *M. cordifolium* (Hook f.) Schltr. (*Tainia cordifolia* Hook f.) and *M. scapigerum* (Hook. f.) Schltr. (*Nephelaphyllum scapigerum* Hook. f.) A fourth, *M. papuanum* (J.J. Sm.) Schltr. (*Tainia papuana* J.J. Sm.) evidently is related to the new species described and could be included here also. The species of this genus grow exactly like those of *Nephelaphyllum* Bl., and are inhabitants of humus soil in the primary forests; in habit and floral structure they bear a much closer resemblance to the species of that genus than to those of *Tainia* Bl.

Mischobulbum Schltr., genus nov.

Sepala lanceolato-ligulata, plusminusve acuta, glabra, lateralia basi margine anteriore dilatata mentum conicum, pro magnitudine florum conspicuum cum columnae pede formantia. Petala sepalis similia et fere aequilonga. Labellum inferum e basi cuneata late rhombeum vel ovato-lanceolatum, nunc obscure trilobatum, intus carinis 3 ornatum. Columna semiteres, glabra, subalato-marginata, clinandrio vulgo minute denticulato. Anthera quadrato-vel ovato-cucullata. Pollinia 8, obliqua, basi glandula cohaerentia. Stigma concavulum, quadratum, simplex. Ovarium breviter pedicellatum, leviter 6-sulcatum, subclavatum.

Herbae terrestres, habitu *Nephelaphyllo* simillimae, humiles; rhizomate decumte; radicibus flexuosis, puberulis, elongatis; pseudobulbis petioliformibus, teretibus, unifoliatis; folio cordato, acuminato, subsessili, glabro, textura tenuiter carnosulo, haud plicato; scapis erectis, more Collabiinarum membra separata sympodii, paucivaginatibus, glabris, apice laxe paucifloris; floribus mediocribus, vulge subsecundis.

Species 5 adhuc notae, silvium montanum incolae in regione Himalayae, Perakensi, Formosana et Papuana.

This genus differs from *Tainia* Bl., its closest relative, in the leaves which are stemless and directly attached to the pseudobulbs. As in *Nephelaphyllum*, they are thin-fleshed, not folded and heart-shaped at the base, but in texture differ completely from the multi-ribbed, folded, parchment-like *Tainia* leaves. This genus also differs from *Nephelaphyllum* by its non-spurred labellum.

I consider the above leaf differences significant, which, as in the case of *Nephelaphyllum*, have proved to be completely consistent. The transformation of its pseudobulb into a genuine leaf stem, as also in *Nephelaphyllum*, is conspicuous for this particular form.

1. *M. lancilabium* Schltr., sp. nov.

Terrestre, humile, usque ad 20 cm altum; rhizomate decumbente vaginis mox fissis oblecto, laxe pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis petioliformibus, teretibus, glabris, apicem versus paululo attenuatis, 4–5 cm longis; folio late cordato-ovato, acuminato, glabro, 7.5–8.3 cm longo, infra medium 4.5–5.5 cm lato; scapo erecto, basi paulo incrassato, tereti, glabro, vaginis 2–3 dissitis, alte amplexantibus, acuminatis obsesso, inflorescentia inclusa usque ad 18 cm alto; racemo subsecundo, laxe pauci-(2–5)floro, usque ad 5 cm longo; bracteis anguste lanceolatis, acuminatis, ovario plus duplo brevioribus; floribus mediocribus, erecto-patentibus; sepalis anguste lanceolatis, acutis, extus nervo medio carinato-incrassatis, glabris, c. 2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata mentum breve obtusum formantibus; petalis oblique lanceolatis, acutis, sepalis paulo brevioribus latioribusque, glabris; labello lanceolato vel elliptico-lanceolato, acuto, integro, dimidio anteriore marginibus undulato, glabro, c. 2 cm longo, medio vel infra medium 0.8–0.9 cm lato, carinis 2 tenuibus, undulatis, e basi usque infra apicem decurrentibus, carina intermedia aequilonga, dimidio anteriore tantum subundulata interjecta; columna semitereti, subalata, glabra, clinandrio utrinque auriculo bidentato donato, dorso denticulato; anthera ovato-cucullata; stigmatibus quadrato, marginibus incrassato; ovario cum pedicello clavato, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: In humis in the forests of the Torricelli Range, on the Rin-Tejao [River], alt. c. 800 m—R. Schlechter no. 20127, flowering in Sept. 1909; in humis in the forests of the Gomadjidji [Mountain], alt. c. 450 m—R. Schlechter no. 17469, fruiting in Mar. 1908; in humis in the forests of the Maboro Range, alt. c. 800 m—R. Schlechter no. 19522, flowering in May 1908 [Ed.—possibly 1909.]

This species seems to be related closely to *M. papuanum* (J.J. Sm.) Schltr., which has been described recently by J.J. Smith as *Tainia papuana*. From the description that plant has larger leaves, and broader petals and labellum.

35. *Tainia* Bl.

This genus has been placed in the group *Collabiinae* by J.J. Smith, who has had the opportunity of studying its vegetative structure from the living material of *T. speciosa* Bl. in Java. It is difficult to form a clear view of these conditions from the herbarium

material, since that of *T. speciosa* Bl. in particular is poor for checking the nature of the inflorescence. It appears as though Ridley was quite right when he removed the genus *Ascotainia*, for this certainly belongs to *Phajinae*, and is otherwise recognisable by the presence of a spur to the flowers. Ridley has included the two species *A. penangiana* Ridl. and *A. Hookeriana* Ridl. in this genus and, furthermore, *A. Fürstenbergiana* Schltr. (*Tainia Fürstenbergiana* Schltr.) also belongs here.

The species described here is a true *Tainia*, closely related to the Malayan form; it grows in the humus soil of the mountain forests in the misty regions.

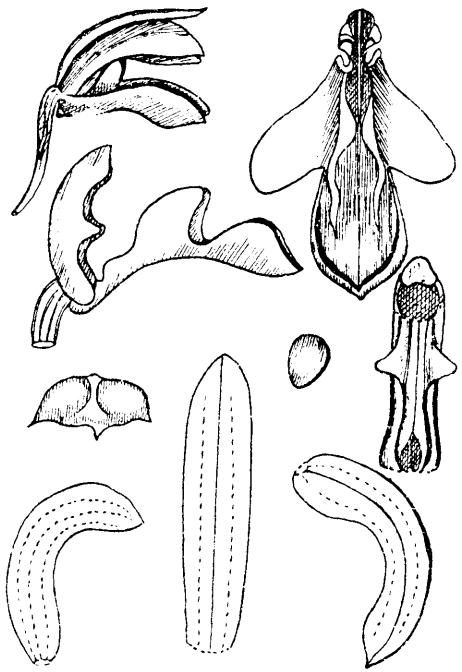
1. *T. parviflora* Schltr., sp. nov.

Terrestris, erecta, usque ad 45 cm alta; rhizomate decumbente, abbreviato; radicibus flexuosis, elongatis, puberulis; pseudobulbis cylindraceis, glabris, 4.5–7 cm longis, 0.5 cm diametentibus, unifoliatis; folio longipetiolato, elliptico, acuto vel acuminato, glabro, lamina usque ad 19 cm longa, medio fere 4.5–6 cm lata, petiolo usque ad 6 cm longo, sulcato; scapo erecto, stricto vel substricto, tereti, glabro, usque ad medium vaginis paucis, alte amplexantibus, dissitis obsessis, caeterum nudo; spica laxa 10–15-flora, usque ad 16 cm longa; bracteis patulis, lanceolatis, acutis, ovario brevioribus; floribus in genere inter minores, erecto-patentibus; sepalis lineari-ligulatis, obtusis, glabris, 1.3 cm longis, lateralibus subfalcato-obliquis, intermedio paulo brevioribus; petalis sepalis valde similibus, obtusis, glabris, 1.2 cm longis; labello e basi minute unguiculato cuneato, e medio trilobato, 0.9 cm longo, inter apices loborum lateralium 0.7 cm lato, glabro, lobis lateralibus parvulis, triangulis, obtusiusculis, intermedio late ovato, apiculato, marginibus leviter undulato, 4.5 cm longo carinis 2 parallelis, intus supra basin natis, sensim attenuatis usque in basin lobi intermedii decurrentibus, carinula intermedia tenui per totum lobum intermedium addita, utrinque lamella laterali leviter undulata semilonga aucta; columna lata, labello duplo longiore, glabra; anthera quadrato-cucullata, glabra; ovario cum pedicello glabro 0.8 cm longo.

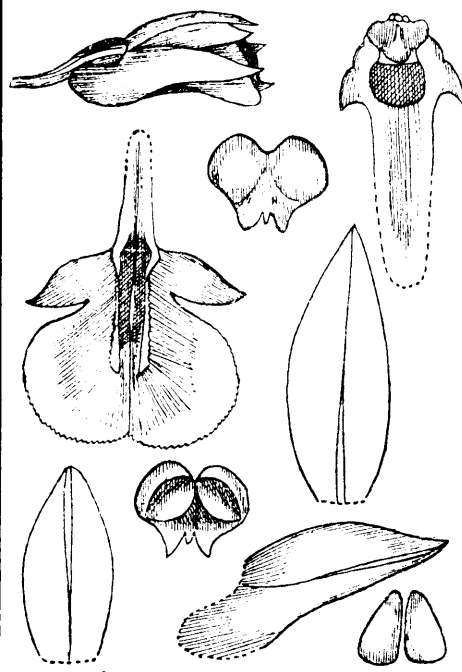
Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20132, flowering in Sept. 1909.

A very characteristic, small-flowered species, easily recognised by the labellum. The flowers are pale green on the outside, the petals with broad red margins, the labellum red-veined and decorated in front with three orange-red lamellae.

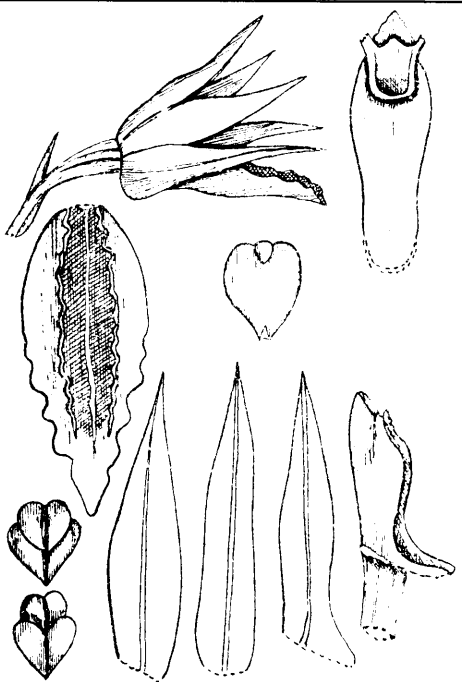
GROUP XI *Collabiinae*



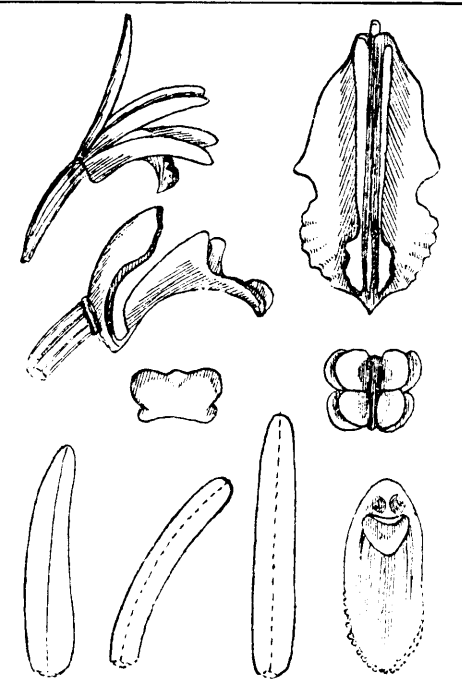
Chrysoglossum cyrtopetalum Schltr.



Nephelaphyllum papuanum Schltr.



Mischobulbum lancilabium Schltr.



Tainia parviflora Schltr.

Group XII *Coelogyne*

This group, which is still numerically so well represented in the Malay Archipelago, is much reduced in numbers in New Guinea, and occurs eastwards of our Territory in only a few scattered forms. Genuinely very characteristic or isolated forms are no longer to be found in the Territory. All species are more-or-less closely related to those from the more western archipelago and are often separated only by insignificant differences. As far as is known at present, only three genera of the group occur in New Guinea, viz: *Coelogyne* Lindl., *Dendrochilum* Bl. and *Pholidota* Lindl.

36. *Coelogyne* Lindl.

The species occurring in the Territory are distributed, according to the Pfitzer-Kränzlin division, into four sections of the genus, viz: *Speciosae*, *Lentiginosae*, *Venustae* and *Verrucosae*. Besides these, Rolfe has described a species, *C. carinata* from British New Guinea, which, according to Kränzlin, belongs to the *Longifoliae*. No further species have been recorded from the Territory. In Kränzlin's treatise on the genus, there are, actually, eight species mentioned from New Guinea, but we will see on closer examination that this number is reduced to about half.

The *Coelogyne* of the Territory are habitually all epiphytes, nevertheless it occasionally happens that *C. pustulosa* Ridl. grows terrestrially on steep cliffs and then develops quite strikingly, though it is peculiar that among the many hundreds of specimens I have found under such conditions I have never seen a single one in flower, even at the time when the same species (at least what I believed to be the same) were in full bloom on the trees in the neighbourhood.

C. Beccarii Rchb. f., with its variety *tropidophora* Schltr., seems to be one of the most widely distributed species in the Territory; it is found at altitudes of from 350 up to over 1000 metres.

Most of the others, such as the beautiful *C. fragrans* Schltr., *C. Veitchii* Rolfe and *C. truncicola* Schltr., are typical species of the mist-regions of the mountain forests, and grow only in an atmosphere saturated with moisture.

§ 1. *Succedaneae*—*Speciosae*

1. *C. fragrans* Schltr., sp. nov. [Ed.—nom. nov.]

C. rumphii Ridl., in Journ. Bot. XXIV (1886), p. 353 (nec Lindl.)

Epiphytica, erecta 25–40 cm alta; rhizomate decumbente, pseudobulbis obsessis; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis c. 2–3 cm distantibus, anguste ovoideis vel oblongoideis, unifoliatis, primum teretibus, demum longitudinaliter 4-sulcatis, 6.5–9 cm altis, supra basin 2–3 cm diametentibus; folio erecto, elliptico, acuminato, basi in petiolum sulcatum, 2.5–7 cm longum angustato, lamina 17–34 cm longa, medio fere 5–8 cm lata; racemo laxo 2–4-floro, erecto, synantho; pedunculo tereti, glabro, usque ad 20 cm longo; bracteis caducis, ligulatis, convolutis, primum florem obtegentibus, ovarium superantibus; floribus in genere magnis, speciosis, vulgo 2–4-nis simultaneis vel succedaneis, glabris; sepalis dorso carinatis, c. 3.8 cm longis, basi concavis, intermedio ovato-elliptico, acuto, medio c. 1.5 cm lato, lateralibus oblique oblongis, subacutis, intermedio medio angustioribus; petalis reflexis, oblique linearibus, obtusiusculis, supra medium paululo dilatatis, sepalis paulo brevioribus; labello e basi late oblonga infra medium trilobo, lobis lateralibus oblique oblongis, obtusis, intermedio e isthmo brevi late ovato, apiculato, carinis 2 leviter arcuatis, crenulatis, carnosus, e basi usque in medium lobi intermedii decurrentibus, carina tenuiore intermedia, paulo brevior interjecta, labello toto 3.3 cm longo, infra medium 1.8 cm lato, lobis lateralibus c. 0.5 cm longis, lobo intermedio 2.1 cm longo, infra medium 1.7 cm lato; columna leviter arcuata, glabra, apicem versus dilatata, clinandrio mediocri, leviter angulato; ovario 6-costato, glabro, pedicello incluso c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no 18083, flowering in Aug. 1908; on trees in the forests of the

Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18838, flowering in Nov. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18216, flowering in Sept. 1908.

A magnificent species which well deserves to be introduced into European nurseries. It belongs to the relationship of *C. Rumphii* Lindl., but is distinguished easily by its floral characters. It generally opens with two to four flowers simultaneously. When I, in spite of these characters, place it in the *Succedaneae*, it is on account of the close relationship to *C. Rumphii*. The flowers are very fragrant and pale yellowish white in colour; the labellum marked a pretty chocolate-brown, and the column is golden yellow at the apex. I have seen a specimen of this species, which, at the one time, had no less than 12 flower peduncles each with two to four large fragrant flowers.

2. *C. Beccarii* Rchb. f., in Bot. Centralbl. XXVIII (1886), p. 345.

C. Micholitziana Krzl., in Gardn. Chron. II (1891), p. 300.

C. Rumphii Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 96. (nec Lindl.)

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600-700 m—R. Schlechter no. 14323, flowering in Apr. 1902; no. 20034, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter [Ed.—no number cited], flowering in Oct. up to Dec. 1908; on trees in the forests on the Njonge [Creek] near Ambo, alt. c. 600 m—R. Schlechter no. 18129, flowering in Aug. 1908.

The species has been recently well illustrated by J.J. Smith in 'Nova Guinea' VIII, t. XLV. The Kränzlin species which I previously thought identical with *C. Rumphii* (known only at the time from illustrations) doubtlessly belongs here.

var. *tropidophora* Schltr., var. nov.

Differt a forma typica labello carinis 7-9 separatis ornato, caeterum cum forma typica bene congruente et formis intermediis conjugendar; colore simili.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Bolobo, alt. c. 700 m—[Ed.—no number cited], flowering in Sept. 1907; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18090, flowering in Aug. 1908; no. 17895, flowering in July 1908; on trees in the forests of the Ibo Range alt. c. 1000 m—R. Schlechter no. 18977, flowering in Dec. 1908; on trees in the forests of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 18519, flowering in Oct. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19110, flowering in Jan. 1909; on trees in the forests of [Mount] Dscheregi, alt. c. 600 m—R. Schlechter no. 17440, flowering in Mar. 1908; on trees on the Waria [River] near Gobi, alt. c. 350 m—R. Schlechter no. 19848, flowering in June 1909.

When I found this variety first I thought it should be regarded as a separate species, but had to alter my opinion and thought it better to treat it as a variety, since in some species the 7-9 keels are not so sharply developed and the plant agrees in its vegetative characteristics entirely with *C. Beccarii* Rchb. f. I am almost inclined to believe that, in this case, in my *C. tropidophora* the Type species may be present, of which *C. Beccarii* Rchb. f., by the confluence of its keels, is a sub-species. At any rate it is quite possible, that after further observations in their habitat, both will have to be regarded as separate species.

§ 2. *Simultaneae*—*Lentiginosae*

3. *C. truncicola* Schltr., sp. nov.

Epiphytica, humilis, c. 13 cm alta; rhizomate abbreviato, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis, leviter 4-angulatis, apice diphyllis,

2–3.5 cm altis, infra medium 1.2–1.5 cm diametientibus; foliis erecto-patentibus anguste lanceolato-ligulatis, acuminatis vel subacutis, basi subpetiolato-angustatis, glabris, 9–13 cm longis, medio fere 1.2–2.2 cm latis; scapis synanthis, laxe pauci-(2–3)floris, erectis, quam folia evoluta brevioribus; pedunculo evaginato, tereti, glabro, bracteis caducis, ellipticis, acutis, convolutis, ovarium superantibus; floribus in genere inter minores, illis *C. chloropterae* Rehb. f. similibus et aequimagnis; sepalis oblongis, subacutis, dorso nervo medio carinato-incrassatis, glabris, c. 2 cm longis, lateralibus obliquis; petalis lineari-ligulatis, obtusis, sepalis paulo brevioribus; labello circuito oblongo, supra medium trilobato, c. 1.8 cm longo, inter lobos laterales c. 1 cm lato, glabro, lobis lateralibus brevibus, truncatis, intermedio subquadrato, obtusissimo, c. 0.7 cm longo, lamellis 2 parallelis supra medium panlo dilatatis, e basi labelli usque supra basin lobi intermedii decurrentibus, lamellula intermedia tenuiore et brevior interjecta; columna gracili, apice dilatata, glabra, 1.2 cm longa, clinandrio minutissime denticulato, mediocri; ovario 6-costato, glabro, cum pedicello clavato c. 1.2 cm longo; capsula ellipsoideo-ovovata, 6-alata, c. 3.5 cm longa, medio c. 2 cm diametiente.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Dischore [Range], on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19618, flowering and fruiting in June [Ed.—possibly May] 1909.

An interesting small species which has a certain resemblance in habit with *C. breviscapa* Lindl., but differs considerably in the flowers. The species seems to occur only in isolated specimens and prefers the moist valleys of the mountain creeks. In such localities I always found it on the trunks of trees, never on their crowns.

§ 3. *Simultaneae*—*Venustae*

4. *C. Veitchii* Rolfe, in Kew Bull. (1895), p. 282.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20052, flowering in Sept. 1909; on trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 14062, flowering in Jan. 1902; on trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19055, flowering in Jan. 1909.

This pretty, snow-white-flowered species is, in some places, fairly common and then often forms large clusters with its long pendant-like, multi-flowered racemes on old moss-covered tree-trunks. In the structure of its flowers, the species shows a certain resemblance to *Pholidota* Lindl., especially in the short column.

§ 4. *Simultaneae*—*Verrucosae*

5. *C. pustulosa* Ridl., in Journ. Bot. XXIV (1886), p. 353.

C. Edelfeldtii F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV (1884), p. 421. [Ed.—from the dates, this name should possibly have priority.]

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14062, [Ed.—14062 used for the previous species] flowering in Jan. 1902; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17126, flowering in Jan. 1908; on tall trees in the forests near Toliba, alt. c. 300 m—R. Schlechter no. 18969, flowering in Dec. 1908; on trees in the forests of the Finisterre Range alt. c. 1200 m—R. Schlechter no. 19108, flowering in Jan. 1909; on trees in the hill forests near Jaduna, alt. c. 250 m—R. Schlechter no. 19265, flowering in Apr. 1909; on trees in the mountain forests on Waube Creek, alt. c. 400 m—R. Schlechter no. 19437, flowering in May 1909.

The plants collected by Lauterbach near Finschhafen under no. 1598 in January 1891 probably belong here.

C. Edelfeldtii Krzl. is certainly identical with *C. pustulosa* Ridl. as confirmed for me by Dr. A.B. Rendle who kindly compared a flower of my specimen of *C. Edelfeldtii* Krzl. with the Type of *C. pustulosa* Ridl. The plant named *C. asperata* Lindl. from Dutch New Guinea by J.J. Smith in 'Nova Guinea' VIII (1909), p. 20, may also,

perhaps, belong here. The species certainly is related closely to *C. asperata*, but shows certain differences, especially in the bi-lobed emarginate apex of the labellum and in the column which made me think it advisable to keep it separate from *C. asperata*. From the illustration of the labellum by Kränzlin in Engler's *Pflanzenreich* IV, 50, II, B. 7, p. 75, Fig. 26B, this species cannot be recognised.

The species is very common in German New Guinea and occurs both in the lowland forests at 100 metres altitude, and in the mist-forests of the mountains up to 1200 metres altitude.

37. *Dendrochilum* Bl.

Since the appearance of the monograph on this genus in the year 1907, the latter has increased to such an extent that already Kränzlin's treatise has become useless. In the monograph, 72 species are dealt with, but since then no less than 45 new species have been added which were overlooked by Kränzlin at the time. Whereas a few years ago *Dendrochilum* was regarded as a small genus of little importance, it has now become the richest in species among the *Coelogyne*inae, and, in consequence, even surpasses *Coelogyne* itself.

The species mentioned here is not new, but was described by Ridley in 1908, as *Platyclinis Bartonii* Ridl. and, up to the present, is the only species known from New Guinea. It does not appear to be uncommon in the mountains throughout the island, and seems to grow mostly in colonies, very often in immense broad patches on the older trees. As I have mentioned already, it occurs at comparatively low altitudes, e.g. I have found specimens on the Waria [River] at about 350 metres altitude, but it occurs also up to about 1000 metres altitude.

1. *D. Bartonii* (Ridl.) Schltr.

Platyclinis Bartonii Ridl., in Journ. Straits Branch Royal Asiat. Soc. (1908), no. 50, p. 128.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20104, flowering in Sept. 1909; on tall trees in the mountain forests near Kelel, alt. c. 600 m—R. Schlechter no. 16500, flowering in Sept. 1907; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17984, flowering in July 1908.

The species is, doubtless, related closely to *D. longifolium* Rchb. f., where it seems to be placed by J.J. Smith, but in habit and structure of flowers, especially the column, it has slight differences which seem to make it advisable to regard it as a separate species. The plant is especially interesting as the extreme eastern sentinel of the genus.

38. *Pholidota* Lindl.

No species belonging to this genus have been known with certainty from the island of New Guinea up to the present, although it could be assumed reasonably that the genus might also be represented here, since the 'form-circle' of *P. imbricata* Lindl. was known to occur in Australia and New Caledonia. My observations have now shown that this genus is in no way missing in New Guinea, but is even represented by a series of species which belong to three different *Pholidota*-forms viz. by the *Crinonia*-form, by the *P. ventricosa* Rchb. f.-form, and, as was anticipated, by the *P. imbricata* Lindl.-form. Endemic forms, therefore, prove to be more numerous than I had at first expected, although they are related closely to the Malayan forms and may, certainly, be regarded as radiants. The two *Crinonia*-forms; and *P. sororia* Schltr., related to *P. ventricosa* Rchb. f., prove to be new, whereas the fourth may be regarded best as a form of the widely distributed *P. imbricata* Lindl. I, at least, have not been able to find sound

reasons to justify the separation of the species. The whole 'form-circle' of *P. imbricata* Lindl. requires a thorough revision; it may then be possible to divide it into some better-defined species. Such a revision would be possible only by the examination of living material from the various areas. With a more exact knowledge of species it is, generally, found that the ubiquitous species do not represent a single species, but several related ones of a similar 'form-circle'. There are plenty of examples of this.

I need not repeat here what has been explained already by J.J. Smith and others, viz. that the division of the *Coelogyninae*, as far as it was carried by Kränzlin, is untenable. The division of the genus *Pholidota*, as formerly circumscribed, has been accepted in the way we were accustomed to regard it, that is to say, to consider *Crinonia* Bl. as *Pholidota* Lindl., which is really the case.

1. *P. bismarckiensis* Schltr., sp. nov.

Epiphytica, dependens, usque ad 4 cm longa; rhizomate vaginis imbricantibus oblecto, pseudobulbis appressis dense obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, apicem versus attenuatis, longitudinaliter sulcatis, bifoliatis, 3–4.5 cm longis, supra basin 0.5–0.7 cm diametientibus; foliis linear-ligulatis, acutis, basi subpetiolato-angustatis, glabris, subtus trinerviis, 11–21 cm longis, medio fere 0.7–1.3 cm latis; spicis cum foliis juvenilibus synanthis, subdense multifloris, elongatis, folia superantibus, bifariis, usque ad 1.5 cm longis; pedunculo evaginato, gracili, usque ad 7 cm longo; bracteis caducis; floribus in genere inter minores; sepalo intermedio subquadrato-ovato, obtuso, glabro, c. 2.5 mm longo, lateralibus concavis, dorso alte carinatis, oblongis, intermedio aequilongis; petalis late elliptico-ovatis, obtusis, obliquis, margine anteriore paulo decurrentibus, sepalis paulo minoribus, glabris; labello e basi concava late cuneato, supra medium trilobo, lobis lateralibus parvulis, subquadrato-rotundatis, intermedio ovato, obtuso, supra basin callis 2 V-formiter divergentibus ornato, labello toto glabro, sepalis aequilongo, inter apices loborum lateralium 2 mm lato, lobo intermedio c. 1 mm longo; columna crassiuscula, brevi, glabra; ovario clavato, pedicello incluso c. 0.4 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, near Hokrocho, alt. c. 1400 m—R. Schlechter no. 18611, flowers wilted, in Nov. 1908.

Unfortunately, my material had almost finished blooming, but I could still reconstruct the flower from the floral parts attached to the young fruit. The species is related closely to *P. torricellensis* Schltr., described below, but differs in the labellum.

2. *P. torricellensis* Schltr., sp. nov.

Epiphytica, dependens vel patula, usque ad 30 cm longa; rhizomate vaginis imbricantibus oblecto, pseudobulbis subdense obsesso; radicibus filiformibus, elongatis, flexuosis, glabris, rhizomati appressis; pseudobulbis ovoideis vel cylindraceis, apicem versus attenuatis, demum leviter sulcatis, bifoliatis, 1.5–3.5 cm longis, infra medium 0.7–1 cm diametientibus; foliis lineari-ligulatis, acutis, basi subpetiolato-angustatis, glabris, subtus trinerviis, 8–20 cm longis, medio fere 0.7–1 cm latis; spicis cum foliis juvenilibus synanthis, elongatis, subdense multifloris, bifariis, pedunculo brevi incluso usque ad 15 cm longis, arcuatis; bracteis caducis, ellipticis, acutis, ovario fere aequilongis; floribus in genere inter minores, erectis, brunnescenti-carneis, glabris; sepalo intermedio ovato, obtuso, glabro, 0.3 cm longo, lateralibus circuitu oblique oblongis, acutis, genuflexuo-concavis, intermedio fere aequilongis; petalis oblique rhombeo-ovatis, obtusis, glabris, sepalo intermedio paulo brevioribus; labello e basi concava late elliptico, oblongo, obtuso, indiviso, apice paulo incrassato et toris 2 V-formiter divergentibus, usque ad margines medium versus decurrentibus ornato, sepalo intermedio aequilongo; columna brevi, crassiuscula, clinandrio parvulo trilobulato; anthera subreniformi, glabra; ovario cylindraceo-clavato, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20133, flowering in Sept. 1909.

As already explained above, this species is related closely to the previous one. In habit these two are strikingly similar, but in the flowers, above all in the labellum, there are noticeable, rather appreciable differences. The flowers of this species are of a brownish flesh colour.

3. *P. sororia* Schltr., sp. nov.

Epiphytica, erecta, valida, usque ad 75 cm alta; rhizomate valde abbreviato, dense pseudobulbis

obesso; radicibus filiformibus, elongatis, flexuosis, breviter tomentosulis; pseudobulbis valde approximatis, cylindraceo-oblongoideis, paulo compressis, longitudinaliter mox plurisulcatis, apice bifoliatis, 12–15 cm altis, infra medium usque ad 3 cm latis; foliis erectis vel erecto-patentibus, anguste ellipticis, obtusiuscule acuminatis, basin versus sensim in petiolum satis longum (usque ad 25 cm) augustatis, petiolo incluso 50–65 cm longis, lamina medio fere 5–7.5 cm lata; scapis erectis, strictis, cum foliis juvenilibus synanthiis, teretibus, glabris, inflorescentia inclusa usque ad 60 cm longis, evaginulatis; racemo disticho, dense multifloro, elongato, usque ad 30 cm longo; bracteis distichis, mox caducis, imbricantibus, oblongo-ellipticis, obtusis vel apiculatis, glabris, flores primum omnino obtegentibus; floribus secundis, illis *P. ventricosae* Rchb. f. similibus, albis, glabris; sepalis ovatis, obtusis, 0.7 cm longis, lateralibus obliquis; petalis recurvis, oblique lineari-ligulatis, obtusis, sepalis subaequilongis; labello porrecto, columnae subparallelo, circuitu obcordato, e basi concava, incrassata dimidio anteriore plus minusve distincte quadrilobato, lobis lateralibus parvulis, vulgo irregulariter 1–2-lobulatis, circuitu oblique quadratis vel triangulis, lobis intermediis majoribus, rotundatis, labello medio antice (i.e. margine anteriore hypochilii) distincte incrassato, lobis intermediis inclusis 0.8 cm longo, antice 0.6 cm lato, columnae brevi, labello subparallela, apicem versus valde dilatata, 0.4 cm longa, clinandrio peramplio, apice leviter lobulato; anthera subreniformi, leviter 4-lobulata, antice breviter excisa; ovario cum pedicello glabro, clavato, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20277, flowering in Sept. 1909.

The species is, indisputably, related closely to *P. ventricosa* Rchb. f., but is distinguished by the more marked lobing of the labellum, and its column almost parallel with the labellum, while in *P. ventricosa* Rchb. f. it is always at a distinct angle to the lip: furthermore the column is also broader. The flowers in *P. sororia* Schltr. are white, in *P. ventricosa* Rchb. f. a cream colour. I was for some time wondering whether it would not be better to regard the species as a variety of *P. ventricosa* Rchb. f., but decided to consider it as a separate species, all the more since the countries of origin of the two species are separated widely.

In his monograph of *Coelogyinae*, Kränzlin has again tried to restore his *P. sesquitoria*. I myself have examined the Type material from the Botanical Garden, Berlin and agree with J.J. Smith that this species differs in no way from *P. ventricosa* Rchb. f.

var. *djamuensis* Schltr., var. nov.

Differt a forma typica labello brevior, lobis minoribus petalisque sublatioribus.

Kaiser-Wilhelms-Land: On trees in the forests on the slopes of the Kani Range, on the Djamu [River] alt. c. 450 m—R. Schlechter no. 16612, flowering in Oct. 1907.

It is distinguished by slightly broader petals and a slightly different-shaped labellum, which appears shorter owing to the middle lobes being smaller and more triangular than in the species.

4. *P. imbricata* Lindl., in Hook. Exot. Fl. II (1825), t. 138.

var. *montana* Schltr., var. nov.

Differt a forma typica habitu humiliore, foliisque crasse coriaceis.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17367, flowering in Jan. [Ed.—possibly Feb.] 1908.

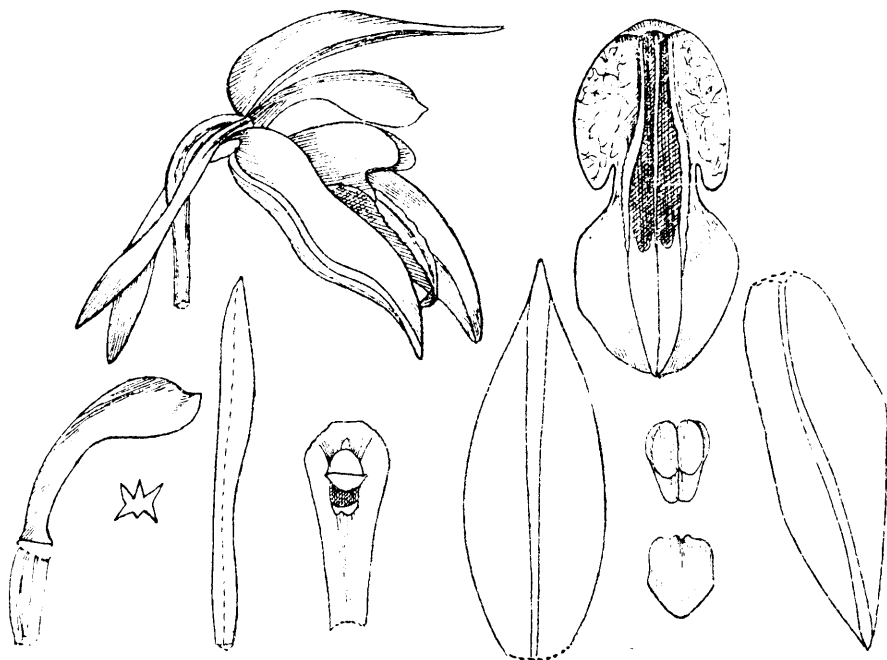
var. *longifolia* Schltr., var. nov.

Differt a forma typica bulbis altis, angustis, foliisque longioribus.

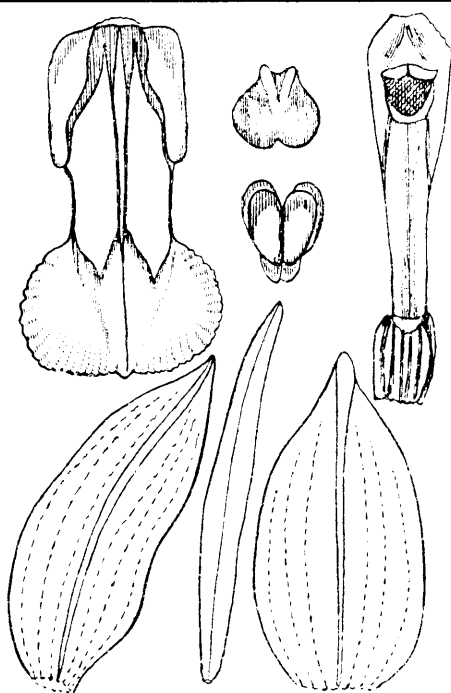
Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 17535, flowering in Apr. 1908.

The 'form-circle' of *P. imbricata* Lindl. perhaps contains several species. For this reason it is necessary to examine accurately abundant living material, to be able to define the circumscription of the species.

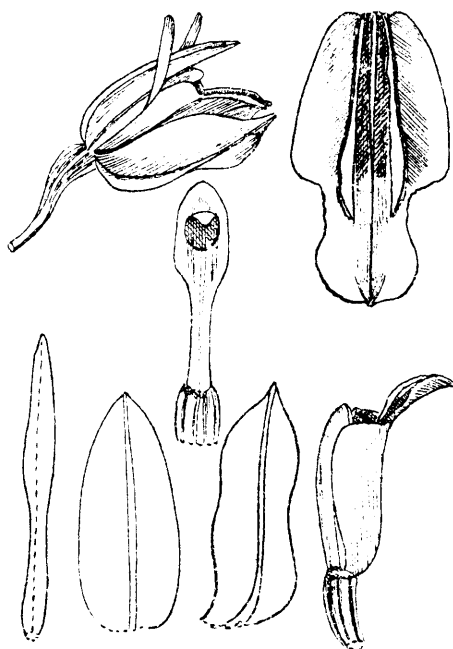
GROUP XII *Coelogyinae*



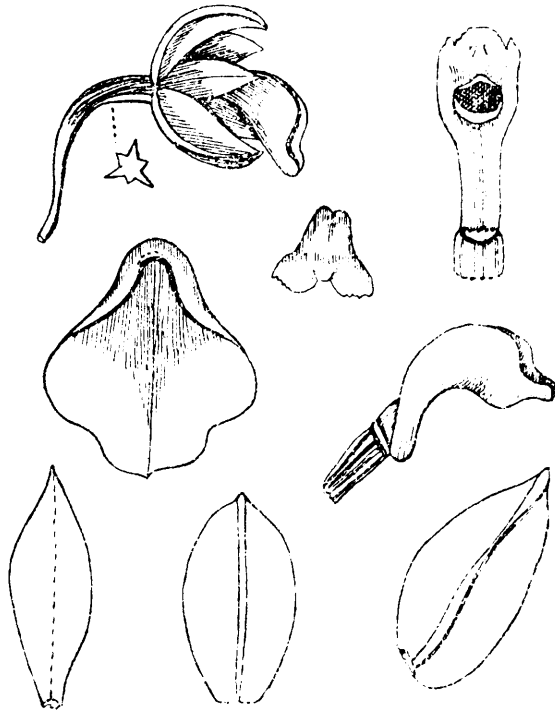
Coelogyne fragrans Schltr.



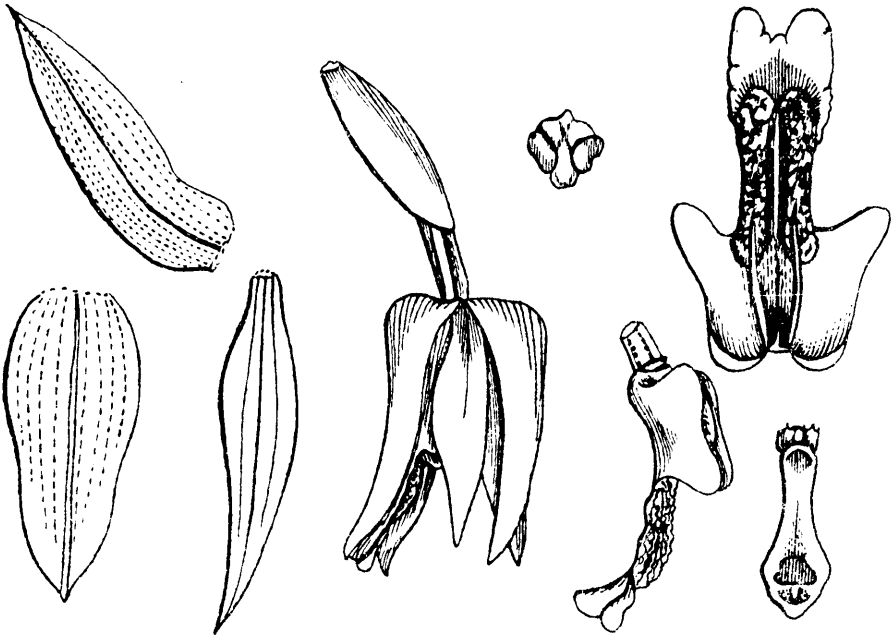
Coelogyne Beccarii Reichb. f.



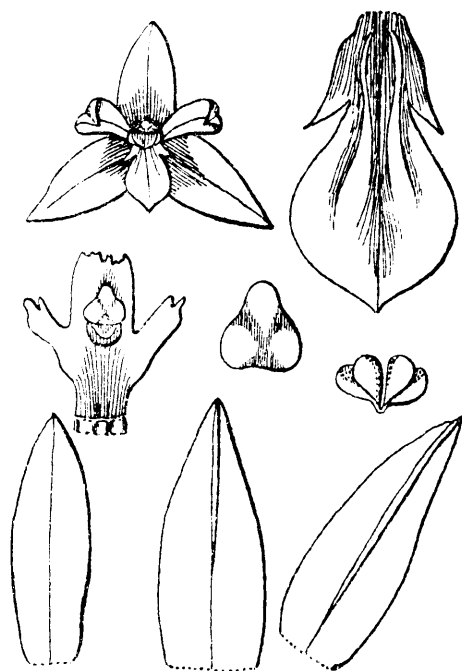
Coelogyne truncicola Schltr.



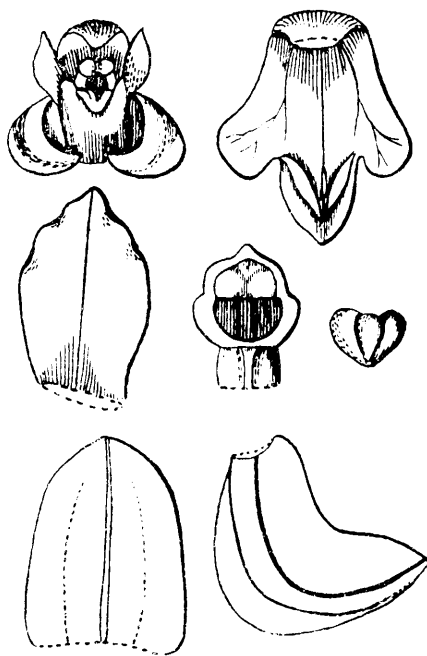
Coelogyne Veitchii Rolfe



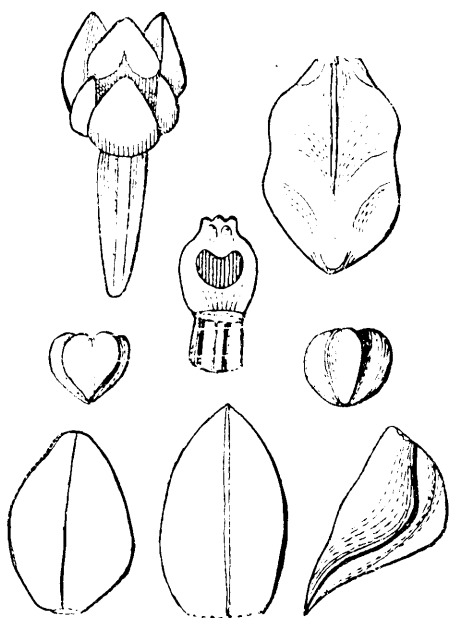
Coelogyne pustulosa Ridl.



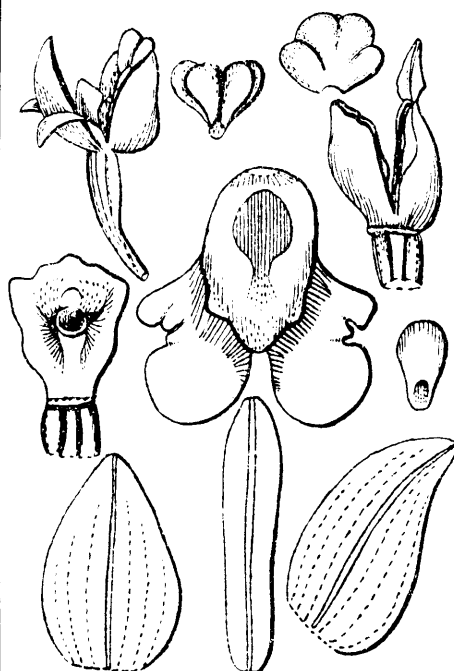
Dendrochilum Bartonii (Ridl.) Schltr.



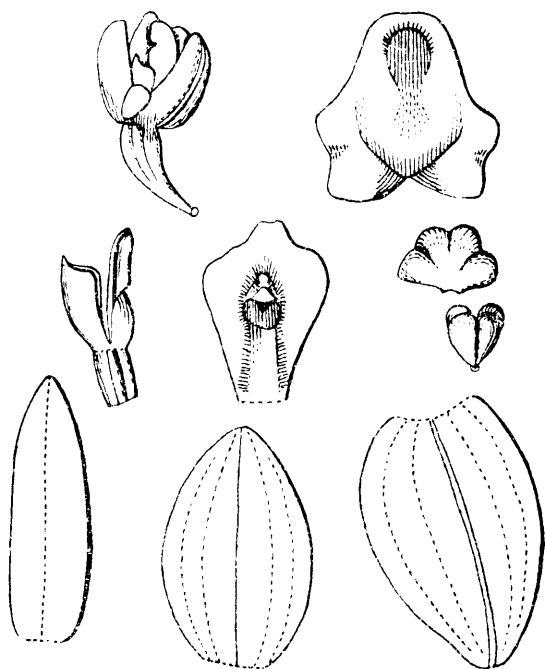
Pholidota bismarckensis Schltr.



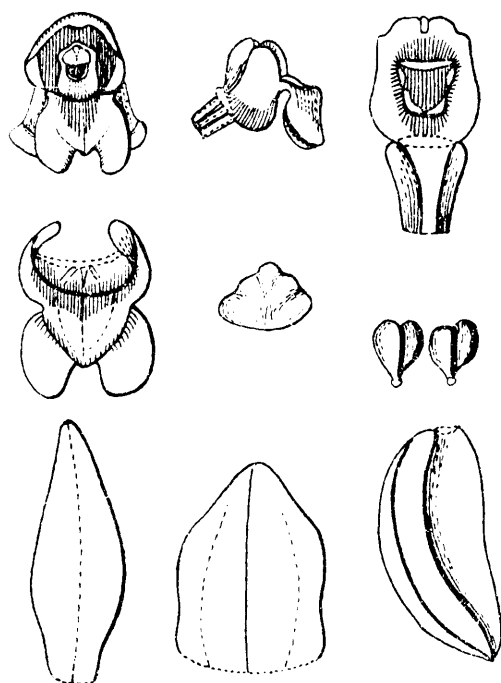
Pholidota torricellensis Schltr.



Pholidota sororia Schltr.



Pholidota sororia var. *djamuensis* Schltr.



Pholidota imbricata var. *montana* Schltr.

Group XIII *Liparidinae*

According to Pfitzer, this Group embraces nine genera, viz. *Malaxis* Sw., *Microstylis* Nutt., *Orestia* Ridl., *Ephippianthus* Rchb. f., *Liparis* L.C. Rich., *Cestichis* Thou., *Oberonia* Lindl., *Calypso* Salisb. and *Corallorhiza* R. Br. It is impossible for these genera to remain in such a polymorphic union since several of these are related more closely to others placed further apart by Pfitzer. In my opinion the following must be excluded, viz. *Ephippianthus* Rchb. f., *Calypso* Salisb. and *Corallorhiza* R. Br., which together with *Aplectrum* Nutt., *Tipularia* Nutt., *Dactylostalix* Rchb. f., *Oreorchis* Lindl. and *Cremastra* Wall. will form a separate group, for which I propose the name *Corallorhizinae*. The order of the genera would be as follows:—

1. *Calypso* Salisb.
2. *Dactylostalix* Rchb. f.
3. *Ephippianthus* Rchb. f.
4. *Tipularia* Nutt.
5. *Aplectrum* Nutt.
6. *Corallorhiza* R. Br.
7. *Oreorchis* Lindl.
8. *Cremastra* Wall.

It is probable that *Hexalectris* Rafin. also belongs here. According to Pfitzer's division this group may be regarded, at least, as the first group of *Pleuranthae*, since it definitely shows lateral inflorescences. After exclusion of these genera the following remain in the group *Liparidinae*, viz. *Malaxis* Sw., *Microstylis* Nutt., *Orestia* Ridl., *Liparis* L.C. Rich., *Cestichis* Thou. and *Oberonia* Lindl. Later on I shall have to deal in detail with the question of the retention of *Cestichis*, and endeavour to prove that it is better to unite it with *Liparis* L.C. Rich. Consequently, we have five genera, to which a few years ago I added another, *Hippeophyllum* Schltr.

At present the group comprises six genera, according to my definition of it. Of these, not less than four are found in our Territory. The missing genera are the monotypic West African *Orestia* Ridl., and the likewise monotypic European *Malaxis* Sw.

Up to the present, we have been accustomed to regard British India as the region which is richest in *Liparidinae*. In his 'Fl. Brit. India', Hooker f. published 121 species. If we assume that since then another 25 species have been recorded, the total will still not equal even the number of species already published from German New Guinea, the area of which is very small when compared with that of British India. But it is certain that the number of *Liparidinae* occurring in the Territory has not been exhausted.

39. *Microstylis* Nutt.

The great increase in the number of species in the Territory belonging to this genus makes it necessary to consider dividing it into sections.

The majority of the species, indeed, belong to a section difficult to divide and which is distinguished by a labellum split in front into several marginal teeth. It is possible, however, to establish other sections whereby a considerable proportion of the species may be separated.

The first characteristic section comprises a group of forms which centre on *M. epiphytica* Schltr. This section, for which the name *Pseudo-Liparis* may be retained (unsuitable though it is), was regarded by Finet as a separate genus; but this view is not tenable as confirmed by the too many transitions to the typical *Microstylis*-form. On the other hand J.J. Smith, who has accepted this section, has made it too

comprehensive, if he includes *M. moluccana* J.J. Sm. within its limits. In my opinion the chief character of the section is to be found in the column, which is provided always with a peculiar excrescence or horn, giving it a bent appearance. Within it I include, in addition to the species here enumerated, *M. tubulosa* J.J. Sm., *M. incurva* J.J. Sm. and *M. rhinoceros* J.J. Sm. Amongst those species included within it by J.J. Smith, the following do not belong, viz: *M. moluccana* J.J. Sm., *M. Zippelii* J.J. Sm. and *M. dryadum* Schltr.

The second section embraces the 'form-circle' of *M. moluccana* J.J. Sm. and is given the section name of *Oistochilus*. It has the non-concave labellum of *Pseudo-Liparis*, but also the straight column (without excrescence) of the typical *Microstylis* species.

The section *Bothrocardia* possesses a straight column, and a completely undivided labellum with a concavity. The column is often similar to that of the common *Microstylis*-form, whereas in *Oistochilus* there is a tendency for it to elongate.

As a transition to the principal form, we now obtain several more-or-less isolated forms, such as the sections *Ophthalmodes*, *Gastroglottis* and *Hololobus*.

The majority of the species in the Territory are grouped within the large section *Pleiodon*, in which the lip is more-or-less markedly toothed in front.

Separated by its habit, but with the same floral structure, is the section *Commelinodes*, and lastly must be mentioned the section *Herpetorhizis*, which is also to be recognised by its habit.

§ 1. *Pseudo-Liparis*

I have mentioned above the chief characteristics of this section, which comprise a flat non-concave labellum, and above all the column provided with an excrescence or horn. It would appear that we are dealing here with an almost purely Papuan section, since, apart from the 18 species recorded from New Guinea, I know of only one species from elsewhere belonging to this relationship, viz. *M. trigonopetala* J.J. Sm. from the Celebes. The latter species, on account of its four-lobed labellum, would best be allocated to a separate section, *Trigonopetalum*. It is surprising that a large proportion of the species always occur as epiphytes, growing either on young branches, as in the case of *M. epiphytica* Schltr., or on the trunks of trees, as for *M. brachycaulos* Schltr. and *M. Finisterrae* Schltr. These epiphytes are very constant in their habitat conditions; for instance I have never seen *M. brachycaulos* on the weaker tops of trees, but always at a certain height above the ground on thick trunks; whilst other species, such as *M. curvatula* Schltr., prefer thinner trees. Some species grow in humus, but only in dense primary forests, as in the case of *M. laevis* Schltr., *M. Schumanniana* Schltr., *M. maboroensis* Schltr., *M. umbonata* Schltr. and the peculiar narrow-leaved *M. stenophylla* Schltr.

1. *M. laevis* Schltr., sp. nov.

Terrestris, erecta, simplex, 18–30 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, erecto, 4–5-foliato; foliis erecto-patentibus, petiolatis, lamina oblique ovato-lanceolata vel elliptico-ovata, acuta, basi nunc rotundata nunc oblique cuneata, glabra, marginibus leviter undulata, 3.5–6 cm longa, infra medium 1.7–2.4 cm lata, petiolo basi dilatata caulem vaginante, 1.7 bis 2.5 cm longo; scapo gracili, erecto, glabro, inflorescentiam versus angulato, vaginulis paucis bracteiformibus, dissitis obsesso; spica subaxe 10–20-flora, usque ad 7 cm longa; bracteis patulis, lanceolatis, acuminatis, ovario brevioribus; floribus in genere mediocribus, inversis patentibus; sepalo intermedio oblongo, obtusiusculo, glabro, 5.5 cm longo, lateralibus oblique suborbicularibus, obtusiusculis, glabris, 0.4 cm longis; petalis lineari-ligulatis, obliquis, subacutis, sepalis lateralibus aequilongis; labello subreniformi, subacuto, basi in aurículas lanceolatas, acutas, 2.5 mm longas producto, glabro, superne omnino laevi, 2.5 mm longo, supra basin 3.5 mm, lato;

columna brevi dorso in gibbum corniformem, obtusum producta, glabra, brachiis productis, oblique et inaequaliter bilobulatis; anthera ovato-cucullata, obtuse acuminata; ovario cum pedicello glabro, 0.5 cm longo, 6-costato.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17131, flowering in Jan. 1908; in humus in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19142, flowering in Jan. 1909.

The species is distinguished from all others in the section by the smooth labellum, occurring in groups of a few specimens or singly in the primary forest, never in colonies. The flowers are yellowish with an orange-yellow labellum, the anther and column almost blue at the tip. This blue, or occasionally dark green-blue colouring of the anther and apex of the column, is very striking in the genus and seems only to occur in the two sections *Pseudo-Liparis* and *Oistochilus*.

2. *M. macrotis* Schltr. [Ed.—comb. nov.]

Liparis macrotis Krzl., in K. Schum. et Laut., Nachtr. [1905], p. 104.

Kaiser-Wilhelms-Land: Simbang—Nymann no. 789; in the forests of [Mount] Sattelberg, alt. c. 600 m—R. Schlechter no. 19961, flowering in July 1909.

[Ed.—this number also cited for *O. Kaernbachiana*—p. 205.]

This plant is a true *Microstylis* resembling *M. laevis* Schltr. in habit, but approaching *M. umbonata* Schltr. in floral structure.

3. *M. umbonata* Schltr., sp. nov.

Terrestris, erecta, 18–27 cm alta; rhizomate brevi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, erecto vel suberecto, 4–6-foliato; foliis erecto-patentibus, petiolatis, lamina oblique elliptica, acuta vel subacuta acuminata, basi oblique cuneata, utrinque glabra, 3.5–5 cm longa, medio vel infra medium 1.5–2 cm lata, petiolo sulcato, basi dilatata vaginante, 2–2.5 cm longo; scapo gracili, angulato; racemo dense multifloro, elongato, usque ad 12 cm longo; bracteis deflexis, lanceolatis, acuminatis, ovario brevioribus; floribus patentibus, in genere mediocribus, glabris; sepalo intermedio ovato, obtuso, apiculato, 0.4 cm longo, lateralibus oblique et late ellipticis, obtusis, sepalo intermedio paululo brevioribus; petalis oblique lineari-ligulatis, obtusis, 3.5 mm longis; labello reniformi, subapiculato, toris 2 leviter falcatis e basi usque ad apicem ibique confluentibus ornato, 2 mm longo, basi 3.5 mm lato, auriculis oblique subfalcato-lanceolatis, subparallelis, subacutis, 2 mm longis; columna brevi, dorso medio umbone brevi, conico, obtuso donata, glabra, brachiis antice oblique truncatis; anthera ovato-cordata, cucullata, obtusiuscula, glabra; ovario cum pedicello cylindraceo, 6-costata, glabro, 4.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests at the foot of the Bismarck Range, near the Kenejia Base, alt. c. 300 m—R. Schlechter no. 18631, flowering in Nov. 1908.

In habit this species has some resemblance to *M. laevis* Schltr., but differs in its smaller flowers, the presence of a callus on the lip, and the column. It would appear to occur at lower altitudes than other species of this relationship. The flowers are golden yellow with the column green-blue at the apex.

4. *M. Schumanniana* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 101.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 14058, flowering in Jan. 1902.

The species is smaller than *M. umbonata*, but otherwise not unlike it. I have not found it again.

5. *M. maboroensis* Schltr., sp. nov.

Terrestris, erecta, 12–24 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, 3–4-foliato, erecto; foliis erecto-patentibus vel suberectis, petiolatis, oblique ellipticis vel elliptico-lanceolatis, acuminatis, basi cuneatis, margine leviter undulatis, glabris, lamina 3–6.5 cm longa, medio fere 1–2.5 cm lata, petiolo basi dilatata caulem vaginante, 1.5–2.5 cm longo; scapo gracili, usque ad medium fere florifero, hinc et inde vaginula bracteiformi obsesso, subtereti, glabro; racemo subaxe multifloro, elongato, usque ad 1.3 cm longo; bracteis patentibus,

lanceolatis, acuminatis, ovario brevioribus; floribus patentibus, in genere mediocribus, glabris; sepalis ovato-oblongis vel late ovatis, obtusiusculis, intermedio 4.5 mm longo, lateralibus obliquis, vix 3.5 mm longis; petalis oblique lineari-lanceolatis, obtusiusculis, glabris, sepalis lateralibus aequilongis; labello sagittato-subreniformi, breviter acuminato, toris 2 falcatis, carnosus, antice confluentibus e basi usque infra apicem ornato, glabro, c. 2 mm longo, basi 2.5 mm lato, auriculis oblique triangulis, subacutis, subparallelis, 1.5 mm longis; columna brevi, dorso basi gibbo brevi, crasso, retrorsum spectante donata, brachiis antice in lobum parvulum productis, glabra; anthera ovato-cucullata, obtusa; ovario cylindraceo, glabro, 6-costato, pedicello incluso 0.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19507, flowering in May 1909.

This species, likewise, is related to the previous one, but has looser inflorescences, erect bracts and a very characteristic column. The flowers are olive-green with the front of the column almost blue.

6. *M. torricellensis* Schltr., sp. nov.

Epiphytica, pusilla, erecta, 8–12 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule usque ad medium vel supra foliato, usque ad 5 cm longo; foliis 5–9, erectopatentibus vel patentibus, petiolatis, lamina oblique ovata vel ovato-lanceolata, acuta vel acuminata, saepius cum apiculo, glabra, 2–2.8 cm longa, infra medium 1.4–2 cm lata, basi vulgo rotundata, petiolo basi dilatata caulem vaginante, 1–2 cm longo; scapo erecto, folia subduplo superante, usque ad medium fere florifero, hinc et inde vaginula bracteiformi, parvula obsessa, subtereti; racemo subdense 10–15-floro, usque ad 5 cm longo; bracteis reflexis, lanceolatis, acutis, ovario brevioribus; floribus in sectione inter minores, patentibus, glabris; sepalis intermedio ovato, obtuso, 3.5 mm longo, lateralibus oblique et late ellipticis obtusis, c. 2.5 mm longis; petalis oblique linearibus, obtusis, sepalis lateralibus aequilongis; labello antice semiorbiculari, apiculato, toro hippocrepiformi antice sensim evanescente, medio anguste foveolato e basi usque infra apicem decurrente, vix 0.2 cm longo, basi 2.5 mm lato, auriculis subfalcato-lanceolatis acutis, apicem versus sese approximantibus, 0.2 cm longo; columna brevi, lata, dorso supra basin cornu parvulo, subulato, erecto ornata, brachiis productis, antice oblique lobulatis; anthera ovato-cucullata, subcordata, obtusa; ovario cylindraceo, 6-costato, 0.4 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20043, flowering in Sept. 1909.

One of the smaller epiphytic species of the section distinguished by the peculiar subulate column-process. In habit it constitutes, in a way, the transition from *M. Schumanniana* to *M. seleniglossa* Schltr. The sepals and petals are of a green-yellow colour, the labellum orange-yellow, the column olive-green with a blue apex.

7. *M. seleniglossa* Schltr., sp. nov.

Epiphytica, pusilla, 8–15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule stricto vel substricto, bene foliato; foliis erecto-patentibus, 4–7, petiolatis, lamina oblique lanceolata, acuminata, basi subcuneata, glabra, 2.5–5.5 cm longa, infra medium 0.8–1.5 cm lata, petiolo basi dilatata caulem vaginante, 0.5–1 cm longo; racemo breviter pedunculato, vulgo sub anthesi folia superiora vix superante, subdense 5–20-floro; bracteis patulis, lanceolatis, acutis, ovario paulo brevioribus; floribus in genere inter minores, patentibus, glabris; sepalis intermedio oblongo, obtuso, 0.3 cm longo, lateralibus oblique ovatis, obtusis, intermedio paulo brevioribus; petalis oblique linearibus, obtusiusculis, sepalis intermedio subaequilongis; labello lunato-sagittato, antice semiorbiculari, obtuso, callo hippocrepiforme intus supra basin usque supra medium decurrente et in crures 2 evanescente, 0.2 cm longo, basi 2.5 cm lato, auriculis subparallelis, subfalcato-lanceolatis, acutis, 2.5 mm longitudine subattingentibus; columna brevi, dorso medio gibbo parvulo, depresso, retrorso donata, brachiis productis, oblique lobulatis; anthera ovato-cucullata, obtusa; ovario subclavato, leviter 6-costato, glabro, pedicello incluso 0.5 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18062, flowering in July 1908.

In habit a very characteristic species, with a relatively leafy upper stem. In floral structure it is related to *M. torricellensis* Schltr. and *M. Schumanniana* Schltr. The flowers are green-yellow, the column a dark green-blue towards the apex, the labellum flushed pale brown.

8. *M. microhybos* Schltr., sp. nov.

Epiphytica, erecta, c. 20 cm alta; rhizomate abbreviato; radicibus elongatis, flexuosis, puberulis; caule usque ad 7 cm longo, usque ad apicem c. 5-foliato; foliis erecto-patentibus vel suberectis, petiolatis, valde obliquis, lanceolatis vel elliptico-lanceolatis, acuminatis, 3.5–7 cm longis, infra medium 1.4–2.2 cm latis, petiolo basi dilatata caulem vaginante, 2–3 cm longo; scapo gracili, tertia parte superiore florifero; bracteis lanceolato-subulatis, acutissimis, ovarium vulgo plus minusve superantibus, patentibus patulisve; floribus in sectione inter minores, erecto-patentibus, glabris; sepalis ovatis, obtusiusculis, intermedio 0.4 cm longo, lateralibus obliquis, 0.3 cm longis, petalis oblique linearilanceolatis, obtusiusculis, sepalis lateralibus sequilongis; labello ovato-sagittato, glabro, lamina antice marginibus incurvulis acuta, toris 2, fovea parvula separatis, supra medium ad basin versus decurrentibus et sensim evanescentibus, 0.2 cm longa, basi 2.5 mm lata, auriculis brevibus falcato-triangularibus, acutis, c. 1 mm longis; columna brevi, dorso basin versus incrassata et basi gibbo parvulo, retrorso, humili donata, brachiis porrectis, subcuspidato-lobulatis; anthera cordato-ovata, obtusa, cucullata, umbone angusto, ligulato donata; ovario cylindraceo, 6-costato, glabro, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19865, flowering in June 1909.

At first I was doubtful whether this was a luxuriant form of *M. seleniglossa* Schltr., but I was convinced at once by a closer examination of the flowers that it was a completely distinct species. All the floral parts are different in the two species. In *M. microhybos*, the flowers are grass-green, with a dark green-blue lip-furrow and column apex.

9. *M. breviscapa* Schltr., sp. nov.

Epiphytica, erecta, humilis, 10–13 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, pillosulis; caulibus incrassatis, brevibus, 2–3.5 cm longis, crassitudine 1–1.3 cm diametentibus, apicem versus 2–3-foliatis; foliis erecto-patentibus, petiolatis, lamina oblique elliptico-ovata vel elliptico-lanceolata, acuminata, utrinque glabra, 7–12 cm longa, medio vel infra medium 3–5.5 cm lata, petiolo basi dilatata caulem amplexante, c. 1.5 cm longo; scapo erecto, angulato, foliis distincte brevioribus; racemo dense multifloro elongato, usque ad 3.5 cm longo; bracteis sub anthesi patentibus, demum deflexis, lanceolatis, acuminatis, flores aequantibus vel paulo superantibus; floribus in sectione inter minores, inversis, subpatulis, glabris; sepalo intermedio lanceolato-ovato, obtuso, c. 3.5 mm longo, lateralibus oblique ovatis, obtusis, 0.3 cm longis; petalis oblique lanceolato-linearibus, obtusiusculis, sepalis lateralibus fere aequilongis; labello circuito elliptico-sagittato, glabro, lamina marginibus antice incurvis obtusiuscula, callo reniformi cruribus parallelis apicem versus decurrentibus et infra apicem evanescentibus ornato, 2.5 mm longa, basi 2.5 mm lata, auriculis basilaribus falcato-triangularibus, obtusiusculis, apice subapproximatis, c. 1 mm longis; columna brevi, apicem versus dilatata, dorso gibbo minuto recurvo infra apicem; anthera late ovato-cordata, obtusa, dorso gibbo minuto donata; ovario cylindraceo, 6-costato, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On large tree-trunks in the forests of the Bismarck Range, near Hokrocho, alt. c. 1400 m—R. Schlechter no. 18587, flowering in Nov. 1908.

The differences which separate this species from *M. brachycaulos* Schltr., described below, will receive consideration there. I will just mention here that both species agree completely in their peculiar compact habit, which also separates them immediately from all the other species of the section. The floral colouring in *M. breviscapa* I have noted as olive-green with brown labellum.

10. *M. brachycaulos* Schltr., sp. nov.

Epiphytica, erecta, 6–10 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, bulbiformi-incrassato, 1.5–3 cm longo, 0.8–1 cm diametente, 2–3-foliato, vaginis foliorum oblecto; foliis erecto-patentibus, breviter petiolatis, oblique ovatis, acuminatis, glabris, 3.5–7 cm longis, infra medium 2–4.3 cm latis, petiolo lato, basi dilatata caulem vaginante, 0.7–1 cm longo; scapo cum racemostrieto foliis brevioribus, pedunculo angulato, glabro, racemo dense multifloro, usque ad 2 cm longo; bracteis lanceolatis, acuminatis, sub anthesi patentibus, demum deflexis, flores superantibus; floribus in sectione inter minores, subpatulis, illis *M. breviscapae* Schltr. similibus, sed majoribus, glabris; sepalo intermedio ovato-lanceolato, obtusiusculo, 4.5 mm longo, lateralibus oblique ovatis, obtusiusculis, 3.5 mm longis; petalis oblique lanceolato-linearibus, obtusiusculis, sepalis lateralibus fere aequilongis; labello alte sagittato, lamina antice

semiorbiculari, subapiculata, callo ovato-lanceolato medio anguste foveato e basi usque ad apicem donata, 2.5 mm longa, basi 3 mm lata, auriculis basilaribus subparallelis, oblique lanceolatis, subacutis, 2.5 mm longis; columna brevi, apicem versus ampliata, dorso medio gibbo parvulo, conico, erecto donata, brachiis productis, rhombeis; anthera subreniformi-cucullata, glabra; ovario cylindraceo, 6-costato, glabro, cum pedicello c. 3 mm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18158, flowering in Sept. 1908.

As already mentioned above this species is related closely to *M. breviscapa* Schltr., but on comparing the floral parts, we find not only differences in size, but especially also in the labellum and column, which necessitates the separation of the two species. In *M. brachycaulos*, the flowers are of a brownish flesh colour and olive-green towards the centre.

11. *M. curvatula* Schltr., sp. nov.

Epiphytica, subacaulis, pusilla, 4.5–6 cm alta; rhizomate valde abbreviato; radicibus flexuosis, elongatis, puberulis; caule valde abbreviato, nunc subnullo; foliis 2–4, erecto-patentibus vel erectis, oblique ellipticis vel elliptico-lanceolatis, acutis vel subacuminatis cum apiculo tenui, minuto, basi sensim in petiolum brevem angustatis, lamina 2.5–5.5 cm longa, medio fere 1.2–2.2 cm lata, petiolo basi dilatata amplectente, 0.5–1 cm longo; scapo cum racemo folia vulgo haud excedente, curvatulo, pedunculo gracili, vulgo evaginulato, racemo laxo 5–9-floro, usque ad 3 cm longo; bracteis ovatis, acuminatis, amplectentibus, ovario duplo fere brevioribus, patentibus; floribus in sectione inter minores, patentibus, subsecundis, glabris; sepalis ovatis, obtusis, intermedio 0.4 cm longo, lateralibus obliquis, 3.5 mm longis; petalis oblique linearibus, obtusiusculis, sepalis lateralibus fere aequilongis; labello circuitu elliptico-sagittato, lamina antice late ovata, apiculata, umbone anguste oblongo e basi, medio anguste et profunde foveolato, apicem versus evanescente ornato, 0.3 cm longo, basi 3.5 mm lato, auriculis basilaribus falcato-lanceolatis, acutis, apice approximatis, 0.3 cm longis; columna brevi, crassiuscula, dorso medio gibbo parvulo, conico, obtuso donata, brachiis falcato-productis obliquis; anthera ovato-cucullata, obtusa, leviter cordata; ovario cylindraceo, 6-costato, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On slender tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17499, flowering in Mar. 1908.

A very characteristic species distinguished less by the structure of the flowers than by the habit. It is recognised easily by the short, very slender-stemmed and slightly pendant inflorescences. The flowers are orange-yellow with the column dark blue-green in front.

12. *M. epiphytica* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 99.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], alt. c. 250 m—R. Schlechter no. 20348, flowering in Sept. 1909; on branches of shrubs in the forests of the Torricelli Range, below Apur, alt. c. 500 m—R. Schlechter no. 14382, flowering in Apr. 1902.

This species, according to J.J. Smith, now has been found also in Dutch New Guinea. The illustration of the labellum by Finet is incorrect in that the basal lamella does not seem to be present in the normal flowers, for I have never been able to find it either in the living or dry material. The only close relative of this species known to me is *M. diploceras* Schltr., described below.

13. *M. diploceras* Schltr., sp. nov.

Epiphytica, erecta, subacaulis, 8–12 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule valde abbreviato, bulbiformi, paulo compresso, ovoideo, foliis c. 6, distichis obsocto, 1–1.8 cm longo, medio 0.7–1 cm lato; foliis erecto-patentibus, oblanceolato-ellipticis, tenuiter apiculatis, basin versus sensim angustatis, basi dilatata caulem amplectentibus, 4–8 cm longis, supra medium 0.8–1.4 cm latis; scapis erectis, angulatis, glabris, vaginis paucis, dissitis, bracteiformibus obsocto; racemo subaxe 4–8-floro; bracteis erecto-patentibus, ovato-lanceolatis, acuminatis, glabris, ovario fere aequilongis; floribus in sectione mediocribus, patentibus, glabris; sepalis intermedio ovato, obtuso, 0.5 cm longo, lateralibus obliquis, late ellipticis, subapiculatis, 0.4 cm longis; petalis oblique linearibus, obtusiusculis, glabris, sepalis intermedio subaequilongis; labello alte

sagittato, lamina antice e basi lata sinuato-angustato, oblongo, obtusissimo, apice subretuso cum apiculo, lamella vel callo lyriformi-curvato infra apicem usque infra medium ornato, c. 0.3 cm longo, basi 2.5 mm lato, auriculis basilariibus lanceolato-ligulatis, obtusiusculis, falcatis, apicibus bene approximatis, c. 1.5 mm longis; columna brevi, dorso medio callis 2 corniformibus, recurvis, lateraliter paulo compressis ornato, brachis ligulato productis, amplis; anthera ovato-cucullata, leviter cordata, obtusa, dorso umbonata; ovario cylindraceo, glabro, 6-costato, pedicello incluso 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17228, flowering in Jan. 1908.

This species is distinguished markedly from the above by the labellum and column, but otherwise resembles it closely. The plant seems to be rather rare, for I found only one locality, and only a few specimens. The flowers are yellow, the labellum orange-yellow, the column dark green-blue in front.

14. *M. stenophylla* Schltr., sp. nov.

Terrestris, erecta, 13–25 cm alta; rhizomate brevi, decumbente; radicibus elongatis, flexuosis, puberulis; caule elongato, usque supra medium dense foliato, tereti, glabro; foliis erecto-patentibus, linearibus, acutis, basin versus paulo angustatis, basi dilatata caulem amplexantibus, 5–12 cm longis, medio fere 0.3–0.5 cm latis; scapo gracili, folia superante, angulato, vaginulis paucis, bracteiformibus obsesso; racemo subdense multifloro, usque ad 9 cm longo; bracteis deflexis, lineari-lanceolatis, acuminatis vel acutissimis, ovario fere aequilongis; floribus in sectione mediocribus, patulis, glabris; sepalis late ellipticis vel late oblongis, obtusis, intermedio 3.5 mm longo, lateralibus paulo brevioribus et latioribus, obliquis; petalis oblique ellipticis, obtusis, sepalis lateralibus fere aequilongis; labello sagittato, lamina antice late ovata, obtusa cum apiculo brevi, marginibus medio minute serrulata, toro anguste oblongo per medium usque infra apicem foveato e basi usque ad apicem decurrente, 2.5 mm longa, basi 3 mm lata, auriculis oblique triangulis subacutis, subparallelis, 1.5 mm longis; columna brevi, apice perlata, dorso medio callo lato, conico, retrorso, obtuso donata, glabra, brachiis productis, obliquis, bene evolutis; anthera oblongoideo-cucullata, obtusa; ovario cylindraceo, 6-costato, glabro, pedicello incluso 3.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the hill-forests on the Djamu [River], alt. c. 350 m—R. Schlechter no. 17564, flowering Apr. 1908; in humus in the forests on the Wakeak [River], alt. c. 350 m—R. Schlechter no. 19048, flowering in Jan. 1909.

Evidently is related to *M. latipetala* J.J. Sm., previously described, but differs in shape and the denticulation of the labellum. The flowers are pale brown-yellow, the column in front with a dark blue-green apex.

var. *crispatula* Schltr., var. nov.

Differt a forma *typica* foliis margine crispatis.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20025, flowering in Sept. 1909.

This variety, at first, makes a strange impression with its leaves curled on the edges, but agrees fairly well with the Type in the floral characteristics.

15. *M. undulata* Schltr., sp. nov.

Terrestris, pusilla, erecta, 10–15 cm alta; rhizomate cauliformi, brevi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, tereti, glabro, usque ad 15-foliato, vaginis foliorum amplexantibus obsesso; foliis erecto-patentibus, oblique lineari-ligulatis, apiculatis, glabris, basi paulo angustatis, margine leviter undulatis, 2.5–4.5 cm longis, medio fere 0.4–0.7 cm latis; scapo erecto, brevi, cum inflorescentia folia superiora superante; pedunculo angulato, glabro, racemo laxo 4–10-floro, usque ad 3 cm longo; bracteis patulis, lanceolatis, acutis, ovario brevioribus, glabris; floribus mediocribus, inversis, patentibus; sepalis oblongis, obtusis, glabris, intermedio 0.4 cm longo, lateralibus obliquis, paulo brevioribus; petalis obliquis, anguste rhombo-spathulatis, obtusiusculis, glabris, 3.5 mm longis; labello hastato-auriculato, antice late ovato vel subreniformi, obscure 5-angulato, obtusiusculo, margine integro, toro hippocrepiformi e basi usque infra apicem donato, 3.5 mm longo, basi 4.5 mm lato, auriculis oblique oblongis, obtusis, 3 mm longis, columna brevi, dorso gibbo triangulo depresso medio donata, brachiis brevibus, inaequaliter bilobulatis; anthera reniformi, antice quadrato-producta, obtusissima, glabra; ovario cum pedicello glabro, leviter 6-costato, c. 4 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 16631, flowering in Oct. 1907.

This plant undoubtedly is related to *M. stenophylla* Schltr., but has broader leaves and good floral characteristics. It occurs as solitary specimens inhabiting humus soil, growing usually in the shade. The colour of the flowers is yellow-green with column-tip dark green-blue in front.

§ 2. *Oistochilus*

This section reminds one in habit of the latter species of *Pseudo-Liparis*, but differs from these in the absence of the horn or tubercular excrescence on the back of the column, which is such a characteristic feature of *Pseudo-Liparis*. This labellum is usually rather narrowly sagittate and undivided as in *Pseudo-Liparis*; the concavity at the base is absent likewise. Generally, the disc is provided with only two lamellae, which may be rather differently shaped. To this section also belongs *M. moluccana* J.J. Sm.

16. *M. graminifolia* Schltr., sp. nov.

Terrestris, erecta, gracilis, 10–27 cm alta; rhizomate brevi, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, dense 4–7-foliato, tereti, glabro; foliis erecto-patentibus vel suberectis, linearibus, acutis, basi paulo dilatata caulem amplectentibus, 4–11 cm longis, medio fere 2–4.5 mm latis; scapo erecto, vaginulis paucis, dissitis, bracteiformibus obsesso, folia plus minusve superante, nunc plus duplo longiore; racemo dense multifloro, elongato, usque ad 13 cm longo; bracteis deflexis, lanceolatis, acutis, ovarium subduplo superantibus; floribus mediocribus in genere, patulis, glabris; sepalis oblongis, obtusis, 3.5 mm longis, lateralibus obliquis; petalis oblique obovato-spathulatis, obtusis, sepalis paulo brevioribus; labello circuitu hastato-ovato, obscure 5-angulato, obtusiuscule acutato, lamella duplici, antice forcipato-incurva, parvula intus supra medium donato, 0.3 cm longo, basi 3.5 mm lato, auriculis oblique triangulis obtusis, 0.1 cm longis; columna pro genere gracili, brachiis longius productis, oblique oblongis; anthera oblongo-cucullata, obtusissima; ovario cum pedicello cylindraceo, glabro, 6-costato, 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of [Mount] Gomadjidji, on the Waria [River] alt. c. 450 m—R. Schlechter no. 19352, flowering in May 1909.

A very narrow-leaved species related to *M. moluccana* J.J. Sm. and *M. Zippelii* J.J. Sm., but is distinguished especially by the labellum and column.

17. *M. Zippelii* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XXXIX (1910), p. 17.

M. platycheila Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds., [1901], p. 242 (nec Rehb. f.).

M. moluccana Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 100 (nec J.J. Sm.).

M. moluccana J.J. Sm. var. *sagittata* J.J. Sm., in Nova Guinea VIII (1909), p. 32.

Kaiser-Wilhelms-Land: In humus in the forests on the Garup [River] alt. c. 50 m—R. Schlechter no. 20018, flowering in Sept. 1909; in the forests at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14596, flowering in Apr. 1902; in humus in the forests of Albo, alt. c. 500 m—R. Schlechter no. 16120, flowering in May 1907; in humus in the forests of Boroai, alt. c. 500 m—R. Schlechter no. 17069, flowering in Dec. 1907; widespread in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13889, flowering in Jan. 1902; in humus in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18898, flowering in Nov. 1908; in humus in the forests near Constantinhafen, alt. c. 500 m—R. Schlechter no. 14299, flowering in Mar. 1902; in humus in the forests near Ambo, alt. c. 500 m—R. Schlechter no. 19045, flowering in Jan. 1909; in forest near Butaueng—Hellwig no.

459, flowering in Mar. 1889; in humus in the hill forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 19280, flowering in Apr. 1909.

This plant may be regarded better as a separate species now that more material is available. It is, however, related closely to *M. moluccana* J.J. Sm.

§ 3. *Bothrocardia*

A small section with species which resemble closely those of *Oistochilus* in the structure of the labellum, but in the column structure completely agreeing with *Pleiodon*. Clearly, a few of the Indo-Malayan forms belong here.

18. *M. dryadum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 98.

M. gibbosa J.J. Sm., in Bull. Dep. Agric. Ind. Néerl. XIX (1908), p. 28.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 14048, flowering in Jan. 1902; on wet rocks at places (or localities) on the Waria [River] not far from Udu, alt. c. 300 m—R. Schlechter no. 17451, flowering in Mar. 1908; on wet rocks on the Waria [River] near Gobi, alt. c. 350 m—R. Schlechter no. 19856, flowering in June 1909.

My specimen agrees well with the original Type of *M. gibbosa* J.J. Sm., which I was kindly given by Buitenzorg, except that the leaves are a little broader. I found the plant growing chiefly on wet rocks or in crevices covered with running water, but on the Bismarck Range it grew in the mountain forests. According to my notes, the colour of the flowers was, previously, stated somewhat incorrectly.

The sepals and petals are greenish, the labellum yellowish.

19. *M. oligantha* Schltr., sp. nov.

Terrestris, erecta, pusilla, 3.5–13 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule tereti, glabro, brevi, 3–5-foliato; foliis erecto-patentibus, oblique lanceolatis vel rarius ovato-lanceolatis, acuminatis, basi cuneatis, sensim in petiolum brevem angustatis, glabris, petiolo incluso 2.5–5.5 cm longis, infra medium 0.5–1.3 cm latis; scapo erecto, vulgo stricto, gracili, teretiusculo, glabro, folia superante; racemo laxo 3–8-floro, secundo, usque ad 5.5 cm longo; bracteis patulis vel deflexis, lanceolatis, acutis, ovario pedicellato brevioribus; floribus erecto-patentibus, in genere vix inter mediocres, glabris, pallide viridibus; sepalis ovatis, obtusis, intermedio 0.3 cm longo, lateralis obliquis, paulo brevioribus; petalis anguste lineari-ligulatis, obtusiusculis, sepalo intermedio subaequilongis; labello circuitu semiorbiculari, basi sagittato-auriculato, apice subapiculato, medio foveato, cum fovea basi dilatata, vix 2.5 mm longo, basi 0.3 cm lato, auriculis falcato-lanceolatis acutis, 0.1 cm longis, incurvulis; columna crassiuscula brevi; anthera reniformi, obtusa; ovario cum pedicello glabro, cylindraceo, leviter 6-costato, 0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17976, flowering in July 1908.

Closely related to *M. dryadum*, but is distinguished by the much broader leaves of a different shape, and by the narrower petals. It inhabits the mist-forest and occurs there in colonies in shady places.

var. *neuroglossa* Schltr., var. nov.

Differt a forma *typica* labello sicco nervis reticulatis incrassatis per totum discum ornato.

Kaiser-Wilhelms-Land: On mossy rocks in the forests of the mountain country of Asai, alt. c. 900 m—R. Schlechter no. 17708, flowering in May 1908.

It is possible that this variety may sometime prove to be a species. The veins are thickened conspicuously in the dried labellum and it also appears to me that the auricles of the labellum are shorter and blunter.

§ 4. *Ophthalmodon*

The only species of this section, which I know up to the present, is a very conspicuous

plant with long grass-like leaves and slender inflorescences with large, almost sessile flowers. The labellum is tri-lobed with broad, round auricles at the base. The only concavity is a short, small deepening at the base of the column, forming with the latter a figure reminiscent of an eye. The column is short with a cup-shaped, enlarged clinandrium and two narrow crests on the back.

20. *M. caricoides* Schltr., sp. nov.

Terrestris, valida, usque ad 60 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caule crassiusculo, dense 10–14-foliato; foliis linearibus, apicem versus angustatis, acutissimis, basi dilatata vaginantibus, 18–25 cm longis, medio fere 0.6–1 cm latis, folia Caricis in mentem revocantibus; scapo stricto vel substricto, glabro, angulato, vaginulis paucis dissitis, bracteiformibus obsesso; spica laxa multiflora, elongata, usque ad 20 cm longa; bracteis deflexis, anguste lanceolatis, valde acuminatis, ovarium bene superantibus; floribus in genere inter majores, inversis, glabris; sepalis late ellipticis, valde obtusis, intermedio 0.7 cm longo, medio 0.5 cm lato, lateralibus obliquis 0.6 cm longis, medio 0.4 cm latis; petalis oblique oblongis, obtusis, 0.6 cm longis; labello circuitu hastato-trilobo, lobis lateralibus obscuris, brevissimis, intermedio semiorbiculari, obtusissimo, fovea in basi labelli parvula, auriculis basilaribus peramplis, suborbicularibus, obtusissimis, 0.4 cm longis; columna brevi, dorso tenuiter 2-carinata, clinandrio ampliato, cupulari; anthera quadrato-rhombea, obtusa; ovario perbrevis, cylindraceo, 6-costato, glabro, c. 0.3 cm longo, sessili.

Kaiser-Wilhelms-Land: In humus between rocks under bushes in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18245, flowering in Sept. 1908.

Unrelated to any species previously described. Both in habit and in floral structure it is a very striking plant. The flowers are olive-green with a darker central eye.

§ 5. *Gastroglottis*

Since *G. montana* Bl., the Type of the genus, is identical with *M. latifolia* (Rees) J.J. Sm., the name of the genus may be applied to the section. The latter, as such, is well characterised in the large genus *Microstylis* by the structure of the labellum. This is recognised by the absence of basal auricles and by the presence of a broad callus over the short claw, furthermore by the very concave centre of the disc. The lamina is also tri-lobed with a thickened apex.

In all probability, there will be found a number of similar species under the collective names of *M. latifolia* (Rees) J.J. Sm., formerly *M. congesta* Rchb. f. To decide this question it will be necessary to examine much material from the various habitats.

21. *M. latifolia* (Rees) J.J. Sm., Orch. Flor. Jav. (1905), p. 248.

Kaiser-Wilhelms-Land: In humus in the forests at the foot of the Bismarck Range, alt. c. 400 m—R. Schlechter no. 18855, flowering in Nov. 1908; in humus in the mountain forests near Jaduna, alt. c. 200 m—R. Schlechter no. 19314, flowering in Apr. 1909; in humus, in the forests on [Mount] Mimi, on the Waria [River, alt. c. 650 m—R. Schlechter no. 17424, flowering in Mar. 1908.

As mentioned above, I am not quite certain of the relationship of this plant to the Indian species; there are some differences in the labellum which may perhaps necessitate the separation of this species.

The numerous specimens I saw in the Territory always had pale green-violet or green-yellow flowers.

§ 6. *Hololobus*

In this section I would like to place those species which have a simple tri-lobed labellum. The front lobe in these plants may be either undivided or shortly bifid. The

denticulation of the lateral lobes, which is characteristic of the section *Pleiodon*, is absent.

There are a number of Indian and Malayan species which also belong here; nevertheless in consequence of other characteristics, some of them might be better regarded as Types of special sections. Up to the present, this section is represented in New Guinea only by a single species.

22. *M. nitida* Schltr., sp. nov.

Terrestris, erecta, nitida, gracilis, 17–20 cm alta; rhizomate cauliformi, brevi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule abbreviato, tereti, glabro, 3–4 foliato; foliis patentibus, petiolatis, lamina oblique ovato-lanceolata vel lanceolata, acuta vel subacuminata, glabra, basi rotundata, 2.5–3.5 cm longa, infra medium 1–1.8 cm lata, petiolo basi dilatata vaginante, 0.7–1.3 cm longo; scapo stricto vel substricto, angulato, glabro, racemo laxo 5–10-floro, usque ad 5 cm longo; bracteis deflexis, lanceolatis, acuminatis, ovario brevioribus; floribus in genere mediocribus, patentibus, glabris; sepalis intermedio oblongo, obtuso, 3.5 mm longo, lateralibus obliquis, late ellipticis, obtusis, intermedio subaequilongis; petalis linearis-ligulatis, obtusis, glabris, 0.3 cm longis; labello circuitu late rhombeo, basi alte sagittato, e medio trilobo, 0.3 cm longo, ad apices loborum lateralium 0.3 cm lato, lobis lateralibus patentibus, triangulis, subacutis, intermedio bene longiore, oblongo, obtuso, alte bifido, auriculis triangulo ligulatis, obtusiusculis, parallelis, c. 2.5 mm longis; columna brevi, apicem versus bene ampliata; anthera subreniformi-cucullata, obtusissima; ovario cum pedicello glabro, 6-costato, 3.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20059, flowering in Sept. 1909.

The only species of the section in our Territory. It is evidently rather rare, for I only found a few specimens. It grows in the mist-forest, in the deep shade, amongst shrubs in rich humus soil. The flowers, initially a pale yellow, change to orange-yellow on wilting.

§ 7. *Pleiodon*

By far the greater number of species found in the Territory belong to this section. It is distinguished by the denticulations on the lateral lobes of the labellum. These denticulations may be reduced either to a single tooth, each between the outer point of the lateral lobes and the middle lobe, or consist of several (up to five) more-or-less sharp teeth on each side of the middle lobes. In some species, e.g. *M. arachnoidea* Schltr., these teeth are developed as thin thread-like appendages; in others, however, e.g. *M. melanophylla* Schltr., they are much reduced. A division of this section is very difficult, since the species often are related rather closely, although they may be recognised easily by their habit or vegetative characters.

I have so arranged the species here, that those having the smallest number of teeth on each side of the middle lobe are treated first, while those with the greatest number are placed at the end of the section.

The various representatives of the section grow under very different conditions, and, with the exception of *M. heliophila* Schltr., all are true inhabitants of the humus soil.

Some species, however, e.g. *M. xanthochila* Schltr., occur in the close vicinity of the sea coast and are typical inhabitants of the lowland forests, while others, e.g. *M. oreocharis* Schltr., dwell in the mist-forests of the mountains. Evidently, all species are fond of a regular supply of moisture from the soil and atmosphere, because all are found in places where they are protected from prolonged drought. Many species are distinguished by their beautifully coloured leaves. No epiphytic species are known up to the present in the section.

Besides the species enumerated here, the following, which also belong to this section, have been reported from Dutch New Guinea, viz. *M. pedicellaris* Rchb. f., *M. pectinata* J.J. Sm., *M. retusa* J.J. Sm., *M. hydrophila* J.J. Sm. and *M. riparia* J.J. Sm.

23. *M. leucodon* Schltr., sp. nov.

Terrestris, humilis, c. 10–14 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule vulgo valde abbreviato, 4–6-foliato; foliis erecto-patentibus, petiolatis, lamina sub-falcata, elliptico-lanceolata, acuta vel subacuta, basi cuneata, glabra, 4.5–8.5 cm longa, medio fere 1.1–2.1 cm lata, petiolo basi paulo dilatata vaginante, 1.3–2 cm longo; scapo stricto vel substricto, vaginulis paucis bracteiformibus obsesso, angulato, glabro; racemo subdense plurifloro, elongato, usque ad 7 cm longo; bracteis deflexis, anguste lanceolatis, acuminatis, ovario vulgo paulo brevioribus; floribus in genere mediocribus, patentibus, glabris; sepalis oblongis vel ovato-oblongis, obtusis, 3.5 mm longis, lateralibus obliquis; petalis oblique linearibus, obtusis, sepalis paululo brevioribus; labello peralte sagittato, antice trilobo, 0.3 cm longo, inter apices loborum lateralium 4.5 mm lato, lobis lateralibus triangulis, subacutis, ad basin lobi intermedii lacinia subulato-lanceolata acuta auctis, lobo intermedio rotundato, forcipato-bifido, segmentis falcatis, incrassatione hippocrepiformi e basi labelli usque ad basin lobi intermedii, auriculis parallelis, oblique lanceolato-ligulatis, subacutis, 3.5 mm longis; columna brevi, crassiuscula; anthera reniformi-cucullata, antice subacuta; ovario cum pedicello glabro, 6-costato, 0.6 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16732, flowering in Oct. 1907; in humus in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19024, flowering in Dec. 1908.

This extremely characteristic species is distinguished by the structure as well as colour of the flowers, for while the sepals and petals are dark carmine-red, the labellum in front of the middle lobe and the two teeth standing beside it are a bright white-yellow. The leaves are dark red-green.

24. *M. quadridens* Schltr., sp. nov.

Terrestris, erecta, 22–27 cm alta; rhizomate brevi, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule cylindrico, glabro, 6–8 cm longo, 3–4-foliato; foliis erecto-patentibus, petiolatis, lamina oblique ovata vel ovato-elliptica, acuminata, glabra, 9–11 cm longa, infra medium 4–5.5 cm lata, petiolo basi dilatata vaginante, 2.5–4 cm longo; scapo gracili, vaginulis paucis, dissitis, bracteiformibus obsesso, angulato, glabro; racemo dense multifloro, cylindraceo, elongato, usque ad 7 cm longo, c. 1.2 cm diametiente; bracteis deflexis, anguste lanceolatis, acuminatis, ovario aequilongis vel paulo longioribus; floribus in sectione inter minores, patentibus, glabris; sepalo intermedio oblongo, obtuso, 2.5 mm longo, lateralibus oblique ellipticis, obtusis, intermedio paululo brevioribus; petalis oblique linearibus, obtusis, sepalis lateralibus aequilongis; labello e basi alte sagittata supra medium trilobo, c. 0.2 cm longo, inter apices loborum lateralium vix 0.3 cm lato, lobis lateralibus anguliformibus, obtusiusculis, brevibus, intermedio in lacinias 4, sub-falcato-lanceolatas, subaequilongas fisso, callis 2 hippocrepiformi-divergentibus, e basi lobi intermedii usque ad basin auricularum decurrentibus, auriculis oblique ovato-ligulatis, obtusis, vix conniventibus, vix 1.5 mm longis; columna brevi, crassiuscula; ovario cum pedicello glabro, 6-costato, 2.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18579, flowering in Nov. 1908.

Hardly characteristic on superficial examination, but easily recognised from the others by the shape of its labellum. The teeth, belonging otherwise more to the side lobes, are here nearer the middle lobe, so that they may just as well be described as parts of the latter, as I have done here for convenience sake.

25. *M. heliophila* Schltr., sp. nov.

Terrestris, erecta, pusilla, 6–13 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule valde abbreviato, paulo incrassato, 3–4-foliato; foliis erecto-patentibus vel suberectis, ellipticis, acutis, basi sensim subpetiolato-angustatis, ima basi vaginantibus, 1.2–4 cm longis, medio fere 0.6–1.5 cm latis; scapis strictis, gracilibus, vulgo evaginulatis, subangulatis, glabris; racemo laxo 4–17-floro, usque ad 6.5 cm longo; bracteis deflexis, lanceolatis, acuminatis, ovario duplo vel plus duplo brevioribus; floribus patentibus, in genere mediocribus, inversis, glabris; sepalis oblongis, obtusis, intermedio 3.5 mm longo, lateralibus obliquis, intermedio paulo brevioribus et latioribus; petalis oblique lineari-ligulatis, obtusis, sepalis lateralibus fere aequilongis; labello circuitu suborbiculari, sagittato, tertia parte anteriore trilobo, 0.3 cm longo, inter apices loborum lateralium 3.5 mm lato, lobis lateralibus in lacinias 3, triangulares, acutas, subfalcatas fissis, lacinia exteriori interioribus paulo brevioribus, lobo medio semiorbiculari, lacinii interioribus aequilongo, minute trilobulato, callo excavato hipposiphoniformi, e basi labelli usque infra basin lobi intermedii decurrente,

auriculis falcato-triangularibus obtusis, c. 1.5 mm longis; columna perbrevis, crassiuscula; ovario gracilius pedicellato, cum pedicello subclavato, 6-costato, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On more open clay slopes of the Dischore Range, in the vicinity of the Govidjoa Creek, alt. c. 1200 m—R. Schlechter no. 19732, flowering in June 1909.

The species grows mostly in groups and seems to be the only one in the section which occurs in the open country exposed fully to the sun. The whole plant is dark violet-green, the flowers are rose-red.

26. *M. oreocharis* Schltr., sp. nov.

Terrestris, erecta, pulchella, 10–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule abbreviato, 3–5-foliato; foliis erecto-patentibus, petiolatis vel subpetiolatis, vulgo vix obliquis, lanceolatis vel elliptico-lanceolatis, acutis, basi cuneatis, in petiolum plus minusve distinctum angustatis, lamina 4–8 cm longa, infra medium 1.5–2.7 cm lata, petiolo basi dilatata vaginante, 1–2.5 cm longo; scapo gracili, stricto vel substricto, hinc et inde vaginula minuta bracteiformi obsessa, vel nudo angulato, glabro; racemo laxo 7–20-floro, usque ad 10 cm longo; bracteis deflexis, lanceolatis, acutis, ovario triplo fere brevioribus; floribus in genere mediocribus, patentibus, glabris; sepalis oblongis, obtusis, intermedio 0.5 cm longo, lateralibus obliquis paulo brevioribus; petalis oblique linearibus, obtusis, subfalcatis, sepalis lateralibus fere aequilongis; labello altius auriculato, supra medium trilobo, 3.5 mm longo, medio fere 0.4 cm lato, lobis lateralibus tridentatis, dente exteriori abbreviato, triangulo, interioribus falcato-subulatis acutis, conspicue longioribus, lobo intermedio semiorbiculari, antice breviter exciso, dentes interiores loborum lateralium paululo superante, fovea medio constricta, marginibus basi lateribusque incrassatis, e basi labelli usque in medium lobi intermedii exeunte, auriculis triangularibus, obtusiusculis, 0.2 cm longis; columna brevi, crassiuscula; anthera subreniformi, obtusa; ovario graciliter pedicellato, 6-costato, costis leviter undulatis, pedicello incluso c. 0.8 cm longo, glabro.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18007, flowering in July 1908.

A magnificent species with glossy, metallic, dark violet leaves, which well deserves to be introduced into European collections. The flowers are yellowish with a few pale reddish spots. In habit the species reminds one somewhat of *M. heliophila* Schltr., but it is more robust, with a different labellum to the larger flowers. The pedicels of *M. pedicellaris* Rchb. f. [Ed.—from Dutch New Guinea] are about twice as long and the peduncle is more elongated together with smaller leaves.

27. *M. melanophylla* Schltr., sp. nov.

Terrestris, erecta, gracilis, 25–40 cm alta; rhizomate brevi, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, densius 6–8-foliato, usque ad 9 cm longo, paulo incrassato, tereti, glabro; foliis erecto-patentibus, petiolatis, lamina oblique elliptica vel lanceolato-elliptica, acuminata, basi plus minusve cuneata, margine vulgo undulata, utrinque glabra, 5–8.5 cm longa, medio fere 2–3.2 cm lata; scapo stricto vel substricto, gracili, vaginulis paucis dissitis, bracteiformibus obsessa, angulato, glabro; racemo laxo 15-multi-floro, elongato, usque ad 13 cm longo, c. 1.5 cm diametiente; bracteis patulis vel deflexis, lanceolatis, acutis, ovario brevioribus; floribus in sectione interminores, patentibus, glabris; sepalis elliptico-vel ovato-oblongis, obtusis, vix 0.3 cm longis, lateralibus obliquis; petalis oblique linearibus, obtusis, sepalis paululo brevioribus; labello basi alte auriculato, lamina antice e medio trilobo, 2.5 mm longo, medio fere 0.3 cm lato, lobis lateralibus tridentatis, dentibus decrescentibus, exteriori parvulo anguliformi, subacuto, interioribus falcato-triangularibus acutis, lobo intermedio oblongo, obtuso, usque ad medium fere bifido, dentes interiores loborum lateralium duplo fere superante, 0.1 cm longo, callo intus excavato hippocrepiformi, e basi labelli usque in medium decumbente, callo altero bicuri, cruribus V-formiter divergentibus e medio lobi intermedii usque infra medium labelli evanescentibus, auriculis oblongo-ligulatis, subfalcatis, obtusis, subparallelis; anthera reniformi-cucullata, obtusa; ovario cum pedicello glabro, cylindraceo, 6-costato, 4.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19620, flowering in May 1909.

The species is evidently not so common as many of these 'bright-leaved' orchids growing in the humus soil of the Territory, for I found only two specimens. The

flowers are prettily coloured dark violet, but dull; not glossy as in *M. oreocharis* Schltr. The species is recognised by the labellum, which shows a 'vee'-shaped thickening (in front of the usually excavated basal callus), which, beginning at the centre of the middle lobe, extends down into two shanks over the middle of the lamina of the labellum. The flowers are olive-green, with violet-red tips, the labellum reddish at the centre.

28. *M. fasciata* Schltr., sp. nov.

Terrestris, erecta, 15–25 cm alta; rhizomate cauliformi, brevi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, 4–7 cm alto, bene foliato, tereti, glabro; foliis 4–8, erecto-patentibus vel patentibus, petiolatis, lamina oblique elliptica vel elliptico-lanceolata, acuta vel acuminata, basi rotundata, utrinque glabra, margine plus minusve undulata, 5–7.5 cm longa, infra medium 2.2–3.2 cm lata, petiolo basi dilatata vaginante, 1–2 cm longo; scapo gracili, stricto vel substricto, angulato, vaginulis paucis, distantibus, bracteiformibus obsesso, glabro; racemo subdense multifloro, elongato, usque ad 10 cm longo, 1–1.3 cm diametiente; floribus in sectione mediocribus, patentibus, glabris; bracteis deflexis, anguste lanceolatis, acuminatis, ovario subaequilongis; sepalis oblongis, obtusis, intermedio 3.5 mm longo, lateralibus obliquis, paulo brevioribus; petalis ligulatis, obtusis, sepalis lateralibus subaequilongis; labello alte lunato-auriculato, infra medium trilobo, 0.3 cm longo, infra medium 3.5 mm lato, lobis lateralibus cum angulo exteriori minuto obtuso, caeterum bidentato, dentibus deltoideo-subulatis, acutis, lobo medio oblongo, obtuso, usque ad medium fere bifido, segmentis obtusis, dentes loborum lateralium subduplo superante, fovea basilari parvula, toro hippocrepiformi e basi usque ad medium marginata, auriculis basilaribus oblique lanceolato-triangulis, subacutis, 0.2 cm longis; columna brevi crassiuscula, apicem versus paulo dilatata; anthera subreniformi; ovario cylindraceo, glabro, 6-costato, cum pedicello 0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the primary forests of Wobbe, alt. c. 250 m—R. Schlechter no. 16440, flowering in Aug. 1907; in humus in the mountain forests of Jaduna, on the Waria [River], alt. c. 200 m—R. Schlechter no. 19231, flowering in Apr. 1909.

Evidently closely related to *M. retusa* J.J. Sm., but the leaves are considerably broader and the flowers larger. The latter are initially yellow, but soon become red a few days after opening. The leaves are yellow-green in the centre and have a broad, pale brown band on each side near the margin.

var. *concolor* Schltr., var. nov.

Differt a forma typica foliis superne concoloribus, pallide brunneis, racemo laxiore.

Kaiser-Wilhelms-Land: In loamy soil in the gallery forests on the Kenejia [River], at moist localities together with *M. arachnoidea* Schltr. alt. c. 150 m—R. Schlechter no. 18310, flowering in Oct. [Ed.—possibly Sept.] 1908.

This variety has leaves uniformly pale brown uppermost, and a somewhat open inflorescence.

29. *M. macrophylla* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 99.

Kaiser-Wilhelms-Land: In humus in the forests on the upper Nuru [River], alt. c. 500 m—R. Schlechter no. 14211, flowering in Feb. 1902; in humus in the forests near the Kaulo Base, alt. c. 300 m—R. Schlechter no. 16763, flowering in Nov. 1907; in humus in the forests near the Saugueti Base, alt. c. 200 m—R. Schlechter no. 18917, flowering in Dec. 1908; in humus in the forests at the foot of the Bismarck Range, alt. c. 500 m—R. Schlechter no. 18648, flowering in Nov. 1908.

With better material now available it has been established that, among the Type material used in describing the species, a flowerless piece of *M. grandifolia* Schltr. was found which somewhat increased the quantity of leaves. Therefore, I now give another short description of the lower part of the plant: "Caule brevi 4–6-foliato; foliis erecto-patentibus, oblique ovato-vel ellipticolanceolatis, acutis vel acuminatus, glabris, lamina

10–16 cm longa, infra medium 3.5–5.5 cm lata, petilo 4–6.5 cm longo; scapo usque ad 40 cm alto”.

The description of the flower of the Type is based only on that of the true plant.

30. *M. grandifolia* Schltr., sp. nov.

Terrestris, erecta, valida, 50–65 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caule crassiusculo, cylindrico, brevi, dense foliato, 10–12 cm longo; foliis 7–10, erectopatentibus, petiolatis, lamina oblique elliptica, acuminata, basi cuneata, glabra, 16–25 cm longa, 4.5–6.5 cm lata, petiolo basi dilata caulem vaginante, 7–9 cm longo; scapo stricto vel substricto, angulato, vaginulis paucis, distantibus, bracteiformibus obsesso, glabro; spica densius multiflora, elongata, cylindrica, usque ad 25 cm longa, c. 2.2 cm diametiente; bracteis deflexis, lanceolatis, acuminatis, ovario pedicellato brevioribus; floribus in sectione inter mediocres, patentibus, glabris; sepalis oblongis, obtusis, marginibus revolutis, intermedio 4.5 mm longo, lateralibus paulo brevioribus et latioribus; petalis oblique lineari-ligulatis, obtusis, basin versus subangustioribus, 0.4 cm longis; labello circuitu semilunato, lamina 3.5 mm longa, basi 0.4 cm lata, dimidio anteriore triloba, lobis lateralibus cum angulo exteriore triangulo, acuto, brevi, caeterum in dentes 3, quorum dens exterior caeteris conspicue minor, fissis, dentibus 2 interioribus lanceolato-subulatis, acutissimis, lobo intermedio in dentes 2, illis loborum lateralium simillimis aequimagnisque partito, auriculis basilaribus oblique oblongis, obtusiusculis, 0.3 cm longis, fovea profunda, hemisphaerica, marginibus hippocrepiformi-incrassata in basi labelli; columna brevi, antice dilatata; anthera reniformi-cucullata, obtusa; ovario cum pedicello glabro, 6-costato, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the primary forests of Kelel, alt. c. 180 m—R. Schlechter no. 16406, flowering in Aug. 1907; in humus in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18904, flowering in Dec. 1908.

As stated above, I have confused a flowerless fragment of this species with *M. macrophylla* Schltr., from which it differs in its more robust growth and shape of the labellum. The flowers have a tendency to develop the denticulations of the labellum irregularly, so that many observations were necessary in ascertaining the normal arrangement of the teeth. The colour of the flowers is wine-red, with bright, pale yellow tips to the basal auricles of the labellum.

31. *M. olivacea* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 100.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 13976, flowering in Jan. 1902.

I did not find any further material of this very characteristic species on my last journey in New Guinea.

32. *M. stenostachys* Schltr., sp. nov.

Terrestris, erecta, 35–50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule valde abbreviato, vulgo subnullo, 3–5-foliato; foliis erecto-patentibus vel erectis, petiolatis, lamina subfalcato-elliptica, acuminata, glabra, 6–16 cm longa, medio fere vel infra medium 2.5–4.5 cm lata, petiolo lato, basi vaginante, 2.5–5 cm longo; scapo stricto vel substricto, angulato, vaginulis paucis distantibus, bracteiformibus obsesso, glabro; racemo gracili, dense vel subaxe multifloro, elongato, usque ad 20 cm longo, 0.7–0.8 cm diametiente; bracteis deflexis, anguste lanceolatis, longius acuminatis, ovarium vulgo superantibus; floribus patentibus, in genere inter minores, glabris; sepalo intermedio ovato, obtuso, vix 0.3 cm longo, lateralibus oblique oblongis, intermedio subaequilongis, obtusis; petalis oblique lineari-ligulatis, obtusis, sepalis paululo brevioribus; labello basi sagittato, lamina antice tertia parte triloba, 2.5 mm longa, medio fere 0.3 cm lata, lobis lateralibus 5-dentatis, dente exteriore parvulo triangulo, acuto, medianis 2 interioribus paululo longioribus, omnibus falcato-lanceolatis acutis, lobo intermedio brevi, semiorbiculari, obtuso, apice breviter bifido, laciniis 3 interioribus loborum lateralium paulo brevioribus, callo hippocrepiformi e basi, cruribus antice conspicue dilatatis in medio laminae evanescentibus, fovea mediana ovata, auriculis oblique triangulis, obtusiuscule subacuminatis, parallelis, 1.5 mm longitudine paulo superantibus; columna brevi, crassiuscula; anthera reniformi-cucullata, obtuse apiculata; ovario cum pedicello glabro, subclavato, 6-costato, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the mountains near Jaduna, alt. c. 300 m—R. Schlechter no. 19273, flowering in Apr. 1909; in humus in the forests of [Mount]

Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19372, flowering in May 1909.

This species shows a certain agreement in habit with *M. xanthochila* Schltr., but is well distinguished by its longer leaves and the shape of the labellum. The flowers are violet-red, the leaves evenly coloured dull brown-red.

33. *M. vinicolor* Schltr., sp. nov.

Terrestris, erecta, gracilis, 20–25 cm alta; rhizomate brevi, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule tereti, glabro, haud incrassato, 4–7 cm longo, 4–7-foliato; foliis erecto-patentibus, petiolatis, lamina oblique lanceolata vel elliptico-lanceolata, acuta vel acuminata, 4–6.5 cm longa, infra medium 1.2–1.8 cm lata, petiolo basi vaginante, 1–2 cm longo; scapo stricto vel substricto, angulato, vaginulis paucis, minutis, distantibus obsesso, glabro; racemo subaxe multifloro, usque ad 10 cm longo; bracteis deflexis, anguste lanceolatis, ovario vulgo paulo brevioribus; floribus in sectione mediocribus, patentibus, glabris; sepalis oblongis, obtusis, intermedio 0.3 cm longo, lateralibus paulo brevioribus, obliquis; petalis anguste ligulatis, obtusis, obliquis, sepalis lateralibus fere aequilongis; labello sagittato-auriculato, e medio trilobo, 2.5 mm longo, medio fere 0.3 cm lato, lobis lateralibus angulo exteriori rotundato-lobatis et lacinii 3 ornatis, lacinii falcato-lanceolatis, acutis, marginem exteriori versus paulo decrescentibus, lobo intermedio semiorbiculari, obtuso, usque ad medium fere exciso, lacinias loborum lateralium superante, toro hippocrepiformi e medio lobi intermedii usque supra basin labelli decurrente, fovea basali, oblonga, vix medium laminae attingente, auriculis ovato-triangularibus, obtusis, parallelis, c. 1.5 mm longis; columna perbrevis, crassiuscula; anthera reniformi cucullata, obtuse umbonata; ovario cylindraceo, 6-costato, glabro, cum pedicello 3.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20168, flowering in Sept. 1909.

The species is recognised easily by its colouring; the stem and flowers are dark wine-red, the leaves with wine-red main nerves underneath. The floral structure resembles that of *M. xanthochila*, but the habit is rather different.

34. *M. xanthochila* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 102.

Microstylis sordida J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 30.

Kaiser-Wilhelms-Land: In humus in the forests near Erimahafen, alt. c. 10 m—R. Schlechter no. 13678, flowering in Oct. 1901; in the primary forests of Wobbe, alt. c. 300 m—R. Schlechter no. 16341, flowering in July 1907; in humus in the forests at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18666, flowering in Nov. 1908; in humus in the mountain forests near Jaduna, alt. c. 200 m—R. Schlechter no. 19229, flowering in April 1909; in the forests not far from Udu, on the Waria [River], alt. c. 200 m—R. Schlechter no. 17454, flowering in Mar. 1908; in humus in the forests near Gobi, alt. c. 300 m—R. Schlechter no. 19560, flowering in May 1909.

I do not doubt that *M. sordida* J.J. Sm. is completely identical with this species, which occurs frequently in the Territory. The illustration of *M. sordida* in 'Nova Guinea' VIII t. II, fig. 35 is identical with my own sketches.

35. *M. longispica* Schltr., sp. nov.

Terrestris, erecta, gracilis, 30–40 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule abbreviato, dense 5–8-foliato, paulo incrassato, cylindrico, glabro; foliis erecto-patentibus vel patentibus, petiolatis, lamina oblique elliptica vel ovato-elliptica, acuta, glabra, basi nunc subrotundata, vulgo cuneata, 4–7.5 cm longa, medio vel infra medium 1.7–2.5 cm lata, petiolo basi dilatata caulem vaginante, 1.3–2 cm longo; scapo angulato, vaginulis paucis, distantibus, bracteiformibus obsesso, glabro; racemo subdense multifloro, elongato, usque ad 27 cm longo; bracteis deflexis, lanceolatis, acuminatis, ovario nunc aequilongis, nunc brevioribus; floribus in sectione mediocribus, patentibus vel patulis, glabris; sepalis late ellipticis, c. 3.5 mm longis, lateralibus obliquis; petalis oblique obovato-oblongis, obtusis, glabris, sepalis, paulo brevioribus; labello circuitu semilunato, lamina supra medium triloba, 2.5 mm longa, medio fere 4.5 mm lata, lobis lateralibus cum angulo exteriori brevi, triangulo, obtuso, lacinii 3 subfalcatis, lanceolatis, acutis, subaequilongis ornatis, lobo medio oblongo, apice breviter inciso, lacinias loborum lateralium superante, callo

hippocrepiformi, cruribus antice valde dilatatis, infra medium laminae evanescentibus, in basi labelli orto, fovea ovato-oblonga, basali, medium laminae vix attingente, auriculis triangulis, obtusiusculis, parallelis, c. 1.5 mm longis; columna brevi, crassiuscula, anthera ovato-cucullata, obtusiuscula; ovario cylindraceo, glabro, 6-costata, cum pedicello c. 2.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19872, flowering in June 1909.

The species belongs, likewise, to the relationship of *M. xanthochila* Schltr., but is distinguished easily by the very elongated inflorescence, larger flowers, and by the labellum. In this relationship the broad petals are rather rare.

The greenish yellow flowers change to an orange-yellow colour before wilting.

36. *M. wariana* Schltr., sp. nov.

Terrestris, erecta, 20–30 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule abbreviato, paulo incrassato, tereti, glabro, usque ad 6 cm longo, 4–6-foliato; foliis erecto-patentibus vel erectis, lanceolato-ellipticis, acutis, basi cuneatis, sensim in petiolum angustatis, lamina 5–9 cm longa, medio fere 1.7–2.5 cm lata, nitida, petiolo basi dilatata vaginante, 1.7–3 cm longo; scapo gracili, stricto vel substricto, angulato, vaginulis paucis, dissitis, bracteiformibus obsesso, glabro, racemo laxo 8–20-floro, cylindrico, usque ad 13 cm longo; bracteis deflexis, lineari-lanceolatis, acuminatis, ovario gracillime pedicellato plus duplo brevioribus; floribus in genere mediocribus patentibus, glabris; sepalis oblongis, obtusis, intermedio 4.5 mm longo, lateralibus obliquis, paulo brevioribus et angustioribus; petalis oblique linearibus, obtusis, 3.5 mm longis; labello basi auriculato, lamina e medio fere triloba, 0.3 cm longa, medio 4.5 mm lata, toro obscuro e basi usque infra apicem, fovea lanceolata e basi usque in basin lobi intermedii ornato, lobis lateralibus 4-fidis, segmentis, subulato-linearibus, acutis, 3 interioribus exteriori dentiformi multo longioribus, lobo medio semiorbiculari, usque ad medium bifido, auriculis basi-laribus oblique triangulis, subacutis, c. 1.5 mm longis; columna brevi, crassiuscula; anthera suborbiculari, subapiculata; ovario cum pedicello glabro, 6-costato, pedicello incluso c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna, on the Waria [River] alt. c. 450 m—R. Schlechter no. 19268, flowering in Apr. 1909.

This species is related to *M. pedicellaris* Rchb. f. and *M. pectinata* J.J. Sm. from Dutch New Guinea, but has shorter pedicels.

The colour of the flowers is pale green with a darker anther.

var. *oreogena* Schltr., var. nov.

Differt a forma typica habitu humiliore et inflorescentiis paucifloris.

Kaiser-Wilhelms-Land: In humus in the forests near Dschischungari, alt. c. 1000 m—R. Schlechter no. 19597, flowering in May 1909.

This variety is a mountain form of the Type, initially appearing to be different, but agreeing with it in the flowers.

37. *M. atrata* Schltr., sp. nov.

Terrestris, erecta, c. 50 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule brevi, paulo incrassato, 5–6-foliato, c. 5 cm longo; foliis erecto-patentibus, petiolatis, ellipticis vel ovato-ellipticis, acutis vel acuminatis, glabris, lamina 4–6 cm longa, medio vel infra medium 1.8–2.5 cm lata, petiolo basi dilatata vaginante, 2–3 cm longo; scapo gracili, angulato, vaginulis paucis, dissitis, bracteiformibus obsesso, glabro; racemo dense multifloro, elongato, usque ad 40 cm longo, c. 0.7 cm diametiente; bracteis deflexis, anguste lanceolatis, acuminatis, ovario longioribus; floribus in sectione inter minores, patentibus, glabris; sepalis intermedio oblongo, obtuso, 2.5 mm longo, lateralibus oblique ovatis, obtusis, intermedio paululo brevioribus; petalis anguste ligulatis, obtusis, 0.2 cm longis; labello alte auriculato, lamina infra medium triloba, 0.2 cm longa, infra medium 2.5 mm lata, lobis lateralibus cum angulo exteriori abbreviato, obtuso, caeterum dentibus 4 deltoideis, acutis, marginem anteriorem versus vix decrescentibus ornatis, lobo medio circuitu semiorbiculari, usque supra basin bifido, incrassatione ovali, medio fovea ovali donata, e basi labelli usque ad basin lobi intermedii, auriculis basilaribus triangulis subacutis, 0.1 cm longis; columna brevi, crassiuscula, anthera late ovato-cucullata, obtusa; ovario cum pedicello glabro, 6-costato, 0.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19098, flowering in Jan. 1909.

A species conspicuous by its colour; the leaves are black-green above, dark carmine-red below; the flowers are carmine-red. It is arranged beside *M. hydrophila* J.J. Sm. from Dutch New Guinea, but is well recognised by its broad leaves and the lip.

38. *M. brachyodonta* Schltr., sp. nov.

Terrestris, erecta, 20–25 cm alta; rhizomate brevi; radicibus elongatis, flexuosis, puberulis; caule valde abbreviato, vulgo subnullo; foliis 3–4, erecto-patentibus, petiolatis, lamina ovata vel ovato-elliptica, acuta, 4–6.5 cm longa, medio fere 1.7–3.2 cm lata, glabra, petiolo basi dilatata vaginante, 1.2–2.5 cm longo; scapo stricto vel substricto, angulato, vaginulis paucis, distantibus, bracteiformibus obsesso; racemo densius multifloro, elongato, usque ad 13 cm longo; bracteis deflexis, anguste lanceolatis, acuminatis, ovario vulgo aequilongis; floribus patentibus, in sectione vix inter mediocres, glabris; sepalis ovatis, obtusis, c. 0.3 cm longis, lateralibus obliquis; petalis anguste ligulatis, obtusis, sepalis paululo brevioribus; labello circuitu suborbiculari, auriculato, lamina infra medium triloba, c. 2.5 mm longa, infra medium 0.3 cm lata, lobis lateralibus cum angulo exteriori subobsoleto obtusissimo, caeterum dentibus 4 brevibus, oblique triangulis, subacutis, aequimagnis donato, lobo intermedio brevi, apice bifido, segmentis sese subtegentibus, carina duplici in basi mox evanda, foveam oblongam brevem marginante, callo triangulo, parvo, obtuso in basi lobi intermedii, auriculis basilaribus falcato-oblongis, obtusis, columnam amplectentibus et apicibus sese subtegentibus, 0.1 cm longis; columna brevi, crassiuscula; anthera suborbiculari-cucullata, obtusa; ovario cum pedicello glabro, 6-costato, 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 18542, flowering in Oct. 1908

It is well distinguished from all the related species by the labellum, and it belongs, likewise, to the brightly-leaved species. Its leaves are glossy violet-red and the flowers are also violet-red, but the tips of the sepals are yellowish and the anther white. The species is, evidently, rare and grows generally hidden below shrubs in the dense mist-forests of the mountains.

39. *M. arachnoidea* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 98.

Kaiser-Wilhelms-Land: On the borders of sago swamps in the vicinity of the Schumann River, alt. c. 100 m—R. Schlechter no. 13846, flowering in Jan. 1902; in wet places in the gallery forests on the Keneja [River], alt. c. 150 m—R. Schlechter no. 18312, flowering in Oct. [Ed.—possibly Sept.] 1908.

The species appears to be restricted to marshy places in the Ramu area of central Kaiser-Wilhelms-Land. It is recognised from all related species especially by the thread-like segments of the labellum.

§ 8. *Commelinodes*

This section is separated from *Pleiodon* by its habit characters; it has creeping, rooting leafy stems which rise up at the tips to form pedicels. The species usually grow together in “nests” and frequently form fairly extensive caespitose patches. The section has this practical value, that it enables the exclusion of a number of species with distinctive habit from the crowded section *Pleiodon*. These habit characters, to a certain extent, form a transition to the following section, *Herpetorhizis*. All species are inhabitants of the humus soil in the forests of the Territory. The Malayan species *M. commelinifolia* Zoll. may be regarded as the Type of the section.

40. *M. decumbens* Schltr., sp. nov.

Decumbens, e basi ramosa, usque ad 29 cm alta; rhizomate elongato; cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, dense foliato, tereti, glabro, apice adscendente; foliis erecto-patentibus, petiolatis, lamina oblique elliptico-vel ovato-lanceolata, acuta vel acuminata, 4–6 cm longa, medio vel infra medium 1.5 bis 2.5 cm lata, margine vulgo leviter undulata, petiolo basi dilatata caulem vaginante, 1–1.5 cm longo; scapo gracili erecto, stricto vel substricto, angulato,

vaginulis 1–2 dissitis, bracteiformibus, obsesso, glabro; racemo subaxe multifloro, elongato, usque ad 13 cm longo, c. 1 cm diametiente; bracteis deflexis, anguste lanceolatis, acuminatis, ovario fere aequilongis; floribus in genere inter minores, patentibus, glabris; sepalis oblongis, obtusis, 0.2 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusis, sepalis paululo brevioribus; labello sagittato-auriculato, lamina e medio fere triloba, 1.5 mm longa, basi 0.2 cm lata, lobis lateralibus in segmenta 4, falcato-subulata, acuta fissis, lacinia exteriori aliis duplo brevior, lobo medio semiorbiculari, parvulo, apice breviter exciso, lacinias interiores loborum lateralium haud excedente, fovea basilaris oblonga usque ad medium decurrente, margine hippocrepiformi-incrassata, auriculis oblique triangulis, subparallelis, obtusiusculis, 0.1 cm longis; columna brevi, incrassata, apice paulo dilatata; anthera reniformi-cucullata, obtusa; ovario cum pedicello glabro, cylindraceo, 6-costato, 0.3–0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests not far from Unu on the lower Waria [River], alt. c. 150 m—R. Schlechter no. 17371, flowering in Mar. 1908.

Amongst the species described previously from New Guinea, this one is related most closely to *M. Warapussae* Schltr., but differs in its smaller and shorter leaves and in the four-toothed lateral lobes of the labellum. The flowers are either yellow or pale wine-red. In the wine-red variety the stems and primary veins of the lower sides of the leaves are coloured similarly.

41. *M. paguroides* Schltr., sp. nov.

Adscendens, ramosa, 10–17 cm alta; rhizomate elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, densius foliato, tereti, glabro; foliis erecto-patentibus vel patentibus, petiolatis, lamina oblique lanceolata, acuta, margine undulata, 2–5 cm longa, infra medium 0.7–1.5 cm lata, petiolo basi dilatata caulem vaginante, 0.5–1.5 cm longo; scapo gracili, stricto vel substricto, angulato, vaginulis paucis distantibus, bracteiformibus obsesso vel interdum nudo; racemo subdense pluri-multifloro, usque ad 5 cm longo; bracteis lineari-lanceolatis, acuminatis, deflexis, ovario fere aequilongis; floribus in sectione mediocribus, patentibus, glabris; sepalis late oblongis, obtusis, 0.3 cm longis, lateralibus obliquis; petalis lineari-ligulatis, obtusis, obliquis, sepalis paulo brevioribus; labello altius sagittato-auriculato, lamina e medio fere triloba, 1.5 mm longa, medio 2.5 mm lata, lobis lateralibus cum angulo exteriori divaricato, dentiformi, acuto, caeterum in lacinias 3 filiformi-elongatas, 1.5–2 mm longas fissis, lobo intermedio semiorbiculari, parvulo, bifido, segmentis sese forcipiformi-obtegentibus, fovea late oblonga, e basi labelli usque supra medium, margine hippocrepiformi-incrassata, auriculis basilaribus subfulcato-lanceolatis, acutis, apice approximatis, 0.2 cm longis; columna brevi crassiuscula; anthera subreniformi; obtusa, glabra; ovario cum pedicello glabro, 6-costato, 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19384, flowering in May 1909.

This interesting small species is related closely to *M. fissa* Schltr., described below, but the leaves are considerably larger and the middle lobe of the labellum is much shorter and smaller. The colouring of the leaves also is different in each species. In the species under consideration the whole plant is a dark wine-red colour.

42. *M. fissa* Schltr., sp. nov.

Adscendens, pusilla, ramosa, usque ad 15 cm alta; rhizomate elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, apice adscendente, foliato, tereti, glabro; foliis patentibus vel erecto-patentibus, breviter petiolatis, lamina oblique lanceolata, acuta, margine undulata, 1.7–3.5 cm longa, infra medium 0.7–1.2 cm lata, petiolo basi dilatata caulem amplectente, 0.6–1 cm longo; scapo gracili, plus minusve flexuoso, angulato, vaginulis 1–2, distantibus, bracteiformibus obsesso, vel nudo; racemo subdense multifloro, usque ad 6 cm longo, c. 1.2 cm diametiente; bracteis deflexis, lineari-lanceolatis, acuminatis, glabris, ovario vulgo paulo brevioribus; floribus patentibus, in sectione mediocribus, glabris; sepalis ovalibus, obtusis, 0.3 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusis, sepalis paululo brevioribus; labello altius sagittato-auriculato, lamina infra medium triloba, 2.5 mm longa, medio fere 3.5 mm lata, lobis lateralibus cum angulo exteriori divaricato, triangulo-dentiformi, acuto, caeterum in lacinias 3, filiformes, 1.5–2 mm longas fissis, lobo intermedio ovato-suborbiculari, usque ad medium bipartito, segmentis falcatis, acutis, sese forcipato-obtegentibus, fovea basali lanceolata, usque ad basin lobi intermedii decurrente, margine e basi incrassata torum hippocrepiformem formante, auriculis basilaribus oblique lanceolato-ligulatis, subacutis, parallelis, 2.5 mm longis; columna brevi crassiuscula, antice-dilatata; ovario cylindraceo, glabro, cum pedicello c. 0.4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests above Dschischungari, (Waria District), alt. c. 800 m—R. Schlechter no. 19567, flowering in May 1909; in humus in the forests on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19816, flowering in June 1909.

The species is related closely to *M. paguroides* Schltr., but distinguished outwardly by its smaller leaves. Furthermore, the middle lobe of the labellum is considerably larger and the horse-shoe-shaped callus is different. While in *M. paguroides* the whole plant is a dark wine-red, in *M. fissa* the leaves are greenish silver-grey above and the flowers are dark violet-red.

43. *M. sciaphila* Schltr., sp. nov.

Terrestris, decumbens, pusilla, usque ad 13 cm alta; rhizomate elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, apice adscendente, bene foliato; foliis erecto-patentibus vel patentibus, petiolatis, lamina oblique elliptico-vel ovato-lanceolata, acuta vel acuminata, margine plus minusve undulata, 2.5–3.5 cm longa, infra medium 1–1.5 cm lata, petiolo basi dilatata caulem vaginante, 1–1.5 cm longo; scapo gracili, plus minusve flexuoso, angulato, vaginulis paucis, distantibus, bracteiformibus obsesso, glabro; racemo subdense multifloro, usque ad 5 cm longo, c. 1.2 cm diametiente; bracteis deflexis, anguste lanceolatis, acutis, ovario pedicellato subaequilongis; floribus in genere inter minores, patentibus, glabris; sepalis ovato-oblongis, obtusis, 0.2 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusis, glabris, sepalis paululo brevioribus; labello alte lunato-auriculato, lamina e medio triloba, 1.5 mm longa, basi 2 mm lata, lobis lateralibus cum angulo exteriori abbreviato triangulo, caeterum in lacinias 4, lanceolato-acuminatas, subfalcatas, marginem anteriorem versus decrescentes fissis, lobo intermedio semiorbiculari, apice breviter exciso, lacinias loborum lateralium haud excedente, callo hippocreiformi e medio lobi intermedii usque in basin labelli decurrente foveam angustam marginante, auriculis basilaribus lanceolato-triangularibus obtusiusculis, 1.5 mm longis; columna brevi, apicem versus conspicue dilatata; ovario cylindraceo, 5-costato, cum pedicello c. 3.5 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18267, flowering in Sept. 1908.

In the structure of the lip this species reminds us mostly of *M. Warapussae* Schltr., but the foliage is rather different and the entire plant appreciably smaller. The flowers are dark wine-red with translucent darker streaks.

var. *bismarckiensis* Schltr., var. nov.

Differt a forma typica foliis latioribus floribusque longius pedicellatis.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18607, flowering in Nov. 1908.

This variety has mostly oblique ovate leaves up to 2.3 cm broad, and pedicels 0.6 cm long. In colour it otherwise agrees well with the Type.

44. *M. Warapussae* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 101.

Kaiser-Wilhelms-Land: In humus in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16709, flowering in Sept. [Ed.—possibly Oct.] 1907; in humus in the forests on the Schumann River, alt. c. 150 m—R. Schlechter no. 13834, flowering in Dec. 1901.

This species is recognised easily by the leaves which are the largest in the section *Commelinodes* and by the lateral lobes of the labellum split into five teeth. While the flowers of the specimens from the Schumann River were violet-red, those collected on the Kaulo [River] were more of a brown-red. The leaves have delicate red margins.

45. *M. nephroglossa* Schltr., sp. nov.

Terrestris, decumbens, usque ad 10 cm alta; rhizomate elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, apice adscendente, bene foliato; foliis erecto-patentibus, petiolatis, lamina oblique ovato-lanceolata, acuta vel subacuta, margine plus minusve undulata, glabra, 2–3 cm longa, infra medium 0.7–1.3 cm lata, petiolo basi dilatata vaginante, 0.5–1.3 cm longo;

scapo erecto, gracili, stricto vel substricto, angulato, vaginulis paucis bracteiformibus obsesso, glabro; racemo subdense pluri-multifloro, usque ad 6 cm longo; bracteis deflexis, anguste lanceolatis, acutis, ovario vulgo brevioribus; floribus vulgo cleistogamis, patentibus, in sectione inter minores, glabris; sepalis late ovatis, obtusis, c. 0.2 cm longis, lateralibus obliquis; petalis oblique lanceolato-ligulatis, obtusis, sepalis paulo brevioribus; labello circuitu late reniformi, basi perlato, c. 0.3 cm lato, 1.5 cm longo, angulis basilaribus obtusis, dentibus 5 triangulis, brevibus in margine anteriore, lobo medio semiorbiculari, apice breviter exciso, dentes laterales vix superante, fovea mediana oblonga, e basi usque infra apicem decurrente, margine incrassata; columna brevi, crassiuscula; anthera reniformi, obtusa; ovario cum pedicello, glabro, clavato, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17742, flowering in May 1908.

Unfortunately, all my specimens of this species are cleistogamous. For this reason I presumed that I had to deal with a malformation of the floral parts, until I made further observations with *M. latilabris* Schltr., described below, that exactly the same type of lip shape occurs also in normally developed flowers. The flowers are dark purple with longish, green transparent spots on the petals.

46. *M. latilabris* Schltr., sp. nov.

Terrestris, decumbens, usque ad 20 cm alta; rhizomate elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, puberulis; caule elongato, apice adscendente, bene foliato, tereti, glabro; foliis erecto-patentibus vel patentibus, petiolatis, lamina oblique lanceolata vel ovato-lanceolata, acuta vel acuminata, glabra, margine leviter undulata, 4–6 cm longa, infra medium 1.5–2.5 cm lata, petiolo basi dilatata caulem vaginante, 1.5–2 cm longo; scapo stricto vel substricto, angulato, vaginulis paucis, bracteiformibus, distantibus obsesso, glabro; racemo dense multifloro, usque ad 9 cm longo; bracteis anguste lanceolatis, acutis vel acuminatis, deflexis, ovarium vulgo superantibus; floribus in sectione inter minores, patentibus, glabris; sepalis oblongis, obtusis, 2.5 mm longis, lateralibus paulo obliquis; petalis lineari-ligulatis, obtusis, obliquis, sepalis paululo brevioribus; labello circuitu transverse triangulo, angulis basilaribus obtusis, incurvulis, supra medium utrinque in dentes 5 lanceolato-falcatos, acutos, basin versus decrescentes producto, lobo medio semi-orbiculari, minute exciso, dentibus lateralibus distincte brevioribus, fovea lanceolato-oblonga, toro hippocrepiformi usque infra apicem labelli marginata, labello toto 0.2 cm longo, basi 0.3 cm lato; columna brevi, crassiuscula; anthera subreniformi, obtusa; ovario cum pedicello glabro, 6-costata, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the primary forests near Wobbe, alt. c. 200 m—R. Schlechter no. 16273, flowering in July 1907.

This species is distinguished from *M. nephroglossa* by its larger leaves, the more triangular labellum and its longer teeth. The flowers are carmine-red.

§ 9. *Herpetorhizis*

The representatives of this section are well separated from other *Microstylis* species by their habit. They possess a long creeping rhizome on which shoots are developed individually at intervals of 10 cm. Similar vegetative conditions are known in *Liparis*, in the Ridleyean group *Prorepentes*, but have not been described previously in *Microstylis*, only the African *M. prorepens* Krzl. having a widely creeping rhizome. This species is, evidently, related to the African *M. stelidostachya* Rchb. f. and to *M. katochilus* Schltr., which constitute the separate sub-genus *Katochilus*.

The two species of the section are related closely to each other; they are inhabitants of the higher mountains of New Guinea where they grow in humus at more exposed locations, creeping, by preference, widely between dense pads of moss.

47. *M. distans* Schltr., sp. nov.

Terrestris, longe repens, 23–30 cm alta; rhizomate gracili, elongato, vaginis amplectentibus, distantibus obiecto, radicante; radicibus filiformibus elongatis, flexuosis, puberulis; caulibus erectis, c. 10 cm distantibus, basi vaginatis, apicem versus c. 3-foliatis, teretibus, glabris, crassiusculis, 5–7 cm altis; foliis erecto-patentibus, petiolatis, lamina ovato-lanceolata, acuminata, basi rotundata, utrinque glabra, margine undulata, 4–9 cm longa, infra medium 2–4 cm lata, petiolo lato, basi caulem

vaginante, 2–3 cm longo; scapo stricto vel substricto, leviter angulato, vaginulis paucis distantibus, bracteiformibus obsesso, glabro; racemo subdense multifloro, cylindraceo, usque ad 12 cm longo, c. 2.5 cm diametiente; bracteis deflexis, lanceolatis, acuminatis, ovario fere aequilongis; floribus in genere inter majores patentibus; sepalis oblongis, obtusis, glabris, intermedio 0.7 cm longo, lateralibus obliquis, paulo brevioribus et latoribus; petalis anguste ligulatis, obtusis, obliquis, glabris, sepalis lateralibus subaequilongis; labello semilunato-sagittato, antice rotundato, marginibus crenulato-dentato, apice in lobum oblongum, 1.5 mm longum, forcipato-excisum productum, e basi usque ad basin lobi apicalis 0.6 cm longo, basi 0.8 cm lato, fovea orbiculari concavula, margine incrassato circumdata, auriculis basilaribus triangulis, obtusiusculis, 0.4 cm longis, subparallelis; columna brevi, crassiuscula; anthera reniformi-cucullata, obtusa; ovario cylindraceo, 6-costato, glabro, cum pedicello 0.9 cm longo.

Kaiser-Wilhelms-Land: In humus between moss in open places in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18792, flowering in Nov. 1908.

This species differs in the labellum from the very similar *M. megalantha* Schltr. The flowers are green.

48. *M. megalantha* Schltr., sp. nov.

Terrestris, longe repens, 20–25 cm alta; rhizomate gracili, elongato, vaginis distantibus, amplexantibus obsesso, radicante; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus c. 10 cm distantibus, 3–5 cm altis, basi vaginatis, apicem versus 3–4-foliatis; foliis erecto-patentibus vel suberectis, petiolatis, oblique ellipticis vel lanceolato-ellipticis, acuminatis, 5.5–10 cm longis, medio vel infra medium 2.5–4 cm latis, basi cuneatis, petiolo basi dilatata caulem vaginante, 2.5–4 cm longo; scapo erecto, substricto, angulato, vaginulis paucis distantibus obsesso, glabro; racemo subdense multifloro, usque ad 10 cm longo, c. 2.5 cm diametiente; bracteis deflexis, lanceolatis, acuminatis, ovario brevioribus; floribus in genere inter majores, patentibus, glabris; sepalo intermedio oblongo-ligulato, obtuso, 0.9 cm longo, lateralibus oblique oblongis, obtusis, 0.8 cm longis; petalis anguste ligulatis, obliquis, obtusis, apice minute excisis, sepalis lateralibus aequilongis; labello circuitu semilunato-sagittato, 0.7 cm longo, basi 1.1 cm lato, antice utrinque dentibus 6 brevibus, triangulis donato, apice medio in lobum paulo repositum, circuitu ovatum, acutum, apice forcipato-bifidum, dentes laterales haud superantem expanso, fovea basilari late oblonga parvula, incrassato-marginata, carinis 2 usque ad basin lobi intermedii decurrentibus, auriculis basilaribus triangulis, acutis, paulo divergentibus, c. 0.5 cm longis; columna perbrevis, crassiuscula, antice dilatata; anthera late quadrato-rhombea, antice truncata; ovario cylindraceo, glabro, 6-costato, cum pedicello 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus between moss on open slopes in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18718, flowering in Nov. 1908.

As previously explained, the species is related closely to *M. distans*, but the stems are shorter, the flowers larger, and the labellum quite different. The sepals are yellow-green and the labellum brownish yellow.

40. *Oberonia* Lindl.

There has always been much difficulty in dividing the polymorphic genus *Oberonia* Lindl., so that in examining a species one should know the limits within which it is necessary to conduct a search. Lindley created two sections *Acaules* and *Caulescentes* which, until recently, have been retained by most authors, less perhaps because the distinction between the two was useful, than for the reason that no better division was available. J.D. Hooker was the only one who, in the rearrangement of the genus for the 'Flora of British India', clearly perceived the untenability of this division. He created new sections, both of which were monotypic.

In the arrangement of my Sumatran *Orchidaceae* in 'Engl. Bot. Jahrb.' XLV, Beibl. 104, p. 13, I have expressed the belief that a more satisfactory division would be found in other characters, viz. as to whether the leaves are jointed or not. Since then I have studied the question more closely and reached the conclusion that this character is indeed of great importance, and that the genus, which has now reached large dimensions, requires further sub-division. I have, therefore, divided it into two

sub-genera *Apotemnophyllum* and *Menophyllum* as I characterised them initially. Each sub-genus is divided further into sections.

In the classification of my very considerable *Oberonia* material from this point of view, very interesting results have arisen, which I hope to publish soon. At present this is not possible, since a monographic treatment of the whole genus would be involved.

Whereas in Asia and Malaysia the species of the sub-genus *Apotemnophyllum* are very numerous and predominate in certain areas such as Ceylon, of a total of about 50 species [Ed.—of the genus *Oberonia* in Papuasias] a single species only of this sub-genus occurs in German New Guinea. Here, therefore, we shall be occupying ourselves almost exclusively with the other sub-genus, *Menophyllum*, which is characterised by its unjointed leaves and, as undoubtedly the larger of the two sub-genera, probably includes about 75% of the known species.

The genus as a whole at present embraces probably about 130 species (excluding those described here) of which about 40 belong to *Apotemnophyllum* and the rest to *Menophyllum*. It appears to me that the latter approaches more closely to *Microstylis* Nutt., hence it should be the first of the sub-genera for consideration; these relationships are discussed later on. This sub-genus has wider distribution than *Apotemnophyllum*, of which the chief centres of dispersion are in Asia and Malaysia, with only a few species, such as *O. Vieillardii* Schltr., having radiated further eastwards into the Pacific Ocean regions.

I have attempted here to divide the Papuan [Papuasian] species (which as already stated, all belong with one exception to *Menophyllum*) into sections.

Due to lack of time I have not been able to work through the whole genus in detail; and many gaps may appear in this division; in particular it will probably be desirable to dissect more extensively the large section *Otoglossum* when the time arrives to consider those species from the more distant western areas. I believe, however, that with the division [into sections] given here, a sure foundation will have been established, on which it will be possible to group the species more readily.

§ [1] *Labidous*, in which the shape of the flower bears a decidedly close relationship to that of *Microstylis* Nutt. The labellum has very large auricles, with a more-or-less split lamina in front.

The species, as is also the case in the next groups, have all stout elongated stems.

§ [2] *Hymenobractea* and § [3] *Platystreptus* are both characterised by a bend in the pedicel. In habit the latter section approaches § [3a] *Diurium*, which has a straight pedicel, but which is distinguished from the sections which follow by its labellum.

§ [4] *Adenorhachis* may be distinguished from the large § [5] *Otoglossum* (which may later on have to be further subdivided) by its flower spike, which in the former is provided with glands and other coverings, and also by the characteristic shape of the labellum.

§ [6] *Podostachys* has short stems, a distinct pedicel and an undivided labellum.

§ [7] *Platyacron*, characterised chiefly by the shape of the labellum, comprises principally species with greatly reduced stems, although some species with elongated stems are included also.

Up to this stage, there has been present in all the sections a distinct stem, but in the last two [above] there exists a definite tendency to shortening. § [8 and 9] *Arachnochilus* and *Scytoxiphium*, which can be designated really as stemless, are recognised by the character of the leaves.

I shall describe in detail below the conditions under which the representatives of the individual sections occur in the Territory, and shall also mention, under the relevant section, those species reported from other parts of New Guinea.

A. SUB-GENUS *Menophyllum*

§ 1. *Labidous*

The species of this section form a well-defined group, always recognised immediately by the flowers. Most species, i.e., all with the exception of *O. pachyambon* Schltr. and *O. Kaernbachiana* Krzl., may be identified externally by the greatly reduced breadth of the leaf. The stems of all species are much elongated and twisted. The flowers are arranged in a long, narrow, dense spike; their structure is very characteristic. As in *Microstylis*, the auricles of the labellum are very much developed and embrace the column. At the base of the labellum a small cavity usually exists which, as in *Microstylis*, is surrounded by a thickened border. The lamina itself is more-or-less toothed on the margin. The petals, as in *Microstylis*, are generally narrow, and, like the sepals, are sharply reflexed or revolute. There is here an undoubted resemblance to *Microstylis*.

Besides the species described here, *O. imbricata* Bl. from Java and *O. lucida* J.J. Sm. from Ambon, belong also to this section. The species mostly grow in colonies as epiphytes on trees, at various altitudes up to 1000 metres but it is of note, however, that they grow only on those branches which are quite free from moss and where, therefore, their roots may dry out completely on the surface quickly after rain.

1. *O. pachyambon* Schltr., sp. nov.

Epiphytica, patula vel dependens, pluricaulis, 15–20 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus elongatis, flexuosis, dense foliatis, peralte basibus foliorum adnatis; foliis falcato-ligulatis, acutis vel acuminatis, glabris, basin versus paulo dilatatis, usque ad 8 cm longis, basi usque ad 1.2 cm latis; spicis usque ad basin floriferis, cylindraceis, elongatis, dense multifloris, usque ad 10 cm longis, 0.6 cm diametientibus, apicem versus vulgo nudis; bracteis lanceolatis, subacutis, glabris, margine subdentatis, ovario vix aequilongis; floribus minutis, inversis, patentibus, glabris; sepalo intermedio late ovato, obtuso, vix 0.1 cm longo, lateralibus late ellipticis, obtusis, obliquis, sepalo intermedio aequilongis; petalis oblique lineari-ligulatis, obtusis, margine apicem versus nunc subirregularibus, sepalis aequilongis; labello alte auriculato, auriculis falcato-oblongis, obtusis, margine incrassato subdentatis, lamina circuitu ovato-oblonga, usque ad basin grosse pluridentata, dentibus apicem versus majoribus, 1.5 mm longa, supra medium c. 1 mm lata, lamella suborbiculari-lunata in basi; columna perbrevis, apicem versus dilatata; anthera suborbiculari-cucullata, apiculata; ovario clavato, glabro, c. 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, on the Rin-Tejao [River], alt. c. 800 m—R. Schlechter no. 20121, flowering in Sept. 1909.

By the large leaves this species is well-defined from all the rest of the section. The flowers also are distinguished by the thickened labellum with auricles on the edge and the lamina which is sharply toothed to the base; their colour is yellow-brown.

2. *O. anguina* Schltr., sp. nov.

Epiphytica, patula val dependens, pluricaulis, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caule omnino basibus foliorum abscondito, valde flexuoso, polyphylo; foliis subfalcato-lanceolatis, acutis, glabris, parte libera usque ad 2 cm longis, basi c. 0.6 cm latis; spicis dense multifloris, cylindraceis, elongatis, usque ad 12 cm longis, c. 0.4 cm diametientibus; bracteis lanceolatis, acuminatis, ovario fere aequilongis, glabris, margine subdentato-irregularibus; floribus minutis, patentibus, inversis, glabris; sepalis late ovato-oblongis, obtusis, glabris, 0.5 mm longis; petalis oblique linearibus, obtusis, sepalis aequilongis; labello alte auriculato, auriculis falcato-oblongis, obtusis, margine exteriore subdentatis, per medium carina vel lamella e basi ad apicem decurrente ornatis, 0.4 mm longis, columnam amplectentibus, lamina circuitu late obovata, dimidio anteriore margine grosse et irregulariter inciso-dentata, 0.1 cm longitudine paulo superante,

0.75 mm supra medium lata; columna perbrevis, crassiuscula; anthera subreniformi, obtusa, dorso umbonata; ovario cylindrico, cum pedicello 1.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests on the Maijen [River], near Meireka, alt. c. 300 m—R. Schlechter no. 18081, flowering in July 1908.

In habit this species chiefly resembles *O. kaniensis* Schltr., but is distinguished markedly by the shape of the labellum. The leaves, especially the free portion of them, are longer and acute, while in *O. kaniensis* they are blunt. The flowers are brown.

3. *O. Kaernbachiana* Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds. (1901), p. 242.

Kaiser-Wilhelms-Land: Without accurate information on the locality, 'on wild bamboo'—Kärnbach no. 73 flowering in Dec. 1893; on trees in the forests near [Mount] Dattelberg [Ed.—probably Sattelberg] alt. c. 700 m—R. Schlechter no. 19961, flowering in July 1909. [Ed.—this number also cited for *M. macrotis* p. 183].

The species is very close to *O. wariana* Schltr., but is distinguished by the more elongated leaves and the shape of the lip. The flowers are brown.

4. *O. wariana* Schltr., sp. nov.

Epiphytica, dependens, 25–30 cm longa, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule substricto, omnino vaginis foliorum abscondito, polyphyllis; foliis erecto-patentibus, parte libera oblique lanceolatis, acutis, 1.5–2.5 cm longis, basi 0.5–0.6 cm latis; spica usque ad basin fere florifera, elongata, cylindrica, c. 6 cm longa, 0.4 cm diametiente; bracteis patentibus, ovato-lanceolatis, acutis, glabris, ovario vulgo brevioribus; floribus minutis patentibus, inversis, glabris; sepalis late elliptico-oblongis, obtusis, vix 0.1 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusis, sepalis aequilongis; labello e basi altius auriculata in laminam circuitu oblongam, c. 1.5 mm longam producto, lamina tertia parte apicali bifida, dimidio superiore margine serrato-denticulata, medio fere 0.75 mm lata, auriculis falcato-oblongis, obtusis, columnam amplexantibus, per medium e basi ad apicem carina distincta ornatis, vix 0.5 mm longitudine superantibus; columna perbrevis crassiuscula; anthera subreniformi; ovario cylindraco, glabro, vix 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Udu, on the Waria [River], alt. c. 250 m—R. Schlechter no. 17406, flowering in Mar. 1908.

The species is characterised by the relatively deeply bipartite labellum which also has a central lamella provided with auricles. Unfortunately, I have found only one specimen of this plant.

5. *O. kaniensis* Schltr., sp. nov.

Epiphytica, patula vel dependens, pluricaulis, 25–35 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus elongatis, flexuosis, usque ad apicem foliatis, polyphyllis; foliis erecto-patentibus, parte libera falcato-vel oblique-oblonga, obtusa, basi nunc dilatata, usque ad 1.5 cm longa, basi 0.4–0.5 cm lata; spica usque supra basin florifera, vulgo incurva, cylindrica, elongata, dense multiflora, parte apicali vulgo sterili nuda, usque ad 13 cm longa, 0.3 cm diametiente; bracteis lanceolatis, acuminatis, margine irregularibus, glabris, ovario subaequilongis; floribus minutis, patentibus inversis, glabris; sepalis late oblongis, obtusis, vix 0.5 mm longitudine superantibus; petalis oblique ligulatis, obtusis, glabris, sepalis aequilongis; labello e basi alte auriculata supra medium constricto, sursum dilatato et in laminam late subreniformi-obcordatam expanso, margine dimidio anteriore denticulato, 0.75 mm longo, supra medium 0.75 mm lato, fovea basilari orbiculari, margine carinato-incrassato circumdata, auriculis falcato-oblongis, obtusis, margine interiore carinato-incrassatis, 0.40 mm longis; columna perbrevis, crassiuscula; anthera subreniformi-cucullata, obtusa; ovario cum pedicello cylindraco, glabro, 1.5 mm vix longitudine attingente.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17763, flowering in May 1908.

Amongst the Papuan [Papuasian] species of this section, this one is more similar in habit to the Type of the section, *O. imbricata* Lindl., than to the others, since the reduction in size of the leaf-blade is very conspicuous. The shape of the labellum distinguishes it sufficiently from all the other species. The flowers are brownish yellow.

6. *O. urostachya* Schltr., sp. nov.

Epiphytica, patula vel dependens, pluricaulis, 20–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus elongatis, flexuosis, omnino basibus foliorum absconditis, polyphyllis; foliis erecto-patentibus vel subrectis, oblique triangulo-lanceolatis, acutis vel obtusiusculis, parte libera usque ad 1.5 mm longa, basi usque ad 0.5 cm lata, vulgo minoribus; spica breviter pedunculata, gracili, dense multiflora, elongata, usque ad 10 cm longa, apicem versus vulgo sterili, subnuda; bracteis lanceolatis, acuminatis, ovario vulgo aequilongis vel paulo longioribus; floribus minutis, patentibus, inversis, subverticellato-approximatis, glabris; sepalis ovato-oblongis, obtusis, 0.75 mm longis, lateralibus obliquis; petalis oblique linearibus, obtusis, margine irregularibus, sepalis aequilongis; labello e basi alte auriculata ligulato, usque ad medium fere bifido, segmentis falcato-divergentibus, lanceolato-falcatis, obtusis, hinc inde subdentatis, vix 0.2 cm longo, basi callo hippocrepiformi parvulo donato, auriculis basilaribus columnam amplexantibus, falcato-ligulatis, obtusis, medio intus carinato-incrassatis, 0.7 mm longis; columna brevi, crassiuscula; anthera reniformi-cucullata, obtusa; ovario cylindraco, glabro, cum pedicello 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, alt. 300 m—R. Schlechter no. 19330, flowering in Apr. 1909.

From all other species of the section, this one is well distinguished by the shape of the lip; in habit it is reminiscent of *O. kaniensis*.

It is interesting that all species of this section have inflorescences more-or-less stunted at the apex, with only here-and-there a flower reaching normal development. The flowers are yellow with a brown labellum.

§ 2. *Hymenobractea*

This is, apparently, a typical Papuan [Papuasian] section. The few species known to me, those described here, are inter-related closely. The characters of the section are to be found in the leathery leaves and in the flowers, which here, contrary to all the other sections except *Platystreptus*, clearly show a bend in their axis, so that the flower, previously standing parallel with the rachis, is here bent towards the summit of the inflorescence. A similar bend is found only in *Platystreptus*. The flowers of the section all have a common lip-shape, viz. on a broad base, very wide auricles and a lamina gradually diminishing forwards. The petals usually are delicately toothed on the margins. It appears that all the species are inhabitants of the mist-forests in the ranges and are found rarely below an altitude of 1000 metres.

7. *O. cordata* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 20 cm longa; rhizomate brevi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus omnino basibus foliorum absconditis, paulo flexuosis, c. 7–10-foliatis; foliis erecto patentibus vel subrectis, parte libera lineari-ligulatis, acutis, plus minusve falcato-obliquis, usque ad 10 cm longis, basi 0.5–0.6 cm latis; spicis cylindracois, dense multifloris, foliis superioribus brevioribus, usque ad basin floriferis; bracteis patentibus, lanceolatis, acutis vel acuminatis, dorso carinatis, margine subdentatis, hyalinis, floribus aequilongis; floribus minutis, patentibus, apice subincurvis, glabris; sepalo intermedio oblongo, obtuso, 1.5 mm longo, lateralibus oblique ovato-oblongis, obtusiusculis, intermedio aequilongis; petalis oblique oblongo-ligulatis, apice subfalcatis, subacutis, glabris, margine integris, sepalis aequilongis; labello late ovato-cordato, obtusiuscule acuminato, 0.1 cm longo, basi 0.75 mm lato; columna brevi; anthera suborbiculari, obtusa, glabra; ovario cylindraco, glabro, pedicello incluso 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16678, flowering in Oct. 1907.

Closely related to the following species, but is distinguished by the shape of the shorter labellum and the entire margins of the petals. I found only one specimen, but the flowers seemed to be constant in their characters, so that I could hardly assume that we are dealing with a variety of *O. serrulata* Schltr. The flowers are yellow.

8. *O. serrulata* Schltr., sp. nov.

Epiphytica, erecta vel patula, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis,

flexuosis, glabris; caulibus strictis, basibus foliorum omnino absconditis, dense 6–9-foliatis; foliis suberectis, parte libera lineari-lanceolatis vel lineari-ligulatis, acutis, falcatis, 9–17 cm longis, basi 0.4–0.7 cm latis; spica dense multiflora, cylindrica, foliis superioribus fere aequilonga, 0.6 cm diametiente; bracteis patentibus, lanceolatis vel oblongo-lanceolatis, acuminatis, dorso carinatis, margine irregulariter subdentatis, glabris, flores aequantibus vel paulo superantibus; floribus patentibus, apice incurvulis, parvulis, glabris; sepalo intermedio oblongo, obtuso, 0.2 cm longitudine subattingente, lateralibus falcato-ovatis, obtusis; petalis oblique oblongo-ligulatis, obtusis, margine minute serrulatis, medio paulo dilatatis, sepalis fere aequilongis; labello parvulo, vix 1.5 mm longo, e basi reniformi-subcordata supra medium valde angustato et in lobum oblongum obtusum producto; columna brevi, apicem versus incrassata; ovario clavato, glabro, cum pedicello 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17062, flowering in Dec. 1907; no. 18978, flowering in Dec. 1908.

Is related closely to *O. cordata* and the next two species, but differs in the petals and labellum. The flowers are sulphur-yellow, with an orange-yellow ovary.

9. *O. falcifolia* Schltr., sp. nov.

Epiphytica, patula, pluricaulis, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus subflexuosis, basibus foliorum omnino absconditis, laxe 6–9-foliatis; foliis erecto-patentibus vel erectis, lineari-falcatis, acutis, parte libera 10–19 cm longis, basi 0.7–0.8 cm latis; spicis gracilibus, usque supra basin floriferis, elongatis, cylindraceis, dense multifloris, foliis superioribus fere aequilongis, 0.5 cm diametientibus; floribus minutis, erecto-patentibus, apice incurvulis, viridibus, glabris; bracteis oblongis, longius apiculatis, glabris, apicem versus margine pluridentatis, floribus fere aequilongis; sepalo intermedio oblongo, obtuso, 1.5 mm longo, lateralibus aequilongis, oblique ovatis, obtusiusculis, subfalcatis; petalis subfalcatis, lanceolato-ligulatis, subacutis, medio margine anteriore paulo ampliatis, marginibus minute serrulatis, sepalis subaequilongis; labello trilobo, sepalis paulo brevior, lobis lateralibus basalibus divergentibus, oblique quadratis, truncatis, intermedio conspicue longiore, ligulato, antice subtruncato; columna perbrevis, crassiuscula, anthera reniformi, obtusa; ovario clavato, glabro, 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17160, flowering in Jan. 1908.

From the related species this is well distinguished by the long, more loosely attached leaves, the narrow spike and shape of the labellum. The flowers are green, while in all other species of the section they are more-or-less yellowish.

10. *O. longispica* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 40 cm longa; rhizomate decumbente, brevi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis vel subflexuosis, usque ad 15 cm longis, basibus foliorum omnino absconditis; foliis erectis vel suberectis, oblique lineari-ligulatis, acutis, parte libera 7–10 cm longis, basi 0.4–0.6 cm latis; spica usque supra basin florifera, elongata, usque ad 23 cm longa, folia superiora multoties superante, c. 0.7 cm diametiente; bracteis patentibus, hyalinis, lanceolatis, apiculatis, dorso carinatis, flores aequinantibus vel paulo superantibus; floribus parvulis, apice paulo incurvis, glabris; sepalo intermedio oblongo, obtuso, 0.2 cm longo, lateralibus aequilongis, oblique ovatis, obtusis; petalis oblique oblongo-ligulatis, obtusis, dimidio superiore margine serrulatis, sepalis aequilongis; labello e basi cordata trilobo, lobis lateralibus divaricatis, semiorbicularibus, intermedio multo longiore lanceolato-triangulo, apice truncato et minute serrato, labello toto 1.5 mm longitudine vix excedente, supra basin 0.1 cm lato; columna brevi, crassiuscula; anthera subreniformi, obtusissima, dorso umbonata; ovario clavato, cum pedicello 2.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests near Dschischungari (Waria District), alt. c. 800 m—R. Schlechter no. 19573, flowering in May 1909.

This species differs outwardly from the others by the striking, long inflorescence. It is distinguished also by the petals and labellum.

The flowers are pale green with a yellow anther.

11. *O. scytophylla* Schltr., sp. nov.

Epiphytica, erecta, pluricaulis, 15–25 cm alta; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis, dense 5–8-foliatis, basibus foliorum omnino absconditis;

foliis erectis vel suberectis, oblique linearibus, acutis, crassius coriaceis, parte libera 4–8 cm longis, basi 0.3–0.4 cm latis; spica usque ad basin fere florifera, dense multiflora, usque ad 12 cm longa, folia superiora vulgo superante, 0.5 cm diametiente; bracteis hyalinis, patentibus, oblongo-ellipticis, apiculatis, dorso carinatis, margine irregulariter serratis, flores vulgo paululo superantibus; floribus parvulis, patentibus, apice incurvulis, glabris; sepalo intermedio oblongo, obtuso, 0.2 cm longo, lateralibus ovato-oblongis, obtusiusculis intermedio aequilongis; petalis oblique ligulatis, subacutis, margine subintegris, sepalis aequilongis; labello e basi subcordato-dilatata medio constricto, supra medium sursum dilatato, antice bilobato, apiculo interjecto, lobis apicalibus brevibus, truncatis, antice minute denticulatis, labello toto 0.2 cm longo, basi 1.5 mm lato, apice 1.5 mm lato; columna brevi, apicem versus paululo dilatata; anthera subreniformi, obtusiuscula; ovario clavato, glabro, cum pedicello 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 19036, flowering in Dec. 1908.

A species of the section *Hymenobracteae*, well characterised by the narrow, fairly thick leathery leaves and by the labellum. It is interesting that no less than four species of this section occur on the Kani Range, some of which I happened to notice on the neighbouring ridges, e.g. on the Ibo Range. The flowers of *O. scytophylla* are yellowish, orange-yellow towards the base. Like all the species of the section it seems to grow mostly amongst thick moss.

§ 3. *Platystreptus*

Most of the species are of very characteristic habit, but a few of the less characteristic ones, such as *O. platychila* Schltr., show a distinct tendency towards the section *Otoglossum*. They are distinguished by their much-flattened, twisted, snake-like and usually much-elongated stems. The ovaries are generally hairy. The flowers, as in *Hymenobracteae*, acquire, more-or-less, a bend at their insertion and are not so rigid as in the following sections. The labellum is usually rather simple viz. diminishing from a rather broad cordiform base to a narrow apex, or spread out in front in a double flap (i.e. bi-lobed). The leaves are moderately lax and very thin after drying (as in herbarium) specimens). There is still uncertainty whether *O. platychila* Schltr. belongs to this section.

The species of the section hang down lax and perpendicularly from trees; some of them, as in *O. cardiochila* Schltr. and *O. platychila* Schltr., are found on the plains or lower hills and the rest further up the mountains. The delimitation of the species is somewhat difficult; it is quite possible that some of the 'species' may prove to be merely varieties, when further specimens are forthcoming from new localities; at present I feel obliged to regard these as species.

Besides the Papuan [Papuasian] species, *O. monstrosa* Lindl. from Jæ also belongs here.

12. *O. platychila* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 113.

Neu-Pommern: On trees near Malapau and near Mandres, on the Gazelle Peninsula, alt. c. 20 m—R. Schlechter no. 13773, flowering in Nov. 1901.

The inclusion of this species in section *Platystreptus* is not yet quite certain. The labellum is much widened towards the front without a constriction at the centre, but in habit it resembles the other species.

13. *O. cardiochila* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 111.

Kaiser-Wilhelms-Land: On trees in the forests of Wobbe, alt. c. 250 m—R. Schlechter no. 16393, flowering in Aug. 1907; on trees beside the creeks in the Bismarck Range, alt. c. 600 m—R. Schlechter no. 13929, flowering in Jan. 1902.

The species is related to *O. monstrosa* Lindl., I have found specimens with stems not less than 45 cm long hanging from the branches and oscillating in the wind.

14. *O. longicaulis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 112.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17202, flowering in Jan. 1902 [Ed.—possibly 1908]; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 19149, flowering in Jan. 1909.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14666, flowering in July 1902.

We have now specimens over 50 cm long, growing in similar manner to *O. cardiochila* Schltr. I have drawn attention already to the differences between these two species.

15. *O. bilobulata* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 110.

Kaiser-Wilhelms-Land: On trees in the forests by the creeks in the Bismarck Range, alt. c. 800 m—R. Schlechter no. 14083, flowering in Jan. 1902.

During my last visit to the Bismarck Range, I found no fresh material of this species. It is related closely to *O. longicaulis*, but shows differences in the labellum; whether these will prove constant, the future will tell when more material of the species becomes available.

16. *O. papillosa* Schltr., sp. nov.

Epiphytica, dependens, 9–10 cm longa, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus flexuosis, 5–6-foliatis, basibus foliorum omnino absconditis; foliis erecto-patentibus vel suberectis, falcatis, lanceolato-ligulatis, acutis, parte libera 1.7–2.5 cm longis, basi 0.4–0.6 cm latis; spica in exemplario unico brevi, sublaxe c. 15-flora, c. 2 cm longa, folia superiora superante, 0.5–0.6 cm diametiente, usque supra basin florifera; bracteis ovato-lanceolatis, apiculatis, dorso carinatis, margine dentatis, extus papillois, ovario brevioribus; floribus parvulis, erecto-patentibus; sepalo intermedio oblongo, obtuso, c. 1.5 mm longo, extus minute papilloso, lateralibus intermedio paulo brevioribus, oblique ovatis, obtusis, extus minute papillois; petalis oblique ligulatis, obtusis, apice margine subdentato-irregularibus, basin versus paululo angustatis, glabris, sepalis lateralibus aequilongis; labello e basi cordato-ovato angustato, apice breviter et obtuse bilobulato, glabro, 0.1 cm longo; columna brevi, crassiuscula; anthera reniformi, obtusa; ovario clavato, dense papilloso, cum pedicello 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19138, flowering in Jan. 1909.

This species is distinguished from the others in the section by its smaller stems, shorter leaves and inflorescences, the externally papillose bracts and the sepals likewise covered with small papillae. Otherwise it resembles *O. longicaulis* Schltr. very closely in the flowers. The colour of the flowers is green-yellow.

§ 3a. *Diurium*

In habit this small section reminds one of the shorter forms of the foregoing section *Platystreptus*; but it has flowers with straight pedicels standing out at right angles to the rachis. The sepals, petals and labellum, likewise, stand at right angles to the axis of the flower. The sepals are always broader than in *Platystreptus*; the labellum is tongue-shaped, narrowing towards the apex and ending in two tails or narrow teeth.

Besides the two species dealt with here, there is still a third, *O. cuneata* J.J. Sm., recorded from Dutch New Guinea. The species grow by preference from overhanging trees alongside creeks, where they usually appear in colonies.

17. *O. diura* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 111.

Kaiser-Wilhelms-Land: On trees in the forests of Wobbe, alt. c. 250 m—R. Schlechter no. 16581, flowering in Sept. 1907; on trees by the creeks of the Bismarck Range, alt. c. 600 m—R. Schlechter no. 14085, flowering in Jan. 1902.

The species is extremely characteristic in the shape of the labellum and, together with *O. cuneata* J.J. Sm. and *O. forcipifera* Schltr., forms a well-defined section.

17a. *O. hybrida* Schltr., hybr. nov.

O. diura Schltr. \times *O. forcipifera* Schltr.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 400 m (between the parents [species])—R. Schlechter no. 17172, flowering in Jan. 1908.

I found two sturdy plants of this very characteristic hybrid growing amongst the parents. There can be no doubt as to the hybrid nature of the plant, in habit the specimens are absolutely midway between the parents; the spikes are closer than in *O. forcipifera*, but not so close as in *O. diura*. In relative size the flowers are intermediate between the two and have toothed but narrower petals than *O. forcipifera*. In the labellum it more closely resembles *O. diura*, but this organ is less elongated, the caudicle shorter and an apiculum inserted between them, thus forming an intermediate stage between the two species.

18. *O. forcipifera* Schltr., sp. nov.

Epiphytica, dependens, pluricaulis, usque ad 35 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus flexuosis, laxe 6–10-foliatis, basibus foliorum omnino absconditis; foliis erecto-patentibus vel suberectis, falcatis, lanceolato-ligulatis vel ligulatis, acutis, parte libera 6–13 cm longa, basi 0.5–0.7 cm lata; spica pro sectione laxa multiflora, cylindrica, usque ad 12 cm longa, c. 0.9 cm diametiente; bracteis lanceolatis, acutis, margine serratodentatis, dorso submuricatis, ovario paulo brevioribus; floribus patentibus, pro genera mediocribus; sepalis elliptico-oblongis, obtusiusculis vel subacutis, 2.5 mm longis, glabris, lateralibus obliquis; petalis oblique obovato-spathulatis, dimidio superiore grosse serrato-dentatis, glabris, sepalis paulo brevioribus; labello e basi cordata ligulato, apicem versus sensim paulo angustato, apice in lobulos 2 lineari-falcatos, acutos exeunte cum apiculo minuto interjecto, 2.5 mm longo, basi 0.1 cm lato; columna brevi, crassiuscula; anthera reniformi, apiculata; ovario clavato, minute papilloso-puberulo, cum pedicello 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 400 m—R. Schlechter no. 17170, flowering in Jan. 1908; on trees in the forests near the Saugueti Base, alt. c. 250 m—R. Schlechter no. 18876, flowering in Nov. 1908.

The species is, certainly, related very closely to *O. cuneata* J.J. Sm., but is distinguished by its more slender growth, narrower, sharper and regularly toothed or serrated petals and the labellum narrower, clearly pointed towards the front, and relatively longer. The sepals and petals are brownish green, the labellum darker.

§ 4. *Adenorhachis*

The Type of this section is *O. glandula* [Ed.—*glandulosa*] Lindl. from Tahiti. The species belonging here are related closely to each other, as well as to the Type. From New Guinea I know only the two species mentioned here, but as an example, *O. flexuosa* Schltr. from New Caledonia also belongs to this section, together with *O. brevifolia* Lindl. from the Mascarene Islands.

The section is related closely to the one which follows, but differs chiefly in the conspicuous hairiness of the rachis, ovaries and bracts, as well as in the pandurate labellum, which is usually split in front.

The only species occurring in the Territory, *O. aurea* Schltr., is distributed widely, and occurs along creeks in the hill-country from an altitude of about 250 metres up to in excess of 1000 metres in mist-forest areas. I have found it in flower often on the mountain tops in the undergrowth on very thin branches, hardly more than two years old. *O. Govidjoae* Schltr. occurs under quite similar conditions, but higher up the mountains.

19. *O. aurea* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 109.

Kaiser-Wilhelms-Land: On bushes in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17614, flowering in Apr. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19030, flowering in Dec. 1908; on trees in the forests near Pema, alt. c. 250 m—R. Schlechter no. 19399, flowering in May 1909; on trees and bushes in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19529, flowering in May 1909.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14673, flowering in July 1902.

The species is more compact in growth than *O. glandulosa* Lindl., and has a very closely-flowered, fuller spike than the latter. The colour of the flowers is generally pale yellow, but forms also occur with darker flowers, which may be designated golden yellow.

20. *O. Govidjoae* Schltr., sp. nov.

Epiphytica, erecta, vel patula, usque ad 23 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus flexuosis, dense 8–14-foliatis, basibus foliorum omnino absconditis; foliis erecto-patentibus, falcato-lanceolatis, acutis, glabris, parte libera 2.5–5 cm lata, basi 0.4–0.7 cm lata; spica usque ad basin florifera, dense multiflora, rhachi papilloso-puberula; floribus patentibus, parvulis; bracteis lanceolatis, acuminatis, margine subdendatis, extus papilloso-puberulis, ovarium vulgo paulo superantibus; sepalo intermedio ovato-oblongo, subacuto, glabro, 0.75 mm longo, lateralibus late et oblique ovatis, obtusiusculis, glabris, sepalo intermedio aequilongis; petalis oblique lanceolatis, subacutis, glabris, sepalis paulo brevioribus; labello e basi cordato auriculata, auriculis subtriangulo-falcatis, obtusis, infra medium paulo angustato et in lobum subquadratum, apicem versus paulo dilatatum, apice retusum cum apiculo minuto expanso, 0.1 cm longo; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtuse apiculata, glabra; ovario clavato, subvillosa-papilloso, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Govidjoa [Creek], alt. c. 1300 m—R. Schlechter no. 19774, flowering in June 1909.

A magnificent species, with all the typical characteristics of the section *Adenorhachis*, but owing to the labellum being entire in front and not split, as is the case with other species, it stands isolated in the section. My specimens differ much in size. Some are very small and grew on young twigs, which leads me to assume that they cannot exceed two years in age, and yet these small plants are already in flower. But since I cannot regard them as completely developed specimens, I have not yet described the consistence of the leaves. The flowers are yellowish or yellowish green, as in all species of this section.

§ 5. *Otoglossum*

The boundaries of this section are not defined so sharply as one could wish, about half the species known from New Guinea belong to it; as mentioned already, it is quite possible that this large section may be split into a series of smaller ones, as soon as the forms from the neighbouring countries are better known and more specimens are available from New Guinea. These all have rather narrow leaves and very small flowers standing out at right angles to the axis of the rachis. The flowers are always glabrous on the outside; the labellum is auriculate or cordiform at the base, usually with a constriction in the middle, widening out in front and more-or-less bipartite. Only in rare cases has a definite narrowing towards the apex been observed. The species are all small, mostly with erect, fairly short stems. Even where the latter are much elongated the Type of the section is always apparent in the other characters.

In Dutch New Guinea, the following belong to this section, viz. *O. spathipetala* J.J. Sm., *O. rhizomatosa* J.J. Sm. and perhaps *O. pedicellata* J.J. Sm. *O. microphylla*

Lindl. is recorded also from here by J.J. Smith ('Nova Guinea' VIII, p. 27), but a closer examination of this plant may prove it to be a separate species. Two species recorded from British Papua, viz. *O. hexaptera* F.v.M. and *O. papuana* Bail. are, unfortunately, not known to me and cannot be recognised solely from their descriptions.

The area of dispersion extends from India to the south seas; in the north as far as Japan, and southwards to Australia, where *O. palmicola* F.v.M. occurs. All species in the Territory are epiphytic and grow partly on the trunks of trees, but mostly on the not-too-thick branches of tall trees, or even on shrubs.

In general, the species would appear to be rather local in occurrence, and this explains their large number. Most are inhabitants of the mountains, especially in the mist-forest zone, nevertheless a whole series of species is found in the forests of the lowlands, where they grow by preference along creeks on overhanging trees.

Very characteristic is the red-brown or orange-red, sometimes even red-lead, colour of the flowers or entire inflorescence after drying, the colour being assumed often even by the leaves and stems.

21. *O. volucris* Schltr., sp. nov.

Epiphytica, erecta, pluricaulis, usque ad 15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus subflexuosis, laxe 5-6-foliatis, basibus foliorum omnino obtectis, usque ad 7 cm longis; foliis subfalcato-linearibus, acutis, glabris, parte libera 3-6 cm longa, basi 0.3-0.4 cm lata; spica usque ad basin florifera, gracili, dense multiflora, usque ad 5.5 cm longa, vix 0.4 cm diametiente; bracteis lanceolatis, acuminatis, margine irregulariter dentatis, dorso carinatis, quam flores paulo brevioribus; floribus subverticellatis, parvulis, patentibus, glabris; sepalis oblongo-ovalibus, obtusis, 0.5 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, dimidio superiore margine irregulariter subdentatis, sepalis subaequilongis; labello e basi cordata trilobo, petalis aequilongo, lobis lateralibus basalibus divaricatis, subquadrato-oblongis, obtusissimis, margine inferiore subcrenatis, lobo intermedio lateralibus longiore, late ligulato, antice subtruncato-obtusissimo, integro; columna perbrevis, crassiuscula; ovario clavato, glabro, cum pedicello 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18775, flowering in Nov. 1908.

A species of the mountains, easily recognised by the labellum, the two wing-like lateral lobes and column representing a figure reminiscent of a flying bird. The flowers are dark brown-red.

22. *O. rhodostachys* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 4-6 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus abbreviatis, 4-5-foliatis, usque ad 1.5 cm longis, basibus foliorum omnino absconditis; foliis erecto-patentibus, oblique ligulatis, acutis vel apiculatis, glabris, parte libera 1-2 cm longa, basi 2-3 mm lata; spicis tenuibus, usque supra basin floriferis, dense multifloris, erectis vel suberectis, usque ad 4.5 cm longis, c. 0.3 cm diametientibus; bracteis lanceolatis, acuminatis, glabris, margine irregularibus, dorso carinatis, nunc ovario aequilongis, nunc paulo longioribus; floribus minutis, patentibus, subverticellatim aggregatis, glabris; sepalo intermedio ovato, obtuso, vix 0.5 mm longo, lateralibus oblique ovalibus, obtusis, intermedio aequilongis; petalis oblique obovatis, obtusis, margine irregulariter pluridentatis, sepalis subaequilongis; labello e basi subcordata trilobo, petalis aequilongo, lobis lateralibus basalibus, patentibus, oblique trapezoides, truncatis, subintegris, lobo intermedio duplo majore, trapezoides-obovato, antice truncato-obtusissimo; columna perbrevis, crassiuscula, glabra; anthera reniformi, obtusa, glabra; ovario clavato, glabro, cum pedicello c. 0.1 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, alt. c. 200 m—R. Schlechter no. 19233, flowering in Apr. 1909.

A small species with a certain likeness to *O. Treubii* Ridl., but distinguished by its dentate petals and the shape of the lobes of the labellum. It grows mainly in colonies on exposed branches of small trees in the primary forest. The flowers, as well as the rachis and bracts, are coloured a brown-red.

23. *O. irrorata* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 112.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900–1100 m—R. Schlechter no. 14443, flowering in Apr. 1902; no. 20242, flowering in Sept. 1909.

The specimens I recently collected agree well with those discovered in 1902, but the margins of the lip-lobes may be somewhat irregular, almost dentate.

24. *O. odontopetala* Schltr., sp. nov.

Epiphytica, erecta, pusilla, pluricaulis, usque ad 18 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule abbreviato, dense 4–5-foliato, vulgo vix 3 cm excedente, basibus foliorum omnino abscondito; foliis erecto-patentibus, linearibus, acutis, vulgo subfalcato-obliquis, parte libera 6–12 cm longa, basi 0.4–0.6 cm lata; spicis usque ad basin floriferis, suberectis, dense multifloris, elongatis, usque ad 13 cm longis; bracteis anguste lanceolatis, acuminatis, margine subdentatis, dorso carinatis, ovario fere aequilongis; floribus subverticellatim aggregatis, patentibus, minutis, glabris; sepalo intermedio oblongo, obtuso, 0.75 mm longo, lateralibus oblique ovatis, obtusis, intermedio aequilongis; petalis circuitu obovato-spathulatis, obtusis, margine dimidio superiore grosse paucidentatis, sepalis subaequilongis; labello e basi cordato-auriculata trilobo, lobis lateralibus patentibus, oblique oblongis, obtusissimis, margine subdentatis, intermedio multo majore, late obcordato, margine subdentato, labello toto sepala paulo superante basi 0.5 mm lato; columna perbrevis, crassiuscula, glabra; ovario cylindraceo, glabro, cum pedicello 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests above Dschischungari, alt. c. 800 m—R. Schlechter no. 19571, flowering in May 1909.

This species is well distinguished by its short stems, sharply toothed petals and the dentate lip with its lobes differently shaped from *O. irrorata*, to which it is related closely. I regarded this species initially as a form of *O. rhodostachys* Schltr., but it is now apparent that it is well separated from the latter. The flowers are red-brown.

25. *O. pectinata* Schltr., sp. nov.

Epiphytica, erecta, pluricaulis, usque ad 20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus dense 5–8-foliatis, basibus foliorum omnino absconditis, strictis, vel substrictis, usque ad 8 cm longis; foliis erectis vel suberectis, linearibus, acutis, vulgo subfalcato obliquis, glabris, parte libera 5–8 cm longa, basi 0.3–0.4 cm lata; spica dense multiflora, elongata, usque ad basin florifera, 6–14 cm longa, 0.5 cm diametiente; bracteis lanceolatis, acuminatis, margine subdentatis, glabris, ovario vulgo fere aequilongis; floribus parvulis, patentibus, subverticellatim approximatis, glabris; sepalo intermedio oblongo, apicem versus paucidentato, 0.75 mm longo, lateralibus oblique latiovatis, obtusiusculis, intermedio aequilongis; petalis oblique oblongis, obtusatis, dimidio superiore marginibus irregulariter pectinato-dentatis, glabris, sepalis paululo brevioribus; labello e basi cordato-auriculata auriculis obtusis late panduriformi, infra medium altius constricto, marginibus irregularibus, antice subexciso, sepalis paulo longiore; columna perbrevis, crassiuscula; ovario subclavato, glabro, cum pedicello c. 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 18540, flowering in Oct. 1908.

The species approaches *O. odontopetala* in its deeply dentate petals, but this toothing is different, also the shape of the labellum, the flowers are likewise brown-red. brown.

26. *O. sarcophylla* Schltr., sp. nov.

Epiphytica, humilis, pluricaulis, usque ad 10 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus laxo 4–5-foliatis, flexuosis, basibus foliorum omnino absconditis; foliis crasse carnosius, lineari-falcatis, acutis, glabris, 3.5–6 cm longis, basi 3.5–4 mm latis; spicis arcuatis, densissime multifloris, usque ad 3.5 cm longis, c. 3.5 mm diametientis, usque ad basin floriferis; bracteis lanceolatis, acuminatis, glabris, margine dentalis, floribus subaequilongis; floribus minutis, patentibus, subverticellatim aggregatis, glabris; sepalis late ovatis, obtusis, glabris, 0.5 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi auriculato-reniformi dimidio anteriore in lobum suborbicularem, apice subretusum, basi labelii paulo angustiore expanso, sepalis aequilongis; columna perbrevis, crassiuscula, glabra; anthera transversa, obtusissima; ovario subclavato, glabro, cum pedicello 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 600 m—R. Schlechter no. 18508, flowering in Oct. 1908.

This species has the most fleshy leaves amongst related species, which induced me to give it the species name 'sarcophylla'.

The flower spikes are very thick and always falcate. In floral structure the species is related most closely to *O. brevispica* Schltr. The flowers are brown-red.

27. *O. brevispica* Schltr., sp. nov.

Epiphytica, repens, pusilla, usque ad 8 cm alta; rhizomate repente, haud bene elongato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus 0.5–0.8 cm distantibus, abbreviatis, dense 4–5-foliatis, basibus foliorum omnino absconditis, usque ad 2.5 cm altis; foliis erectis vel suberectis, linearibus, acutis, vulgo falcatis vel subfalcatis, glabris, parte libera 2–5.5 cm longis, basi 0.3–0.4 cm latis; spica erecta, usque ad basin florifera, brevi, dense multiflora, 1.5–3 cm longa, 3 mm diametiente; bracteis lanceolatis, acuminatis, margine lacerato-dentatis, glabris, dorso carinatis, floribus vulgo subaequilongis; floribus patentibus, minutis, glabris; sepalo intermedio ovato, obtuso, vix 0.5 mm longo, lateralibus oblique latiovatis, subacutis, intermedio aequilongis; petalis oblique lineariligulatis, obtusis, margine apicem versus irregularibus, sepalis subaequilongis; labello e basi auriculato-reniformi contracto, dimidio anteriore in lobum circuitu suborbicularem usque supra medium bifidum expanso, sepalis paululo longiore, basi 0.5 mm lato; columna perbrevis, crassiuscula, glabra; anthera reniformi, obtusissima; ovario cylindraceo, glabro, cum pedicello vix 0.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 150 m—R. Schlechter no. 18479, flowering in Oct. 1908.

Here we find one of the few *Oberonias* with a conspicuously elongated rhizome. *O. rhizomatosa* J.J. Sm. and *O. repens* Schltr. (described below) belong to this relationship. All three species are related closely, but are well distinguished by the characteristics of the flowers and the shape and denseness of the flower spike. The colour of the flowers is a dark brown-red.

28. *O. repens* Schltr., sp. nov.

Epiphytica, repens, pusilla, usque ad 8 cm alta; rhizomate elongato, gracili; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus 1–2 cm distantibus, abbreviatis, dense 4–5-foliatis, basibus foliorum omnino absconditis, usque ad 2 cm longis; foliis oblique linearibus, acutis, 2–6.5 cm longis, basi 0.2–0.3 cm latis; spicis usque supra basin floriferis, erectis, pro genere vulgo laxius multifloris, usque ad 4 cm longis, c. 0.3 cm diametientibus; bracteis lanceolatis, acuminatis, glabris, margine subintegris, quam flores paulo brevioribus; floribus minutis, patentibus, glabris; sepalo intermedio ovato-oblongo, obtuso, vix 0.5 mm longitudine excedente, lateralibus oblique latiovatis, obtusis, intermedio aequilongis; petalis rhombeo-spathulatis, obtusis, dimidio superiore minute serrulatis, sepalis paulo brevioribus; labello e basi cordato-auriculata late pandurato, medio constricto, antice breviter bilobulato, lobulis divergentibus, subquadratis, margine exteriori obtuse paucidentatis, labello antice paulo angustiore quam basi, sepalis paulo longiore; columna perbrevis, crassiuscula, glabra; ovario clavato, glabro, cum pedicello, 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20045, flowering in Sept. 1909.

The species is related clearly to *O. rhizomatosa* J.J. Sm., unknown to me, but the labellum and petals of the latter seem to differ much from the species described here. The colour of the flowers is orange-red.

29. *O. rhizomatosa* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XLV, p. 2.

Kaiser-Wilhelms-Land: Bougainville Range—K. Gjellerup no. 156 [Ed.—no other information.]

This species is unknown to me. According to the description it must be related to *O. repens* Schltr.

30. *O. ruberrima* Schltr., sp. nov.

Epiphytica, erecta, pluricaulis, usque ad 9 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus brevibus, dense 4–6-foliatis, basibus foliorum omnino obtectis,

usque ad 5 cm longis; foliis erectis vel suberectis, lineari-falcatis, acutis glabris, parte libera 2–3.5 cm longa, basi 3–4.5 mm lata; spicis usque ad basin floriferis, perdense multifloris, rectis vel arcuatis, usque ad 4 cm longis, c. 0.4 cm diametientibus; bracteis lanceolatis, acuminatis, margine subdentatis, ovarium vulgo paulo superantibus, dorso papillis paucis donatis; floribus parvulis, patentibus, glabris; sepalis ovatis, obtusiusculis, 0.75 mm longis, lateralibus obliquis; petalis lineari-ligulatis, obtusis, sepalis subaequilongis; labello e basi auriculato-cordata panduriformi, medio constricto et dimidio superiore in lobum suborbicularem, usque ad medium bifidum vel potius obtuse bilobulatum expanso, 0.1 cm longo, basi 0.75 mm lato, antice paulo angustiore; columna perbrevis, crassiuscula, glabra; ovario cylindraco, glabro, pedicello incluso 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18863, flowering in Nov. 1908.

For a long time I was doubtful whether it would not be better to regard this plant as a variety of *O. sarcophylla* Schltr., but after examining the flowers side-by-side I came to the conclusion to regard it as a species. The flowers here are larger; the labellum is constricted at, not below, the middle; the middle lobe of the labellum is deeply bipartite. The leaves also are shorter and less fleshy and the bracts are beset sparsely with papillae on the outside, these being absent in *O. sarcophylla*. As a herbarium specimen this species is very striking since the entire plant dries to red, while in *O. sarcophylla*, and many other Oberonias, only the inflorescence dries to red. The flowers are dark orange-red.

31. *O. arcuata* Schltr., sp. nov.

Epiphytica, erecta, pusilla, pluricaulis, usque ad 7 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus dense 7–8-foliatis, subflexuosis, basibus foliorum omnino absconditis, usque ad 4 cm longis; foliis erecto-patentibus, linearibus, acutissimis, nunc subfalcato-obliquis, 2–3.5 cm longis, basi 0.2–0.3 cm latis; spicis usque ad basin floriferis, arcuatis, dense multifloris, usque ad 3.5 cm longis, c. 4.5 mm diametientibus; bracteis lanceolatis, acuminatis, glabris, margine subdentatis, ovario vix aequilongis; floribus parvulis, patentibus, glabris; sepalis late ovalibus, obtusis, 0.75 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, glabris, sepalis paulo brevioribus; labello e basi auriculato-cordata, circuitu subquadrato, supra basin paululo constricto, antice breviter et obtuse bilobulato, sepalis paulo longiore, 0.5 mm medio lato; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtusa; ovario cylindraco, glabro, cum pedicello c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16901, flowering in Nov. 1907.

This species is related to *O. bifida* Schltr., but is distinguished from it by the short broad lip. The flowers are of a brown colour.

32. *O. bifida* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 109.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20262, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17840, flowering in June 1908; on trees in the range forests of Bolobo, alt. c. 1000 m—R. Schlechter no. 16534, flowering in Sept. 1907; on trees alongside the creeks in the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 14081, flowering in Jan. 1902; on trees in the mountain forests on the Govidjoa [Creek], alt. c. 1100 m—R. Schlechter no. 19795, flowering in June 1909.

All the specimens enumerated here probably belong to this widely distributed species. In the shape of the labellum there are small differences which induced me at first to assume that we are dealing here with different closely related species, but it has not seemed possible to separate them at present.

var. *brachyloba* Schltr., var. nov.

Differt a forma typica labello brevior, lobis apicalibus brevibus.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18841, flowering in Nov. 1908.

This variety may prove to be an individual species, as soon as the consistency of its characteristics is proved by more material.

33. *O. radicans* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 113.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 600 m—R. Schlechter no. 15739 [Ed.—possibly 13739], flowering in Jan. 1902.

Unfortunately, I have not found this peculiar species again, and the specimen collected by me in 1902 is the only one I possess. I am not acquainted with any other *Oberonia* in which similar growing conditions are present. The plant is somewhat reminiscent of *Dichaea*, especially when in the flowerless condition the terminal inflorescences are not visible.

34. *O. brunnea* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 110.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Nuru [River], alt. c. 400 m—R. Schlechter no. 15740 [Ed.—possibly 13740], flowering in Feb. 1902.

Unfortunately, I have also not found this species again. For a species of the section *Otoglossum* the leaves are relatively broad; the labellum is very characteristic and points to a relationship with *O. radicans* Schltr. and *O. linearis* Schltr.

35. *O. linearis* Schltr., nom. nov.

O. stenophylla Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 113, (nec Ridl.).

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600—700 m—R. Schlechter no. 14331, no. 14559, flowering in Apr. 1909 [Ed.—probably 1902]; no. 20028, flowering in Sept. 1909.

This plant had to be renamed, since Ridley had in the meantime described an *O. stenophylla*. The species is distinguished by the ovate-lanceolate petals. The flowers are red-brown

36. *O. torricellensis* Schltr., sp. nov.

Epiphytica, erecta, usque ad 17 cm alta; rhizomate haud bene elongato, gracili; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus c. 0.5–2 cm distantibus, subflexuosis, basibus foliorum omnino obtectis, 9–13-foliatis; foliis erecto-patentibus, subfalcato-obliquis, linearibus, acutis, glabris, parte libera 1.2–2.5 cm longa, basi 2–2.5 mm lata; spica erecta, usque ad basin florifera, dense multiflora, usque ad 5 cm longa, 0.3 cm diametente; bracteis lanceolatis, acuminatis, margine irregulariter dentatis, dorso sparsim granuloso-papillois, floribus fere aequilongis; floribus minutis, patentibus, glabris; sepalo intermedio ovato, obtusiusculo, 0.5 mm longo, lateralibus obliquis, latioribus, obtusis, intermedio aequilongis; petalis oblique lineari-oblongis, obtusis, sepalis subaequilongis; labello e basi cordata medio fere paulo angustato et in lobum subquadratum antice minute trilobulatum producto, sepalis paululo longiore; columna brevissima, crassiuscula; anthera subreniformi, obtusissima; ovario cylindraceo, glabro, pedicello incluso 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20310, flowering in Sept. 1909.

A species related to *O. linearis* Schltr., but easily recognised by the narrow petals. The rhizome is elongated slightly and the stems stand isolated, but are sometimes fairly close. The colour of the flowers is pale brown.

37. *O. maboroensis* Schltr., sp. nov.

Epiphytica, pusilla, usque ad 7 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus dense 7–8-foliatis, strictis vel substrictis; foliis erecto-patentibus, subfalcato-obliquis, lineari-lanceolatis, acutis, glabris, parte libera 1.7–3 cm longa, basi 0.3–0.4 cm lata; spica laxa 15–20-flora, erecta, usque ad basin florifera, c. 3.5 cm longa; bracteis ovato-lanceolatis, acuminatis, subintegris, glabris, dorso carinatis, ovario fere aequilongis; floribus minutis, patentibus, glabris; sepalis ovato-oblongis, obtusis, vix 0.5 mm longis, lateralibus obliquis; petalis oblique rhombo-ellipticis, acutiusculis, margine breviter paucidentatis, sepalis paulo longioribus; labello e basi subcordato-truncata cum angulis subacutis dimidio anteriore paulo angustato et in lobum

subquadratum, antice truncatum, apiculatum producto, sepalis vix longiore; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtusa; ovario subclavato, glabro, pedicello incluso vix 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19496, flowering in May 1909.

The species is distinguished from the related *O. torricellensis* by the elliptic-rhomboidal petals sharply toothed on the margins, and by the labellum. The stems also are shorter and their loose inflorescence bears comparatively few flowers for this genus. I have only one specimen of this species, which I found growing on a small *Rhamnaceae*. The flowers are a yellowish flesh colour with a yellow anther.

38. *O. quadrata* Schltr., sp. nov.

Epiphytica, parvula, multicaulis, usque ad 9 cm alta; rhizomate brevi vel valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus vulgo valde approximatis, interdum usque ad 0.5 cm distantibus, erectis, strictis vel subflexuosis, 5–7-foliatis, basibus foliorum omnino obtectis, usque ad 6 cm longis; foliis oblique linearibus, acutis, glabris, parte libera 1.5–3.5 cm longis, basi 2–2.5 mm latis; spicis usque ad basin floriferis, erectis vel curvatis, pro genere laxius multifloris, usque ad 3.5 cm longis, c. 0.3 cm diametentibus; bracteis lanceolatis, acuminatis, margine subdentatis, ovario subaequilongis vel brevioribus; floribus patentibus, minutis, glabris; sepalis late ovatis, obtusis, vix 0.5 mm longis, lateralibus obliquis; petalis oblique ovatis, subacutis, sepalis paulo minoribus; labello e basi leviter cordata quadrato vel subquadrato apicem versus vix angustato, antice truncato et brevissime atque obscure trilobato, sepalis paulo longiore; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtusa; ovario subclavato, glabro, cum pedicello 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17199, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18215, flowering in Sept. 1908.

This small-flowered species is recognised easily by the almost-quadrate shape of the labellum and the ovate petals. In the specimens from the Finisterre Range the individual stems are at 5 mm intervals, but the flowers are quite similar to those of the Type from the Kani Range. The entire flower spike is red-brown.

39. *O. trigonoglossa* Schltr., sp. nov.

Epiphytica, erecta, pluricaulis, usque ad 9 cm alta; rhizomate elongato, gracili, flexuoso; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus 0.5–1.5 cm distantibus, dense foliatis, basibus foliorum omnino absconditis, usque ad 5 cm altis, 8–10-foliatis; foliis erecto-patentibus, oblique lanceolatis, acutis vel subacutis, glabris, parte libera 1–1.5 cm longa, basi 3.5–4.5 mm lata; spica vulgo curvata, usque ad basin florifera, subdense multiflora, usque ad 2.5 cm longa; bracteis lanceolatis acutis, margine subdentatis, dorso carinatis, glabris, floribus aequilongis; floribus erecto-patentibus, minutis, glabris; sepalis oblongis vel ovato-oblongis, obtusis, vix 0.5 mm longitudine excedentibus, lateralibus obliquis; petalis ovato-lanceolatis, acutis, margine subdentato-irregularibus, sepalis paulo brevioribus; labello e basi subtruncato-cordata ovato-triungulo, apiculato, sepala paulo superante, basi 0.5 mm lato; columna pro genere graciliore, apicem versus paulo incrassata, glabra; anthera subreniformi, obtusa; ovario cylindraco, glabro, cum pedicello 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18840, flowering in Nov. 1908.

It is still doubtful whether this and the following species belong to the section *Otoglossum*. The pale yellow colouring of the flowers, the relatively broad leaves and the peculiar shape of the labellum, which differs from all others known in the section, are characteristic in this species.

40. *O. Finisterrae* Schltr., sp. nov.

Epiphytica, humilis, vulgo pluricaulis, usque ad 12 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus vulgo valde abbreviatis, dense 4–6-foliatis, basibus foliorum omnino obtectis, 1–3 cm altis; foliis subfalcato-obliquis, lanceolato-ligulatis, acutis vel subacuminatis, glabris, parte libera 2.5–6 cm longa, basi 0.4–0.7 cm lata; spicis usque supra basin floriferis, pro genere laxius 15-multifloris, usque ad 3.5 cm longis, 4.5 mm diametentibus; bracteis

lanceolatis, acuminatis, margine subdentatis, ovario fere aequilongis; floribus parvulis, patentibus, glabris; sepalis late ovalibus, obtusis, 0.75 mm longis, lateralibus obliquis; petalis oblique elliptico-oblongis, obtusis, margine erosulo-dentatis, sepalis paulo brevioribus; labello e basi subcordato-truncata auriculata, supra basin paululo angustata, in lobum amplum, subquadratum, antice truncatum, margine subdentato-irregularem, producto, auriculis basalibus margine exteriore denticulatis, labello toto sepalis fere aequilongo; columna brevi, crassiuscula, glabra; anthera reniformi; ovario subclavato, glabro, cum pedicello c. 1.2 mm longo.

Kaiser-Wilhelms-Land: On small trees on the ridges of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18187, flowering in Sept. 1908.

In this species there exists also a somewhat aberrant Type of the section *Otoglossum*. Externally the plant is more reminiscent of some species of section *Platyacron*, but the shape of the lip contra-indicates its place in the section *Platyacron*. I have found the plant only once, on small trees, on very narrow steep ridges in the Finisterre Range in places where it was exposed often to strong winds. The flowers are red-brown.

§ 6. *Podostachys*

The chief characteristics of this section are found in the striking agreement of the plants regarding habit, which seems to go hand-in-hand with certain marks on the labellum. All the species have fairly shortened stems and form tufted, dense clusters, out of which there always arises a distinct stalk bearing the flower spike. There seems to be a tendency to hairiness in the inflorescence. The flowers are small, and possess a simple labellum which is occasionally (though rarely) two-lobed or fissured in front.

The section is, clearly, related closely to *Otoglossum* but clearly is distinguished easily externally by the presence of a clearly stalked spike. The colour of the flowers is usually pale brown or orange-red. Most of the species were found on scattered trees in the low-lands, where occasionally dry periods occur as, for instance, on the alang-plains of the Ramu region, and in the vicinity of the coast. The only species which reaches the mountains is *O. scapigera* Schltr., but apparently it never extends to the mist-forest zone.

41. *O. scapigera* Schltr., sp. nov.

Epiphytica, erecta, caespitifica, usque ad 11 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus brevibus, 3–4-foliatis, basibus foliorum omnino absconditis, 1.5–3.5 cm longis; foliis erecto-patentibus, obliquis, nunc subfalcatis, linearibus, acutis, glabris, parte libera 3–5.5 cm longis, basi 2.5–3 mm latis; spicis graciliter pedunculatis, dense multifloris, elongatis, usque ad 6 cm longis, c. 0.4 cm diametentibus, pedunculo tereti, glabro, c. 1.5 cm longo; bracteis lanceolatis, acuminatis, glabris, margine irregularibus, ovario vulgo fere aequilongis; floribus patentibus, minutis, glabris; sepalis patentibus, late ovalibus, obtusis, 0.75 mm longis, lateralibus obliquis; petalis e basi oblique lanceolata angustatis, subacuminatis, sepalis subaequilongis; labello vix auriculato, circuito ligulato, antice usque supra medium bifido, segmentis lanceolatis, subacutis, 0.1 cm longo; columna perbrevis, crassiuscula, glabra; anthera reniformi obtusa; ovario cylindraceo, glabro, 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the slopes of the Kani Range, alt. c. 500 m—R. Schlechter no. 17831, flowering in June 1908.

An interesting species distinguished from all others in the section by the deeply bipartite labellum of the flowers. Likewise, the shape of the petals is unusual and unknown to me in others in the section. The colour of the flowers is pale brown with a darker, more orange-brown labellum.

42. *O. podostachys* Schltr., sp. nov.

Epiphytica, pusilla, caespitifica, 4–5 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus abbreviatis, dense 3–4-foliatis, basibus foliorum omnino absconditis, 1–1.2 cm longis; foliis lanceolato-ligulatis, acutis vel apiculatis, subfalcatis, parte libera

0.8–1.2 cm longa, basi 2.5–3.5 mm lata; spica pedunculata, subdense multiflora, 2–2.5 cm longa, vix 0.3 cm diametiente, pedunculo 1–1.3 cm longo; gracili; bracteis lanceolatis, acuminatis, glabris, margine irregularibus, ovario aequilongis vel paulo longioribus; floribus patentibus, minutis, glabris; sepalis ovatis, obtusiusculis, 0.5 mm longis, lateralibus obliquis, intermedio latioribus; petalis oblique ovato-lanceolatis, obtusiusculis, margine irregularibus, sepalis paulo minoribus; labello circuitu oblongo-ligulato, basi exauriculato, apice breviter bilobulato, lobulis divergentibus, triangulis, subacutis, 0.75 mm longo, margine irregulari; columna perbrevis, crassiuscula, glabra; anthera suborbiculari-reniformi, obtusa; ovario cylindraceo, glabro, cum pedicello vix 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Danip, not far from Alexishafen, alt. c. 100 m—R. Schlechter no. 19210, flowering in Mar. 1909.

This species is related closely to *O. gracilipes* Schltr. described below. It is distinguished from it by the shorter pedicels, narrower petals and by the labellum which is not widened distinctly in the middle. The colour of the flowers is altogether different in this species, being yellow-green with a brownish labellum.

43. *O. gracilipes* Schltr., sp. nov.

Epiphytica, erecta, caespitifica, usque ad 13 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus brevibus, dense 6–8-foliatis, basibus foliorum omnino absconditis, usque ad 4 cm longis; foliis erecto-patentibus, oblique lanceolatis, subacutis, parte libera 1.3–2.5 cm longa, basi 0.4–0.5 cm lata; spicis graciliter pedunculatis, elongatis, dense multifloris, usque ad 5 cm longis, 0.4 cm diametientibus, pedunculo gracili, 2–4 cm longo; bracteis lanceolatis, acuminatis, margine subdentatis, ovario fere aequilongis, floribus patentibus, subverticellatim aggregatis, minutis, glabris; sepalis ovatis, obtusis, 0.5 mm vix longitudine superantibus, lateralibus obliquis, intermedio latioribus, subovalibus; petalis oblique ovatis, obtusis, sepalis paulo minoribus; labello basi exauriculato, oblongo, medio dilatato, antice breviter bilobulato, lobulis triangulis, obtusis, subparallelis, 0.75 mm longo; columna perbrevis, apicem versus conspicue dilatata; anthera subreniformi-orbiculata, obtusa; ovario cylindraceo, glabro, cum pedicello c. 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the alang-plains near the Saugueti Base, alt. c. 200 m—R. Schlechter no. 18907, flowering in Dec. 1908.

I have indicated above how to distinguish this species from *O. podostachys*. Among the species of the section it has the longest pedicels and its leaves are more leathery than those of the other species. The main colour of the flowers is brown, although the petals and column are more yellowish.

44. *O. ovalis* Schltr., sp. nov.

Epiphytica, erecta, pusilla, usque ad 6 cm alta; rhizomate valde abbreviato, radicibus filiformibus, elongatis, flexuosis, glabris; caulibus brevibus, basibus foliorum omnino absconditis, ut videtur vulgo 4-foliatis, usque ad 2 cm longis, foliis erecto-patentibus, ligulatis, obtusiusculis, subfalcatis, parte libera 1.5–2.5 cm longa, basi 0.3–0.5 cm lata; spica vulgo arcuata, graciliter pedunculata, usque ad 2.5 cm longa, c. 2.5 mm diametiente, pedunculo usque ad 1.7 cm longo; bracteis lanceolatis, acutis, dorso carinatis, margine integris, ovario fere aequilongis; floribus patentibus, minutis, glabris; sepalis late ovatis, obtusis, 0.5 mm longis, lateralibus obliquis; petalis perlate ovatis, obliquis, obtusis, sepalis paulo brevioribus; labello late ovali, basi auriculis minutis donato, apice retuso, sepalis paululo longiore; columna perbrevis, crassiuscula, glabra; anthera reniformi, obtusa; ovario cylindraceo, glabro, cum pedicello vix 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the gallery forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18321, flowering in Oct. 1908.

This species is distinguished easily from the others by its ovate labellum; furthermore the petals are broader than in other species of the relationship.

The two small plants which I possess grew on a tree on the borders of the gallery forests overhanging the alang-plain on the Kenejia [River]; accordingly the species probably will have to be looked for on solitary trees on the alang-plains.

45. *O. cleistogama* Schltr., sp. nov.

Epiphytica, pusilla, usque ad 12 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus brevibus, basibus foliorum omnino absconditis, dense 6–8-foliatis; foliis

erecto-patentibus, oblique lanceolato-ligulatis, acutis, vel obtusiusculis, parte libera 1–2.5 cm longa, basi 0.4–0.7 cm lata; spicis erectis, pedunculatis, subdense multifloris, usque ad 7 cm longis, c. 3.5 mm diametentibus; pedunculo brevi, usque ad 1.5 cm longo; bracteis lanceolatis, acuminatis, subintegris, glabris, ovario subaequilongis; floribus patentibus, minutis, ut videtur vulgo cleistogamis et haud apertis, glabris; sepalis perlate ovatis, obtusis, c. 0.35 mm longis, lateralibus obliquis; petalis suborbiculari-ellipticis, obtusis, sepalis paulo minoribus, margine irregularibus; labello circuitu subreniformi, e basi perlata subtrilobato, lobis lateralibus basalibus, divaricatis, semiorbicularibus, parvulis, intermedio subquadrato-semiorbiculari subretuso, lateralibus multo majore, labello toto sepalis aequilongo, basi 0.4 mm lato; columna perbrevis, crassiuscula; anthera subreniformi; ovario cylindraceo, glabro, c. 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees at the mouth of the Waria [River], alt. c. 10 m—R. Schlechter no. 19938, flowering in July 1909.

It is doubtful whether this species belongs to the section *Podostachys*. It is possible that the normal form will prove to be a species of the section *Otoglossum*, but so long as only these cleistogamous specimens, collected by me, are available I will regard it as an aberrant form of *Podostachys*. The orange-red flowers are conspicuously small.

§ 7. *Platyacron*

In this section are combined all those species of the genus which show, in common, little variation in the shape of the labellum. From a shortly auriculate narrow base, the lamina widens towards the front, where it is divided into two more-or-less sharply separated semi-circular lobes. In almost all the species the sepals are covered with papillae or hairs on the outside surface. The bracts are strongly toothed or notched on their margins, and, together with nearly the entire rachis, are covered with papillae on the outside. The species exhibit much variation in habit, some being almost stemless, others have a short stem, and a few even possess a fairly long stem.

O. djamuensis Schltr. is an aberrant species whose affiliation to this section is not quite definite yet. Of course it is connected with the principal Type through forms such as *O. drepanophylla* Schltr. Of the non-Papuan [Papuasian] species, *O. spathulata* Lindl., and *O. padangensis* Schltr., as examples belong here. The colour of the flowers varies more than in most other sections, viz. between a greenish yellow and a dark brown.

The species in the Territory are found chiefly in hill-country, particularly along creeks on overhanging trees. With the exception of *O. phleoides* Schltr., all have broad leaves.

In the following arrangement, the species have been so placed, that the almost stemless and short-stemmed ones come first, and those with elongated stems are placed at the end of the section.

46. *O. oligotricha* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 115.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 350 m—R. Schlechter no. 17609, flowering in Apr. 1908; on trees in the creeks of the Bismarck Range, alt. c. 500 m—R. Schlechter no. 13933, flowering in Jan. 1902; on trees in the forests above Meireka, alt. c. 600 m—R. Schlechter no. 17955, flowering in July 1908; on trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 19184, flowering in Jan. 1909.

The Type from the Bismarck Range (no. 13933) is not well preserved, but I have no doubt that all the specimens enumerated here belong to the same species. The first description still has to be modified a little. The sepals, as well as the ovary, are covered with short papillae on the outside. The petals towards the apex are irregular on the edges, almost toothed, the labellum is nearly two-lobed through a depression in front. The flowers are probably the smallest among the known species of the section.

47. *O. alopecurus* Schltr., sp. nov.

Epiphytica, erecta, brevicaulis, usque ad 22 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule abbreviato, dense 4–5-foliato, basibus foliorum omnino abscondito, usque ad 5 cm longo; foliis erecto-patentibus, ligulatis, acutis, subfalcato-obliquis, parte libera 6–17 cm longis, basi 0.6–1 cm latis; spica usque supra basin florifera, dense multiflora, cylindrica, usque ad 10 cm longa, c. 0.5 cm diametiente; bracteis lanceolatis, acuminatis, margine serratodentatis, ovario fere aequilongis, extus sparsim papillois; floribus patentibus, pro genere mediocribus; sepalis ovatis, obtusis, extus papillis sparsis donatis, c. 1.5 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, sepalis distincte brevioribus; labello e basi breviter auriculata subquadrata dimidio anteriore conspicue dilatato, antice rotundato-truncato et medio retuso, subbilobato, sepalis paulo longiore, supra medium 2 mm latitudine subattingente; columna perbrevis, crassiuscula, glabra, ovario subcylindraco, papilloso, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 300–450 m—R. Schlechter no. 16564, flowering in Sept. 1907; no. 17619, flowering in Apr. 1908.

The species is related to *O. latilabris* Schltr. in this section, but may be distinguished by the bracts and labellum. The leaves are also longer and narrower and the orange-brown flowers of a paler colour than *O. latilabris*.

48. *O. latilabris* Schltr., sp. nov.

Epiphytica, erecta, brevicaulis, usque ad 23 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule perbrevis, dense 3–5-foliato, basibus foliorum omnino obecto, usque ad 7 cm longo, foliis falcato-obliquis, ligulatis, acutis vel subacutis, parte libera 8–14 cm longis, basi 1.2–1.5 cm latis; spica erecta vel suberecta, usque supra basin florifera, perdense multiflora, usque ad 11 cm longa, c. 0.7 cm diametiente; bracteis ovato-lanceolatis, acuminatis, margine pectinato-dentatis, extus dense papilloso-muricatis, ovarium aequantibus; floribus patentibus, in genere mediocribus; sepalis late ovatis, obtusis, extus dense papillois, 1.5 mm longis, lateralibus obliquis; petalis oblique lanceolato-oblongis, obtusis, glabris, sepalis brevioribus; labello e basi minute auriculata, breviter quadrata subito in laminam subreniformem bilobatam cum sinu obtuso dilatato, lobis semiorbicularibus, obtusissimis, labello toto 1.75 mm longo, supra medium 2 mm lato, basi carina lunata, in nervo medio usque infra apicem producto; columna perbrevis, crassiuscula; anthera reniformi, obtusa; ovario cylindraco-clavato, dense papilloso-muriculato, 0.2 cm longo.

Kaiser-Wilhelms-Land: On palm [tree] trunks on [Mount] Dscheregi, on the Waria [River], alt. c. 400 m—R. Schlechter no. 17431, flowering in Mar. 1908.

The species is related closely to *O. alopecurus* Schltr., but easily distinguished from it by the shape of the labellum and the other differences mentioned above in detail.

The flowers are very dark brown. This is one of the few species which I collected on smooth palm trunks in New Guinea.

49. *O. nephroglossa* Schltr., sp. nov.

Epiphytica, brevicaulis, c. 8 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde abbreviatis, 3–4-foliatis, basibus foliorum omnino absconditis, usque ad 2 cm altis; foliis erecto-patentibus vel suberectis, falcato-obliquis, ligulatis, acutis, parte libera 4–7 cm longis, basi 0.6–0.8 cm latis; spica usque ad basin florifera, perdense multiflora, cylindrica, c. 4.5 cm longa, 0.6 cm diametiente; bracteis lanceolatis, acutis, margine dense pectinato-dentatis, dorso papilloso-muriculatis, ovario fere aequilongis; floribus in genere mediocribus, patentibus; sepalis late ovalibus, obtusis, extus papillois, c. 1.2 mm longis, lateralibus obliquis; petalis oblique lanceolatis, obtusiusculis, glabris, sepalis distincte brevioribus; labello e basi pro sectione altius unguiculata, quadrata infra medium subito in laminam reniformem antice bilobatam dilatato, lobis semiorbicularibus, sinu brevi semiquadrato, labello toto 1.5 mm longo, medio fere 2 mm lato; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtuse apiculata; ovario cylindraco, costis papilloso, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 600 m—R. Schlechter no. 17328, flowering in Feb. 1908.

Likewise, closely related to *O. alopecurus* Schltr., but distinguished by the petals

and labellum. Whether the papillose ridges of the ovaries is a constant character, will be decided when more material is available.

The dark brown flowers are darker than any other species known to me.

50. *O. muriculata* Schltr., sp. nov.

Epiphytica, erecta, brevicaulis, c. 7 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule abbreviato, dense 4–6-foliato, basibus foliorum omnino abscondito, usque ad 2.5 cm longo; foliis erecto-patentibus vel suberectis, lanceolato-ligulatis, acutis, vulgo falcato-obliquis, parte libera 3–5.5 cm longis, basi 0.6–1 cm latis; spica usque ad basin florifera, dense multiflora, c. 4 cm longa, 4.5 mm diametiente; bracteis ovatis, apiculatis, margine pectinato-dentatis, extus muriculatis, ovario fere aequilongis; floribus patentibus, parvulis; sepalis late ovatis, obtusis, extus sparsim muriculatis, 0.1 cm longis, lateralibus obliquis; petalis oblongis, subacutis, margine subdenticulatis, glabris, sepalis paulo brevioribus; labello e basi auriculata, quadrata flabellato-subreniformi, antice bilobato, glabro, sinu altiore cum apiculo obtuso, lobis semiorbicularibus, margine subrenulato-irregularibus 1.2 mm longo, supra medium 1.5 mm lato; columna perbrevis, crassiuscula; anthera reniformi, obtusa; ovario cylindraceo, dense muriculato-papilloso, c. 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20292, flowering in Sept. 1909.

Next to *O. oligotricha* Schltr., this species has the smallest flowers among the short-stemmed species of the section. It is well characterised by the shape of the petals and labellum. The flowers are orange-brown.

51. *O. phleoides* Schltr., sp. nov.

Epiphytica, pluricaulis, usque ad 14 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus erectis vel suberectis, laxe 4–5-foliatis, basibus foliorum absconditis, subflexuosis, usque ad 9 cm longis; foliis erecto-patentibus, linearibus, acutis vel subacutis, 2.5–7.5 cm longis, basi 0.2–0.5 cm latis; spica dense multiflora, cylindrica, usque ad basin florifera, usque ad 5 cm longa, 0.4 cm diametiente; bracteis lanceolatis, acuminatis, margine grosse dentatis, extus sparsim muriculatis, ovario fere aequilongis; floribus parvulis, patentibus; sepalis late ovalibus, obtusis, extus sparsim papilloso-muricatis, 0.75 mm longis, lateralibus obliquis; petalis oblongo-ligulatis, obtusis, apicem versus margine irregulariter serrulatis, glabris, sepalis paulo brevioribus; labello e basi breviter auriculata, auriculis margine minute denticulatis, quadrato, supra basin paululo constricto, deinde sursum in laminam reniformem, bilobatam dilatato, lobis semiorbicularibus, sinu brevi, obtusiusculo, labello toto 0.1 cm longo, supra medium 0.1 cm lato, glabro, dimidio anteriore margine minutissime denticulato; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtusa; ovario cylindraceo, muriculato-papilloso, c. 0.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 600 m—R. Schlechter no. 17315, flowering in Feb. 1908.

In habit this interesting species is reminiscent of the smallest species of the grass genus *Phleum*. It is, as previously mentioned, distinguished from all others of the section by its narrow leaves. I have found the plant only once; it grew on a tree bent over the river in the vicinity of the place where I found *O. nephroglossa* Schltr. and *O. drepanophylla* Schltr. The flowers are pale brown.

52. *O. drepanophylla* Schltr., sp. nov.

Epiphytica, erecta, pluricaulis, c. 17 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis vel substrictis, 7–8-foliatis, basibus foliorum omnino absconditis; foliis falcatis, lanceolatis vel lanceolato-ligulatis, acutis, parte libera 3–5 cm longis, basi 0.7–0.8 cm latis; spica dense multiflora, usque ad basin florifera, folia superiora bene superante, 0.6–0.7 cm diametiente; bracteis lanceolatis, acutis, dorso carinatis, margine subdentatis, ovario subaequilongis, glabris; floribus mediocribus, patentibus, glabris, sepalis late ovatis vel ovalibus, obtusis, 1.5 mm longis, petalis oblique oblongo-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi minute auriculata quadrata subreniformi-dilatato, antice quarta parte bilobato, lobis semiorbicularibus obtusissimis, labello toto sepalis paulo longiore, supra medium 0.2 cm lato, glabro; columna perbrevis, crassiuscula, glabra; anthera subreniformi, obtuse apiculata; ovario cylindraceo, glabro, c. 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 17339, flowering in Feb. 1908.

The only specimen of this species which I found, unfortunately had a spike damaged at the top so I was unable to state its length. The plant is recognised easily in the section by the falcate leaves and the absence of the papillae on the outside of the sepals. The colour of the flowers was olive-green with a labellum brown at the base.

53. *O. djamuensis* Schltr., sp. nov.

Epiphytica, erecta vel patula, pluricaulis, usque ad 20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus subflexuosis, laxius 5–7-foliatis, basibus foliorum omnino absconditis, usque ad 13 cm longis, foliis erectis vel suberectis, lineari-lanceolatis, acutis, vulgo subfalcatis, glabris; parte libera 5–10 cm longis, basi 0.6–0.8 cm latis; spicis erectis, laxe multifloris, usque ad 7 cm longis, c. 1 cm diametientibus, usque supra basin floriferis; bracteis lanceolatis, acuminatis, glabris, margine subdentatis, ovario subaequilongis; floribus in verticillis intervallatis, c. 0.5–0.7 cm distantibus, plurifloris, patentibus, glabris; sepalis ovalibus, obtusiusculis, 0.2 cm longis, lateralibus obliquis; petalis oblique ovato-lanceolatis, subacutis, sepalis paulo minoribus; labello e basi breviter auriculata late cuneato-obcordato, antice tertia parte bilobo, lobis semiorbiculari-subquadratis, obtusissimis, sinu obtuso, labello toto (lobis inclusis) 0.3 cm longo, infra apicem 3.2 mm lato; columna perbrevis, crassiuscula, glabra; anthera reniformi, obtusa; ovario cylindrico, glabro, pedicello incluso 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Djamu Gorge, alt. c. 300 m—R. Schlechter no. 16633, flowering in Oct. 1907.

This species is distinguished immediately from all others by the structure of its inflorescence, which is not familiar to me in other sections. Whether it will remain finally in this section is still uncertain. It is possible that it may be regarded as a basic form of a separate section, if it is proved that the characteristics observed in the inflorescence are of importance. The sepals and petals are green; the labellum brown, darker towards the base.

§ 8. *Arachnochilus*

Here I am compelled to elevate a plant to the Type of a separate section, of which I know only a few related species from Java and the hinterland of India.

This group is characterised by the labellum having two to four long subulate teeth on each side of its base, and with the lamina elongated and disposed in front in two tail-like tips.

All the species agree exactly in habit and appear to have non-articulated leaves. Consequently, it must be assumed that we have here a very characteristic section of the sub-genus *Menophyllum*. Besides *O. punamensis* Schltr. mentioned here, this section also includes *O. insectifera* Hook. f. from the hinterland of India and *O. Lotsyana* J.J. Sm. from Java as certainties.

54. *O. punamensis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 115.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14662, flowering in July 1902.

Unfortunately, I had no opportunity during my last expedition of visiting the island of Neu-Mecklenburg again and therefore I was not able to find this interesting species again. I have pointed out above that the plant is related to *O. insectifera* Hook. f. and *O. Lotsyana* J.J. Sm.; by the shape of the labellum it is well distinguished from both.

§ 9. *Scytoxiphium*

This is a typical Papuan-Pacific section of the sub-genus *Menophyllum*, the species being stemless and reminiscent of some *Iridaceae* in their vegetative structure. The racemes are rather elongated and densely covered with almost verticillate flowers, the rachis always

more-or-less densely covered with papillae. The flowers are very characteristic; first of all the petals are always reflexed; then the labellum is always moderately simple, that is to say, it is usually more-or-less quadrate, always retuse or two-lobed in front and of a conspicuous, thick fleshy consistence, which I have not seen in any other section. Besides those species enumerated here the section also includes *O. heliophila* Rchb. f. from Fiji and *O. Betchei* Schltr. from Samoa.

The species usually hang vertically downwards from tree-trunks or branches and grow by preference alongside creeks in hill-country. *O. crassilabris* Schltr. is the only species which seems to grow at a fairly high altitude, the others are only found at lower levels. The delimitation of the species is difficult, since they are all closely inter-related.

55. *O. rivularis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 115.

Kaiser-Wilhelms-Land: On trees on the banks of the middle courses of the Nuru [River], alt. c. 200 m—R. Schlechter no. 13801, flowering in Dec. 1901.

Unfortunately, this species does not occur amongst the rich material of *Scytoxiphium* which I collected on my last journey. A further comparison with other species shows that this plant may be distinguished also by its broader auricles at the base of the labellum. It is the smallest Papuan [Papuasian] species in the section.

56. *O. dolichophylla* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 114.

Kaiser-Wilhelms-Land: On trees in the forests near Pro, alt. c. 30 m—R. Schlechter no. 19997, flowering in Aug. 1909; on trees on the banks of the Garup [River], at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14579, flowering in Apr. 1902.

The specimens from Pro have slightly broader leaves than the Type from the Garup [River], nevertheless they agree well in the flowers. It is related very closely to the two preceding ones, but is distinguished by the lanceolate petals, which are considerably narrowed in the middle, and terminate in a blunt apex. It could best be designated as 'petals obliquely lanceolate from the base obtusely acuminate'. *O. pachyglossa* Schltr. has a much more slender inflorescence and linear petals, but *O. crassilabris* Schltr. has a deeper two-lobed labellum and simple ovate-lanceolate petals.

57. *O. pachyglossa* Schltr., sp. nov.

Epiphytica, dependens, usque ad 55 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule subnullo; foliis c. 4, lineari-gliadiatis, acutis, medianis longioribus, usque ad 50 cm longis, basin versus c. 1.6 cm latis; spicis usque ad basin floriferis, gracillimis, folia mediana vulgo paulo superantibus; rhachi papilloso-puberula; bracteis ovato-lanceolatis, acutis vel acuminatis, flores vulgo subaequantibus, margine dentatis; floribus parvulis, subverticellatim aggregatis, verticellis 0.3–0.5 cm distantibus; sepalis late ovatis vel ovalibus, obtusis, c. 1.5 mm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, apice subtruncato-obtusissimis, sepalis paululo brevioribus; labello subquadrato, basi minute subauriculato, antice subtruncato, obtusissimo, retuso, glabro, carnosio, 1.5 mm longo, medio fere 1.2 mm lato; columna perbrevis, crassiuscula, glabra; anthera ovata, acuta, glabra; ovario cylindraceo, papilloso, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Kaulo [River], alt. c. 400 m—R. Schlechter no. 16756, flowering in Nov. 1907.

This species is, undoubtedly, a close relative of *O. dolichophylla* Schltr., but differences between the two seem to suffice to regard both as separate species within the group. Here in *Scytoxiphium* the individual species are always related to each other, not only in the same zones, but also in widely separated regions, where the flora has very little in common. The flowers are olive-green.

58. *O. crassilabris* Schltr., sp. nov.

Epiphytica, dependens, usque ad 45 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus subnullis, haud conspicuis; foliis 4–6, lineari-ensiformibus, acutis,

medianis longioribus, usque ad 45 cm longis, basi 1.3–1.5 cm latis; spicis usque ad basin floriferis, gracilibus, dense multifloris, c. 20 cm longis, 0.4 cm diametentibus; bracteis ovato-lanceolatis, acuminatis, margine lacerato-dentatis, floribus fere aequilongis; floribus subverticellatim approximatis, parvulis, verticellis haud bene distantibus; sepalis late ovatis, obtusis, c. 1.5 mm longis, intermedio glabro, lateralibus obliquis, dimidio superiore hinc et inde extus sparsim papillosis; petalis oblique ovato-lanceolatis, obtusis, margine irregularibus, nunc subdentatis; labello e basi minute et subacute auriculata circuitu oblongo-subquadrato, medio vix constricto, antice quarta parte apicali bilobato, lobis paulo divergentibus truncatis, sinu acuto cum apiculo obtuso interjecto, labello toto 1.5 mm longo, c. 1 mm lato, glabro, carnosio; columna perbrevis, crassiuscula, glabra; anthera subreniformi, glabra; ovario cylindraceo, papilloso, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, above Meireka, alt. c. 700 m—R. Schlechter no. 17948, flowering in July 1908.

This species is, likewise, related closely also to the three preceding ones, but is recognised by the broader petals and by the labellum, which is distinctly two-lobed in front. The flowers are pale brown with a green labellum.

B. SUB-GENUS *Apotemnophyllum*

§ 10. *Aphananthos*

Apparently the species described here constitutes the Type of a separate section of the sub-genus *Apotemnophyllum* characterised by its peculiar long-bearded bracts, which completely cover and conceal even the fully developed small flowers. It closely approaches *O. longibracteata* Lindl., which also has very long bracts, but in the latter species the bracts never so completely conceal the flowers. Moreover, *O. longibracteata* is a species belonging to the sub-genus *Menophyllum*. I found the species, described here, on two occasions, but only once collected material, since the plant when first discovered was not in flower. In both cases, they were growing in hill-country on small trees, alongside and overhanging small creeks.

59. *O. cryptantha* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 14 cm alta; rhizomate perbrevis; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde abbreviatis, basibus foliorum omnino absconditis; foliis 4–6, erectis vel suberectis, vulgo subfalcato-obliquis, lanceolato-ligulatis, acutis, 4.5–9 cm longis, basi 0.7–0.8 cm latis; spica usque supra basin florifera, basi ipsa vaginis bracteiformibus pluribus obsessa, usque ad 11 cm longa, c. 0.8 cm diametiente, foliis aequilonga vel longiore; bracteis erecto-patentibus, imbricantibus, lanceolatis, acutis, glabris, margine irregularibus, flores multo superantibus; floribus minutis, inter bracteas omnino absconditis, pallide flavidis; sepalis ovalibus, breviter acuminatis, glabris, 0.5 mm longis, lateralibus obliquis; petalis oblique lanceolatis, obtusiusculis, margine irregularibus, subdentatis, sepalis paulo brevioribus; labello trilobo, lobis lateralibus basalibus, divergentibus, late trapezoideo-quadratis, margine exteriori irregulariter denticulatis, lobo intermedio e basi angusta subflabellato-quadrato, antice truncato, marginibus denticulato, lobis lateralibus duplo fere majore, labello toto glabro, 0.75 mm longo, inter apices loborum lateralium 0.65 mm lato, lobo intermedio 0.5 mm antice lato; columna perbrevis, crassiuscula, glabra; ovario cylindraceo, glabro, cum pedicello 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees on the banks of the upper Mudjene [River], alt. c. 450 m—R. Schlechter no. 17874, flowering in June 1908.

Before I found flowering specimens of this species I had observed this plant once before, but only in fruit. It grew on trees overhanging creeks flowing down from the Albo Hills, thus under similar conditions to those found later. Amongst all species in the Territory, the present one is characterised as being the only representative of the sub-genus *Apotemnophyllum*. The somewhat faded flowers in my specimens were yellowish white.

41. *Hippeophyllum* Schltr.

Since my publication of this genus in the year 1905 (in K. Schum. et Laut., Nachtr. [1905], p. 107) I have examined a large quantity of material and feel convinced that my

action in establishing it was justified. So far as I can at present ascertain, it embraces five species, viz. the two mentioned here, *H. hamadryas* (Ridl.) Schltr., *H. Scortechini* (Hook. f.) Schltr., (in Engl. Bot. Jahrb. Beibl. 104, p. 13) and *H. celebicum* Schltr., a species from the Minahassa Peninsula in the Celebes, which differs from *H. Scortechini* (Hook. f.) Schltr. in its long flower spikes and in the lanceolate tips of the lateral lobes of the labellum.

The genus has the equitant leaves of *Oberonia*, but the rhizome is very long-creeping and rigid; the flowers are more like those of *Liparis*. The structure of the labellum, the relatively slender column and the anther, which has relatively small loculi and is widened in front, bring the species closer to *Liparis* than to *Oberonia*. In all species which I have had the opportunity of examining, I have been able to establish the existence of a double callus at the base of the labellum, as is also the case in nearly all *Liparis* species. It would seem that, until now, all authors have overlooked this callus in analyzing the very small flowers (indeed it escaped my notice in examining my first specimens). J.D. Hooker, in his description of *O. Scortechini*, noticed that the plant differs from all others in the genus, and that the flowers are more reminiscent of those of *Liparis*.

The *Hippeophyllum* species are always epiphytic, growing by preference on rather thick tree-trunks. Both species treated here occur at lower altitudes within the Territory. I have noticed that they grow generally on trees with a more-or-less cracked bark and which are usually free of epiphytic mosses. The roots are very thin and penetrate deeply into the cracks of the bark, but soon rot in places where, after a heavy rain, the water remains for a longer time.

1. *H. micranthum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 108.

Kaiser-Wilhelms-Land: On trees on the banks of the Nuru [River], alt. c. 100 m—R. Schlechter no. 13809, flowering in Dec. 1901; on trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16978, flowering in Dec. 1907; on trees in the forests near Kubai, in the Keneja Valley, alt. c. 150 m—R. Schlechter no. 18924, flowering in Dec. 1908; on trees in the forests near Jaduna, alt. c. 250 m—R. Schlechter no. 19267, flowering in Apr. 1909; on trees on the Waria [River], near Gobi, alt. c. 300 m—R. Schlechter no. 19561, flowering in May 1909.

The plant is common in Kaiser-Wilhelms-Land and appears to be distinguished from *H. hamadryas* Ridl. by the very slender long-stemmed ovaries; also the flowers are smaller. The species often forms large close mats, frequently over a metre long, on old tree-trunks or thick branches; from these mats the pallid yellow inflorescences project at flowering time, reminding one of *Liparis longipes* Lindl.

2. *H. papillosum* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 15 cm altum; rhizomate elongato, lignescens, vaginulis brevibus obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde abbreviatis, vaginis foliorum omnino absconditis; foliis 4–5, erectis vel erecto-patentibus, subfalcato-ligulatis, acutis, 4–8 cm longis, basi 0.4–0.6 cm latis; spicis subdense multifloris, elongatis, usque ad 12 cm longis, c. 0.9 cm diametentibus, rhachi papillis substellatis puberula; pedunculo tereti, papilloso, vaginulis pluribus bracteiformibus obsesso; bracteis ovalibus, vulgo obtusis, ovario plus minusve brevioribus; floribus minutis, illis *H. micranthi* Schltr. paulo majoribus, erecto-patentibus; sepalis oblongis, obtusis, glabris, vix 1.5 mm longis, lateralibus obliquis; petalis linearibus, obtusis, apicem versus paululo dilatatis, sepalis fere aequilongis; labello e basi late cuneata, concava tertia parte apicali trilobo, ima basi callo minuto, duplici ornato, glabro, sepalis aequilongo, inter apices loborum lateralium 1.2 mm lato, lobis lateralibus (in labello explanato) divergentibus triangulis, obtusis, intermedio multo majore subreniformi, apice obtusiuscule apiculato, medio 0.75 mm lato; columna semitereti, labello subduplo brevior, glabra; anthera suborbiculari, obtusissima, glabra, thecis brevibus; ovario subcylindrico, papillis substellatis puberulo, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema, alt. c. 300 m—R. Schlechter no. 19406, flowering in May 1909.

The species is related closely to the preceding one, but is distinguished by its compact growth, larger flowers with narrower petals, and broader labellum, as well as by the peculiar covering of the rachis and ovary. This covering consists of small papillae standing mostly in groups, although in such a manner that one is inclined to mistake them for stellate hairs. *H. hamadryas* Schltr. is also more slender in habit. The other species of the genus are not Papuan [Papuanian]. The flowers are green with a yellow labellum.

42. *Liparis* L.C. Rich.

Among the genera of *Liparidinae* this is undoubtedly the largest and it is certain to increase still further since a large number of new species are still being described annually. Ridley enumerated, in his monograph in 1886, a total of 110 species, but this has doubled subsequently, making it rather difficult to find one's way amongst the 220 species, since no uniform review has been made since Ridley's monograph appeared. It was usual to divide the genus into *Mollifoliae* and *Coriifoliae*, but, with the large number of species now known, this division no longer suffices. I will therefore attempt, as in previous genera, to make a sectional division as a possible basis for a better review. The characters of *Mollifoliae* and *Coriifoliae* are very useful in this regard and will compliment the other vegetative characteristics. On this basis I wish to establish four sub-genera, viz.

1. *Sturmia*: in which the leaves are cabbage-like and unjointed.
2. *Menoneuron*: leaves not cabbage-like and likewise unjointed, decaying slowly on the stems or pseudobulbs, so that even after months, the veins still surround the tops in a broom-like manner.
3. *Heteroblastos*: leaves not cabbage-like, unjointed. Inflorescences pseudobasal.
4. *Cestichis*: leaves not cabbage-like, but jointed.

These four sub-genera are divided further into sections, which I will deal with later on. Through the sub-genus *Menoneuron* an excellent transition is made between *Liparis* L.C. Rich. and *Cestichis* Thou., which, in Pfitzer's opinion, should be separated. In the floral structure all the sub-genera agree so perfectly that I do not think a generic separation necessary, since in *Menoneuron* we have the transitional form between the two basic forms. To retain the genus *Sturmia* Rehb. f. on the grounds of its convoluted buds seems also to be of very little value, and by no means in accordance with the inter-relationship of the species, since thereby a complete separation of related species would ensue.

1. SUB-GENUS *Sturmia*

On the basis of its vegetative characters, we may divide this sub-genus into three well-defined sections. Of these *Eu-Liparis* is the largest and most widely distributed, since it occurs throughout the entire distribution area of the genus. It possesses more-or-less adjacent pseudobulbs or small stems, which have one or more leaves at the tip, but are otherwise enveloped by sheaths. *Rhachidibulbon*, the second section, is characterised by leaves at the base of the pseudobulb, which seems to consist of the swollen base of the flower shaft and surround it with its stalk. The third section corresponds to the Ridleyan group *Ramosae*, characterised by the very much elongated and widely creeping rhizome, and by inflorescences which are pseudoaxillary in the upper leaves. This group is purely American. From New Guinea, up to the present, the only known representatives of this sub-genus belong to the section *Eu-Liparis*, but the occurrence

of species belonging to *Rhachidibulbon* may be expected since this section is represented in Malaysia and also in the south seas, where *L. phyllocardium* Schltr. has been reported as a mountain plant in Samoa.

§ 1. *Eu-Liparis*

From German New Guinea I know at present six species belonging to this section, which in the Old World seems to have its chief centre of dispersion in India. No species have been recorded from the other parts of New Guinea, although it naturally may be assumed that there also a considerable degree of endemism will be found. All the species described here are terrestrial and grow mostly as inhabitants of the humus in the primary forests. One species, *L. Kenejiae* Schltr., which is related to *L. paradoxa* Lindl., grows in the grassy plains of the Kenejia Valley, where it is subjected annually for some time to drought and undergoes periods of rest. Among the species of the primary forests *L. truncatula* Schltr. is the only one observed in the lowlands, the other four here have their habitats in the mountains and principally in the mist-forest zone.

1. *L. Kenejiae* Schltr., sp. nov.

Terrestris, erecta, 35–50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, pilosulis; pseudobulbis ovoideis, carnosis, omnino basibus foliorum primum obtectis, vulgo subterraneis, c. 2 cm altis, infra medium 1 cm diametientibus; foliis 3–4, erectis, vel erecto-patentibus longius petiolatis, lamina elliptica, acuminata, plicata, utrinque glabra, basi sensim in petiolum alte vaginantem angustata, usque ad 18 cm longa, medio fere usque ad 4 cm lata, petiolo usque ad 15 cm longo; scapo stricto vel substricto, acutius angulato, vaginulis parvulis bracteiformibus hinc inde obsessis, glabro, folia plus minusve superante; racemo subdense 4–10 floro, erecto, usque ad 4 cm longo; bracteis erecto-patentibus lanceolatis, acuminatis, glabris, nunc flores superantibus nunc brevioribus; floribus erecto-patentibus, mediocribus; sepalo intermedio anguste oblongo-ligulato, obtuso, glabro, 0.7 cm longo, lateralibus oblique oblongis, obtusis, subfalcatis, c. 0.5 cm longis, glabris; petalis anguste linearibus, obtusis, obliquis, glabris, 0.6 cm longis; labello circuitu subcuneato-oblongo, curvato, obtusissimo, apice exciso cum apiculo minuto interjecto, medio longitudinaliter late sulcato, basi callo brevi quadrato, apice minute trilobulato ornato, sepalis lateralibus fere aequilongo, infra apicem 2.5 mm lato, glabro; columna curvata, glabra, apicem versus subauriculata, vix 0.4 cm longa; anthera subreniformi, obtusa, glabra; ovario torto, cylindraceo, 6-costato, cum pedicello c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On grassy hills and on the plains in the Kenejia Valley, near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18912, flowering in Dec. 1908.

This is the only species in the Territory which occurs terrestrially in the alang-plains. It grows similarly, for instance, to *Habenaria goodyeroides* Don as solitary specimens and is not always found easily on account of the inconspicuous colour of the flowers. *L. habenarina* F.v.M. might be regarded as its nearest relative. The flowers are green with a muddy violet labellum.

2. *L. oligantha* Schltr., sp. nov.

Terrestris, erecta, usque ad 25 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, brevissime puberulis; caulibus cylindraceis, carnosulis, basi vaginis paucis alte amplexantibus obtectis, apicem versus vulgo 3-foliatis, usque ad 6 cm altis, c. 0.5 cm diametientibus; foliis erecto-patentibus vel suberectis, petiolatis, ellipticis, acuminatis, glabris, plicatis, lamina 6–10 cm longa, medio fere 2.7–4.3 cm lata, petiolo alte vaginante 2–4.5 cm longo; scapo erecto, gracili, angulato, glabro, vulgo folia paulo superante, laxa 2–7 floro; bracteis deltoideis, acuminatis, parvulis, ovario multoties brevioribus; floribus erecto-patentibus, bene magnis, glabris; sepalis oblongo-ligulatis, extus nervo medio carinato-incrassatis, glabris, intermedio 1.2 cm longo, lateralibus obliquis, 0.9 cm longis; petalis oblique et anguste linearibus, obtusiusculis, glabris, basi paululo dilatatis, 1.1 cm longis; labello late obovato-cuneato, obtusissimo, apice retuso, dimidio superiore margine minute serrulato, basi callo parvulo bilobulato donato, 1.1 cm longo, supra medium 0.8 cm lato; columna leviter arcuata, glabra, apicem versus paululo dilatata, 0.5 cm longa; ovario cylindraceo, leviter costato, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Maboro Range (Waria

District), alt. c. 1000 m—R. Schlechter no. 19486, flowering in May 1909.

A species related to *L. Rheedii* Lindl., but with a less deeply bipartite labellum and very loose, few-flowered shafts. The plant grows, for preference, between rocks, where a deep layer of humus soil is found, in the primary forest; or on rocks covered with humus. The flowers are greenish violet with a white column.

3. *L. Finisterrae* Schltr., sp. nov.

Terrestris, erecta, c. 30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus valde approximatis, cylindraceis, basi vaginis alte amplexantibus obtectis, supra medium 2–3-foliatis, 7–10 cm altis; foliis erecto-patentibus, late ellipticis, acuminatis, glabris, petiolatis, lamina 8–15 cm longa, medio fere 4–6 cm lata, petiolo basi vaginante, 3–4 cm longo; scapo stricto, angulato, glabro, folia superante, subdense plurifloro; bracteis patentibus patulisve, lanceolatis, acuminatis, parvulis, ovario multo brevioribus; floribus erecto-patentibus, pro genere magnis, glabris; sepalo intermedio ligulato, obtuso, 1.1 cm longo, lateralibus oblique lanceolato-ligulatis, obtusiusculis, c. 0.9 cm longis; petalis oblique et anguste linearibus, sepalo intermedio aequilongis; labello e basi cuneata late obovato, minute apiculato, antice margine minute denticulato, 0.9 cm longo, supra medium 6.5 mm lato, callo parvulo alte emarginate in basi; columna paulo incurva, basi lateraliter bene dilatata, labello duplo brevior, clinandrio mediocri; anthera semiorbiculari, subapiculata; ovario 6-costato, glabro, cum pedicello c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 18037, flowering in July 1908.

Undoubtedly this plant is related to *L. oligantha*, but may be recognised easily by its stronger growth, closer inflorescences and floral parts. I found it in humus soil on high mountain ridges of the Finisterre Range, growing in the shade in the primary forest beneath shrubs.

4. *L. melanoglossa* Schltr., sp. nov.

Terrestris, erecta, valida, usque ad 70 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus carnosius, cylindraceis, basi primum vaginis obtectis, supra medium dense 3–5-foliatis, usque ad 15 cm altis; 0.7–1 cm diametentibus; foliis erecto-patentibus, ellipticis, acuminatis, basi sensim in petiolum brevem, vaginante, angustatis, glabris, plicatis, lamina 10–25 cm longa, medio fere 5–12 cm lata, petiolo 3–8 cm longo; scapo stricto vel substricto, plurifloro, glabro, nudo vel vaginulis minutis, sparsis, bracteis formibus obsesso; racemo cylindrico subdense multifloro, elongato, usque ad 30 cm longo, 2–2.5 cm diametente; bracteis anguste lanceolatis, acuminatis, patulis, nunc pedicello aequilongis, nunc paulo brevioribus; floribus erecto-patentibus, illis *L. clatae* Ldl. fere aequimagnis, glabris; sepalo intermedio oblongo-ligulato, obtuso, 0.5 cm longo, lateralibus oblique ovato-oblongis, obtusis, 0.4 cm longis, petalis oblique linearibus, obtusiusculis, subfalcatis, sepalo intermedio aequilongis; labello e basi quadrata dimidio superiore in laminam late reniformem expanso, apice retuso, marginibus dimidio superiore crenato-dentato, basi callo parvulo bidentato ornato, 0.4 cm longo, supra medium 3.5 mm lato; columna leviter arcuato, auriculis brevibus, basi vix dilatata, labello subduplo brevior; anthera suborbiculari, obtusiuscula; ovario 6-costato, glabro, cum pedicello c. 0.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on [Mount] Mimi, on the Waria [River], alt. c. 700 m—R. Schlechter no. 17425, flowering in Mar. 1908; in humus in the forests of the Maboro [Range], alt. c. 1000 m—R. Schlechter no. 19526, flowering in May 1909.

Among the species in the sub-genus *Sturmia*, this is the most robust-growing species in the Territory. It is related most closely to the Javanese *L. Rheedei* Lindl., but differs in its smaller flowers, in a labellum sharply crenate in front, and in its column. The species grows mostly in colonies and seems to prefer localities where it can grow in the shade of larger rocks or on them.

5. *L. truncatula* Schltr., sp. nov.

Terrestris, erecta, humilis, usque ad 20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule cylindraceo, tereti, basi vaginis alte amplexantibus oblecto, apicem versus 3–4-foliato, usque ad 8 cm longo, maturo c. 0.6 cm diametente; foliis erecto-patentibus, petiolatis, lamina oblique et late elliptica, acuminata, utrinque glabra, 7–10 cm longa, medio fere

0.3–0.5 cm lata; scapo stricto vel substricto, angulato, glabro; racemo subaxe pluri-(6–10-)floro, usque ad 7 cm longo; bracteis parvulis, ovatis, acuminatis, patentibus, patulisve, glabris, ovario multoties brevioribus; floribus erecto patentibus, in genere mediocribus; sepalis ligulatis, apicem versus paulo angustatis, obtusis, glabris, intermedio 0.8 cm longo, lateralibus falcatis, paulo brevioribus; petalis anguste linearibus, obtusis, glabris, sepalo intermedio aequilongis; labello e basi subauriculata oblongo-cuneato, antice truncatulo atque margine serrulato-dentato, glabro, basi callo brevi, retuso ornato, 0.7 cm longo, antice 0.3 cm lato, basi medioque paulo angustiore; columna leviter arcuata, glabra, semitereti, apice vix incrassata, basin versus paululo dilatata; ovario 9-costato, glabro, pedicello incluso c. 0.9 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the Maijen [River], alt. c. 100 m—R. Schlechter no. 19039, flowering in Jan. 1909.

This plant is recognised easily from the other species in the Territory by its undivided labellum which is only toothed on its truncate front border. Unfortunately, my material consists of a single specimen only, which moreover was somewhat withered. It is, therefore, very desirable that collectors in New Guinea should watch out for this species. The flowers are pale yellow with a reddish labellum.

6. *L. maboroensis* Schltr., sp. nov.

Terrestris, erecta, c. 20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule cylindraceo, carnosulo, basi vaginis amplectentibus oblecto, apicem versus c. 3-foliato, usque ad 8 cm longo, c. 0.6 cm diametiente; foliis erecto-patentibus petiolatis, lamina oblique elliptica, acuminata, glabra, vulgo plus minusve plicata, 8–11 cm longa, medio fere 3.5–4.5 cm lata, petiolo basi dilatata vaginante usque ad 5 cm longo; scapo substricto, angulato, glabro, racemo subdense 15–20-floro, usque ad 7 cm longo; bracteis minutis, deltoideis, acutis; floribus erecto patentibus, virescentibus, in genere mediocribus; sepalis anguste oblongis, obtusis, glabris, intermedio 0.8 cm longo, lateralibus obliquis, paululo brevioribus; petalis oblique linearibus obtusiusculis, sepalo intermedio aequilongis; labello e basi oblonga apice subdilatato, medio retuso, margine anteriore medio excepto grosse dentato-subpectinato, basi medio callis 2 parvulis, auriculiformibus ornato, 0.8 cm longo, apice c. 0.5 cm lato; columna leviter arcuata, semitereti, glabra, apice et basi vix ampliata, 0.4 cm longa; anthera late cordata, dorso gibbo ornata, glabra; ovario 6-costato, cum pedicello c. 0.9 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19891 [Ed.—possibly 19391], flowering in May 1909.

This species is, probably, related most closely to *L. pectinifera* Ridl. and *L. truncatula* Schltr., but differs distinctly from both in the labellum, which possesses an emargination on the anterior margin, which is toothless in the middle. The flowers of this rare species are pale green.

2. SUB-GENUS *Menoneuron*

Through this sub-genus quite a gradual transition is made between *Liparis* and *Cestichis* (i.e. according to Pfitzer's conception). The whole of the species possess unjointed leaves throughout like those of the sub-genus *Eu-Liparis*, but these are not cabbage-like as in that group, being of more solid texture as in *Cestichis* species. In habit they are likewise in an intermediate position, the species of the first section having many leaves arranged spirally on a short stem whilst other sections have always only single-leaved stems as for many *Cestichis* species. It is very interesting that most species of this sub-genus seem to be Papuan, only a very small number having been recorded outside the Territory (as in the Moluccas). Here also some well-defined sections can be established, these being characterised as follows:

§ [2] *Pleiophyllum* possesses a short creeping rhizome on which 3-4-leaved cylindrical stems are arranged. The leaves are distributed regularly at intervals from the base of the stem to the top and are narrow and grass-like, so that the plants often remind one of certain *Cyperaceae*. The flowers generally possess a broad labellum and a winged column, slightly bent and of medium length.

§ [3] *Platyichilus* has, undoubtedly, much in common both in habit and flower structure with some *Cestichis* species. The pseudobulb stems are short or elongated, sometimes crowded, sometimes arranged on the rhizome at intervals. The flowers have a labellum variously shaped, but never with the peculiar acute knee-shaped bend which characterises the labellum in the following section. The column is slightly bent, but is never much elongated.

§ [4] *Genyichilus* is strikingly like some *Platyichilus* species in habit, but has good flower characters. The latter include a labellum, always tri-lobed, with an acute knee-like bend between the two lateral lobes and provided with a conspicuously large callus. It reminds one very much of the same floral segment in species of the section *Distichon* in the sub-genus *Cestichis*. The column is never winged; it is often somewhat terete in the middle and is elongated more markedly than in other species of the genus.

§ 2. *Pleiophyllum*

This is one of the many types of groups which seem to be restricted in their occurrence, especially to the Papuan [Papuasian] region. Besides the three species described here, only one other, *L. cymbidiifolia* J.J. Sm., must be included in the section. All the species are very similar in habit and easily distinguished from other *Liparis* species by their grass-like leaves. They appear to be mountain plants but certainly occur in hilly regions down to an altitude of 450 metres, as in the case of *L. mapaniifolia* Schltr., but in the forests of the plains these forms seem to disappear entirely. All species collected by me were found in humus soil in dense forests, mostly between thick undergrowth on slight declivities. *L. imperatifolia* Schltr. and *L. caricifolia* Schltr. grow in the Torricelli Range in typical mist-forest formations down to about 600 metres altitude. *L. mapaniifolia* Schltr. grows below this zone, but it must not be forgotten that it inhabits the narrow river beds at lower altitudes, which are frequently subject to cold dense fogs, and that these mists make it possible for plants which are found in the higher altitudes to thrive also in these lower locations.

7. *L. imperatifolia* Schltr., sp. nov.

Terrestris, erecta, usque ad 60 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus abbreviatis, carnosulis, 2–4.5 cm longis, e basi usque ad apicem 3–4-foliatis, teretibus; foliis erecto-patentibus, linearibus, acutis, supra basin paululo attenuatis, glabris, nervosis, 35–60 cm longis, medio fere 0.8–1.2 cm latis; scapis gracilibus, erectis, cum inflorescentiis foliis vulgo brevioribus, vulgo nudis, subteretibus, glabris; racemo erecto, laxe 6–15-floro, usque ad 15 cm longo; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario pedicellato plus duplo brevioribus, floribus in genere inter majores, olivaceis, erecto patentibus; sepalis reflexis, lanceolato-ligulatis, obtusis, glabris, 1.3 cm longis, extus nervo medio incrassatis, lateralibus obliquis; petalis oblique linearibus, acutiusculis, glabris, sepalis aequilongis; labello e basi paulo angustata, subauriculata oblongo, apiculato, margine denticulato-serrato, glabro, basi callo brevi rotundato ornato, per medium leviter basi sulcato, 1.3 cm longo, medio fere 0.9 cm lato; columna vix arcuata, medioeris, margine alata, basi dilatata, c. 0.8 cm longa, glabra; anthera ovato-cucullata, antice angustata, obtusa, glabra; ovario cum pedicello gracillimo, cylindraceo, glabro, c. 2.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600–800 m—R. Schlechter no. 20044, no. 20336, flowering in Sept. 1909.

This is the largest-flowered species in the section. It differs, moreover, from the others in its conspicuously long flower shaft, the shape of the labellum and in the column. The flowers are olive-green with a darker labellum.

8. *L. caricifolia* Schltr., sp. nov.

Terrestris, erecta, 40–50 cm alta; rhizomate decumbente crasso; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus 2 cm distantibus vel magis approximatis, carnosius, brevibus, e basi usque ad apicem vulgo 4-foliatis, 2.5–4 cm altis; foliis erecto-patentibus, linearibus, acutis, nervosis, glabris, supra basin paululo ampliatis, 30–50 cm longis, medio fere 0.8–1.4 cm latis; scapis gracilibus, vulgo

paulo curvatis, angulatis vel subteretibus, glabris, cum inflorescentia foliorum fere longitudine, nudis vel hinc inde vaginula parvula bracteiformi obsessis; racemo laxo vel sublaxe multifloro, usque ad 25 cm longo; bracteis erecto-patentibus, anguste lanceolatis, acuminatis, ovario paulo brevioribus, glabris; floribus erecto-patentibus, in genere mediocribus; sepalis reflexis, oblongo ligulatis, apiculatis, nervo medio extus incrassatis, glabris, intermedio 0.8 cm longo, lateralibus obliquis, paululo brevioribus; petalis reflexis, anguste falcato-linearibus, acutis, basi paulo dilatatis; labello curvato, e basi quadrato-unguiculata subreniformi-flabellato, antice subretuso cum dente lobuliformi acuto interjecto, margine dense serrato, basi callo oblongo, erecto, facie excavato, unguem labelli subsuperante ornato, 6.5 mm longo, lamina supra basin 7.5 mm lata; columna paulo arcuata, basi valde dilatata, margine bene alata, cum denticulo minuto utrinque juxta medium, glabra, 0.4 cm longa; anthera ovata, antice oblongo-producta, obtusa, glabra, ovario cum pedicello gracili, cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18590, flowering in Nov. 1908.

A very characteristic species easily recognised by the sharply toothed margin of the labellum and the large basal callus excavated in front. It grows in patches in the Bismarck Range up to an altitude of 1600 metres in large tufts and then reminds one (especially in the flowerless state) of some *Cyperaceae*. The flowers are pale green. The labellum is brown-edged and later on becomes orange-brown. The wings of the column are also orange-brown.

9. *L. mapaniifolia* Schltr., sp. nov.

Terrestris, erecta, 35–45 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus carnosulis, brevibus, e basi usque ad apicem 3–4-foliatis, 4–5 cm altis; foliis erecto-patentibus, linearibus, acutis, supra basin attenuatis, 30–40 cm longis, medio 1.4–1.8 cm latis, utrinque glabris, nervosis; scapis gracilibus, vulgo substrictis, nudis vel hinc inde vaginula bracteiformi parvula obsessis, subangulatis, glabris, cum inflorescentia nunc folium aequantibus, nunc paulo brevioribus; racemo laxo 15–25-floro, usque ad 25 cm longo; bracteis erecto-patentibus, anguste lanceolatis, acuminatis, ovario duplo vel plus duplo brevioribus; floribus erecto-patentibus, in genere mediocribus; sepalis recurvis, oblongis, obtusis, glabris; intermedio 5.5 mm longo, lateralibus obliquis, intermedio paulo brevioribus latioribusque; petalis reflexis, oblique linearibus, subacutis, glabris, sepalo intermedio aequilongis; labello e basi breviter unguiculata, subquadrato-reniformi, antice retuso cum apiculo brevi, marginibus lateralibus breviter crenulato-dentatis, intus supra basin medio callo brevi, bilobulato ornato, fovea longitudinali per medium, 0.5 cm longo, lamina supra basin 0.8 cm lata; columna mediocri, apice incurva, margine leviter alata, basin versus paulo dilatata, 0.4 cm longa; anthera suborbiculari-quadrata, glabra; ovario cum pedicello gracili, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna (Waria District), alt. c. 450 m—R. Schlechter no. 19322, flowering in Apr. 1908. [Ed.—possibly 1909].

In the structure of the flowers this species is related most closely to *L. cymbidiifolia* J.J. Sm. from Dutch New Guinea, but it is well separated by the very loose, long, green inflorescences, by its flowers not being pale orange-yellow, by its narrower petals, the more quadrangular labellum and by the column. The colour of the flowers is grass-green with a darker labellum. The plant grows amongst undergrowth on gentle slopes in the Waria Valley; apparently it is found at even higher altitudes in the ranges.

§ 3. *Platychilus*

The boundaries of this section are not defined so sharply in one direction as one might wish. I am compelled to include in it one or two aberrant forms, e.g. *L. schistochila* Schltr. and *L. Werneri* Schltr., which should perhaps be better separated. I will not detach them at present, however, since I wish to avoid the creation of too many monotypic sections. Besides, it is not easy to decide with certainty from the dried material of some species whether the leaves are deciduous or not, since in a dry state certain species of this section, such as *L. ovalis* Schltr. and *L. chlorantha* Schltr., show

a line of demarcation between the leaf and pseudobulb. But this line only appears on drying, and as a matter of fact a dismemberment of the leaf does not occur. The leaves, however, are well jointed and gradually decay on the pseudobulbs of these species, as they also do in the case of related species.

Amongst the species recorded from Dutch New Guinea, *L. cinnabarina* J.J. Sm. certainly belongs to the section and probably also *L. flabellata* J.J. Sm. and *L. exilis* J.J. Sm. I have material of the last two, but it is not possible to determine their relationship to some of the species here from their descriptions and illustrations.

As far as is known up to the present, no *Liparis* species have been recorded from British New Guinea.

From my observations in New Guinea it would appear that the individual species (with the exception of a few very abundant ones) occur very locally, and therefore we must not be surprised at finding such a large number of species, since each range has a number of forms quite peculiar to itself, and these forms are complimented by others on the other ranges.

All species enumerated or described here are typical mountain plants, only one appears to occur below the mist-forest border, while others grow high up into the mountains. It is very interesting to find that the single species, descending into lower levels, grows also in the Waria Valley on hills similar to those on which is found *L. mapaniifolia* Schltr., a plant which provides an analagous example in the section *Pleiophyllum*. It is noteworthy that a large number of the species are terrestrial. Thus epiphytism has not penetrated this section to the same extent as is the rule in *Genychilus* and sections belonging to the sub-genus *Cestichis*. Most species grow in colonies and are found frequently in considerable masses, but there are others (though apparently very rare) which I found always as isolated specimens.

Through the first forms described here, an approach is made to the section *Pleiophyllum*. In their flower structure these species tend to resemble certain *Pleiophyllum* species, but in habit are typical representatives of *Platychilus*.

10. *L. dolichobulbon* Schltr., sp. nov.

Epiphytica, erecta, 40–60 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis (caulibus) gracilibus, basi vaginis paucis amplis, conduplicatis, acutis, usque ad 14 cm altis obtectis, subteretibus, nervosis, basin versus paululo dilatatis, usque ad 0.5 cm diametentibus, 10–15 cm longis, unifoliatis; folio erecto vel suberecto, lineari-lanceolato, acuto, basin versus paulo angustato, plurinervio, 30–45 cm longo, medio fere 2–3 cm lato; racemo terminali, pedunculo stricto vel substricto, erecto, angulato, glabro, hinc inde vaginula bracteiformi obsesso, 10–15 cm longo; racemo subdense multifloro, cylindraceo, usque ad 15 cm longo, c. 2.4 cm diametente; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario vulgo plus minusve brevioribus; floribus in genere mediocribus, erecto-patentibus; sepalis reflexis, oblongo-ligulatis, obtusis, glabris, intermedio 6.5 mm longo, lateralibus obliquis paulo brevioribus; petalis reflexis, anguste linearibus, obtusis, glabris, sepalis intermedio aequilongis, obliquis; labello e basi subunguiculata flabellato-subquadrato, glabro, antice breviter exciso, margine minute subcrenulato, basi callo brevi, humili, transverso ornato, 6.5 mm longo, lamina infra medium 6.5 mm lata; columna brevi, glabra, basi paulo dilatata, vix 0.3 cm longa; ovario cum pedicello gracili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On fallen tree-trunks in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17224, flowering in Jan. 1908; on tree-trunks in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19054, flowering in Jan. 1909.

From all other species of this section this one is characterised by its extremely slender growth. It thus stands, so far as can be ascertained at present, rather isolated amongst the species of the Protectorate. The flowers are yellowish with a pale brown labellum.

11. *L. pedicellaris* Schltr., sp. nov.

Terrestris, erecta, 40–55 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis gracilibus, petioliformibus, cylindraceis, nervosis, 8–10 cm longis, c. 0.4 cm diametentibus, unifoliatis; foliis erecto patentibus vel suberectis, lineari-lanceolatis, acutis, basin versus sensim angustatis, 30–50 cm longis, medio fere 2–3 cm latis; racemis graciliter pedunculatis, laxe 10–20-floris, erectis, foliis brevioribus, pedunculo glabro, angulato, vulgo nudo, 10–13 cm longo; bracteis erecto-patentibus, lineari-lanceolatis, acuminatis, glabris, ovario gracillime pedicellato multo brevioribus; floribus erecto-patentibus, in genere inter majores, sepalis refractis, lanceolato-ligulatis, apiculatis, glabris, c. 1.3 cm longis, lateralibus obliquis; petalis refractis, oblique linearibus, acutis, glabris, sepalis aequilongis; labello curvato, e basi angustata suborbiculari, apiculato, margine minute et dense serrulato, intus basi medio callo minuto brevi ornato, glabro, sepalis aequilongo, lamina medio fere c. 1.2 cm lata; columna leviter arcuata, margine alata, basi dilatata, 0.5 cm longa, glabra; anthera ovata, antice producta, oblonga, obtusa, glabra; ovario cum pedicello gracillimo, glabro, c. 3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19913, flowering in June 1909.

The species, in its flowers, decidedly reminds one of *L. imperatifolia* Schltr. from the Torricelli Range, but in habit it is a typical representative of the section *Platychilus*. Very striking for a *Liparis* species are the very long pedicels. The flowers are olive-green, the labellum brown, the anther grass-green.

12. *L. major* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 104.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 14055, flowering in Jan. 1902.

This species follows closest on *L. pedicellaris* Schltr., but has considerably shorter-stalked green flowers and a very characteristic labellum with two long median pads, which up to the present is unknown in the genus. Unfortunately, I have collected this species only once.

13. *L. altigena* Schltr., sp. nov.

Terrestris, erecta, humilis, 15–23 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; pseudobulbis brevibus, lateraliter compressis, ovatis, unifoliatis, 1.5–2 cm altis, infra medium 0.6–0.8 cm latis; folio erecto-patente vel suberecto, oblique lanceolato, acuminato, utrinque glabro, nervoso, basin versus subpetiolato-angustato, 13–20 cm longo, supra medium 2.5–3.5 cm lato; racemo graciliter pedunculato, erecto, laxe 4–15-floro, folio aequilongo vel paulo longiore, pedunculo angulato, glabro, vulgo nudo; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario graciliter pedicellato multo brevioribus; floribus erecto-patentibus, in genere vix inter majores, viridibus; sepalis patentibus lanceolato-ligulatis, obtusiusculis, glabris, 1.1 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis erecto-patentibus, linearibus, obtusis, glabris, sepalis aequilongis; labello e basi angustata, arcuata late ovali, apiculato, margine, praesertim dimidio superiore minute crenulato-undulato, glabro, intus basi medio callo parvulo quadrato, apice retuso ornato, 1 cm longo, medio fere 6.5 mm lato; columna leviter arcuata, glabra, auriculis brevibus, basi conspicue dilatata, vix 0.5 cm longa; ovario graciliter pedicellato, glabro, 2.3–2.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18706, flowering in Nov. 1908.

This species is related most closely to *L. major* Schltr. and *L. arachnites* Schltr., but is distinguished easily from the former by its shorter pseudobulbs, longer-stemmed flowers and the labellum, and from the latter especially by the shape of the labellum and by the column. The flowers are simply coloured green.

14. *L. arachnites* Schltr., sp. nov.

Terrestris, erecta, humilis, 13–18 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis brevibus, compressis, oblongis, unifoliatis, 1.5–2 cm longis, medio fere 0.5–0.6 cm latis; folio erecto vel suberecto, lanceolato-elliptico, acuto vel acuminato, basi angustato, glabro, 7–16 cm longo, medio fere 2–3.5 cm lato; racemo graciliter pedunculato, gracili, laxe 6–10-floro, folia vulgo haud excedente, pedunculo angulato, glabro, nudo; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario graciliter pedicellato multo brevioribus; floribus in

genere inter majores, erecto-patentibus, nunc inversis, brunneis; sepalis patentibus lineari-ligulatis, obtusiusculis, basi paulo dilatatis, glabris, 1.8 cm longis, lateralibus obliquis; petalis patentibus anguste linearibus, obtusiusculis, glabris, sepalis subaequilongis; labello curvato, oblongo, obtuso cum apiculo, margine dimidio anteriore minute subciliato-serrulato, glabro, intus supra basin medio callo minuto semiorbiculari ornato, petalis aequilongo, medio fere 0.7 cm lato; columna semitereti, leviter arcuata, glabra, 0.7 cm longa, basi vix dilatata; anthera ovato-cucullata, obtusa, glabra; ovario cum pedicello glabro, apice incurvo, 1.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the ridges of the Dischore [Range], (Waria District), alt. c. 1300 m—R. Schlechter no. 19721, flowering in June 1909.

By its narrow spreading perianth segments and the shape of its labellum, this may be recognised easily from related species. Its brown flowers are the most bizarre known to me in the genus, by being frequently reversed through the twisting of the ovaries. In their narrow segments they are reminiscent of certain tropical spiders. The species is evidently rare and does not grow in colonies like most of its relatives. The two plants which I possess I found at the foot of a large tree, growing in humus root-peat.

15. *L. sympodialis* Schltr., sp. nov.

Eiphytica, humilis, c. 6–12 cm alta; rhizomate decumbente, haud abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis plus minus approximatis, usque ad 2 cm distantibus, cum rhizomate persistente sympodium longum formantibus, cylindraceis vel lateraliter plus minus compressis, abbreviatis, usque ad 1 cm altis, c. 0.3 cm diametientibus, unifoliatis; foliis erectis vel suberectis, oblanceolato-ellipticis, breviter acuminatis, basin versus angustatis, utrinque glabris, 7–12 cm longis, supra medium 2–3.5 cm latis; racemis graciliter pedunculatis, erectis, laxe 3–5-floris, vulgo foliis brevioribus, pedunculo angulato, glabro, nudo; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario graciliter-pedicellato multo brevioribus; floribus erecto-patentibus erectisve, in genere mediocribus; sepalis patentibus, ligulatis, obtusiusculis, vulgo apiculatis, c. 0.9 cm longis, glabris, lateralibus obliquis; petalis patentibus anguste linearibus, acutis, glabris, sepalis subaequilongis; labello e basi breviter angustata in laminam suborbicularem, obtuse apiculatam expanso, dimidio anteriore margine serrulato, glabro, callo lanceolato e basi versus medium decurrente, petalis aequilongo, medio fere 0.8 cm lato; columna leviter arcuata, auriculis brevibus, basi dilatata, facie infra stigma longitudinaliter sulcata, glabra, 3.5 mm longa; anthera late ovata, obtusa, glabra; ovario cum pedicello glabro, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees and on rocks in the mountain forests near Pema (Waria District), alt. c. 700 m—R. Schlechter no. 19425, flowering in May 1909; on trees in the forests on the Govidjoa Creek, alt. c. 1000 m—R. Schlechter no. 19769, flowering in June 1909.

This species should be regarded as the nearest relative of *L. cinnabarina* J.J. Sm., with which it has also the vegetative structure in common, viz. the formation of long sympodia. It is well separated by its smaller flowers, by the labellum and the column. The flowers in this species are pale brown; those of *L. cinnabarina*, according to the author's statement, are cinnabar-red.

16. *L. platychila* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 105

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 14041, flowering in Jan. 1902; on trees in the forests of the Dischore [Range], (Waria District), alt. c. 1300 m—R. Schlechter no. 19704, flowering in June 1909.

The two specimens, and the analyses I made at the localities where they were found, agree quite well. The species is related closely to *L. calcaria* Schltr., but differs considerably in the flowers.

17. *L. calcaria* Schltr., sp. nov.

Terrestris, erecta, humilis, 8–17 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis brevibus, vulgo oblongoideis, carnosulis, 1–2 cm longis, medio fere 0.5–1 cm diametientibus, unifoliatis; folio erecto-patente, oblongo vel elliptico, breviter acuminato vel

acuto, utrinque glabro, 3.5–7 cm longo, medio fere 1.7–3 cm lato; racemo pedunculato, erecto, plus minusve laxo 5–10-floro, folia duplo fere superante, pedunculo teretiusculo, glabro, usque ad 6 cm longo; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario vulgo brevioribus, rarius subaequilongis; floribus erecto-patentibus, in genere mediocribus, illis *L. platychilae* Schltr. similibus; sepalis patentibus vel patulis anguste oblongis, obtusis, glabris, 0.6 cm longis, lateralibus obliquis; petalis oblique linearibus, obtusis, glabris, sepalis fere aequilongis; labello e basi breviter subcuneata, suborbiculari, apice breviter emarginato, margine dimidio anteriore minute crenulato, glabro, basi callo brevi minute trilobulato ornato, 0.6 cm longo, medio fere aquilato; columna brevi, apice incurvula, auriculis brevibus, basi dilatata, glabra; 0.3 cm longa; anthera suborbiculari obtusa, glabra; ovario cum pedicello glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On limestone rocks on more open slopes of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18027, flowering in July 1908.

As already mentioned above, this species is related closely to *L. platychila* Schltr. It differs in the thicker pseudobulbs, broader leaves, broader sepals and petals and in the labellum. The flowers are pale yellow with a brownish green labellum, the callus orange-yellow. As the flower ages the labellum assumes a yellow colour.

18. *L. Werneri* Schltr., in Fedde, Repertor. X (1911), inedit.

Kaiser-Wilhelms-Land: On trees in the forests on the summit of the Gelu [Mountain], alt. c. 1500 m—Dr. E. Werner no. 45, flowering in June 1909; on trees in the forests of the Finisterre Range, alt. c. 1250 m—R. Schlechter no. 19077, flowering in Jan. 1909.

This species appears, by preference, to grow on thinner tree stems close to the ground. It is quite isolated among the species of the Territory. It is possible that later on it will have to be considered as the representative of a separate section. The flowers are pale green.

19. *L. schistochila* Schltr., in Fedde, Repertor. III (1906), p. 81

L. pectinifera Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 105 (nec Ridl.).

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17044, flowering in Dec. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18998, flowering in Dec. 1908; on trees in the forests of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 13950, flowering in Jan. 1902; on trees in the forests of the Finisterre Range, alt. c. 1200–1300 m—R. Schlechter no. 18248, flowering in Sept. 1908; no. 19109, flowering in Jan. 1909.

This species is found frequently in the ranges of the central part of Kaiser-Wilhelms-Land at an altitude of about 1000 metres growing in colonies usually between the thick moss pads on the lower sections of tree stems, where they are collected easily. As with *L. Werneri* Schltr., it stands rather isolated in the section and is characterised from others by deep perforations of the two anterior lobes of the labellum.

§ 4. *Genyphilus*

The species placed in this section possess the unjointed leaves of the two previous sections, but are distinguished by the labellum, which has an acute knee-like bend at the base and is more-or-less definitely three-lobed. The two lateral lobes stand obliquely upright, so that between them there is formed a deep furrow in which is placed a large callus, always with a concavity in its front. In most species the column is elongated markedly with an acute furrow in front. All species resemble each other in habit. The only somewhat aberrant form is *L. leptopus* Schltr., which approaches *L. exilis* J.J. Sm., the only species in the section reported from Dutch New Guinea. The basic form of the section seems recognisable in the flowers of this species and this has induced me to place it here, although the labellum, which is rather broad and short in front,

reminds one a little of *Platychilus* and in the structure of its column it resembles several species of this section. Since, to a certain extent, it constitutes a connecting link with *Platychilus*, I have arranged it here as the first species.

All the species, with the exception of *L. leptopus* Schltr., are epiphytic. Whether this species is always terrestrial or only occasionally so, I have not been able to ascertain with certainty, since I have collected the plants only once. The rest of the species are generally to be found growing on thick tree-trunks, not very high above the ground; only very rarely I found odd specimens growing on the thick branches of very old trees in the mist-forest. Up to the present, I have not found a single species of the section below the mist-forest zone; this shows clearly that they prefer a very humid atmosphere. During their principal season of growth the temperature in these mountains frequently falls to 10°C, and often even lower still.

20. *L. leptopus* Schltr., sp. nov.

Terrestris, erecta, gracillima, 30–45 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis gracilibus, valde approximatis cylindraceis, cauliformibus, unifoliatis, nervosis, 7–13 cm longis, 0.2–0.3 cm diametentibus; folio erecto vel suberecto, lineari-lanceolato, acuto, basin versus e medio sensim angustato, glabro, nervoso, 20–38 cm longo, medio fere 1–2 cm lato; racemis gracillimis, erectis, laxe 10–20-floris, folio vulgo brevioribus, nunc subaequilongis, pedunculo teretiusculo, gracillimo, glabro, usque ad 13 cm longo vulgo nudo; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario duplo vel plus duplo brevioribus; floribus in sectione inter minores, erecto-patentibus; sepalis oblongis, obtusis, glabris, recurvis, vix 0.5 cm longis, lateralibus obliquis; petalis recurvis, anguste linearibus, obtusis, glabris, sepalis fere aequilongis; labello genuflexo, e basi breviter et late unguiculata subquadrato, dimidio anteriore paulo angustiore, margine anteriore truncato et obtuse atque irregulariter pauci-dentato, cum apiculo minuto obtuso in medio, callo basali amplo, suborbiculari, facie foramine minuto ornato, labello toto glabro, sepalis aequilongo, dimidio inferiore c. 3.5 mm lato, anteriore 2.5 mm lato; columna leviter arcuata, semitereti, auriculis brevibus semiquadratis, basi dilatata, glabra, 0.3 cm longa; anthera late ovata, obtusa, glabra; ovario cum pedicello glabro, gracili, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19629, flowering in May 1909.

This species may, with tolerable certainty, be regarded as the nearest relative of *L. exilis* J.J. Sm., from which it is well distinguished by its labellum. Both species are somewhat aberrant in the section, but are best included here if one desires to avoid the creation of a large number of monotypic sections. The colour of the flowers is yellow-green.

21. *L. torricellensis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 107.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700–800 m—R. Schlechter no. 14416, flowering in Apr. 1902; no. 20134, flowering in Sept. 1909.

This species is distinguished from the others in the section by the narrow leaves and the stem which is widened in the middle. Specimens which I have now brought with me differ from those found in 1902 by having a blunter lip. The colour of the flowers ranges from cream-yellow to pale orange-yellow, depending on the degree of development, because, as in *Liparis* species, they become darker and yellower every day as they near the end of their flowering period.

22. *L. genychila* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 103

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17216, flowering in Jan. 1908; on small tree-trunks in the forests of the Bismarck Range, alt. c. 1500–1850 m—R. Schlechter no. 18588, flowering in Nov. 1908; no. 14001, flowering in Jan. 1902; on trees in the forests of the Finisterre Range, alt. c. 1250 m—R. Schlechter no. 19178, flowering in Jan. 1909.

Especially striking in this species is the very elongated column, distinctly contracted in the middle; otherwise the structure of the flowers is very similar to that of *L. torricellensis* Schltr. *L. similis* Schltr., which follows, is related very closely to it.

23. *L. similis* Schltr., sp. nov.

Epiphytica, erecta, 25–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabratibus; pseudobulbis valde approximatis, gracilibus, petioliformibus, basin versus vix incrassatis, apicem versus lateraliter paulo compressis, 6–8 cm longis, basi vix 0.3 cm crassitudine excedentibus, unifoliatis; folio erecto vel suberecto, oblanceolato-ligulato, acuto vel acuminato, basin versus sensim in pseudobulbum angustato, utrinque glabro, nervosis, 18–23 cm longo, supra medium 1.5–2.7 cm lato; racemo graciliter pedunculato, laxe pluri-(c. 10–12-)floro, secundo, folio fere aequilongo, pedunculo teretiusculo, glabro, ut videtur vulgo nudo; bracteis erecto-patentibus, ovato-lanceolatis, acuminatis, glabris, ovario duplo fere brevioribus; floribus mediocribus, illis *L. genychilae* Schltr. similibus, erecto-patentibus; sepalis oblongis, obtusis, recurvis, c. 6.5 mm longis, glabris, lateralibus obliquis; petalis oblique linearibus, obtusis, sepalis aequilongis; labello e basi late unguiculata genuflexo-defracto, obscuro trilobo, lobis lateralibus abbreviatis, rotundatis, erectis, intermedio subquadrato-ovali, antice trilobulato, lobulis brevibus triangulis, obtusis, lateralibus intermedio paulo brevioribus, callo amplo subquadrato apice foramine parvo donato in basi labelli inter lobos laterales erecto, labello toto glabro, ominino sepalis fere aequilongo, lobo intermedio medio fere 0.4 cm lato, 0.5 cm longo; columna gracili, supra medium constricta, glabra, leviter arcuata, 5.5 mm longa; anthera subreniformi, obtusa, glabra; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, on the Rin-Tejao [River], alt. c. 800 m—R. Schlechter no. 20120, flowering in Sept. 1909.

This species is related very closely to *L. genychila* Schltr., but is distinguished from it by the middle lobe of the labellum which is less sharply truncate and distinctly three-toothed in front; moreover, the column is shorter and less slender. The inflorescences in my specimen are about the length of the leaves; in *L. genychila* Schltr., on the contrary, they are definitely longer. The colour of the sepals and petals is yellow-green, the labellum brownish green; the column is paler.

3. SUB-GENUS *Heteroblastos*

So far only one species of this sub-genus is known, viz. *L. acaulis* Schltr., it is distinguished from all the rest of the *Liparidinae* by its vegetative structure. As in *Collabiinae* and a number of the *Coelogyninae* the inflorescences appear on reduced leafless shoots. This at first makes it appear as though these inflorescences were rooted, and only on close inspection of the material can it be seen that they actually stand terminally on reduced shoots. As is well known, the same condition is found in species of the section *Eu-Dendrochilum* of the genus *Dendrochilum* Bl.

§ 5. *Choriostachys*

This section contains the only species dealt with here, viz. *L. acaulis* Schltr.

24. *L. acaulis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 102

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 14474, flowering in Apr. 1902; no. 20168, flowering in Sept. 1909.

The specimens I collected in Sept. 1909 agree perfectly with the Type. The colouring of the relatively large flowers is green.

4. SUB-GENUS *Cestichis*

Of the four sub-genera of *Liparis* L.C. Rich., *Cestichis* is undoubtedly the largest, since it includes about two thirds of the entire species of the genus known up to the present. It is all the more noticeable since the number of species of the sub-genus in German New Guinea would have been by no means large were it not for the peculiar and

multiform development of the section *Distichon*, a section in which, until recently, only a few species were known.

The division of this sub-genus into sections is by no means easy so far as the Papuan [Papuasian] species are concerned. In the Territory, species belonging to some of the characteristic Malaysian sections are entirely missing, such for example as in the case of section *Platystylis*. On the basis of the material available, I propose to divide the Papuan [Papuasian] species into five sections. Of these *Genyglossum* approaches very closely to *Genychilus*, but differs in the characters of the sub-genus, in particular in its jointed leaves.

The second section *Platyglossum* also resembles a section of *Menoneuron* viz. section *Platychilus* in its habit and floral characters. The sections *Blepharoglossum* and *Hologlossum* are represented by species which closely resemble those of the Indo-Malayan region.

The last section, *Distichon*, is quite isolated in the genus, in consequence of its acute two-edged inflorescences and its overlapping bearded bracts. Whether it will be necessary to keep the species with long columns separate from those with short broad columns, the future will determine. At present it appears to me as if the characters of *Liparis* taken from the column will be of little value for the delimitation of the section.

§ 6. *Genyglossum*

I find it necessary here to select as the Type of a special section a plant which in habit and floral structure agrees perfectly with *Genychilus*, but differs from the latter greatly in its leaves, which are jointed and, after a time, fall off from the pseudobulb. The species occurs under similar conditions to those of *L. genychila* Schltr., and appears to have the same distribution; it grows also mostly on thicker tree-trunks and is always found in colonies.

25. *L. truncicola* Schltr., sp. nov.

Epiphytica, erecta vel suberecta, 25–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis valde approximatis, cauliformibus, cylindraceis, apicem versus ancipitibus, basi vix dilatatis, unifoliatis, 6–11 cm longis, basi crassitudine vix 3.5 mm excedentibus; folio erecto vel suberecto, lanceolato-elliptico, acuto vel acuminato, e medio basin versus sensim angustato, 15–27 cm longo, medio vel supra medium 2–3.5 cm lato, utrinque glabro, nervoso; racemo erecto, folio brevior, subaxe multifloro, secundo; pedunculo nudo, paulo compresso; bracteis erecto-patentibus, ovato-ellipticis, acuminatis, glabris, ovario subaequilongis; floribus in genere mediocribus, erecto-patentibus; sepalis recurvis, oblongis, obtusis, glabris, c. 6.5 cm longis, lateralibus obliquis; petalis recurvis, oblique linearibus, obtusis, sepalis fere aequilongis, labello e basi subunguiculata defracto, trilobato, lobis lateralibus semiorbicularibus, obtusissimis, suberectis, intermedio late obovato-cuneato, obtuso, multo majore, labello toto sepalis fere aequilongo, lobo intermedio 0.4 cm longo, supra medium vix 0.3 cm lato, callo basali amplo subquadrato, antice excavato, inter lobos laterales erecto; columna gracili, semitereti, antice medio profundius sulcata, auriculis semiquadratis, brevibus, c. 0.5 cm longa; anthera subreniformi-quadrata, antice apiculo obtuso donata, glabra, 6-costata, cum pedicello 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16674, flowering in Oct. 1907.

It would appear that this plant is not uncommon in the central part of Kaiser-Wilhelms-Land. I have stated already the differences which characterise it from other species in the Territory.

var. *oblanceolata* Schltr., var. nov.

Differt a forma typica foliis supra medium latioribus, racemis folio aequilongis vel paulo longioribus, lobis lateralibus labelli paulo minoribus, lobo medio paulo latiore, callo labelli antice magis excavato, subbilobulato, columna paulo brevior, anthera antice subtrilobulata.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18627, flowering in Nov. 1908; on trees in the forests of

the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 19066, flowering in Jan. 1909.

It is probable that this variety may later form the Type of a separate species, however, further observations on living material are necessary. The colour of the flowers is green with the labellum brown at the base.

§ 7. *Platyglossum*

After various analyses and investigations I think I have now been successful in defining the two following sections in a natural way. In *Platyglossum* I include those species which combine the jointed leaves of the sub-genus with the floral characters of *Platychilus*. The species here have a slightly bent labellum which is much broadened in the middle and rounded or pointed in front, and likewise a slightly bent, elongated typical *Liparis* column. The pseudobulbs of the species are more-or-less markedly reduced and apparently single-leaved.

All the species belonging here grow in the Territory in humus soil and occur only in the higher mountains, within the mist-forest zone. *L. chlorantha* Schltr. and *L. brevicaulis* Schltr. grow in dense shade in the peculiar root-peat which is distributed widely on the summits of the higher mountains of New Guinea, both in the mist-forest zone and above it. *L. ovalis* Schltr., however, grows in open country on limestone rocks or amongst limestone rubble on the summits of the Finisterre Range.

Whether *L. flabellata* J.J. Sm. belongs here, I cannot decide with certainty in the absence of material. Certainly *L. plantaginea* Lindl. from India, *L. Forbesii* Ridl. from Java and *L. torta* Hook. f. from Khasya, belong to this section.

26. *L. chlorantha* Schltr., sp. nov.

Terrestris, erecta, 30–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis brevibus, ancipitibus, oblongis, basin versus paulo dilatatis, unifoliatis, nervosis, 2.5–3.5 cm altis, infra medium 0.6–0.8 cm latis; folio erecto, oblanceolato-elliptico, acuto vel acuminato, utrinque glabro, basin versus sensim subpetiolato-angustate, 20–30 cm longo, supra medium 3.3–5 cm lato; racemo erecto, vulgo leviter arcuato, folio vulgo brevior, laxe 8–15-floro, pedunculo gracili, teretiusculo, glabro, vulgo nudo, 7–10 cm longo; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario duplo fere brevioribus; floribus vulgo inversis, erecto-patentibus, in genere inter majores, glabris; sepalis recurvis vel patentibus, oblongo-lanceolatis, obtusis, c. 1.1 cm longis, lateralibus paulo obliquis; petalis recurvis, anguste subfalcato-linearibus, acutiusculis, sepalis aequilongis; labello e basi paulo contracta suborbiculari, antice leviter retuso cum apiculo minuto, glabro, basi intus callo parvulo, bilobulato ornato, margine praesertim apicem versus irregulari, 1.1 cm longo, supra medium aequilato; columna arcuata, glabra, apicem versus paulo ampliata, subauriculata, basi lateraliter distincte dilatata, c. 4.5 mm longa; anthera oblonga, glabra, antice producta, obtusissima; ovario gracili, glabro, cum pedicello c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17147, flowering in Jan. 1908.

This plant is very reminiscent of certain species of the section *Platychilus*, e.g. *L. altigena* Schltr., but it has the articulated leaves of the sub-genus *Cestichis*. From *L. brevicaulis* Schltr., the closest species in the Territory, it is distinguished by its more robust growth, longer inflorescences and broader lip. In habit it stands very close to this species, and grows also under similar climatic and soil conditions. The flowers are pale green.

27. *L. brevicaulis* Schltr., sp. nov.

Terrestris, erecta, humilis, 20–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis valde approximatis, compressis, ancipitibus, quasi petioliformibus, 1.3–3 cm altis, 0.4–0.6 cm latis, unifoliatis; folio erecto vel suberecto, oblanceolato-ligulato, acuminato, basin versus sensim subpetiolato-angustato, utrinque glabro, nervoso, 14–28 cm longo, supra medium 1.5–3.5 cm lato; racemo erecto, folio bene brevior, laxe 3–6-floro, pedunculo leviter angulato, glabro, gracili, usque ad 6 cm longo; bracteis erecto-patentibus, lanceolatis,

acuminatis, ovario duplo fere brevioribus; floribus in genere inter majores, erecto-patentibus, glabris; sepalis reflexis, oblongo-ligulatis, apiculatis, dorso nervo medio incrassatis, 0.9 cm longis, lateralibus obliquis; petalis anguste et oblique linearibus, obtusiusculis, glabris sepalorum longitudine; labello e basi cuneato-angustata suborbiculari, apice brevissime acuminato (subapiculato), margine irregulari, omnino glabro, basi intus callo semiorbiculari, parvulo donato, 0.9 cm longo, supra medium 0.8 cm lato; columna valde arcuata, apicem versus ampliata, juxta stigma subauriculata, basi lateraliter dilatata, glabra, facie longitudinaliter sulcata, 0.3 cm longa; anthera oblonga, antice producta, apiculata, glabra; ovario gracili, glabro, cum pedicello c. 1.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20135, flowering in Sept. 1909.

I have commented already on the differences which separate this species from the previously described *L. chlorantha* Schltr. Here the column is bent conspicuously, almost hook-shaped, but in other respects it does not depart from the usual Type. As with *L. chlorantha* Schltr. the colour of the flowers is pale green.

28. *L. ovalis* Schltr., sp. nov.

Terrestris, erecta, 15–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis valde approximatis, lateraliter compressis, plus minusve ancipitibus, 1.5–3 cm altis, 0.6–1 cm latis, unifoliatis; folio erecto vel suberecto, elliptico vel oblanceolato-elliptico, acuto vel breviter acuminato, basi sensim angustato, utrinque glabro, nervoso, 11–24 cm longo, medio vel supra medium 2.5–4.5 cm lato; racemis erectis, folia vulgo bene superantibus, laxe 6–20 floris, subsecundis, pedunculo angulato, hinc inde vaginula bracteiformi donato, glabro; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario subduplo brevioribus; floribus in genere inter majores, erecto-patentibus, glabris; sepalis patentibus, oblongo-ligulatis, obtusis, cum apiculo obtuso, c. 1 cm longis, lateralibus obliquis; petalis oblique et anguste linearibus, obtusis, sepalorum longitudine; labello e basi breviter constricta late ovali, minute apiculato, margine irregulari, omnino glabro, intus basi callo parvulo, subquadrato ornato, sepalis aequilongo, medio fere 0.7 cm lato; columna leviter arcuata, glabra, apicem versus paululo ampliata, subauriculata, basi lateraliter ampliata, 0.5 cm longa; anthera subreniformi, obtusa, glabra; ovario gracili, glabro, pedicello incluso c. 1 cm longo.

Kaiser-Wilhelms-Land: On limestone on open slopes of the Finisterre Range, alt. c. 1100–1300 m—R. Schlechter no. 18056, flowering in July 1908.

In habit this species is reminiscent of *L. calcaria* Schltr. with which it grows frequently, but it is appreciably larger in all parts and belongs certainly to the sub-genus *Cestichis*. It may be recognised from the other two species of the section by its longer inflorescences, colour of the flowers and by the shape of the labellum. Initially, the flowers are a pale creamy yellow, but the labellum soon becomes more of an orange-yellow.

§ 8. *Blepharoglossum*

This may prove to be the largest section of the sub-genus *Cestichis*, since a large number of species from the Indo-Malayan and Pacific areas are included in it. Characteristic is the labellum, which is generally deeply two-lobed with the densely haired or sharply toothed margins. Although there are some forms which do not have a two-lobed labellum, these nevertheless possess the characteristic hairiness of the section or the sharp toothing on the front of the labellum.

The section is related closely to the following one, *Homoglossum*, in which, however, the labellum is usually undivided, never deeply two-lobed and is neither hairy nor sharply toothed on the margin. The species appear to occur nearly always as epiphytes and growing only in rare instances terrestrially on rocks, e.g. *L. stenostachya* Schltr.

The representatives of this section are found not only in the forests of the plains, but also high up in the mountains. Several of the 'form-circles' contain very beautiful species e.g. those species related to *L. latifolia* Lindl. These are worthy of cultivation in Europe, all the more so since they grow without trouble and regularly produce

beautiful racemes. The majority of these species have yellow-coloured flowers, with a more-or-less orange labellum.

As already mentioned above, this section has a wide distribution. Two 'form-circles' are very rich in species, viz.

(1) The one including *L. latifolia* Lindl., *L. crenulata* Lindl., *L. bicolor* J.J. Sm. and *L. pallida* Lindl. from Java, *L. Beccarii* Ridl. and *L. merapiensis* Schltr. from Sumatra, *L. Minahassae* J.J. Sm. from the Celebes and *L. trichoglottis* (Ames) Schltr. (*Cestichis trichoglottis* Ames) from the Philippines.

(2) That centering on *L. parviflora* Lindl., but whose species, e.g. *L. confusa* J.J. Sm., *L. vestita* Rehb. f., *L. savaicensis* Fleischm. et Reching., and others do not appear to be described adequately.

29. *L. spectabilis* Schltr., sp. nov.

Epiphytica, erecta, robusta, 40–55 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis, cylindraceis vel cylindraceo-ovoides, lateraliter compressis, bi-(rarius tri)foliatis, 6–12 cm altis, infra medium 1.5–2.5 cm latis; foliis erecto-patentibus, lanceolato-ligulatis, subacutis, basin versus sensim paulo angustatis, glabris, 25–35 cm altis, supra medium 4–5 cm latis; racemo erecto, stricto vel substricto, nunc foliis fere aequilongo, nunc paulo brevior, 5–6 cm diametiente, subdense multifloro, cylindraceo, pedunculo 10–15 cm longo, tereti, glabro, hinc inde vaginula parvula bracteiformi obsesso; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario multo brevioribus; floribus erecto-patentibus, in genere inter majores; sepalis reflexis, oblongis, obtusis, glabris, c. 1 cm longis, lateralibus obliquis; petalis reflexis, oblique linearibus, obtusis, glabris, sepalis subaequilongis; labello circuito oblongo-cuneato, quarta parte anteriore bilobo, lobis oblique oblongis, obtusis, margine leviter crenulatis et dense atque minute ciliolatis, sinu angusto cum apiculo minuto, labello lobis inclusis 1.3 cm longo, infra apicem 0.7 cm lato, superne glabro, basi intus callo duplici parvulo conico ornato; columna leviter arcuata, glabra, vix 0.6 cm longa, apicem versus paulo, basi conspicue dilatata; anthera subreniformi-cucullata, obtusa, glabra; ovario cum pedicello gracili c. 2 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17060, flowering in Dec. 1907; on tall trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19027, flowering in Dec. 1908.

This species may be regarded as most closely related to the Javanese *L. latifolia* Lindl., from which it is distinguished by its thicker pseudobulbs, which are always two, even sometimes three-leaved. The flowers are orange-red with paler sepals and petals and a yellow-green column.

The plant may be recognised easily from *L. Beccarii* Ridl. by the very much reduced joints of the rhizomes. This robustly growing species with its large, beautifully coloured inflorescences creates a stately impression.

var. *dischorensis* Schltr., var. nov.

Differt a forma typica habitus mensuris minoribus, floribus minoribus et labelli sinu latiore obtuso.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore [Range] (Waria District), alt. c. 1200 m—R. Schlechter no. 19622, flowering in May 1909.

Apart from its smaller size this variety differs from the original species in a wider and blunter sinus of the lip. I felt compelled to consider this a variety to prevent an unclear definition of the Type.

30. *L. microblepharon* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 11–22 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis, brevibus, lateraliter valde compressis, ancipitibus, unifoliatis, oblongis, 0.8–1.5 cm altis, medio fere 0.5–1 cm latis; folio erecto vel suberecto, elliptico-ligulato, acuto vel apiculato, basin versus sensim paulo angustato, glabro, 5–16 cm longo, medio fere 1.3–2.5 cm lato; racemo erecto, gracili, folium vulgo bene superante, sublate 10–30-floro, pedunculo gracili, glabro, vulgo paulo compresso, vaginulis paucis, dissitis, bracteiformibus obsesso, folio vulgo paulo brevior; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario vulgo

subduplo brevioribus; floribus illis *L. serrulatae* Schltr. similibus et fere aequimagnis, inversis; sepalis reflexis oblongo-ligulatis, obtusis, glabris, c. 4.5 mm longis, lateralibus obliquis; petalis oblique linearibus, obtusis, glabris, sepalis subaequilongis; labello circuitu ligulato-cuneato, quarta parte anteriore bilobo, cum apiculo brevi subtus interjecto, margine exteriori et anteriore dimidio superiore dense et breviter ciliolato et crenulato-dentato, lobis oblique ovatis, obtusis, labello toto lobis inclusis 0.6 cm longo, infra apicem 0.3 cm lato, superne glabro, basi intus juxta medium utrinque lamella parvula calliformi, semielliptica ornato; columna leviter arcuata, glabra, basi lateraliter valde dilatata, apice subauriculato-ampliata, c. 2.5 cm longa; anthera subreniformi-cucullata, obtusa, glabra; ovario cum pedicello glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema, alt. c. 500 m—R. Schlechter no. 19413, flowering in May 1909.

This species is related very closely to *L. serrulata* Schltr., from which it differs in various points which entitle it to be regarded as a separate species. Its pseudobulbs are shorter and more compressed, the inflorescences are less dense, the labellum is narrower and differently toothed, and the column is more spreading below. The flowers are yellow-green, the labellum brownish with dark red-brown in the middle, and the column white with a yellowish anther.

31. *L. serrulata* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 106.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–700 m—R. Schlechter no. 14328, flowering in Apr. 1902; no. 20037, flowering in Sept. 1909.

I have discussed already the differences which separate this species from *L. microblepharon* Schltr.

The flowers are pale yellow with an orange-red labellum.

32. *L. confusa* J.J. Sm., in Orch. Fl. Jav. (1906), p. 275.

L. flaccida Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 103 (nec Rchb. f.).

Kaiser-Wilhelms-Land: On trees alongside the forest creeks of Wobbe, alt. c. 200 m—R. Schlechter no. 16361, flowering in Aug. 1907; on trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17117, flowering in Jan. 1908; on trees in the forests at the foot of the Bismarck Range, alt. c. 200 m—R. Schlechter no. 14091. [Ed.—no date cited, possibly Jan. 1902].

Neu-Mecklenburg: On trees in the range forests of Punam, alt. c. 550 m—R. Schlechter no. 14636, flowering in July 1902.

I cannot decide whether to consider the species as belonging to *L. confusa* J.J. Sm., which itself in all probability is identical with *L. vestita* Rchb. f. I have examined a whole series of flowers and find minor differences, but insufficient to keep the species separate. Some specimens, for instance, show also a distinct approach to *L. clavigera* Ridl., so that I believe that this also is conspecific with *L. confusa* J.J. Sm. The plant mentioned by J.J. Smith (in 'Nova Guinea' VIII, p. 38) belongs here also, at least as far as it concerns Versteeg [no.] 1348, if it does not represent a separate species. It is certainly different from *L. parviflora* Lindl.

33. *L. persimilis* Schltr., sp. nov.

Epiphytica, erecta, 25–30 cm alta; rhizomate decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis nunc usque ad 1.5 cm distantibus, nunc approximatis, e basi ampliata sensim cauliformi-attenuatis, bifoliatis, 8–16 cm longis, basi 0.7–1.2 cm, medio usque ad 0.3 cm diametibus; foliis erecto-patentibus, oblanceolato-ligulatis, acutis, basin versus sensim angustatis, utrinque glabris, 12–18 cm longis, supra medium 1.7–2.6 cm latis; racemis erectis, subdense multifloris, foliis vulgo fere aequilongis, c. 1.5 cm diametentibus; pedunculo brevi, basi spatha compressa protecto; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario vulgo paulo brevioribus; floribus erecto-patentibus, graciliter pedicellatis, illis *L. confusae* J.J. Sm. valde similibus, tamen paululo majoribus; sepalis reflexis, oblongis, obtusis, glabris, 0.3 cm longitudine subattingentibus, lateralibus obliquis;

petalis reflexis, oblique linearibus, obtusis, glabris; labello circuitu ovali, explanato infra medium utrinque subangulato, antice bilobato, lobis semiorbicularibus obtusis, basi intus callo minuto, brevi, semilunato, ornato, margine tertia parte basilari excepta minute et dense ciliato, c. 0.3 cm longo, medio fere 0.2 cm latitudine subattingente; columna leviter arcuata, apice subexauriculata, glabra, basi conspicue dilatata, 0.2 cm longa; anthera subreniformi, glabra; ovario cylindraceo, glabro, pedicello incluso c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18999 (TYPE), flowering in Dec. 1909 [Ed.—possibly 1908], on trees in the forests, above the Mimi [Mountain], on the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19476, flowering in May 1909.

I have, especially, designated no. 18999 as the Type from which the description has been made, since no. 19476 differs somewhat in several respects and in a difficult group like this the species can only be treated in future with strictly defined Types. As previously mentioned, this group of species, with the relationship of *L. parviflora* Lindl. and *L. confusa* J.J. Sm., requires very critical treatment, which is only possible with the very best material. *L. persimilis* Schltr. is related closely to *L. confusa* J.J. Sm., but differs in its broader labellum and the column which is much broader at the base. The flowers are pale green with a pale brown labellum.

34. *L. stenostachya* Schltr., sp. nov.

Terrestris, erecta, 15–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, glabris; pseudobulbis valde approximatis, basi vaginis nunc foliaceis obtectis, cylindraceis, bifoliatis, 1.5–5 cm longis, c. 0.5–1 cm diametentibus; foliis erecto-patentibus, lanceolato-ligulatis, subacutis, basin versus sensim angustatis, utrinque glabris, 10–22 cm longis, medio fere 1.2–3 cm latis; inflorescentiis gracilibus, erectis, folia superantibus, pedunculo subtereti, glabro, hinc inde vaginula bracteiformi obsesso, racemo plus minus laxe 10-multifloro, usque ad 20 cm longo, vulgo pedunculo aequilongo; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario brevioribus; floribus erecto-patentibus vel suberectis, in genere inter minores; sepalis reflexis, oblongo-ligulatis, obtusis, glabris, c. 0.4 cm longis, lateralibus obliquis; petalis reflexis, oblique linearibus, obtusis, glabris, sepalis subaequilongis, labello cuneato-oblongo, antice truncato et leviter crenulato, dimidio inferiore marginibus incrassato, dimidio superiore marginibus lateralibus minutissime ciliolato, intus supra basin callis 2 minutis instructo, 0.4 cm longo, infra apicem 0.2 cm lato; columna leviter arcuata, glabra, apicem versus auriculis semiorbicularibus, brevibus donata, basin versus paulo dilatata, 2.5 mm longa; anthera subreniformi, obtusa, glabra; ovario cylindraceo, glabro, gracili, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna, on the Waria [River], alt. c. 600 m—R. Schlechter no. 19281, flowering in Apr. 1909; on rocks and in humus in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19390, flowering in May 1909; on rocks in the summit forest of the Mimi [Mountain], (Waria District), alt. c. 700 m—R. Schlechter no. 17423, flowering in Mar. 1908.

On superficial observation this species has a striking resemblance to *L. elegans* Lindl. from the hinterland of India, but it is quite different in the labellum. Also *L. dendrochilum* Rchb. f. from Java, at least as far as illustrated by J.J. Smith in the 'Figurenatlas der Orchideen von Java' under no. CCX, resembles it in structure of the flowers, but differs in the lip. The flowers are white-yellow with a golden yellow labellum.

§ 9. *Hologlossum*

The chief centre of distribution for this section appears to be in Asia where quite a large species of forms has developed, especially in the mountains of India. It is distinguished from *Blepharoglossum* by its almost simple green flowers which have neither a hairy nor a sharply toothed labellum. In some western forms, the labellum is distinctly three-lobed. In this section also the species of certain groups resemble each other closely; e.g., the species related to *L. caespitosa* Lindl. If someone would

undertake a monograph, based on good and abundant material, such a treatise on the genus would be very welcome. The boundaries between this section and *Blepharoglossum* are not defined so sharply as I intended. In India several species seem to occur, forming almost a bridge between the two. However, I have deemed it advisable to define the section in the way described above, and have left it to a future monograph to modify or circumscribe it more definitely.

The two species described here seem to occur only as epiphytes in the hill-country; *L. neo-guineensis* Schltr. preferring the trees along the rivers, while *L. Kempteriana* Schltr. is found on taller trees in the primary forest and seems to reach to the lower limits of the mist-forest zone. Whereas the former is distributed widely in the Territory, the latter is found rarely and then only as isolated specimens.

35. *L. Kempteriana* Schltr., sp. nov.

Epiphytica, erecta, 15–25 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; pseudobulbis bene approximatis, cylindraceis, basin versus paulo incrassatis, glabris, apice bifoliatis, 3–6 cm altis, supra basin 0.5–1 cm diametientibus; foliis erecto-patentibus vel suberectis, oblanceolato-ligulatis, acutis vel apiculatis, basin versus sensim paulo angustatis, utrinque glabris, 10–22 cm longis, supra medium 1.2–2.6 cm latis; scapis paulo compressis, apicem versus hinc inde vaginula bracteiformi obses, glabris, cum racemo nunc foliis aequilongis, nunc brevioribus; racemo dense multifloro, elongato, usque ad 12 cm longo, cylindraceo, c. 1.2 cm diametiente; bracteis erecto-patentibus, lanceolatis, acuminatis, glabris, ovario vulgo brevioribus; floribus in genere inter minores, erecto-patentibus, pallide viridibus, glabris; sepalis reflexis, oblongo-lanceolatis, obtusis vel obtusiusculis, c. 3.5 mm longis, lateralibus obliquis, intermedio paululo latoribus; petalis reflexis, anguste linearibus, obtusis, obliquis, sepalis subaequilongis; labello curvato, circuitu oblongo, breviter acuminato, basi foveato, petalis aequilongo, supra medium vix 1.5 mm lato; columna leviter arcuata, glabra, auriculis juxta stigma parvulis, basin versus vix dilatata, c. 0.2 cm longa; anthera subreniformi, obtusissima, glabra; ovario cum pedicello gracili, glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 350 m—R. Schlechter no. 17556, flowering in Apr. 1908; on trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 17997, flowering in July 1908.

This species may be regarded as the closest relative of *L. longipes* Lindl., but is well separated by its more slender pseudobulbs and the shape of the labellum. It would appear to occur only as isolated specimens and has only a restricted distribution in the Territory.

36. *L. neo-guineensis* Schltr., sp. nov. [Ed.—stat. nov.]

L. minima Lindl. var. *neo-guineensis* Schltr., in K. Schum. et. Laut., Nachtr. (1905), p. 105.

Epiphytica, erecta, pusilla, 3–10 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis, lateraliter paulo compressis, late ovatis, unifoliatis, 0.7–1 cm altis, supra basin 0.4–0.7 cm latis; folio erecto, oblanceolato-ligulato, acuto vel apiculato, basin versus sensim angustato, glabro, 4.5–9 cm longo, supra medium 3.5–10 mm lato; scapo erecto, ancipiti, evaginulato, glabro, cum racemo vulgo folio brevior, rarius paulo longior; racemo plus minus laxifloro, nunc subdenso, 5–15-floro, erecto; bracteis erecto-patentibus, lineari-lanceolatis, acuminatis, flores vulgo distincte superantibus; floribus in genere inter minores, illis *L. caespitosae* Ldl. similibus, erecto-patentibus, glabris; sepalis recurvis, oblongis, obtusis, c. 2.5 mm longis, lateralibus obliquis; petalis recurvis, linearibus, obtusis, sepalis subaequilongis; labello circuitu ovali, apice breviter et obtuse apiculato, dimidio anteriore paululo constricto, basi intus callo subquadrato ornato, 2.5 mm longo, dimidio inferiore vix 1.25 mm latitudine excedente; columna leviter arcuata, glabra, c. 1.5 mm longa, basin versus vix dilatata; anthera subreniformi, obtusa; ovario cum pedicello glabro, c. 0.3 cm longo; capsula acute triquetra, oblongoidea, pedicello aequilonga, c. 0.4 cm longa.

Kaiser-Wilhelms-Land: On trees near the Djamu Gorge, alt. c. 350 m—R. Schlechter no. 16803, flowering in Nov. 1907; on trees in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18889, flowering in Nov. 1908; on trees by the creeks in the Bismarck Range, alt. c. 600 m—R. Schlechter no. 13934, flowering in

Jan. 1902; on trees in the forests near Gobi, by the Waria [River], alt. c. 300 m—R. Schlechter no. 19559, flowering in May 1909; on trees on the Govidjoa [Creek] (Waria District), alt. c. 700 m—R. Schlechter no. 19786, flowering in June 1909.

I have now treated this plant (which I formerly regarded as a variety of *L. minima* Lindl.) as a separate species because it definitely is distinguished from the latter specifically. The bracts are usually conspicuously long and the labellum is provided at the base with a callus which is absent in *L. minima* Lindl. The lip, moreover, is narrowed distinctly from the middle towards the apex. I think it is also improbable that *L. caespitosa* Lindl., from Mauritius and Madagascar, is identical with the Javanese plant. Strict examination of the whole 'form-circle' may show that we are dealing with different but closely related species.

The colour of the flowers of all the above is yellow-green.

§ 10. *Distichon*

It could hardly have been expected that this section, represented a few years ago by three species only, should suddenly develop so abundantly. In his monograph of the genus in the year 1886, Ridley mentions only *L. compressa* Lindl., *L. disticha* Lindl. and *L. Cumingii* Ridl., the last of which he described as new. A few years later *L. araneola* Ridl. and *L. divergens* J.J. Sm. were described. In the year 1905 Oakes Ames made a new compilation of the section, adding four more new species from the Philippines, viz. *L. Elmeri* (Ames) Schltr., *L. Merrillii* (Ames) Schltr., *L. benguetensis* (Ames) Schltr. and *L. philippinensis* (Ames) Schltr. In accordance with his concept of the genus these were described under *Cestichis*. In the same year I described another species, *L. pseudo-disticha* Schltr., so that at the end of the year 1905, the section contained 10 species. Since that time more have been added, viz. *L. gibbosa* Finet and *L. Amesiana* Schltr., the latter being described likewise by Ames as *Cestichis gracilis*.

Then J.J. Smith withdrew his *L. divergens* J.J. Sm., stating that it was identical with *Malaxis mucronata* Bl. Thus the name *L. mucronata* (Bl.) Lindl. regained currency.

To those 12 species I can now add a further 13 from New Guinea alone, so that the section now contains the impressive series of 25 species, of which more than half (viz. 14) are Papuan [Papuasian]. The individual species are not always distinguished easily, even though some forms occur which diverge considerably. One must fall back on the differences in habit, colour of flowers, breadth of petals, construction of labellum and column, all of which are very constant in abundant material. On close inspection the species may be divided into two groups, viz. those with the usual narrow column of the *Cestichis* species (as in the sections *Blepharoglossum* and *Hologlossum*); and those with a short and strikingly broad column.

Among the species for consideration here only one belongs to the first group; all the rest have the markedly broad column which is characteristic, for instance, of *L. gibbosa* Finet.

Even though the species seem to avoid the actual coastal regions of the Territory, they are found, otherwise, at all altitudes. They occur in the lower regions on trees by preference along creeks, often in the glaring sunshine; in mist-forests, sometimes covering entire tree-trunks; and frequently embedded in deep beds of moss. The colour of the flowers, partly olive-green, partly ochre-red or brick-red, is very characteristic and constant for the individual species.

37. *L. graciliscapa* Schltr., sp. nov.

Epiphytica, gracillima, vagans, 20–30 cm alta; rhizomate valde elongato, decumbente, ramoso, vaginis obtecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 2–5 cm distantibus, e basi

subglobosa in collem cauliformem subito attenuatis, unifoliatis, 2.5–4 cm altis, parte basilari 0.7–1 cm diametiente; foliis erectis, linearibus vel lineari-ligulatis, apiculatis, basin versus sensim angustatis, glabris, 13–22 cm longis, medio vel supra medium 0.7–1 cm latis; scapo erecto, gracillimo, ancipiti, evaginulato, glabro, folia dimidio fere superante; racemo disticho, dense pluri-multifloro, usque ad 5 cm longo; bracteis erecto-patentibus, subimbricantibus, ovato-lanceolatis, acutis, lateraliter compressis, ovario pedicellato duplo fere brevioribus; floribus in sectione inter minores, erecto-patentibus; sepalis reflexis, ovato-lanceolatis, subacutis vel apiculatis, glabris, c. 0.4 longis, lateralibus intermedio paulo latioribus, obliquis; petalis reflexis, oblique linearibus, acutis vel subacuminatis, glabris, sepalis fere aequimagnis; labello e basi genuflexo-decurva circuitu ovato, apiculato, medio obscure trilobato, basi callo amplo quadrato, obtuse apiculato, antice excavato ornato, gibbis 2 parvulis, late conicis, obtusis juxta basin aucto, pealis aequilongo, infra medium 2.5 mm latitudinis vix excedente; columna leviter arcuata, pro sectione gracili, auriculis juxta stigma semiquadratis, basi haud dilatata, glabra, c. 2.25 mm alta; anthera ovato-cucullata, obtusa, glabra; ovario cum pedicello gracili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests above the Djamu Gorge, alt. c. 450 m—R. Schlechter no. 16807 (TYPE), flowering in Nov. 1907; on trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 19189, flowering in Jan. 1909; on trees in the mountain forests near Pema, on the Waria [River], alt. c. 500 m—R. Schlechter no. 19417, flowering in May 1909; on trees in the forests on the Govidjoa [Creek], alt. c. 1000 m—R. Schlechter no. 19753, flowering in June 1909.

From all species of this section in the Territory, this one is well distinguished by the column. Moreover, the labellum is narrowed appreciably from the middle towards the front so that it must be designated as obscurely three-lobed. The colour of the flowers is brownish olive-green with a reddish brown column.

38. *L. nebuligena* Schltr., sp. nov.

Epiphytica, pusilla, 7–12 cm alta; rhizomate elongato, decumbente, gracili, ramoso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 1–2 cm distantibus, gracilibus, cauliformibus, basi paulo incrassatis, apicem versus paulo compressis, unifoliatis, 1–1.5 cm altis, supra basin usque ad 0.4 cm diametientibus; folio erecto, linearibus, acuto vel apiculato, basin versus paulo angustato, 5–10 cm longo, medio fere 0.3–0.4 cm lato; scapis erectis, gracilibus, ancipitibus, evaginulatis, glabris, folio fere aequilongis; racemo disticho, dense pluri(6–15)-floro, usque ad 1.5 cm longo; bracteis ovatis, acuminatis, distichis, imbricantibus, lateraliter conduplicatis, ovario pedicellato 2–3-plo brevioribus; floribus in sectione inter minores, erecto-patentibus, glabris; sepalis reflexis, oblongis, apiculatis, c. 4.5 mm longis, intermedio angusto, lateralibus obliquis, latioribus; petalis erectis, subfalcato obliquis, lineari-subspathulatis, subacutis, sepalis paulo brevioribus; labello e basi subquadrata genuflexo-decurvo, infra medium angustato et in lobum lanceolatum acutum producto, subtus nervo medio carinato-incrassato, basi intus callo amplo quadrato ornato, callo minore bifido anteposito, labello toto petalorum longitudine, basi vix 0.2 cm latitudine excedente; columna brevi, lata, basin versus conspicue dilatata, labello fere duplo brevior, glabra; anthera suborbiculari-quadrata, glabra; ovario cum pedicello gracili, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, near Akur, alt. c. 700 m—R. Schlechter no. 20112, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16961, flowering in Dec. 1907; on trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19514, flowering in May 1909.

An extremely characteristic species which is smaller than all the others in the section, and which stands isolated in the shape of the much elongated lip. It is distributed widely in the Territory and is a typical epiphyte of the mist-forest formation.

The colour of the flowers may be designated as shining dark salmon-red or orange-red, the rachis and the bracts are likewise flushed orange-red.

39. *L. cyclostele* Schltr., sp. nov.

Epiphytica, ramosa, in ramis aborum decumbens, 13–20 cm alta; rhizomate elongato, ramoso, gracili,

radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 2–3 cm distantibus, cauliformibus, basi incrassatis, apicem versus paulo compressis, 2–3 cm altis, basi 0.3–0.5 cm diametientibus, unifoliatis; folio erecto, lineari, acuto vel apiculato, basin versus sensim angustato, 12–17 cm longo, supra medium 0.5–0.6 cm lato, utrinque glabro; scapo erecto, gracili, ancipiti, glabro, evaginulato, folio aequilongo vel paulo brevior; racemo disticho, dense multifloro, usque ad 3.5 cm longo; bracteis ovatis, acutis, ancipiti-conduplicatis, ovario pedicellato subduplo brevioribus; floribus in sectione inter minores, erecto-patentibus, glabris; sepalis reflexis, ovalibus, apiculatis, 4.5 mm longis, lateralibus obliquis; petalis erectis, subfalcato-obliquis, lineari-spathulatis, obtusis, sepalis paulo brevioribus; labello e basi late quadrata genuflexo-decurvo, e medio angustato et in lobum oblongo-quadratum, antice rotundatum, breviter apiculatum, superne apicem versus minute papillosum producto, basi callo subgloboso, obtuse apiculato ornato, callo parvulo duplici anteposito, labello toto petalorum longitudine, basi 2.5 mm lato; columna circuitu semiglobosa, medio ampliata, basi contracta, glabra, petalis plus duplo brevior; anthera obreniformi, obtusissima, glabra; ovario cum pedicello glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 300 m—R. Schlechter no. 19301, flowering in Apr. 1909; on trees in the mountain forests near Pema, on the Waria [River], [Ed.—no altitude cited, no collection number given], flowering in May 1909.

The species is related more closely to the following than to the preceding species. It is distinguished by its low growth, by a labellum broad at the base and with a very large basal callus and the lip slightly papillose in front. The colour of the flowers is yellow-green, with a lip yellow-ochre towards the base. The species belongs to those which possess an almost semi-globular column. The bracts are relatively a little larger than in the other species, but not so large as in *L. glumacea* Schltr.

40. *L. brunnescens* Schltr., sp. nov.

Epiphytica, erecta, gracilis, 20–25 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis approximatis, cauliformibus, basi paulo incrassatis, apicem versus paulo compressis, unifoliatis, 2–3 cm altis, basi c. 0.4 cm diametientibus; folio erecto vel suberecto, lineari, acuto vel apiculato, basin versus paulo angustato, glabro 12–15 cm longo, medio fere 0.4–0.6 cm lato; scapo erecto, gracili, ancipiti, evaginulato, glabro, folium paulo sed distincte superante; racemo dense 20–25-floro, disticho, usque ad 2.5 cm longo; bracteis erecto-patentibus, ovatis, acutis, ancipiti-conduplicatis, ovario pedicellato duplo brevioribus; floribus erecto-patentibus, in sectione inter minores, glabris; sepalis reflexis, oblongis, acutis vel apiculatis, vix 0.5 cm longis, lateralibus obliquis; petalis erectis, subfalcato-obliquis, spathulato-linearibus, obtusis, sepalis paulo brevioribus; labello e basi auriculato-cordata, late oblonga genuflexo-decurvo, dimidio anteriore sensim paulo angustato, oblongo, apiculato, glabro, basi intus callo amplo suborbiculari ornato, callis 2 parvulis obliquis antepositis, toto petalorum longitudine, supra basin 2.25 mm vix latitudine attingente; columna circuitu suborbiculari, apice paulo contracta, petalis subduplo brevior, glabra; anthera suborbiculari, glabra; ovario cum pedicello glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19102, flowering in Jan. 1909.

Of all the species belonging to this section in the Territory, this one, in common with *L. inamoena* Schltr. and *L. trachyglossa* Schltr., is characterised by a much shortened rhizome bringing the pseudobulbs much closer together. From *L. inamoena* Schltr. this species is well separated by the petals and from *L. trachyglossa* Schltr. by the labellum, moreover, the colouring of the flowers is entirely different in all three species. In *L. brunnescens* Schltr. it is brownish salmon.

41. *L. ochrantha* Schltr., sp. nov.

Epiphytica, in ramis arborum decumbens, 25–40 cm alta; rhizomate elongato, ramoso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 2.5–4 cm distantibus, cauliformibus, basi incrassatis, lateraliter paulo compressis, 2.5–4 cm altis, basi 0.5–0.7 cm diametientibus, unifoliatis; folio erecto, lineari-ligulato, acuto vel subcuspidato, basin versus sensim paulo angustato, glabro; 20–36 cm longo, medio fere 0.7–1.2 cm lato; scapo gracili, erecto, ancipiti, evaginulato, glabro, folio vulgo brevior, nunc aequilongo; racemo disticho, dense multifloro, usque ad 6 cm longo; bracteis bifariis, imbricantibus, ovatis, apiculatis, ancipiti-conduplicatis, ovario pedicellato subduplo

brevioribus; floribus in sectione inter minores, erecto-patentibus, glabris, ochraceis; sepalis reflexis, oblongis, apiculatis, c. 4.5 mm longis, lateralibus obliquis; petalis erectis, oblique spathulato-linearibus, obtusis, sepalis paulo brevioribus; labello e basi oblonga, genuflexo-decurva dimidio anteriore paululo angustato, apiculato, glabro, callo amplo, obtuse apiculato in basi, callo minuto bilobulato anteposito, petalorum longitudine, supra basin vix 2.25 mm latitudine attingente; columna circuitu late rhomboidea, glabra, petalis fere triplo brevior; anthera suborbiculari, obtusa, glabra; ovario cum pedicello glabro, gracili, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, in the Minjem Valley, alt. c. 400 m—R. Schlechter no. 16308, flowering in July 1907; on tall trees near Ambo, alt. c. 500 m—R. Schlechter no. 18260, flowering in Sept. 1908.

The ochre-red flowers distinguish this species from its relatives. A strict comparison shows further that it is more robust in growth, has minor differences in the labellum and differs in many respects in the column. The flowers also have longer stems than usual in this group. The plant frequently occurs on the foot-hills of the mountains in the central part of Kaiser-Wilhelms-Land.

42. *L. anemophila* Schltr., sp. nov.

Epiphytica, gracilis, 17–22 cm alta; rhizomate elongato, ramoso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis vulgo 1.5–2 cm distantibus, gracilibus, cauliformibus, compressis, basi paulo incrassatis, unifoliatis, 3–4.5 cm longis, basi 0.4–0.6 cm diametentibus; foliis erectis vel suberectis, linearibus, acutis, basin versus paulo angustatis, glabris, 15–25 cm longis, medio fere 0.5–0.7 cm latis; scapis erectis, gracilibus, ancipitibus, evaginulatis, glabris, cum racemo vulgo folium paulo superantibus; racemo disticho, dense multifloro, usque ad 4 cm longo; bracteis imbricantibus, bifariis, ovato-lanceolatis, apiculatis, ancipiti-conduplicatis, ovario duplo fere brevioribus; floribus in genere inter minores, erecto-patentibus, glabris; sepalis reflexis, oblongis, apiculatis, 0.5 cm longis, lateralibus obliquis; petalis erectis, oblique linearibus, acutis, dimidio superiore vix dilatatis, sepalis paulo brevioribus; labello e basi oblonga, genuflexo-decurva supra medium distincte angustato et in lobum oblongo-quadratum, apiculatum producto, glabro, basi callo amplo quadrato ornato, callo duplici, duplo minore anteposito, toto petalorum longitudine, supra basin 2.5 mm lato; columna petalis fere 3-plo brevior, dimidio inferiore conspicue dilatata apice paulo contracta; anthera rhombo-suborbiculari, obtusa, glabra; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the ridges of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 17100, flowering in Dec. 1907; on trees in the forests on the ridges of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18592, flowering in Nov. 1908.

I have found this species always only on ridges and crests where it was exposed fully to frequent strong winds. Once seen live it is recognised easily from its relatives by its olive-green flowers. Its flower stalks, moreover, are more rigid and sharply two-edged which reflects on the extra strength needed at its windy locations. *L. pseudo-disticha* Schltr. may be regarded as the nearest related species, but differing in the colour of the flowers.

43. *L. pseudo-disticha* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 106.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 14064, flowering in Jan. 1902.

Amongst the abundant material of the section *Distichon* which I brought from my last expedition, this species is, unfortunately, not represented. Since it became necessary, on account of the great number of species established in the flora of New Guinea, to state more exactly the distinguishing characteristics of the individual species in this critical group I will consider again the characteristics of *L. pseudo-disticha* Schltr. in detail. The species is distinguished from *L. anemophila* Schltr. by the colouring, by the pyramidal column broadened downwards, and the two slightly convex, fine papillose oval shiny areas at the apex of the labellum. *L. apiculata* Schltr. also has similar shiny areas, but here they are developed with regular gibbosities,

similar to those in *L. gibbosa* Finet; moreover the petals are much broader here.

Below I will mention the further differences from *L. apiculata* Schltr. The colour of the flowers of *L. pseudo-disticha* Schltr. is yellowish with an orange-yellow labellum.

The plant presented and illustrated by J.J. Smith (in 'Nova Guinea' VIII, p. 38, t. XIII, 41) under this name should not really belong here at all. Whether it constitutes a species by itself or belongs to one of those described here cannot be established due to the poor quality of the illustration.

44. *L. inamoena* Schltr., sp. nov.

Epiphytica, erecta, c. 25 cm alta; rhizomate brevi; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis approximatis, gracilibus, cauliformibus, lateraliter compressis, basin versus vix incrassatis, 2–3 cm longis, supra basin 0.3–0.4 cm diametentibus, unifoliatis; folio erecto vel suberecto, lineari, acuto, basin versus paululo angustato, glabro, 15–22 cm longo, medio fere 0.5–0.7 cm lato; scapo erecto, gracili, ancipiti, evaginulato, glabro, folio paulo brevior; floribus in sectione inter minores, erecto-patentibus, glabris; sepalis reflexis, ovato-oblongis, apiculatis, vix 3.5 mm longis, lateralibus obliquis; petalis erectis, anguste oblongo-spathulatis, obliquis, obtuse apiculatis, sepalis paulo brevioribus; labello e basi suborbiculari, genuflexo-decurva dimidio anteriore oblongo, apiculato, glabro, basi callo amplo subquadrato, obtuse apiculato ornato, callis 2 parvulis approximatis antepositis, toto petalorum longitudine, supra basin vix 1.5 mm latitudinis excedente; columna brevi, trapezoidea, petalis duplo fere brevior, basi perlata; ovario cum pedicello glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18784, flowering in Nov. 1908.

As mentioned under *L. brunnescens* Schltr., the plant belongs to those species with reduced rhizome and therefore very closely compressed pseudobulbs. The species described here is, moreover, distinguished by the rather broad petals and the shorter sepals than in the rest of the section. Also in the column there are shown peculiarities in the trapezoid outlines. The flowers are olive-green, the labellum brownish yellow. Evidently this species is rare since I have only once been able to collect two plants.

45. *L. apiculata* Schltr., sp. nov.

Epiphytica, gracilis, 25–40 cm alta; rhizomate decumbente, brevi; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis vulgo valde approximatis, nunc usque ad 1 cm distantibus, e basi ovata, subancipiti cauliformi-atenuatis, 4–8 cm longis, parte basali 0.7–1 cm lata, 1–1.7 cm alta, unifoliatis; folio erecto vel suberecto, lineari, acuto vel subacuminato, basin versus sensim paulo angustato, glabro, 20–30 cm longo, medio fere 0.6–0.9 cm lato; scapo gracili, erecto, ancipiti, folia vulgo paulo excedente, evaginulato, glabro; racemo dense pluri-multi-floro, disticho, usque ad 6 cm longo; bracteis erecto-patentibus, bifariis, subimbricantibus, ovato-lanceolatis, acuminatis, ancipiti-conduplicatis, ovario pedicellato subaequilongis; floribus erecto-patentibus, in sectione vix-inter mediocres; sepalis reflexis, oblongis, apiculatis, glabris, c. 6.5 mm longis, lateralibus obliquis; petalis e basi subunguiculata oblique obovato-spathulatis, obtusis, sepalis paulo brevioribus; labello e basi late quadrato-oblonga, genuflexo-decurva, supra medium sensim angustato et in lobum subquadratum, distincte apiculatum, speculis 2 convexis, oblongis, papilloso-puberulis ornatum productum, basi callo subquadrato, obtuso ornato, callis 2 parvulis obtusis antepositis, toto petalorum longitudine, supra basin 2.75 mm latitudine attingente; columna pyramidato-trapezoidea, petalis triplo brevior, basi rotundata, glabra; anthera suborbiculari, obtusissima, glabra; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16552, flowering in Sept. 1907.

Amongst the species of this section in our Territory, this may prove the most robust. Its pseudobulbs are thickened more considerably at the base than those of any other species. The bright salmon-coloured flowers are also larger. The whole plant is in itself more robust, although there may be some species growing taller. The chief characteristics of the species are in the labellum which reminds one somewhat of *L. gibbosa* Finet; in the petals which might be regarded as clawed and in the entire habit,

(for in this species we have the typical intermediate form between the species with elongated rhizome and those with a shortened rhizome). By all these characteristics the species is also distinguished from *L. pseudo-disticha* Schltr., with which I have compared it above.

46. *L. trachyglossa* Schltr., sp. nov.

Epiphytica, erecta, gracilis, usque ad 35 cm alta; rhizomate decumbente, elongato, flexuoso, laxe pseudobulbis obsessis; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 2–2.5 cm distantibus, e basi incrassata cauliformi-angustatis, lateraliter compressis, 2.5–3.5 cm altis, supra basin usque ad 0.4 cm latis, unifoliatis; folio erecto, lineari, acuto vel subacuminato, basin versus sensim paulo angustato, glabro, 20–30 cm longo, medio fere 0.5–0.9 cm lato; scapo erecto, gracilimo, ancipiti, evaginulato, folio vulgo paulo brevior; racemo dense multifloro, ancipiti, usque ad 4.5 cm longo; bracteis erecto-patentibus, bifariis, imbricantibus, ovatis, acuminatis, ovario duplo vel plus duplo brevioribus; floribus in sectione inter minores, subpatentibus; sepalis reflexis, ovatis, apiculatis, extus nervo medio incrassatis, glabris, c. 0.6 cm longis, lateralibus obliquis, suboblongis; petalis erectis, obliquis, sublineari-spathulatis, obtusis, glabris, sepalis subaequilongis; labello e basi late quadrata genuflexo decurvo, e medio sensim ovato-angustato, antice obtusato et in apiculum brevem exeunte, dimidio anteriore superne papilloso-asperato, basi callo amplo, subquadrato, obtuse apiculato ornato, callis 2 oblique conicis minoribus antepositis, labello toto petalorum longitudine, basi c. 0.3 cm latitudine subattigente; columna suborbiculari, clinandrio contracto, petalis fere triplo brevior, glabra; anthera subquadrata, obtusissima, facie obscure bicarinata, glabra; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20338, flowering in Sept. 1909.

This species is related closely to the preceding one, but has considerably thinner and more slender pseudobulbs, narrower petals, a lip broader at the base but narrower towards the front and a differently shaped column. The flowers, which are a bright salmon colour in *L. apiculata* Schltr., are greenish yellow in *L. trachyglossa* Schltr.

47. *L. Govidjoae* Schltr., sp. nov.

Epiphytica, erecta, gracilis, 18–27 cm alta; rhizomate abbreviato, dense pseudobulbis obsessis; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis approximatis, e basi incrassata cauliformi-attenuatis, lateraliter compressis, unifoliatis, usque ad 3.5 cm altis, basi usque ad 0.5 cm latis; folio erecto, lineari, breviter acuminato, basin versus sensim paulo angustato, glabro, 14–20 cm longo, medio fere 0.4–0.5 cm lato; scapo erecto, gracili, stricto vel substricto, ancipiti, evaginulato, foliis fere aequilongis; racemo dense plurifloro, ancipiti, bifario, usque ad 1.5 cm longo; bracteis distichis, erecto patentibus, ovatis, dorso carinatis, imbricantibus, ovario fere aequilongis; floribus erecto-patentibus, ochraceis; sepalis reflexis, ovato-oblongis, apiculatis, glabris, 0.5 cm longis, lateralibus obliquis; petalis oblique oblanceolato-spathulatis, obtusiusculis, glabris, sepalis subaequilongis; labello e basi late quadrata, glabra genuflexo-decurvo, dimidio anteriore paululo angustiore, late quadrato, superne minute papilloso, antice truncato-obtusissimo cum apiculo parvulo, basi callo amplo, quadrato, obtuse apiculato ornato, callis 2 parvulis obtusis antepositis, labello toto petalis aequilongo, basi 0.3 cm lato, dimidio anteriore 2.5 mm lato; columna brevi, late ovata, clinandrio paulo contracto, petalis plus duplo brevior; anthera subreniformi, obtusissima, glabra; ovario cum pedicello glabro, 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19803, flowering in June 1909.

A relation of *L. trachyglossa* Schltr., but easily recognised from the latter by the shorter rhizome, broader petals and shape of the labellum. The flowers are a brilliant ochre-red.

48. *L. miniata* Schltr., sp. nov.

Epiphytica, gracilis, usque ad 45 cm alta; rhizomate decumbente, elongato, gracili; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis c. 3 cm distantibus, e basi oblonga angustatis, ancipitibus, 2.5–3.5 cm altis, supra basin usque ad 0.7 cm latis, unifoliatis; folio erecto, lineari-ligulato, acuto, basin versus paulo angustato, glabro, 15–25 cm longo, medio fere 0.8–1.3 cm lato; scapo erecto, gracilimo, ancipiti, glabro, evaginulato, cum inflorescentia usque ad 45 cm longo; racemo disticho, dense multifloro, usque ad 10 cm longo; bracteis erecto-patentibus bifariis, ovatis, acuminatis, glabris,

imbricantibus, dorso carinatis, ovario 2–3-plo brevioribus; floribus in sectione mediocribus, patentibus, glabris, ochraceo-minutis; sepalis reflexis, oblongis, obtusis, nervo medio carinato-incrassatis, 6.5 mm longis, lateralibus latioribus, obliquis; petalis erectis, oblique sublineari-spathulatis, subacutis, sepalis aequilongis; labello e basi late quadrata genuflexo-decurvo, late oblongo, apiculato, basi callo amplo quadrato, obtuso ornato, callis 2 minoribus, obliquis, obtusis antepositis, labello toto 6.5 mm longo, supra basin 0.4 cm lato, medio 3.5 mm lato; columna orbiculari, petalis fere 4-plo brevioribus; ovario cum pedicello gracillimo, glabro, c. 2.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Govidjoa [Creek], alt. c. 1000 m—R. Schlechter no. 19838, flowering in June 1909.

Among the species of the section in the Territory this may be recognised easily by the broad lateral sepals and the broad tip of the completely flat labellum. The flowers are a brilliant ochre-red.

The plant grows on trees in the mist-forests of the mountains of the Waria District, where the rhizomes are surrounded always by dense trickling-wet moss pads. It often happens that moss covers even the leaves and flower shafts. These circumstances indicate the high level of moisture tolerated by these orchids in the mist-forest regions of New Guinea.

49. *L. glumacea* Schltr., sp. nov.

Epiphytica, gracilis, usque ad 35 cm alta; rhizomate longe decumbente, tereti; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 4–5.5 cm distantibus, e basi paulo incrassata, cauliformibus, paulo compressis, unifoliatis, 4–5 cm altis, basi c. 0.5 cm diametientibus; folio erecto, lineari, acuto, basin versus paulo angustato, 20–25 cm longo, medio fere 0.7–1.1 cm lato; scapo erecto, gracili, stricto vel substricto, ancipiti, evaginulato, glabro, foliis fere aequilongis; racemo dense pluri-multi-floro, usque ad 5 cm longo, ancipiti, disticho; bracteis glumaceo-imbricatis, bifariis, erecto-patentibus, ovatis, acuminatis, compressis, dorso carinatis, ovario pedicellato aequilongis; floribus patentibus, in sectione vix mediocribus, glabris, brunneo-ochraceis; sepalis reflexis, oblongis, apiculatis, 0.4 cm longis, lateralibus obliquis; petalis erectis, oblique oblongo-ligulatis, obtusis, basin versus paulo angustatis, sepalis paulo brevioribus; labello e basi subreniformi-transversa genuflexo-decurvo, dimidio anteriore paululo angustato, reniformi, apiculato, glabro, basi callo amplo quadrato, obtuse apiculato ornato, callis 2 parvulis, oblique conicis, subacutis antepositis, labello toto petalis aequilongo, supra basin 0.3 cm lato; columna petalis duplo brevioribus, quadrata, clinandrio paulo contracta; ovario cum pedicello glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19805, flowering in June 1909.

In the structure of the flowers, this species is related closely to *L. lamproglossa* Schltr., but in its vegetative characters it differs specifically at first glance. Above all things, it is separated by the large bearded bracts, which are frequently a centimetre long. The flowers are ochre-brown.

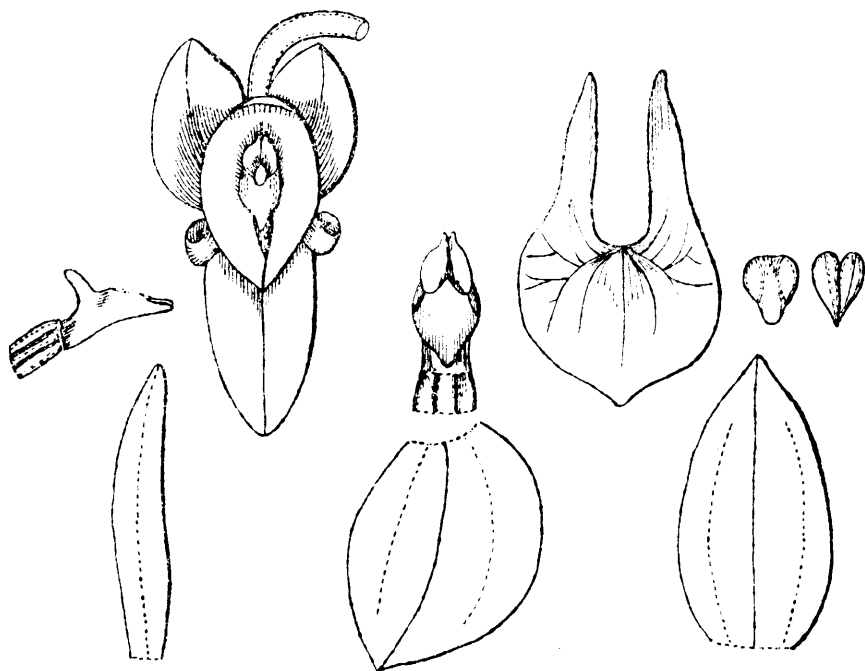
50. *L. lamproglossa* Schltr., sp. nov.

Epiphytica, erecta, gracillima, usque ad 40 cm alta; rhizomate decumbente, elongato, gracili; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 3–4 cm distantibus, e basi paulo incrassata cauliformi-angustatis, gracilibus, lateraliter paulo compressis, 5–6 cm altis, supra basin usque ad 0.4 cm diametientibus, unifoliatis; foliis erectis, anguste linearibus, acutis cum apiculo vel subcuspidatis, basin versus sensim angustatis, glabris, 20–25 cm longis, medio fere 4–6.5 mm latis; scapis erectis, strictis vel substrictis, usque ad 40 cm altis, ancipitibus, glabris, evaginulatis, racemis vulgo arcuatis, dense multifloris, distichis, usque ad 6 cm longis; bracteis erecto-patentibus, subimbricantibus, bifariis, compressis, ovatis, acutis, dorso carinatis, ovario pedicellato plus duplo brevioribus; floribus patentibus, in sectione vix inter mediocres, nitidis; sepalis reflexis, oblongis, apiculatis, glabris, 0.4 cm longis, lateralibus obliquis; petalis erectis, oblique oblanceolato-spathulatis, obtusis, glabris, sepalis fere aequilongis; labello e basi subreniformi, genuflexo-decurvo, dimidio anteriore paulo angustiore reniformi, apice exciso, cum apiculo interjecto, antice obscure gibboso, basi callo amplo, quadrato, obtuso ornato, gibbis 2 parvulis antepositis, labello toto glabro, petalis aequilongo, supra basin vix 0.3 cm lato; columna quadrata, apicem versus paulo angustata, petalis fere duplo brevioribus; anthera subquadrato-cucullata, obtusissima, glabra; ovario cum pedicello glabro, c. 1 cm longo.

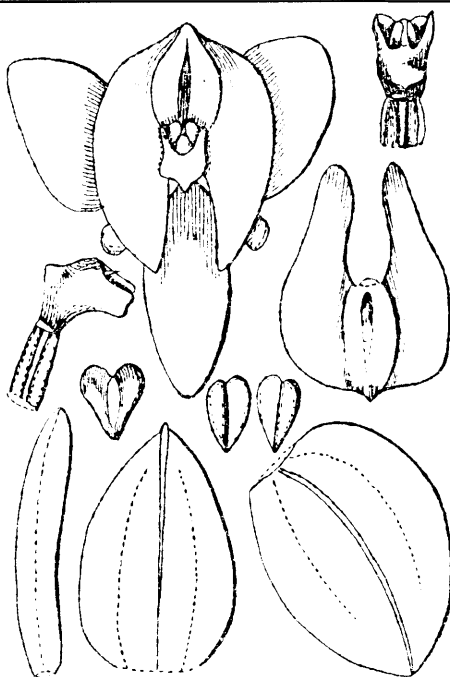
Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18625, flowering in Sept. [Ed.—possibly Nov.] 1908.

Although in the structure of its shiny brownish red flowers this species inclines somewhat towards *L. glumacea* Schltr., it is nevertheless separated from the latter by such considerable differences in its growth, that it is recognised easily from this by the most superficial observation. It grows under similar conditions to those described for *L. miniata* Schltr.

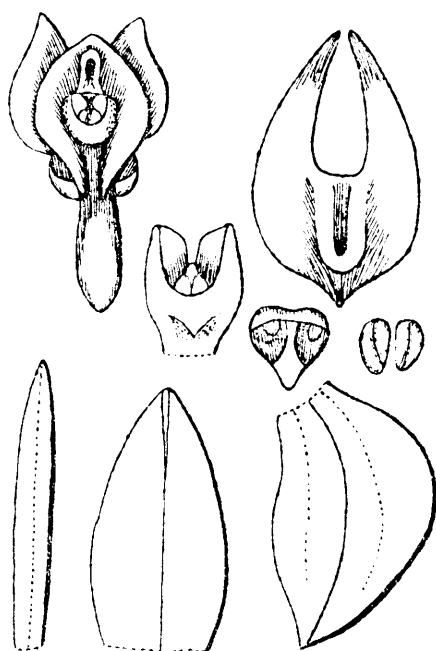
GROUP XIII *Liparidinae*



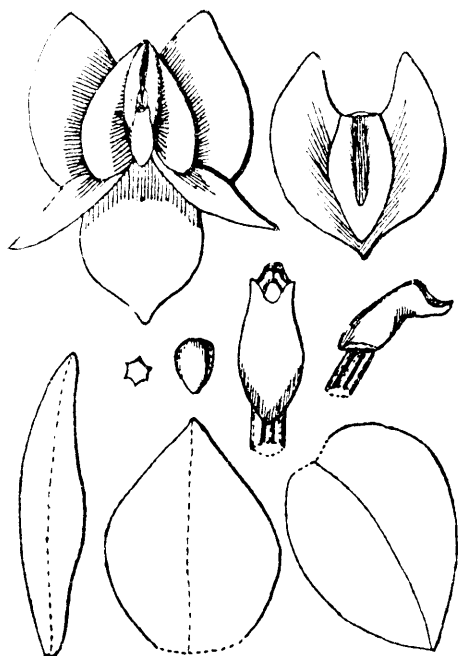
Microstylis laevis Schltr.



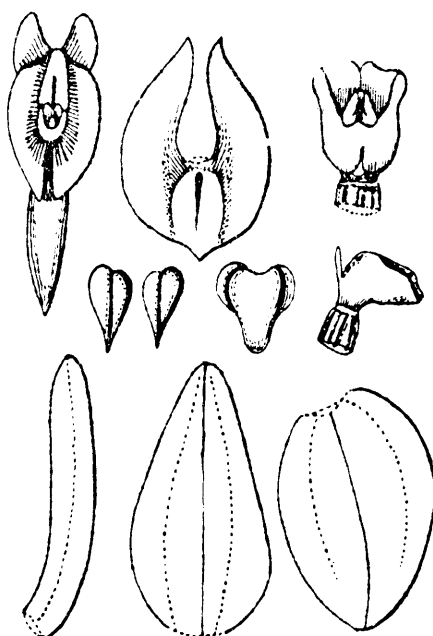
Microstylis umbonata Schltr.



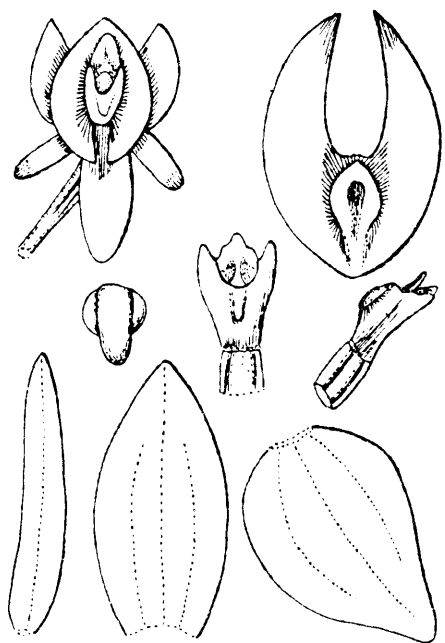
Microstylis Schumanniana Schltr.



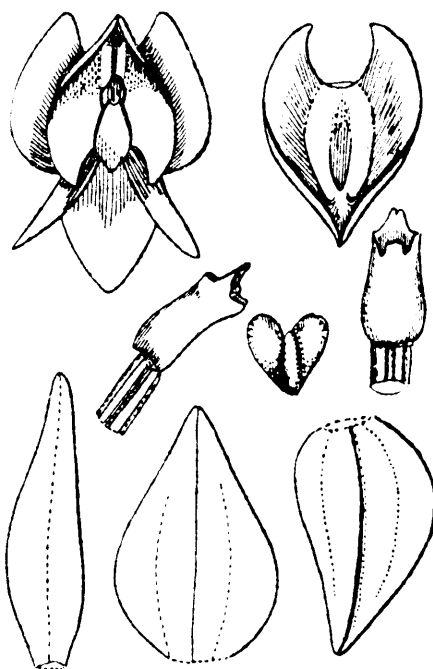
Microstylis maboroensis Schltr.



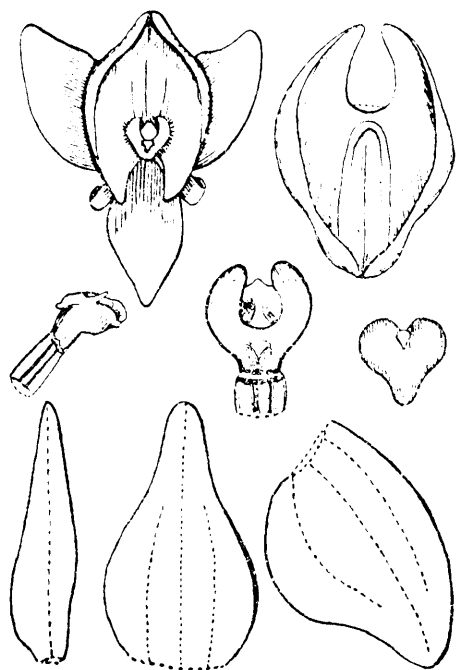
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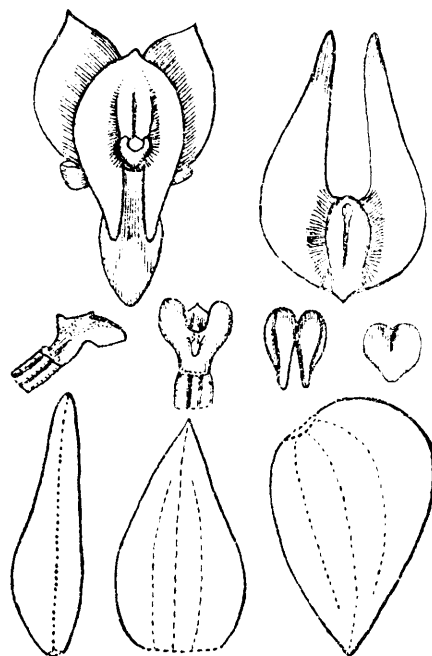
Microstylis seleniglossa Schltr.



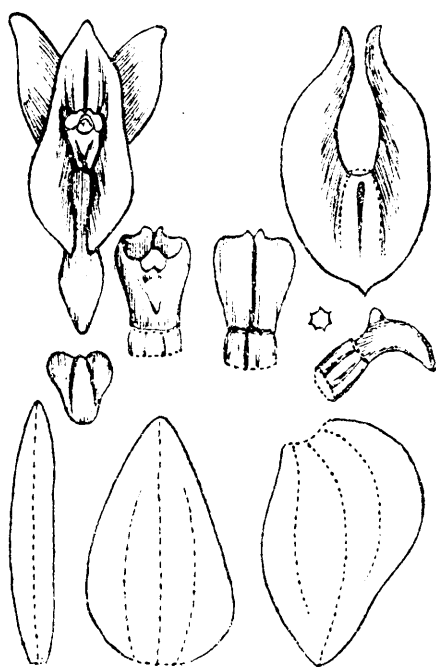
Microstylis microhybos Schltr.



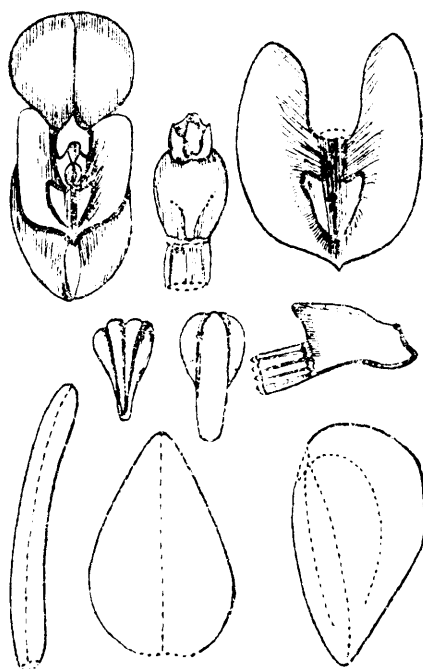
Microstylis breviscapa Schltr.



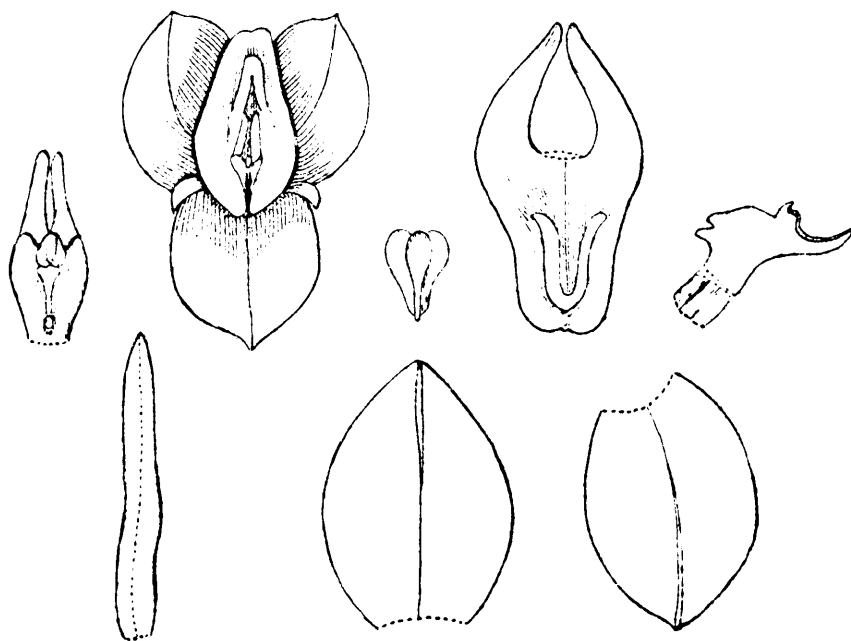
Microstylis brachycaulos Schltr.



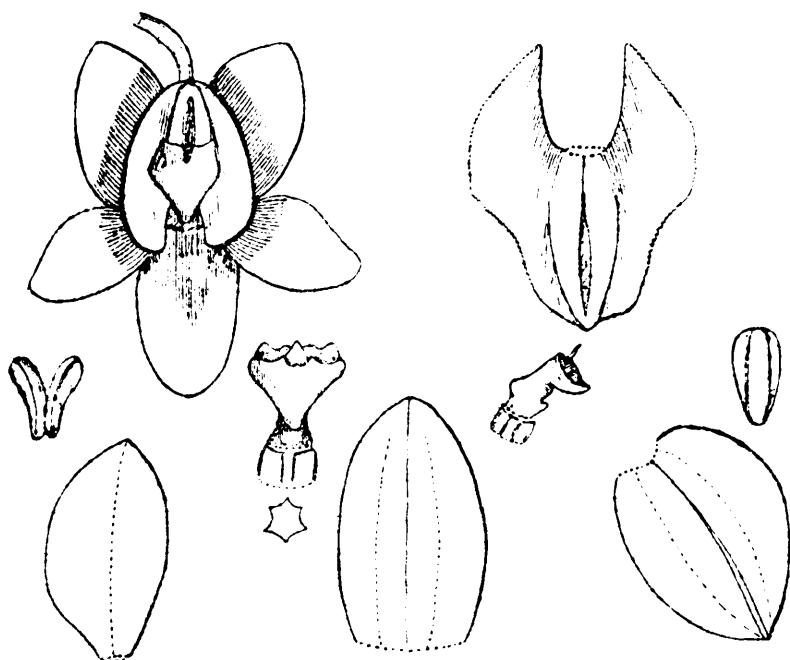
Microstylis curvatula Schltr.



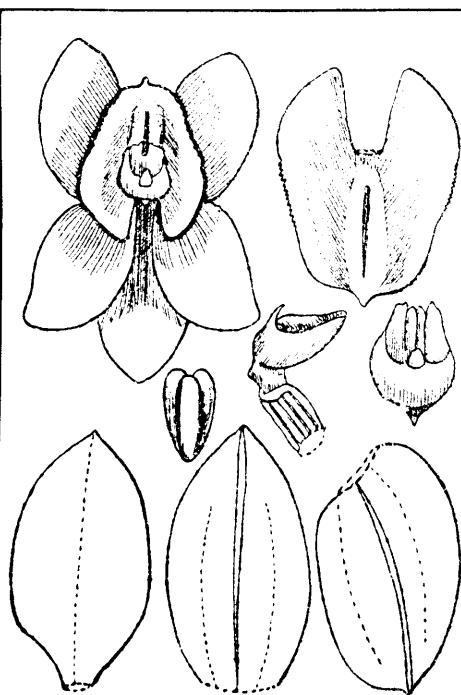
Microstylis epiphytica Schltr.



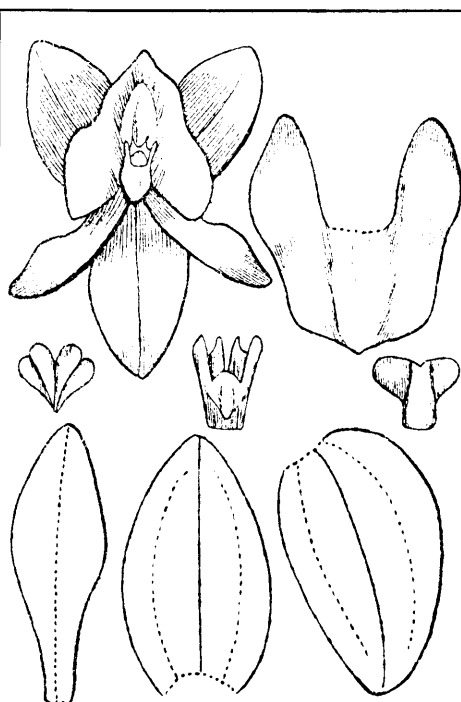
Microstylis diploceras Schltr.



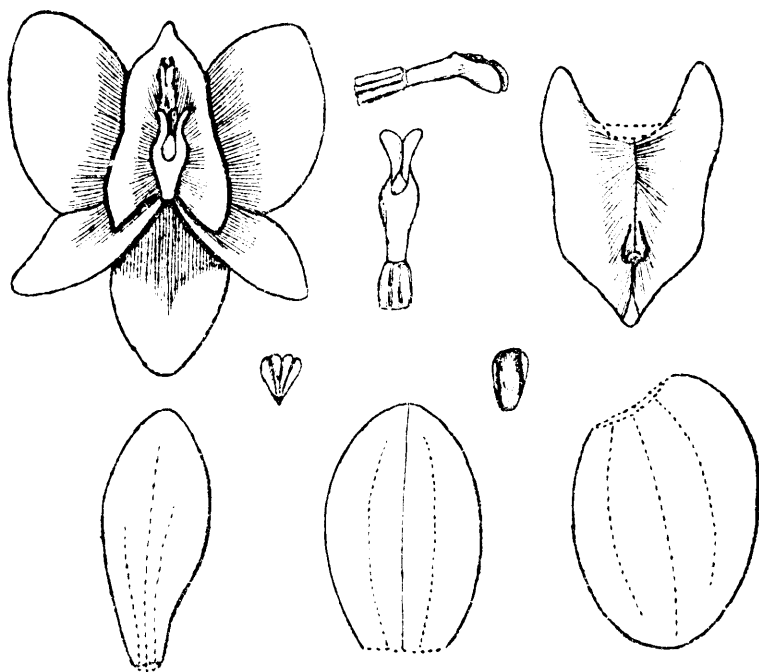
Microstylis stenophylla Schltr.



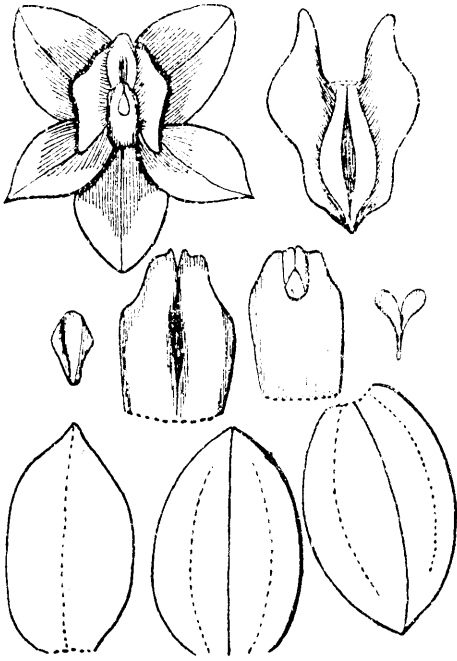
Microstylis stenophylla
var. *crispatula* Schltr.



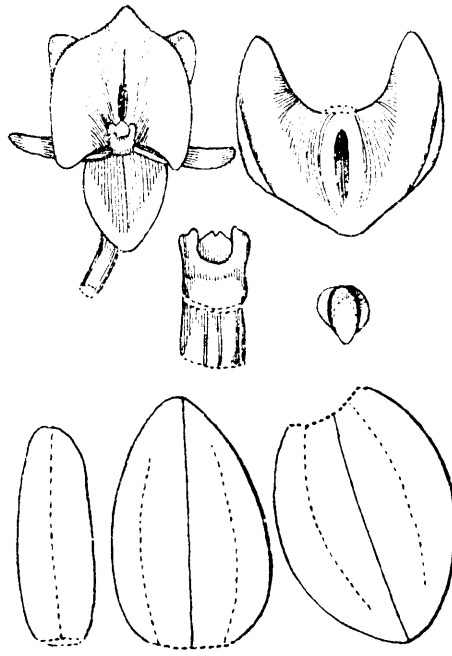
Microstylis undulata Schltr.



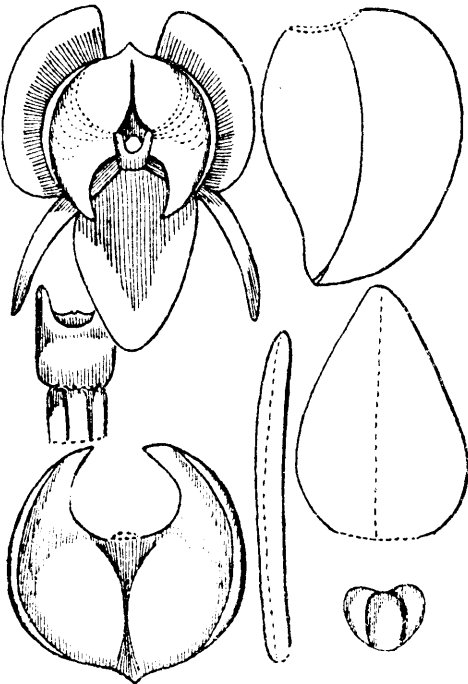
Microstylis graminifolia Schltr.



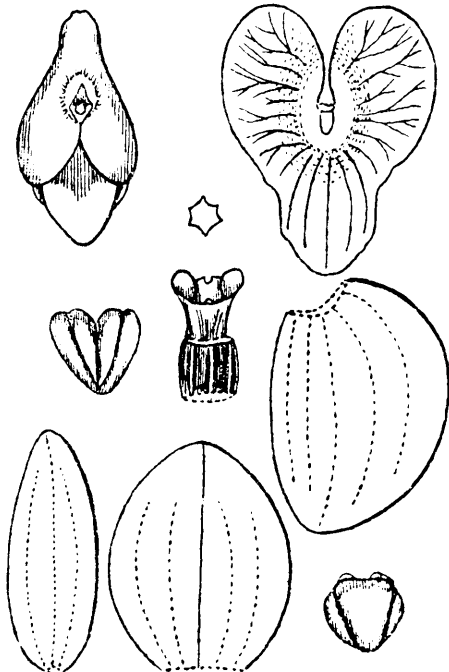
Microstylis Zippelii J.J. Sm.



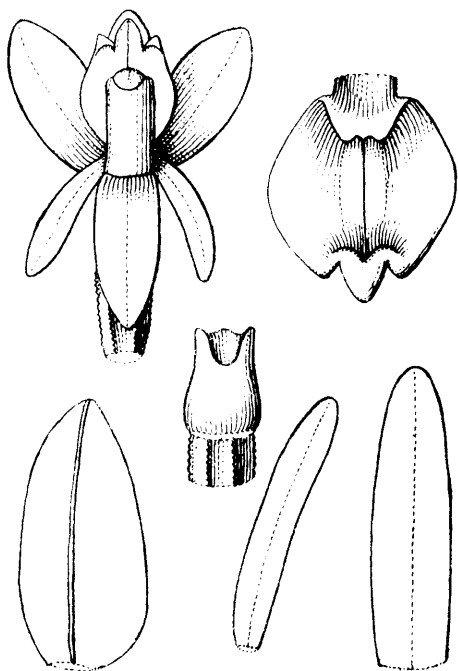
Microstylis dryadum Schltr.



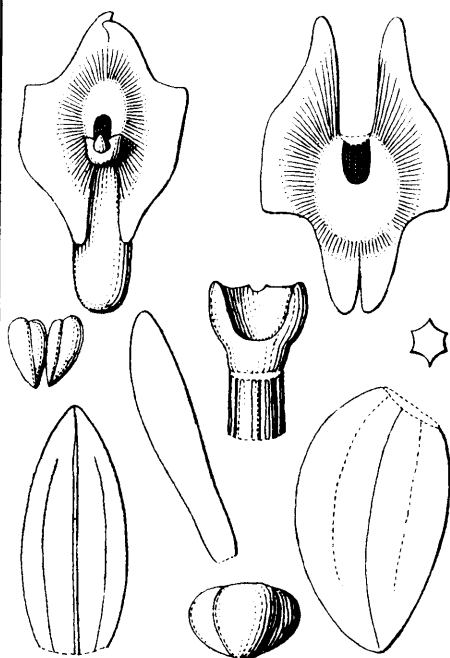
Microstylis oligantha Schltr.



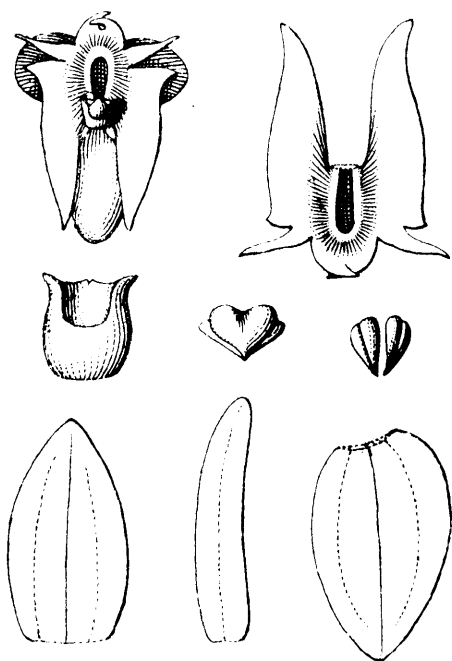
Microstylis caricoides Schltr.



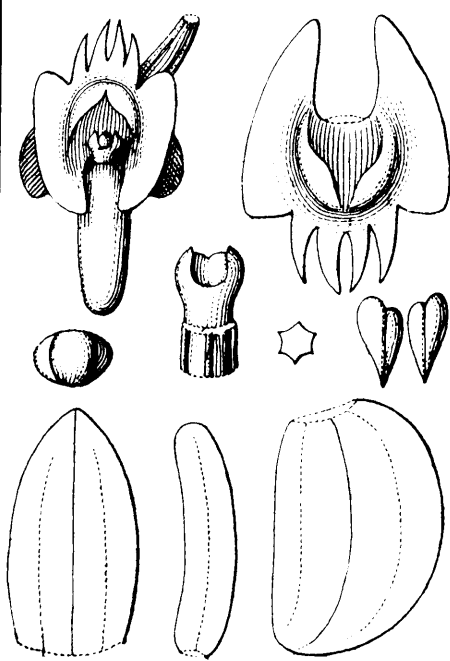
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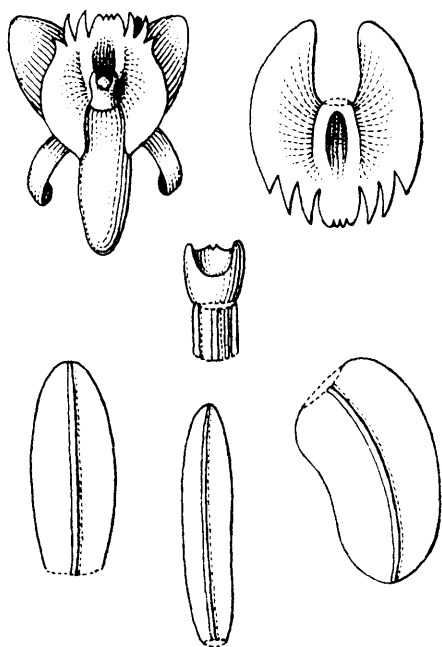
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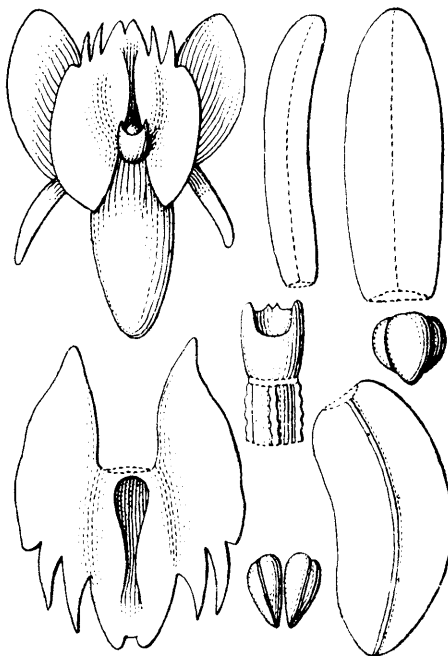
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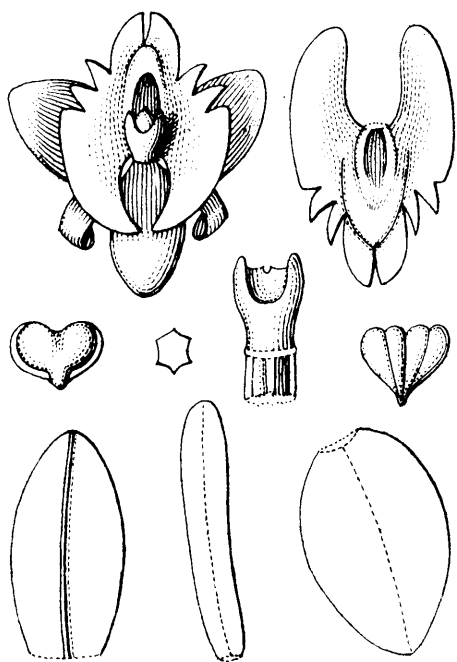
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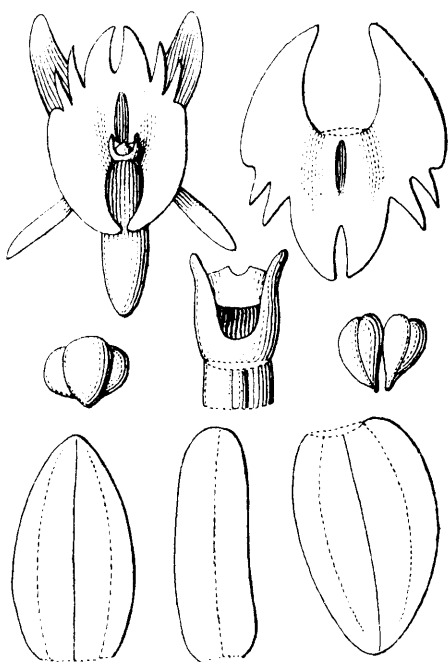
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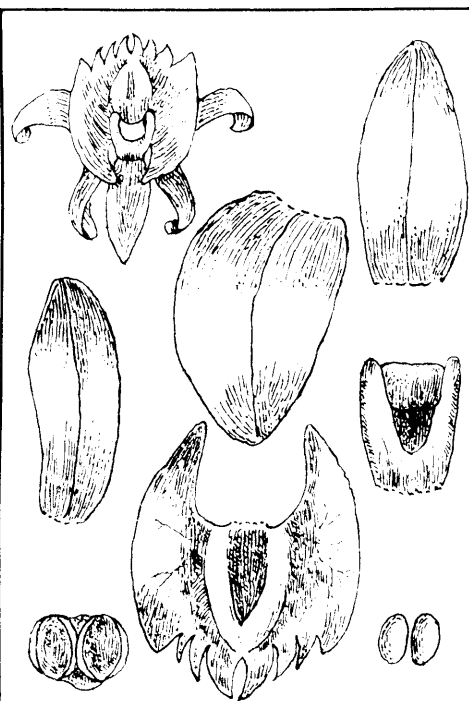
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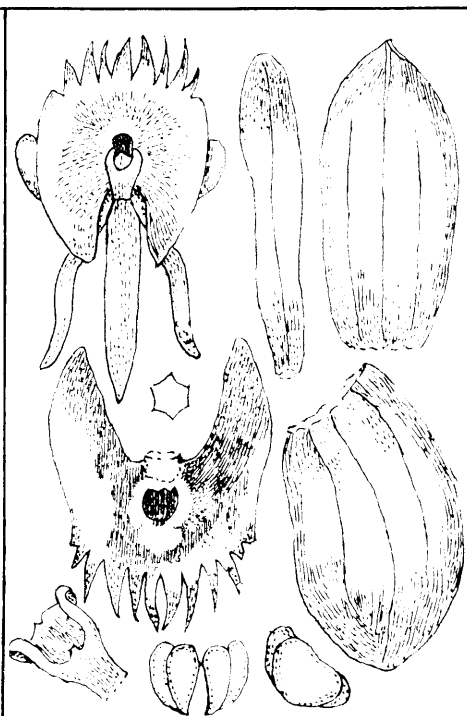
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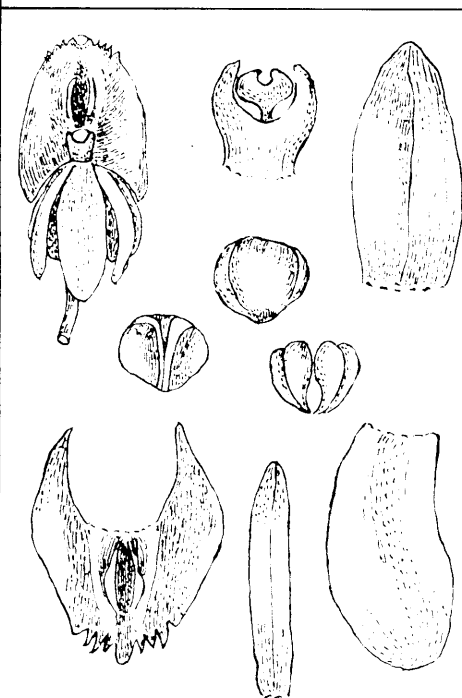
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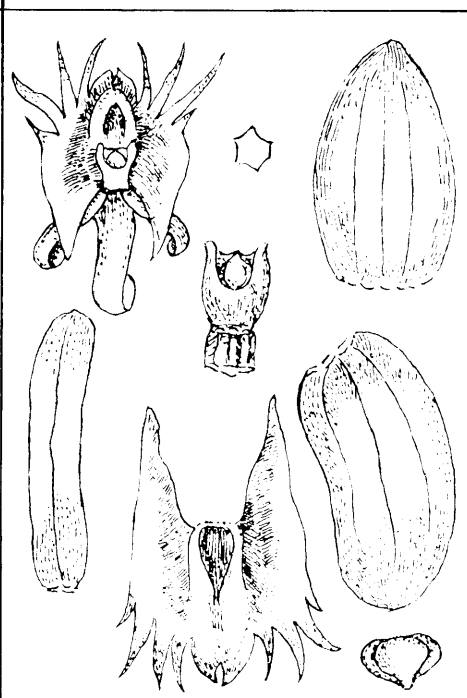
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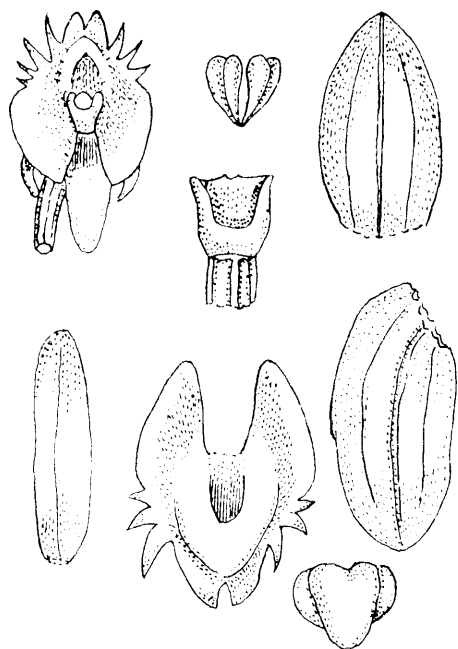
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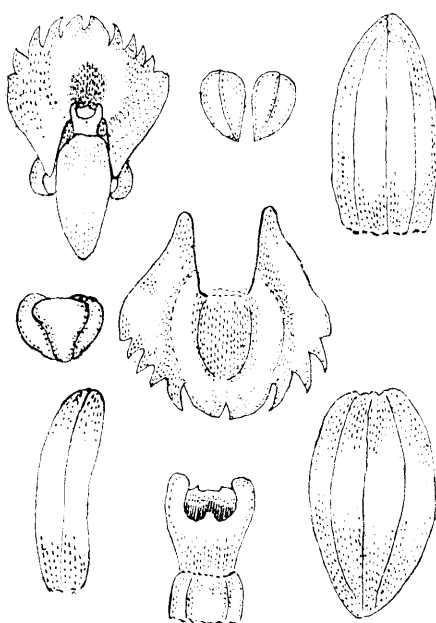
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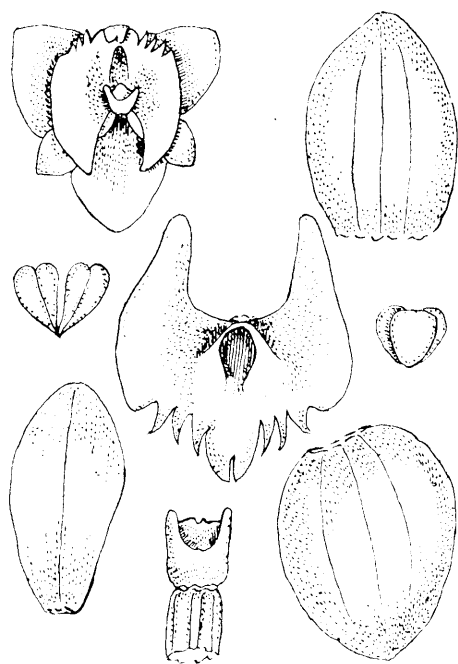
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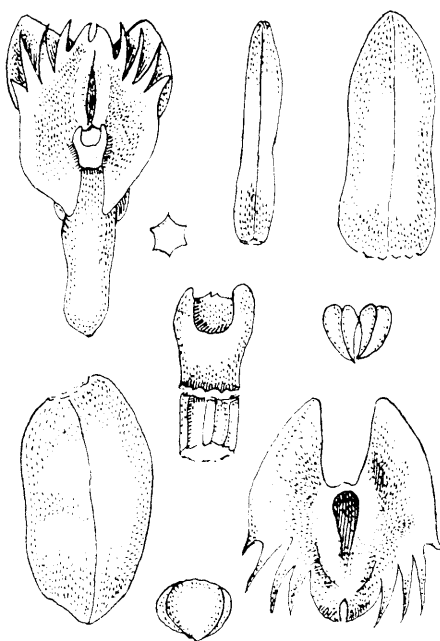
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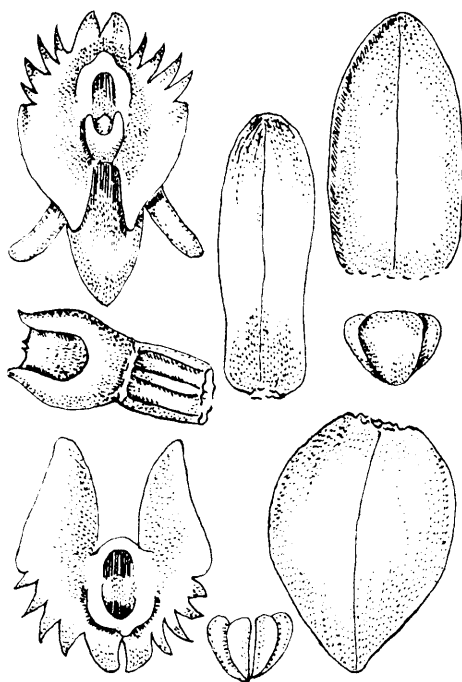
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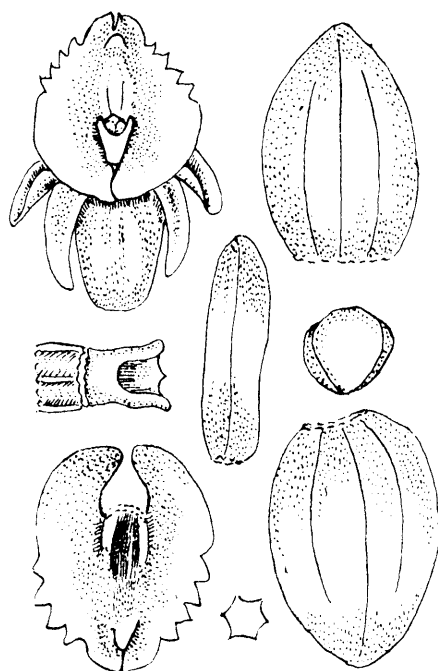
Microstylis longispica Schltr.



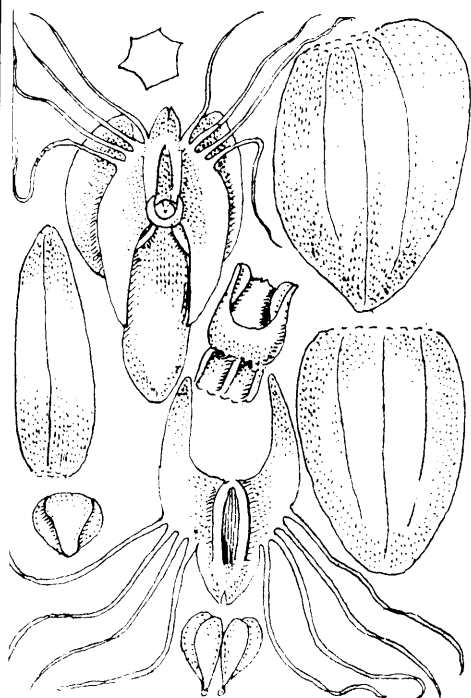
Microstylis wariana Schltr.



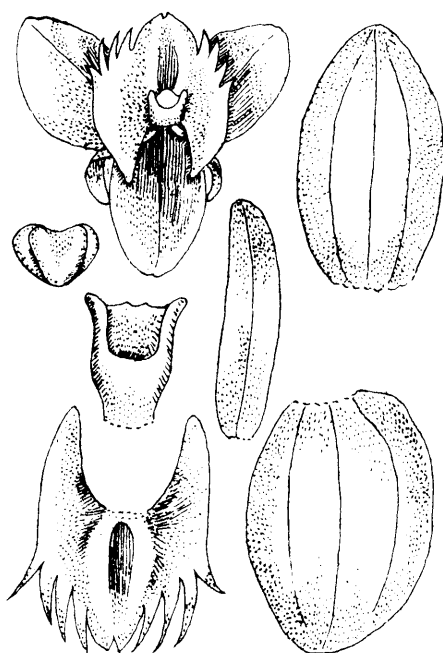
Microstylis atrata Schltr.



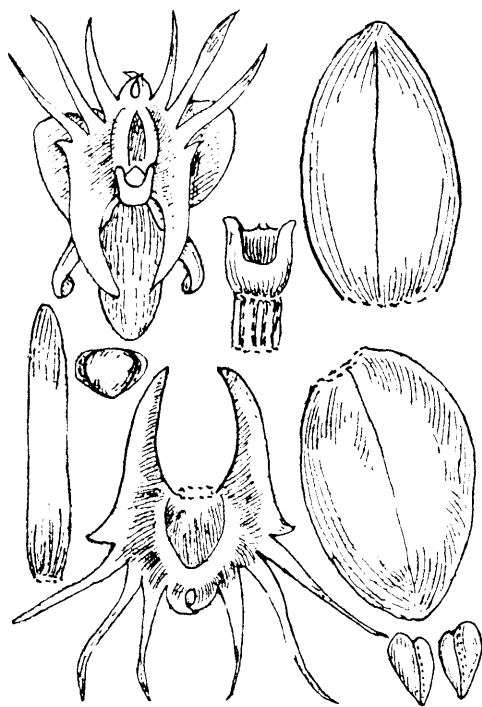
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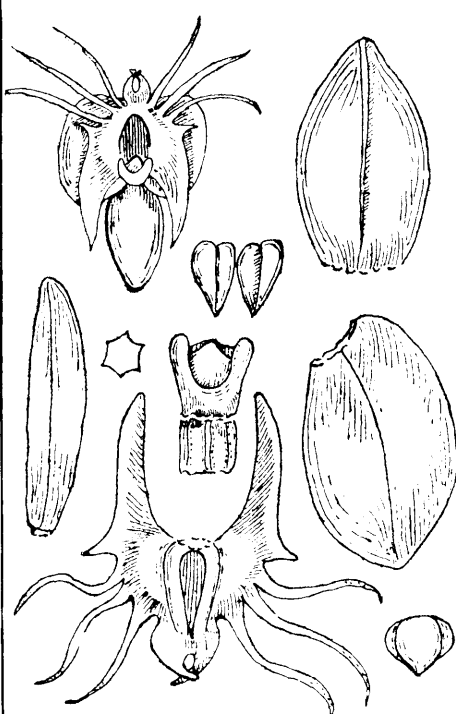
Microstylis arachnoidea Schltr.



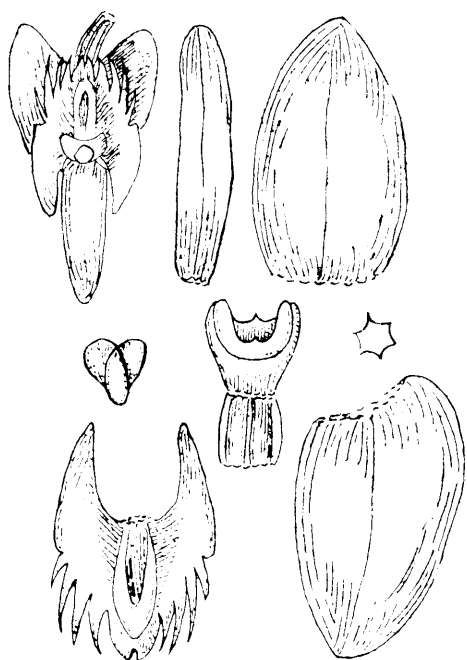
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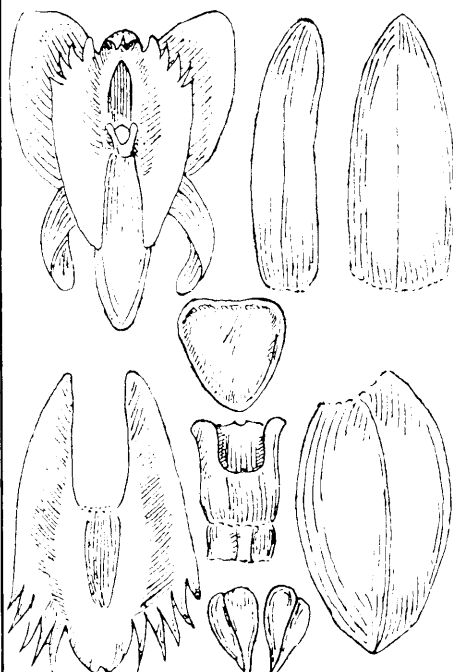
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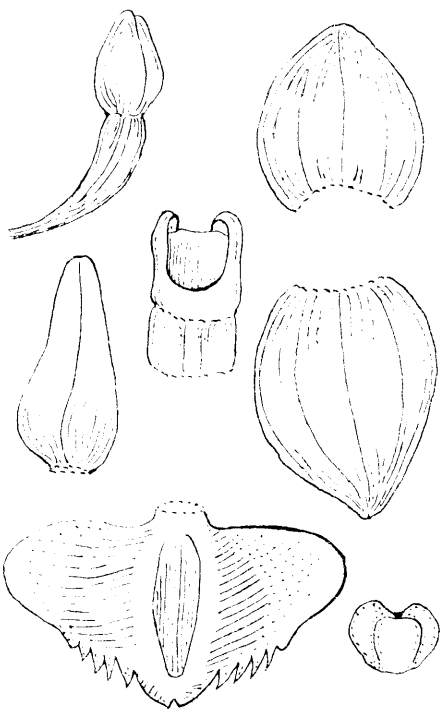
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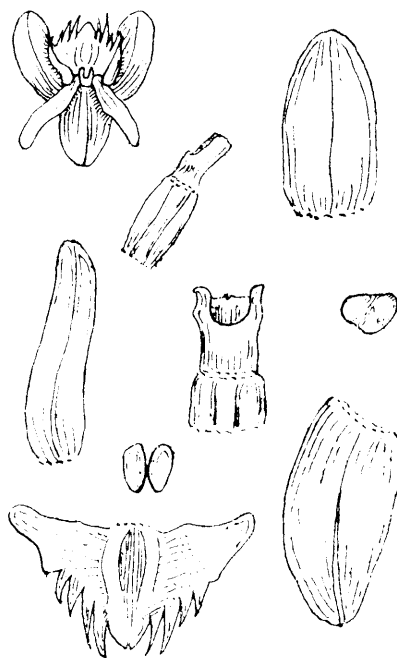
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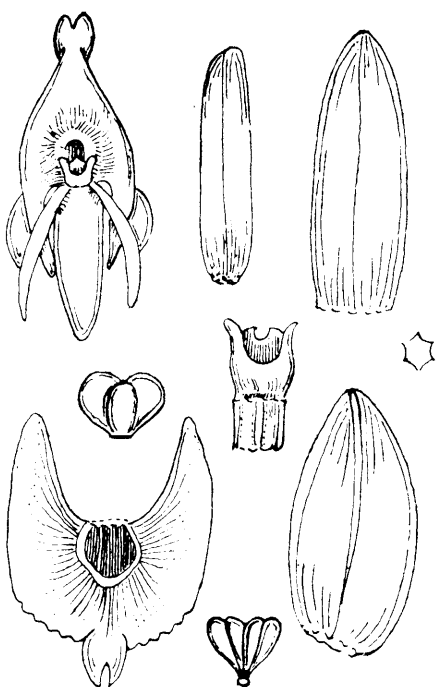
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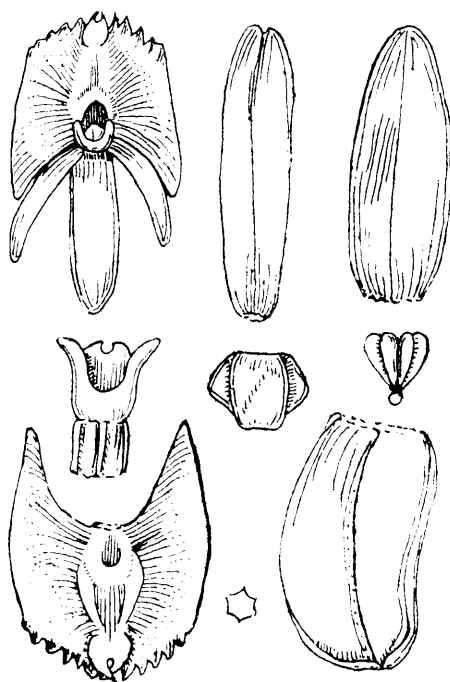
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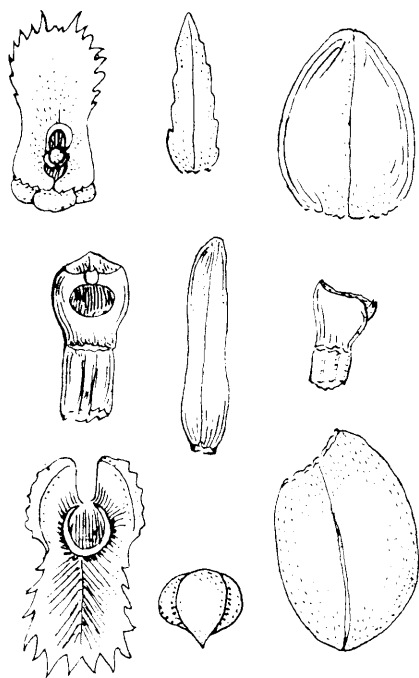
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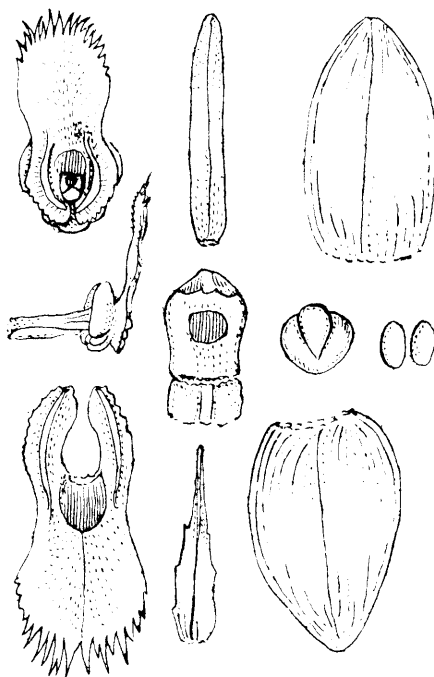
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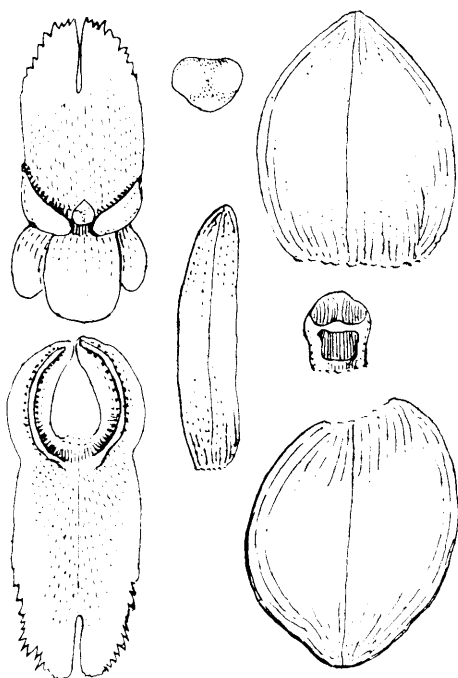
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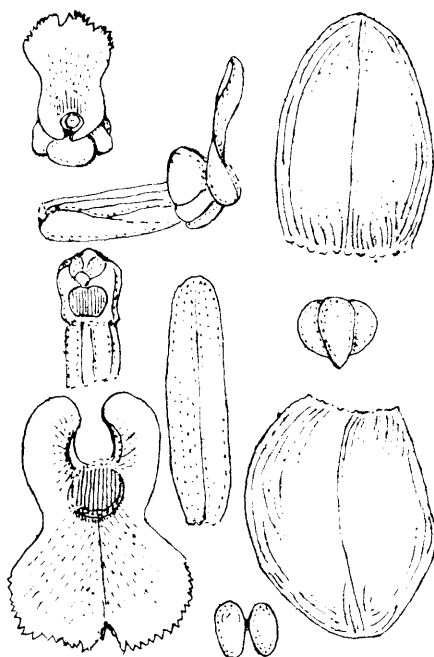
Oberonia pachyambon Schltr.



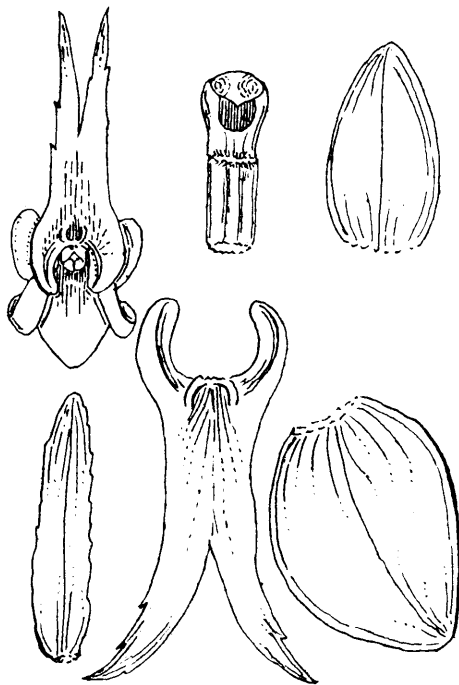
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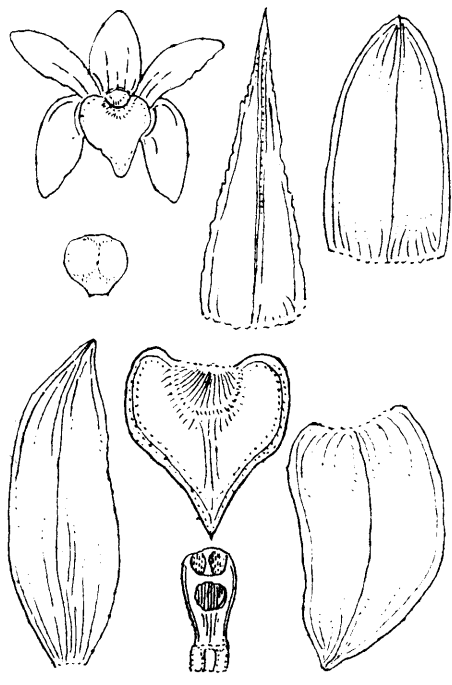
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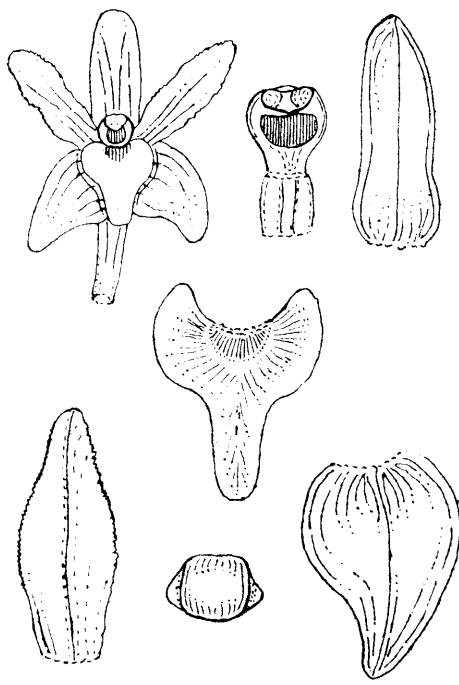
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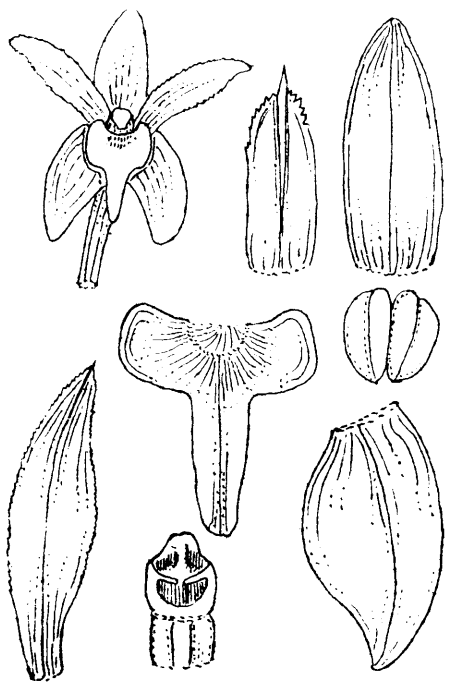
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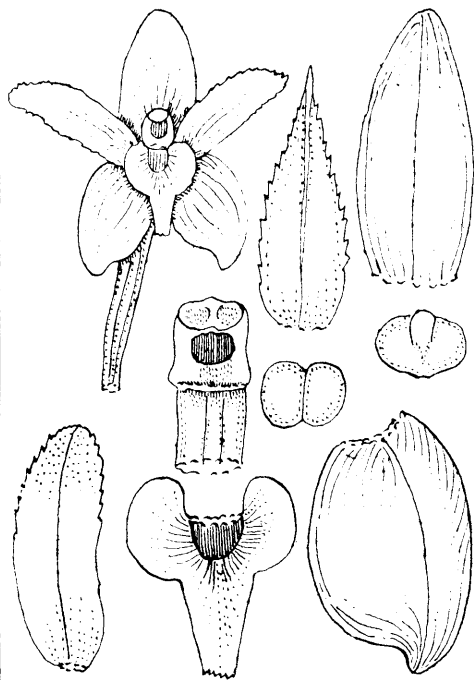
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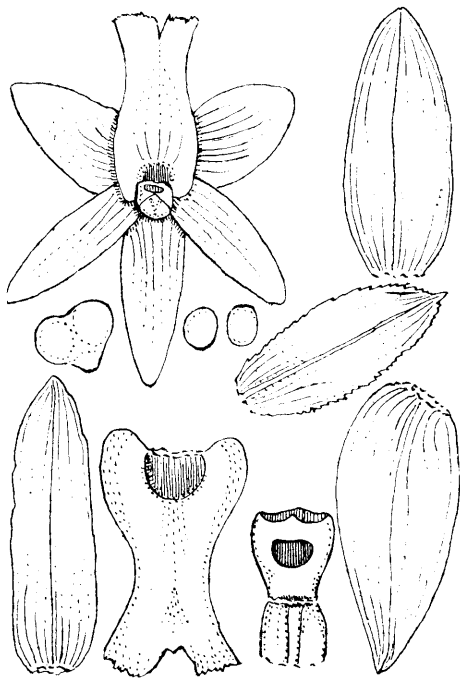
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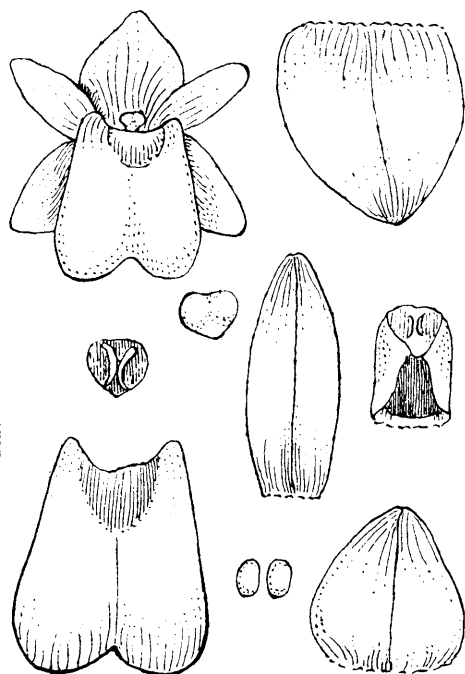
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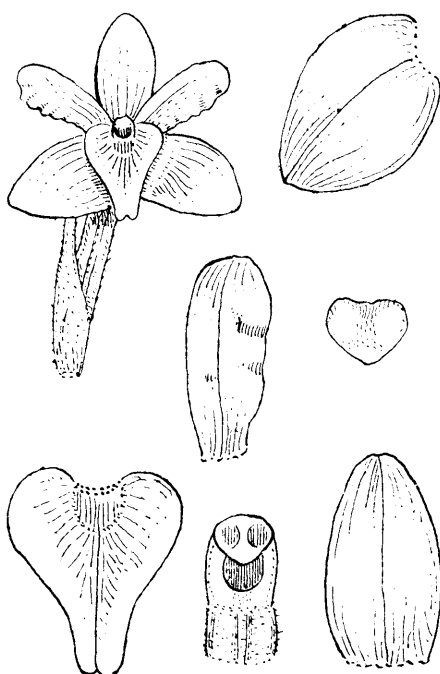
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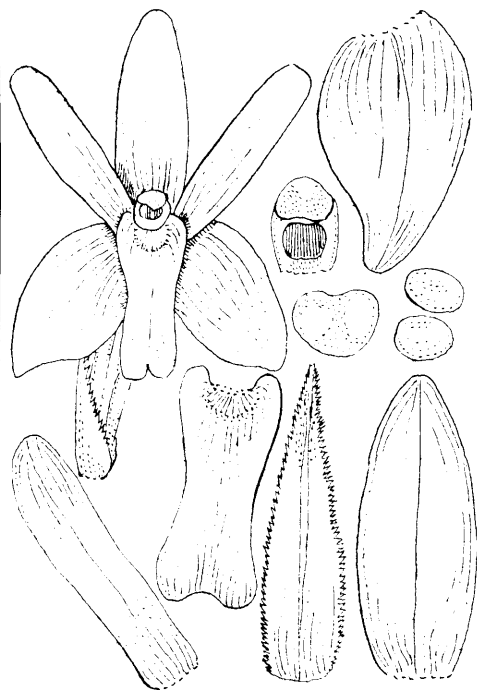
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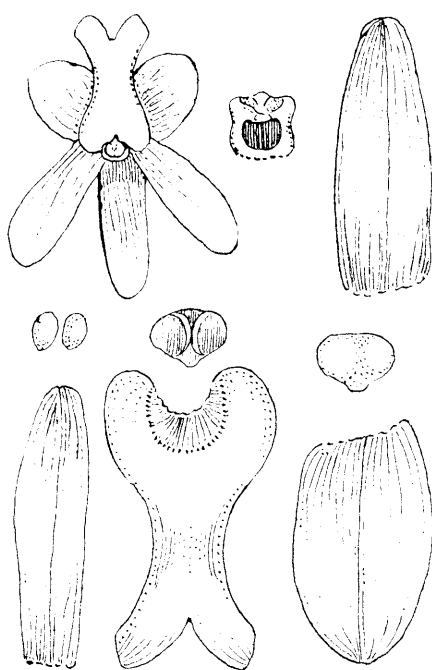
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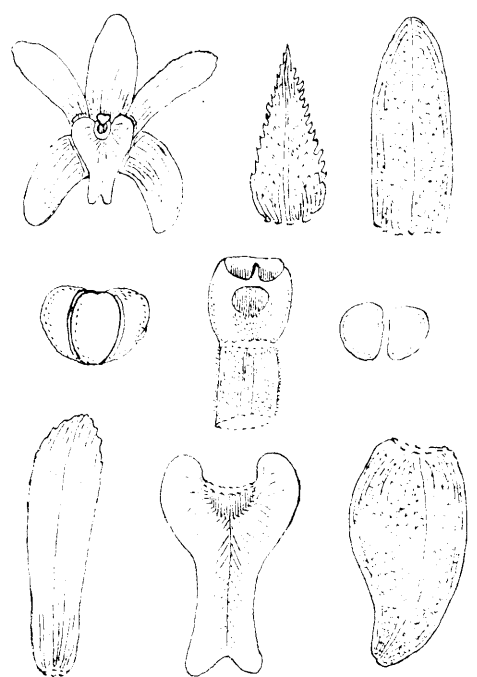
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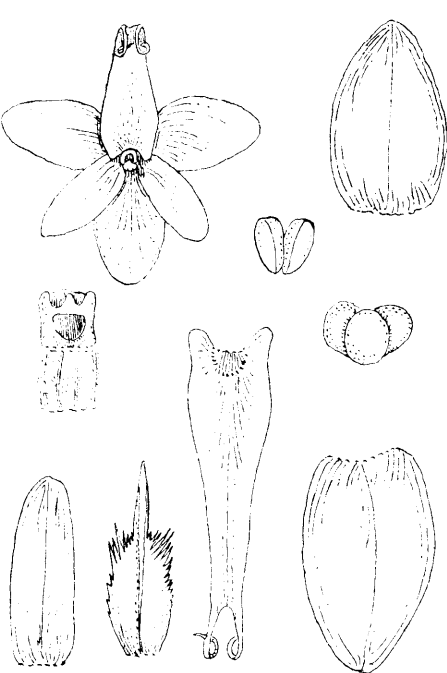
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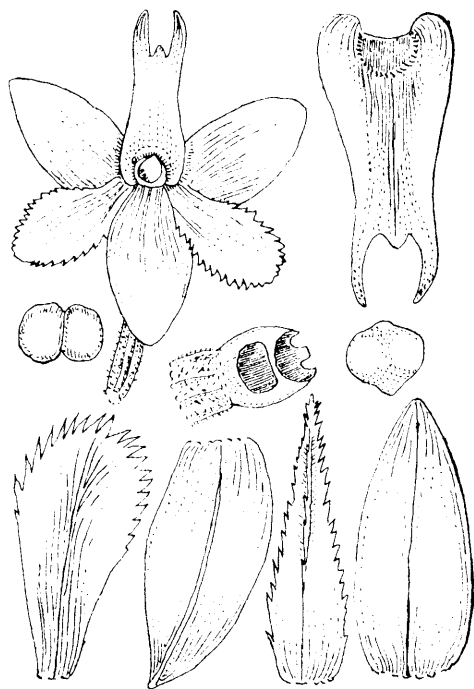
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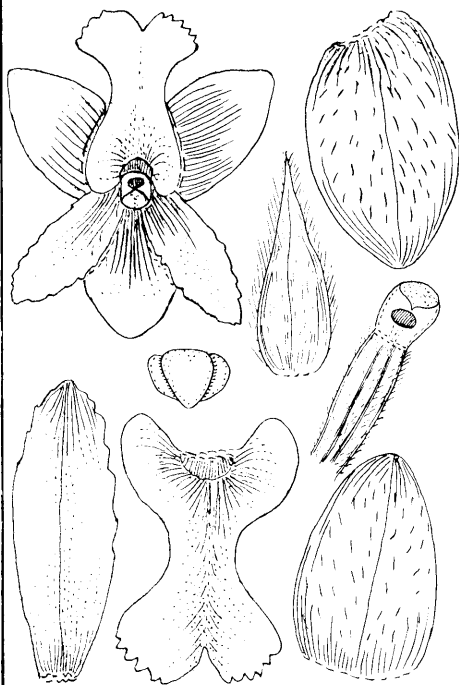
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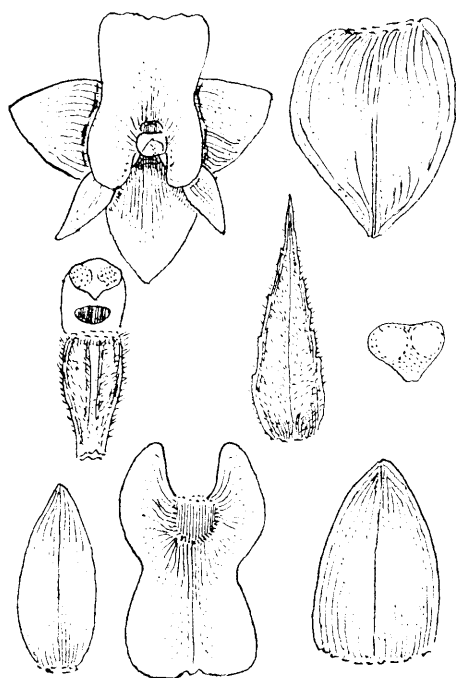
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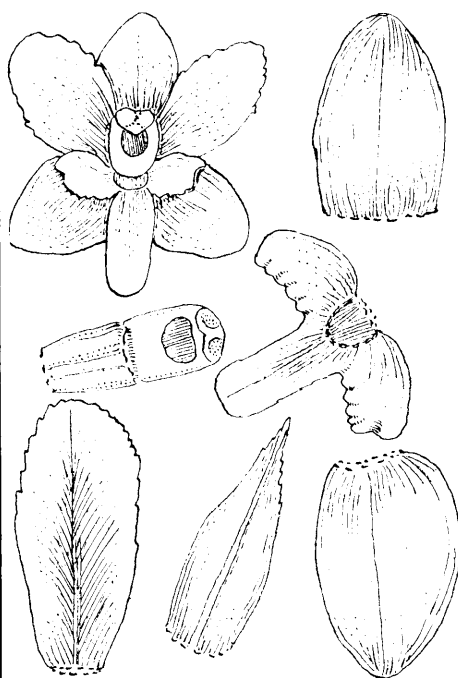
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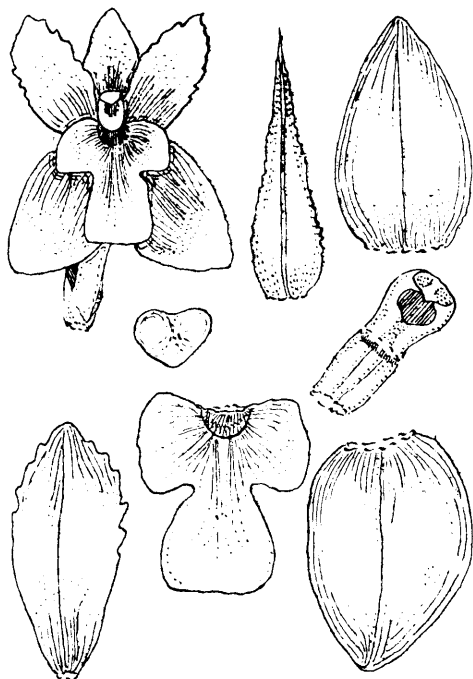
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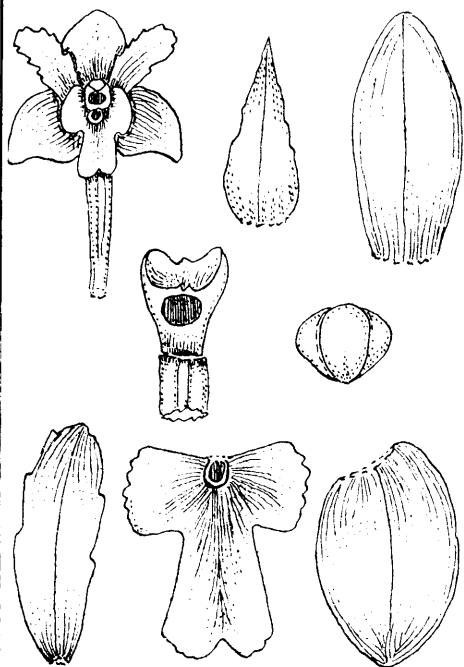
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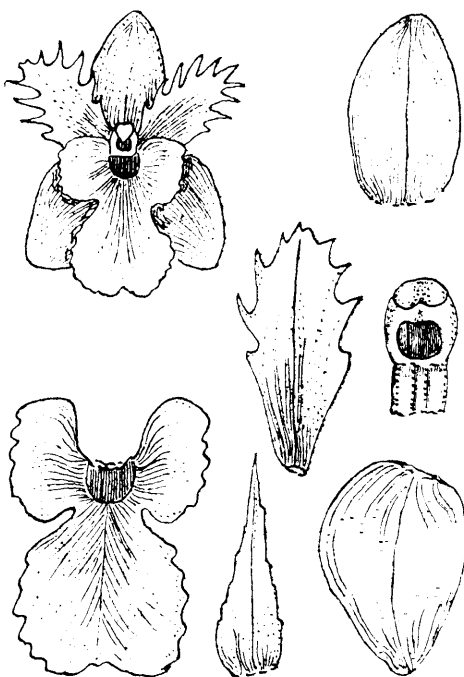
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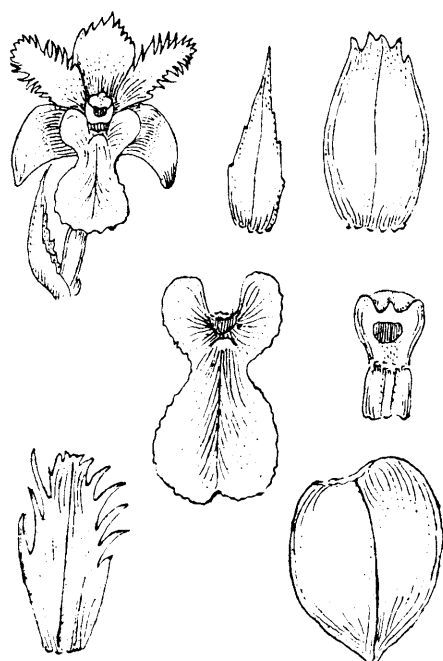
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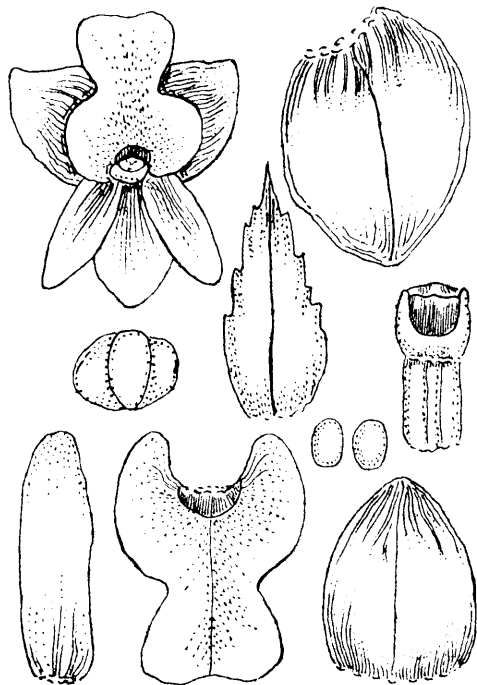
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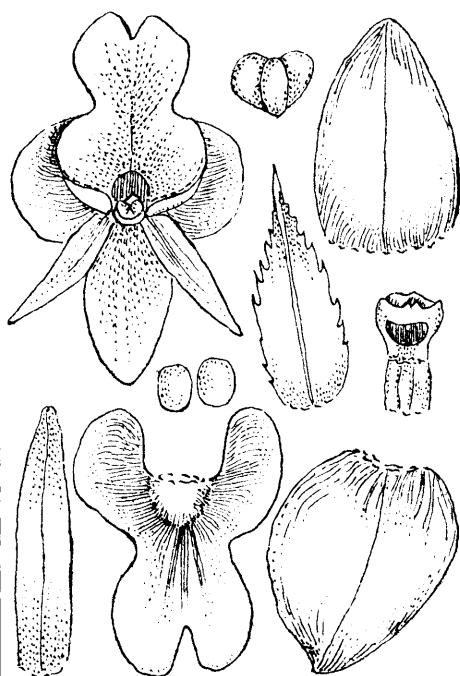
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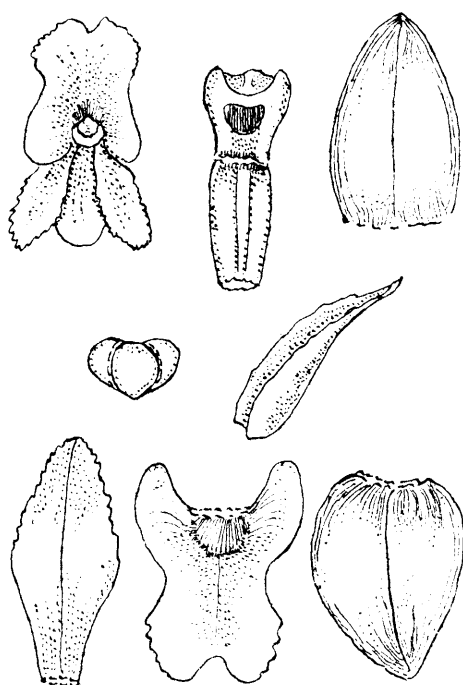
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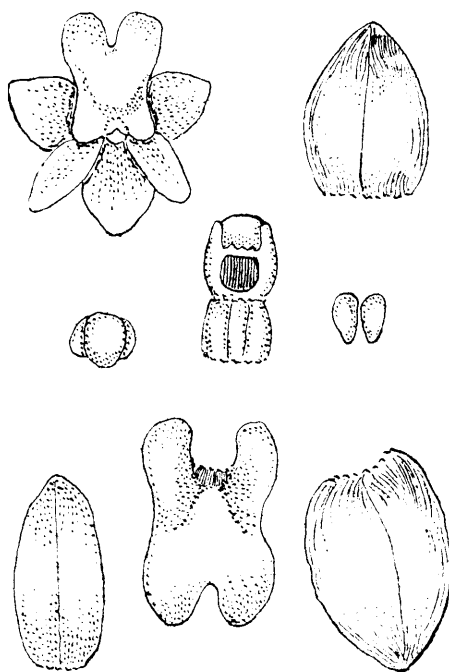
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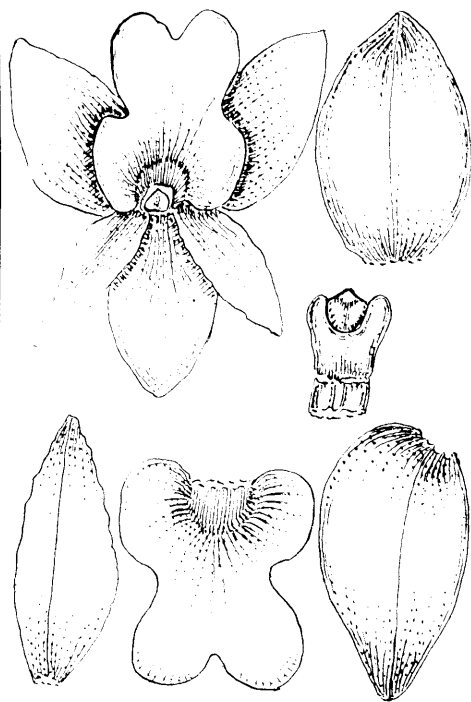
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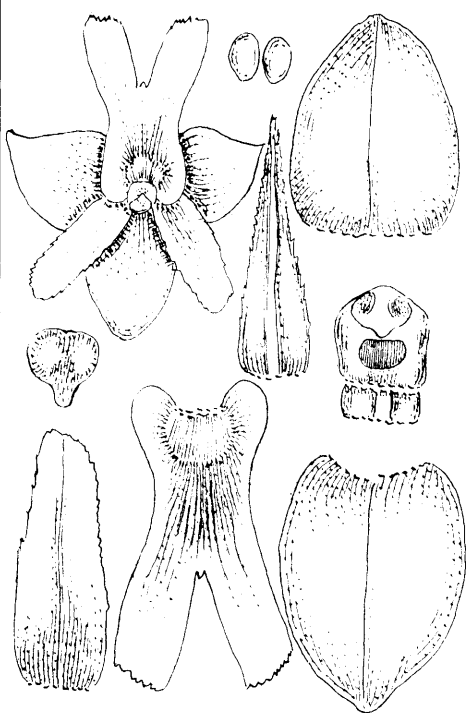
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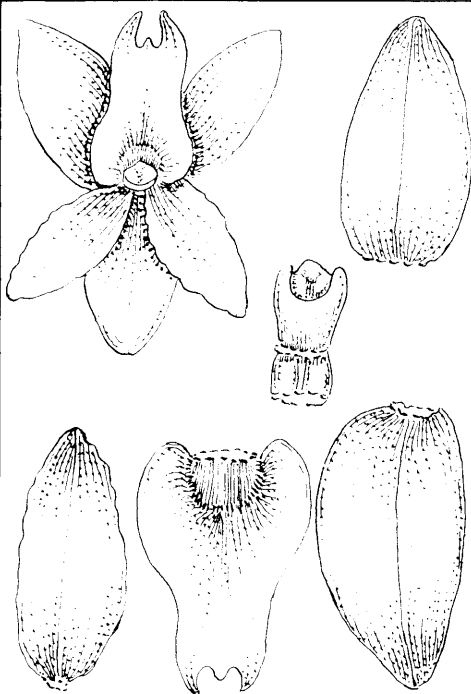
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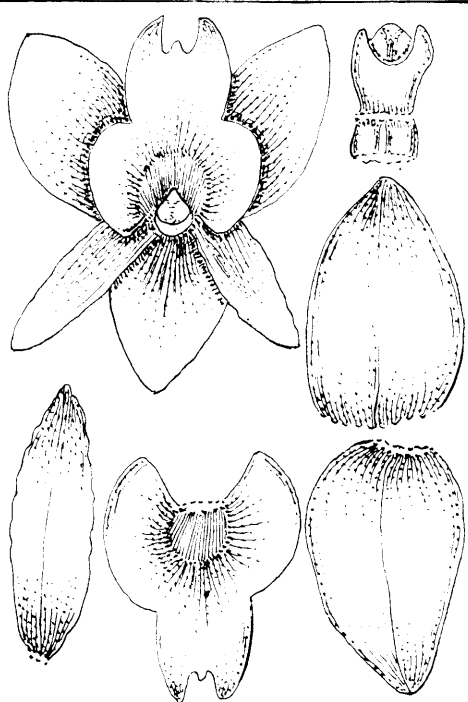
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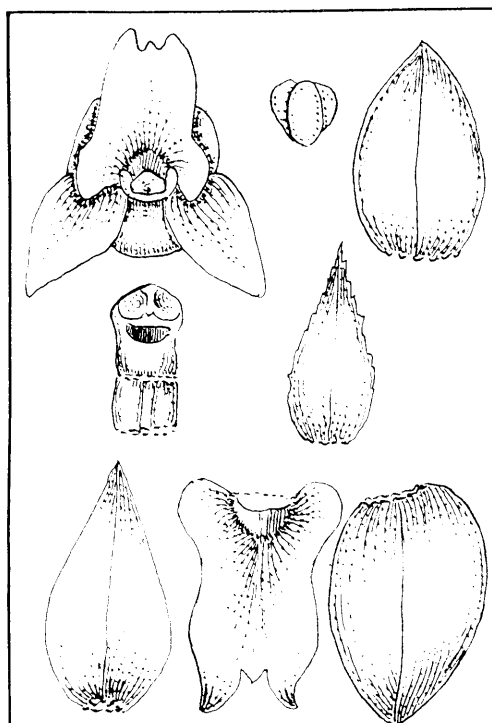
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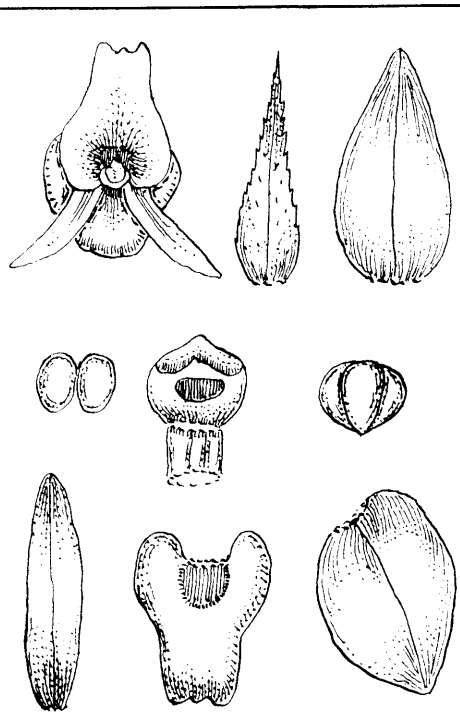
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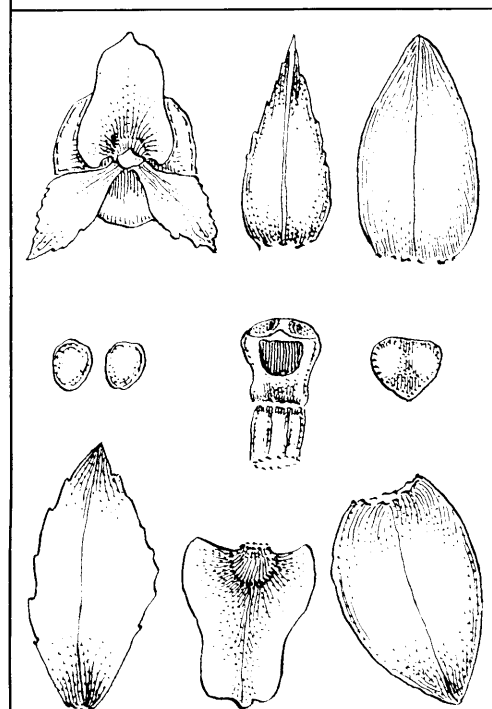
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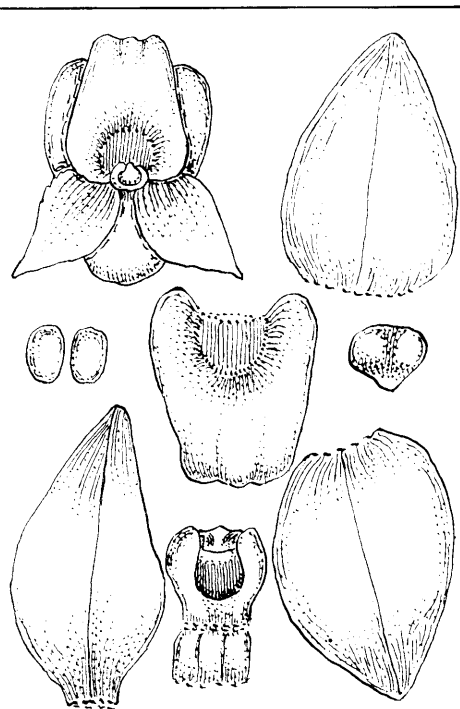
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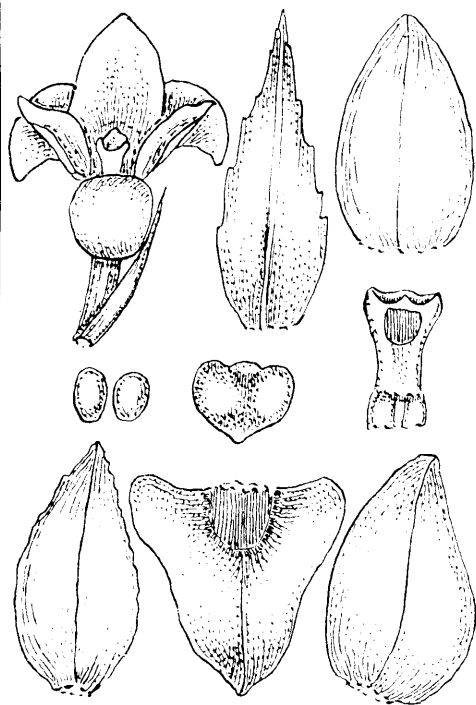
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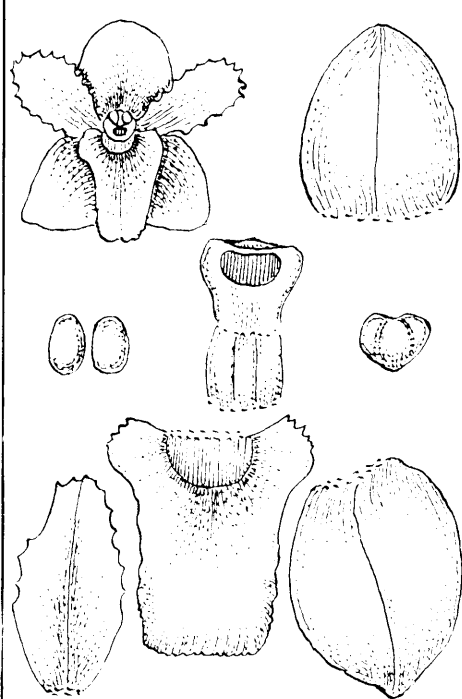
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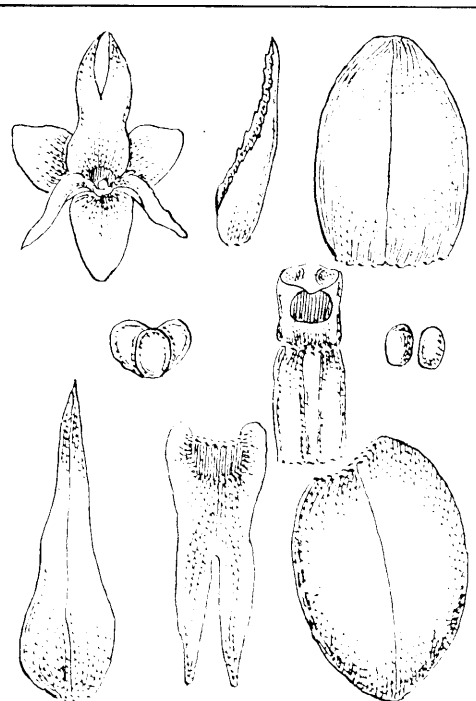
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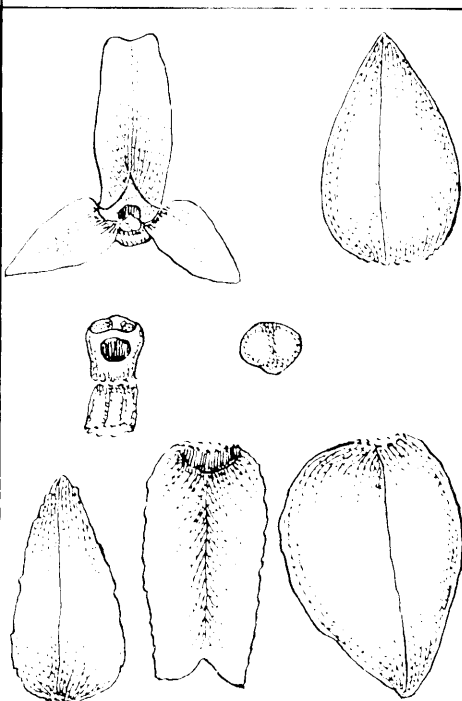
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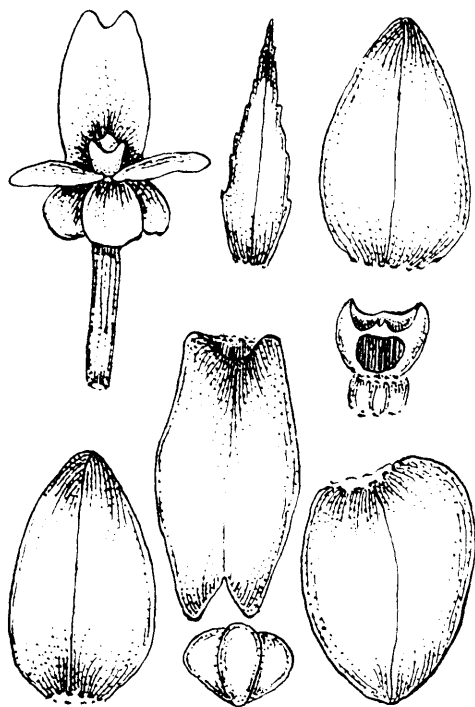
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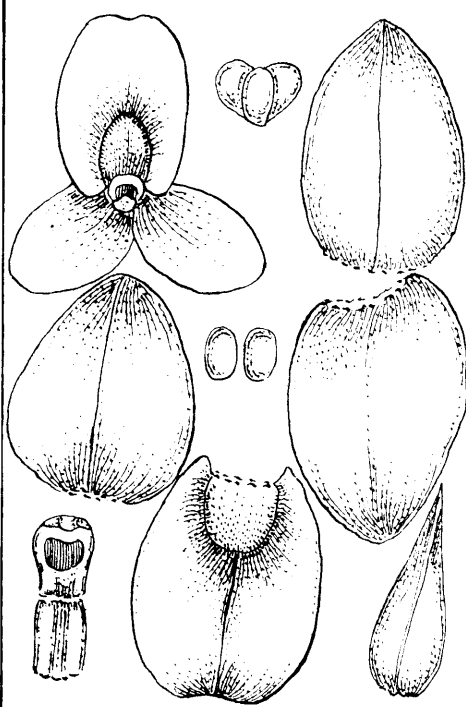
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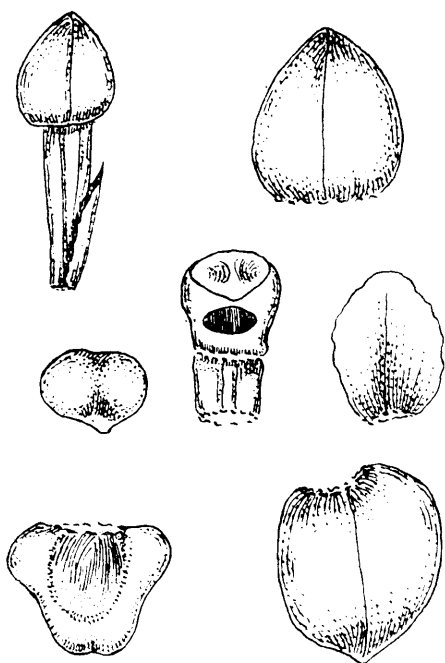
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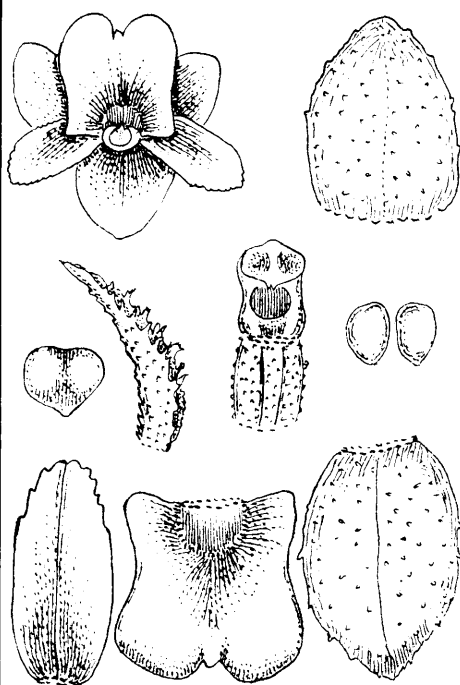
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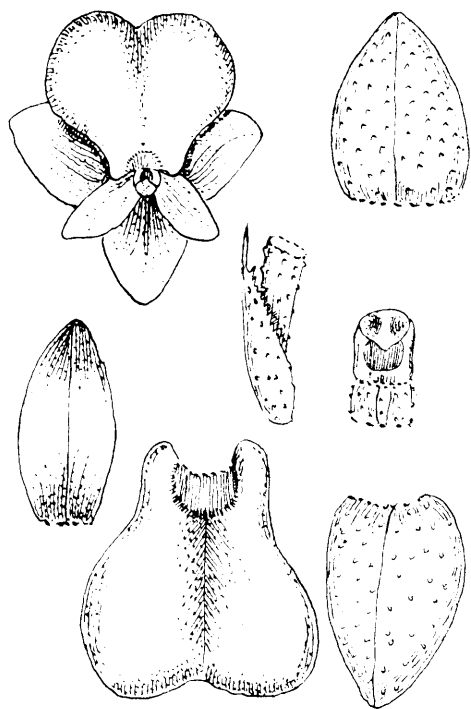
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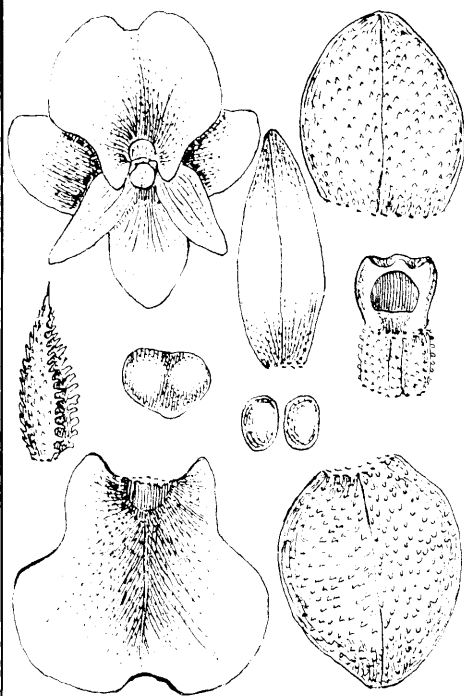
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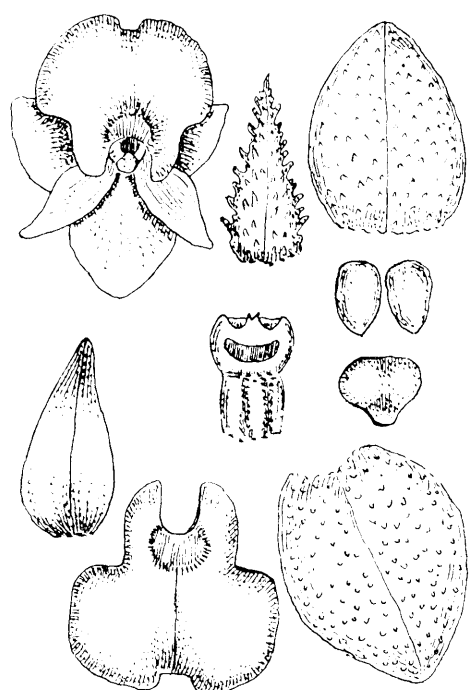
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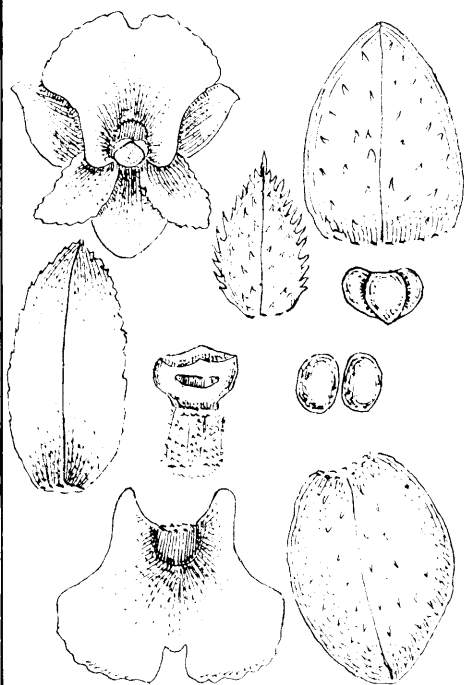
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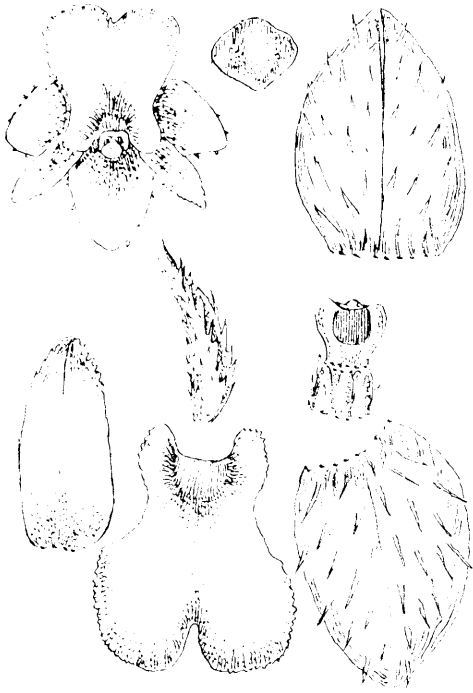
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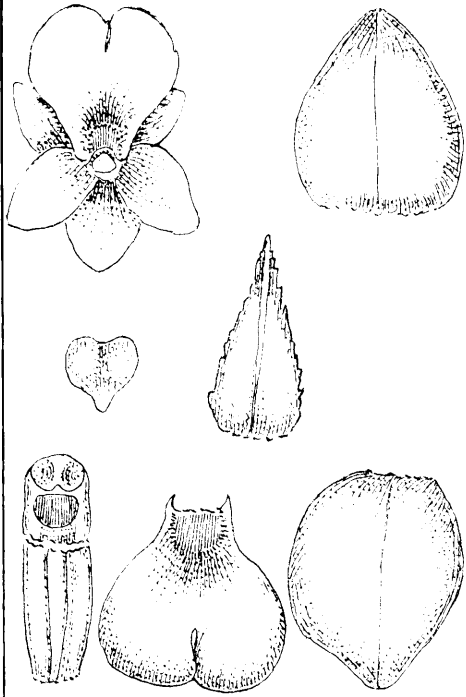
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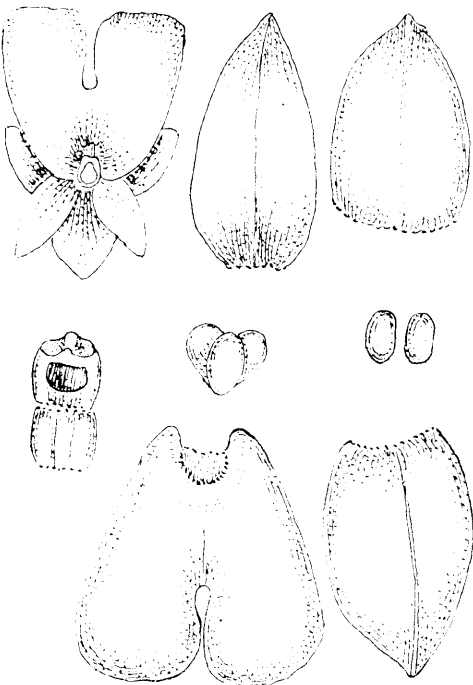
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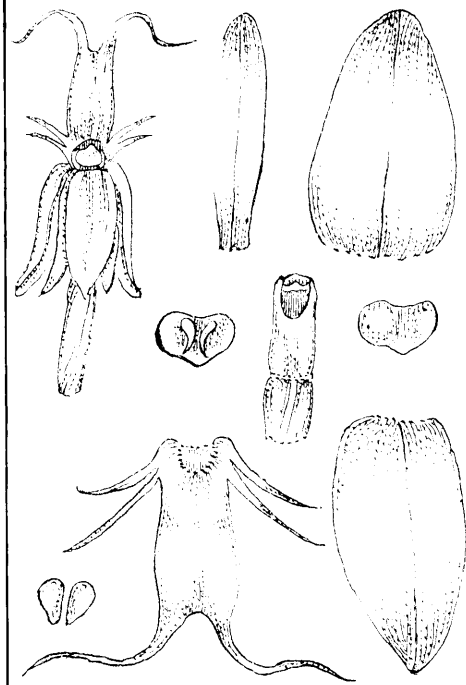
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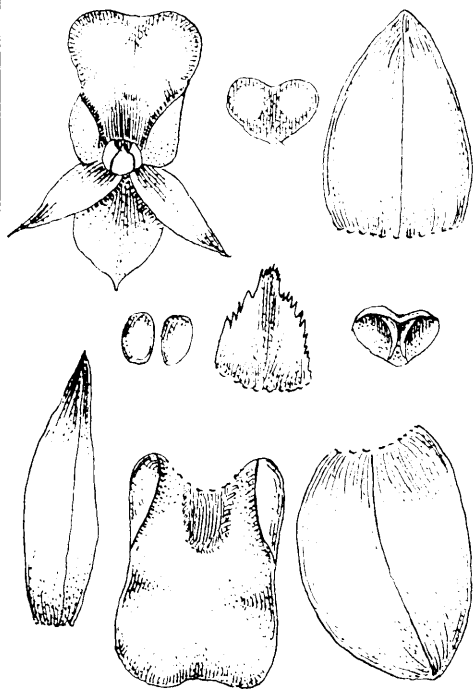
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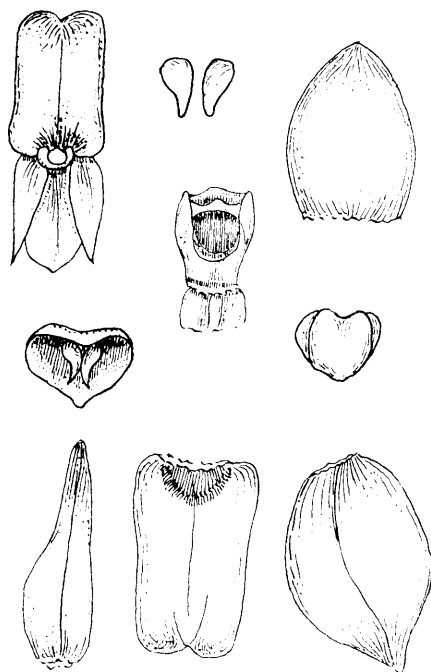
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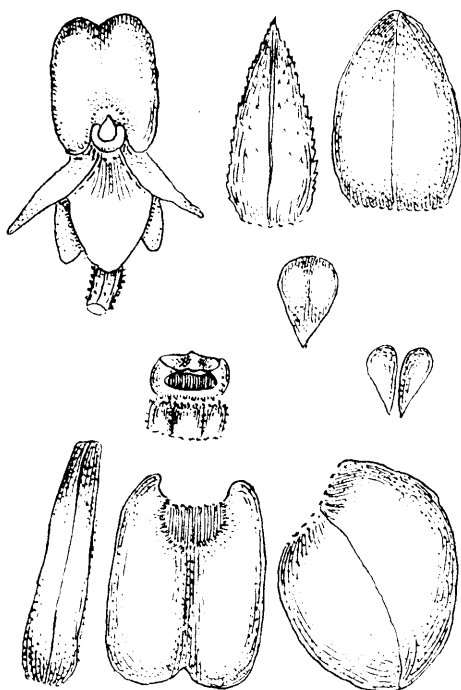
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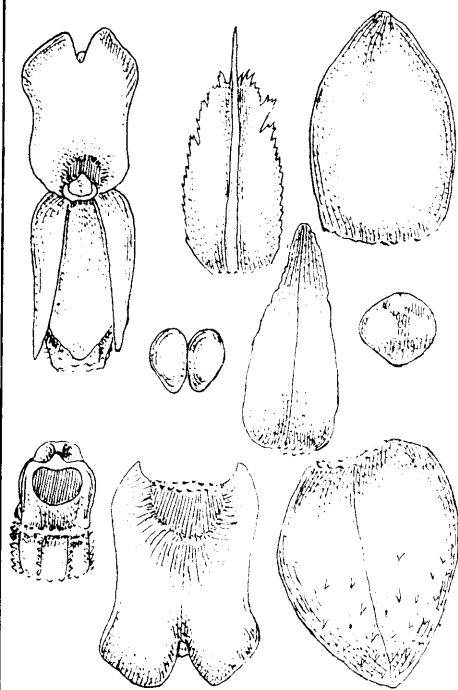
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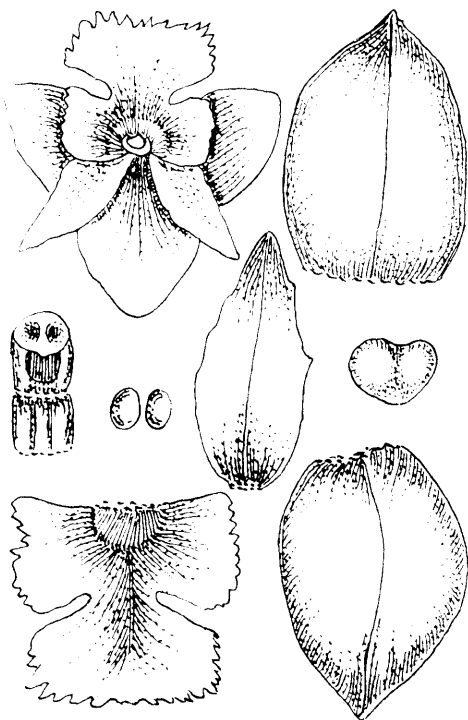
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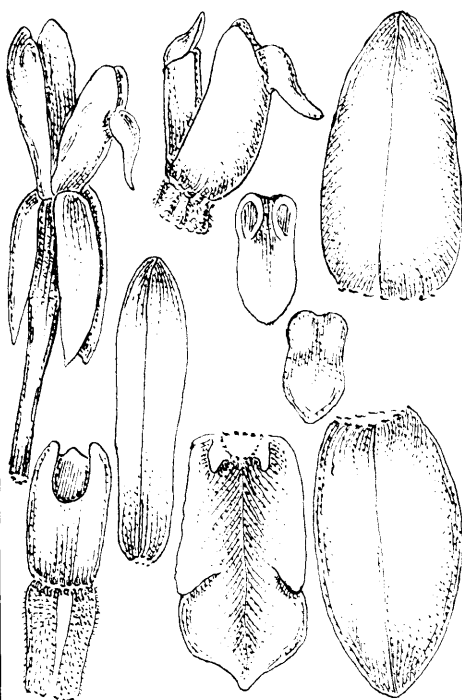
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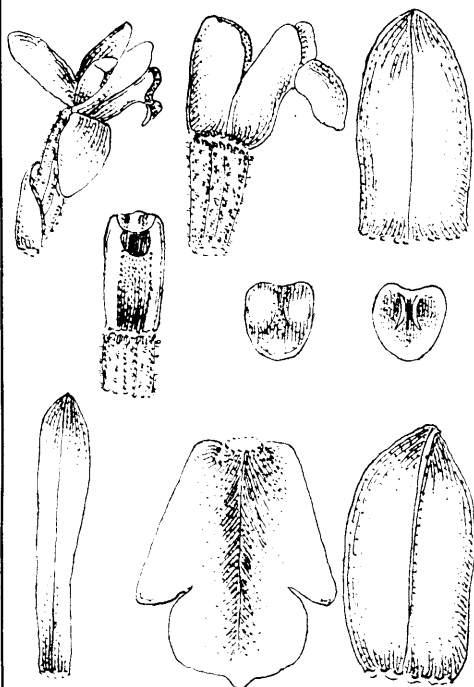
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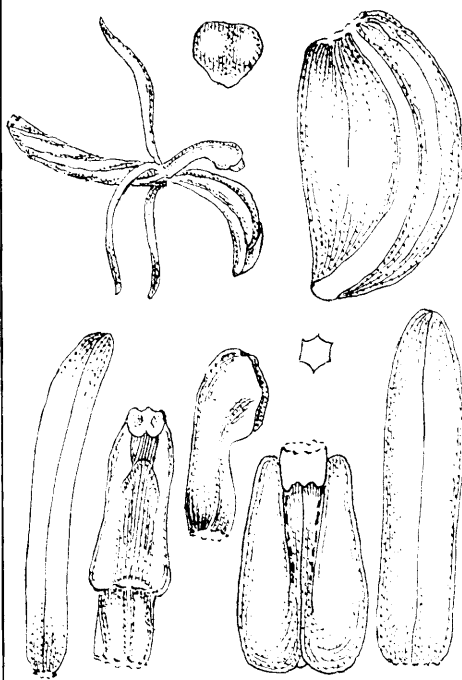
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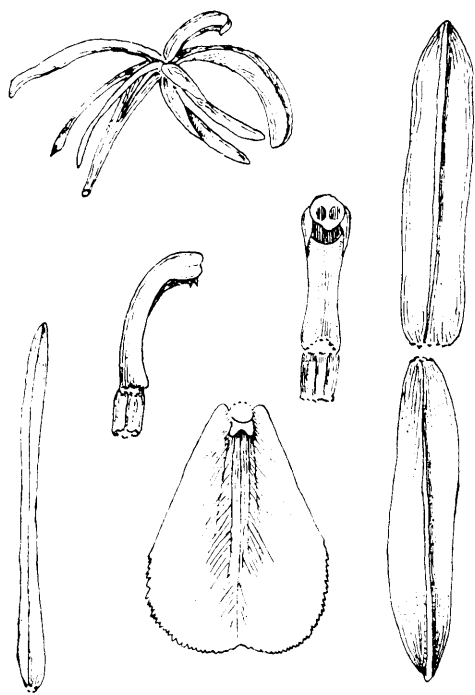
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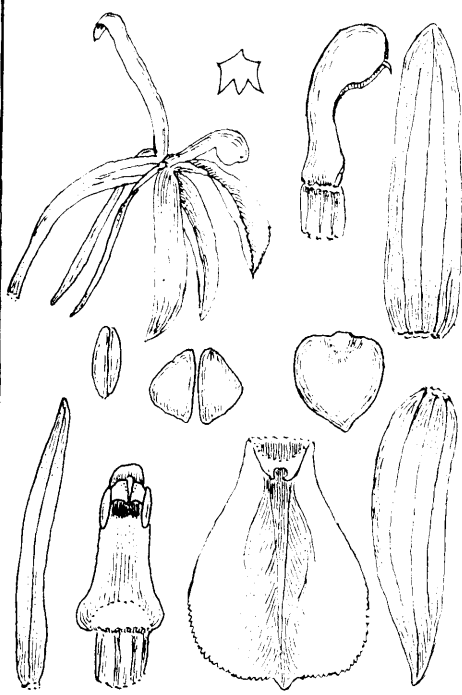
Hippeophyllum papillosum Schltr.



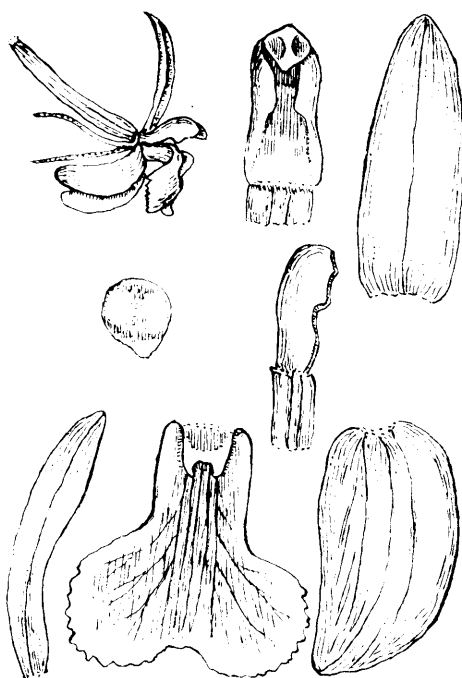
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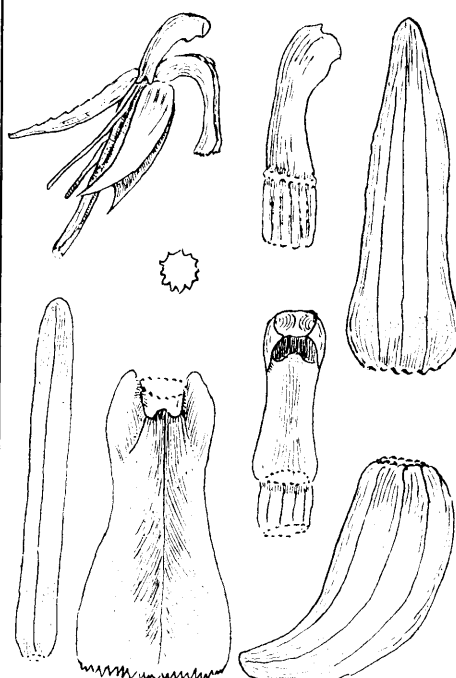
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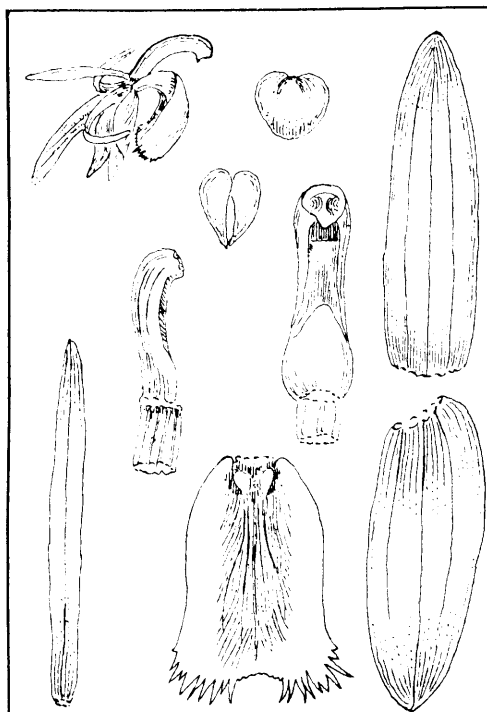
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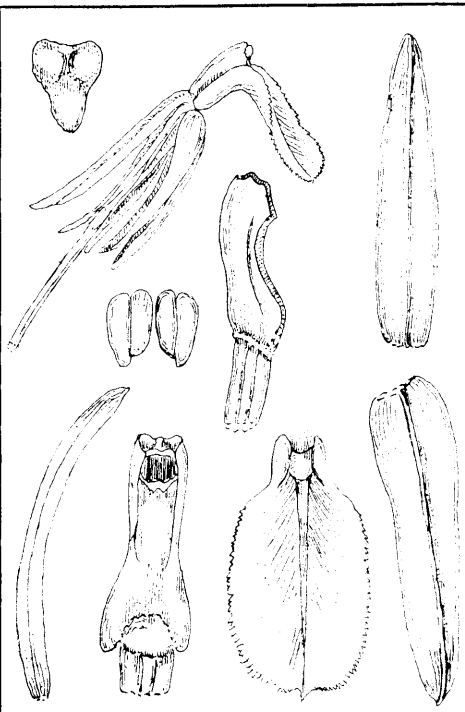
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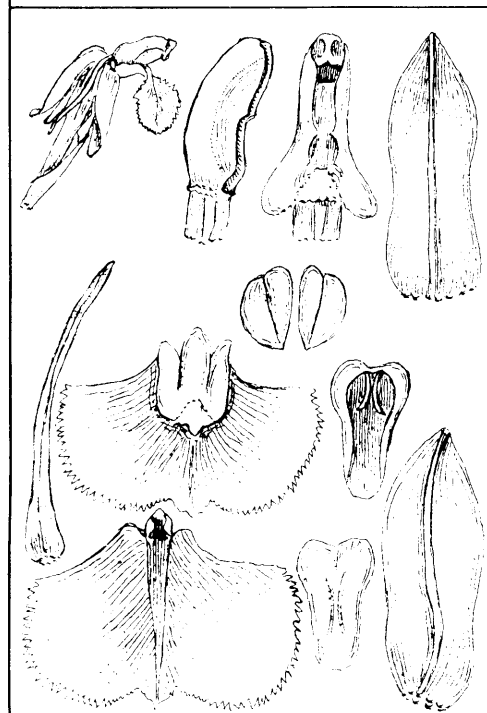
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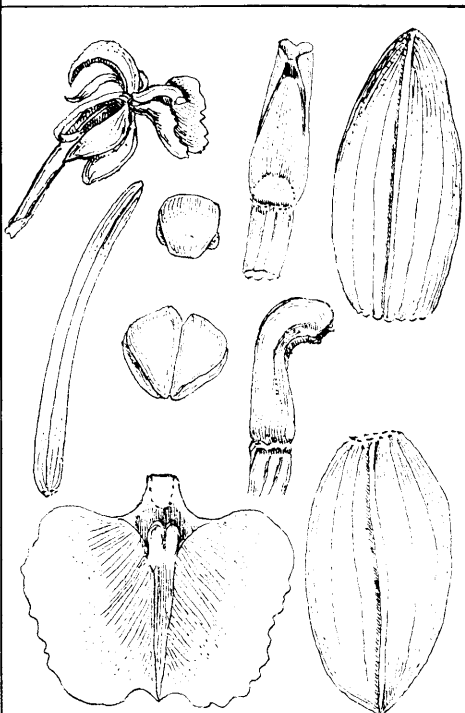
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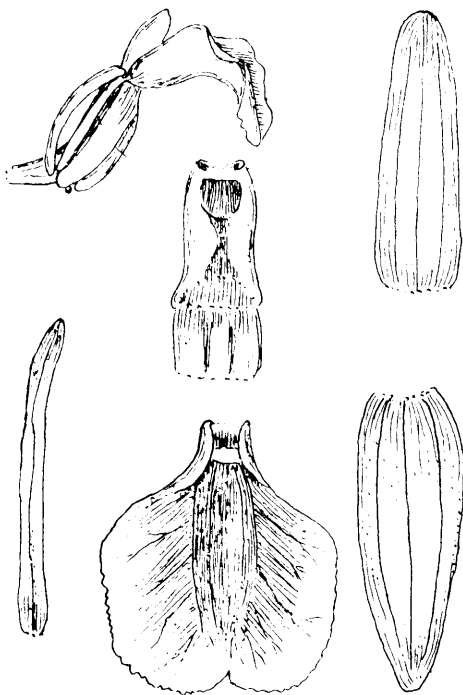
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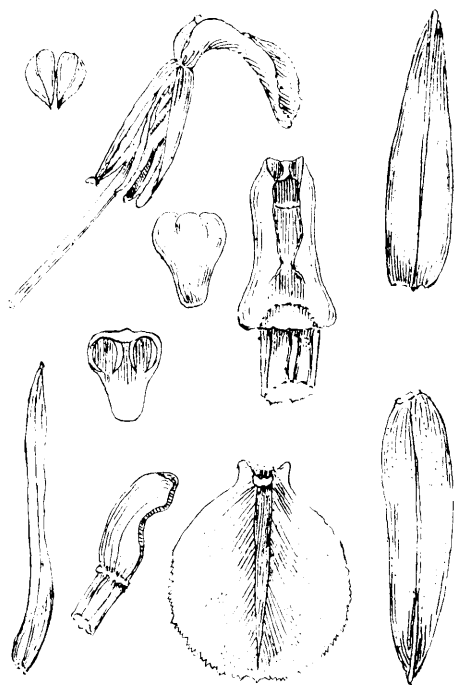
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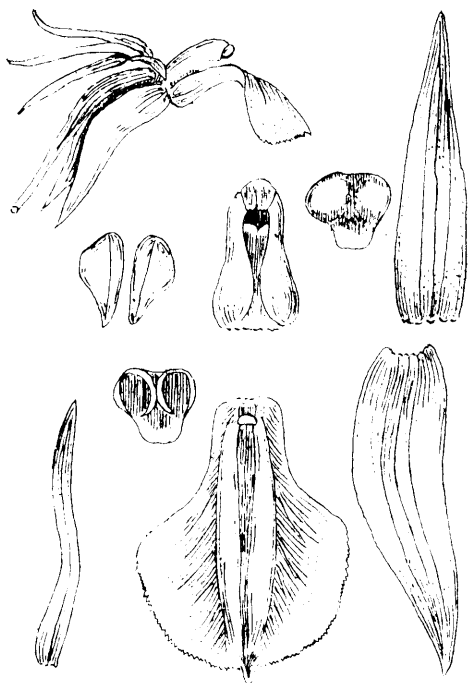
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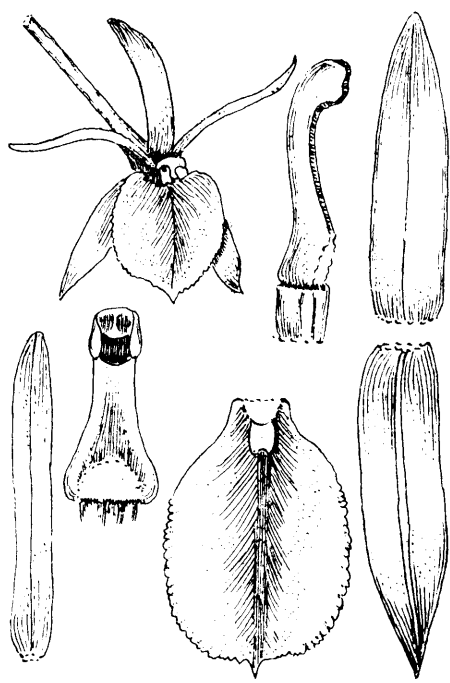
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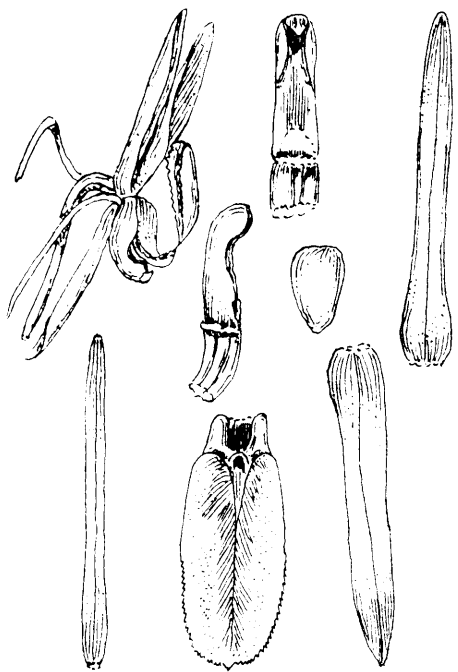
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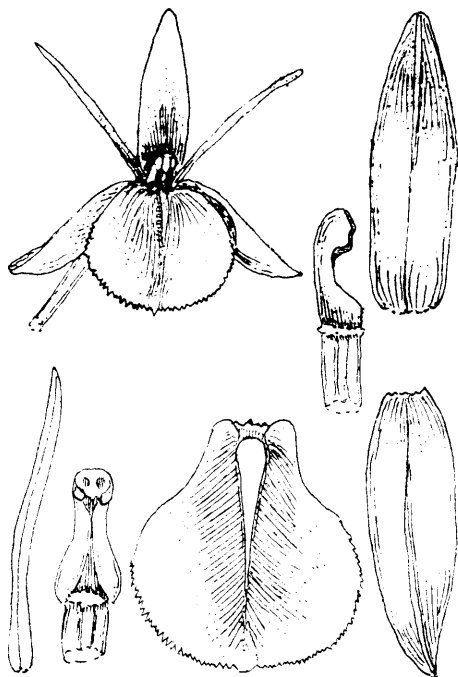
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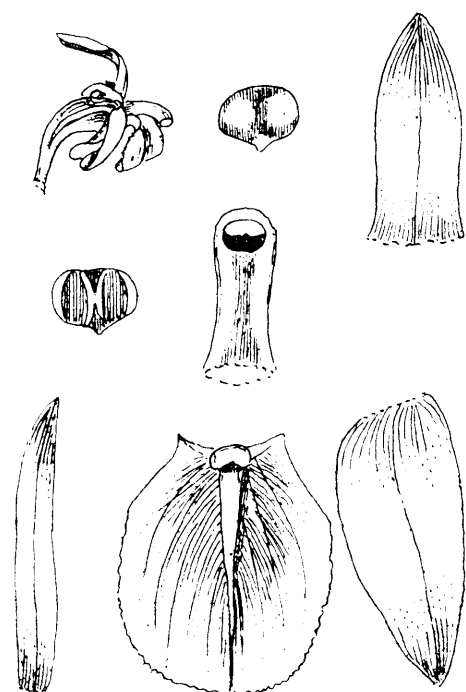
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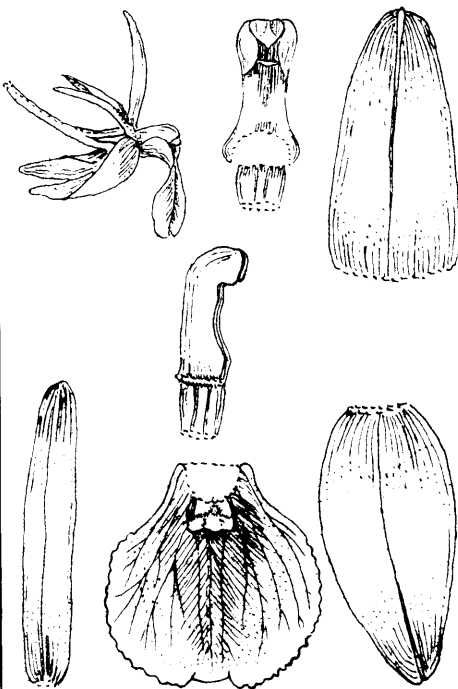
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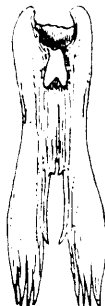
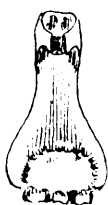
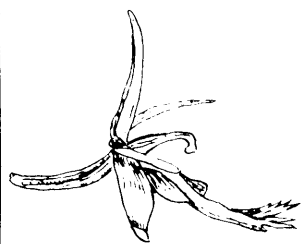
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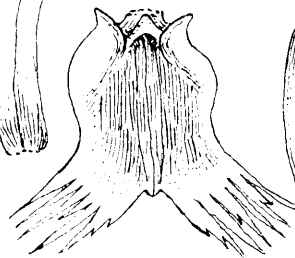
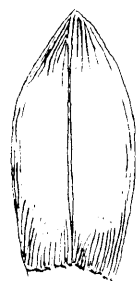
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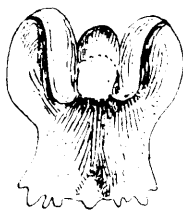
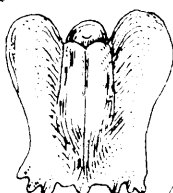
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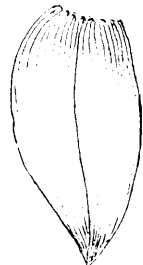
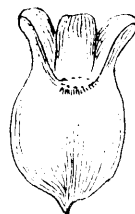
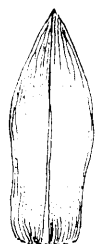
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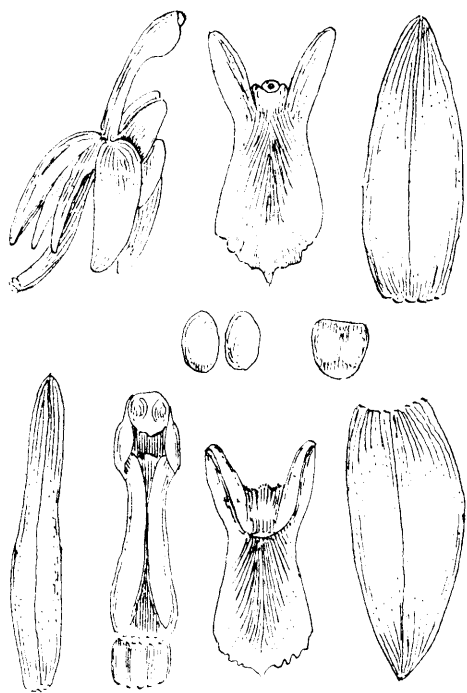
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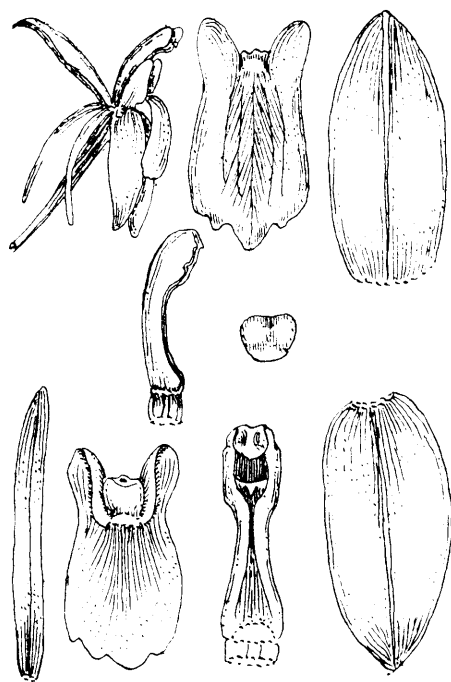
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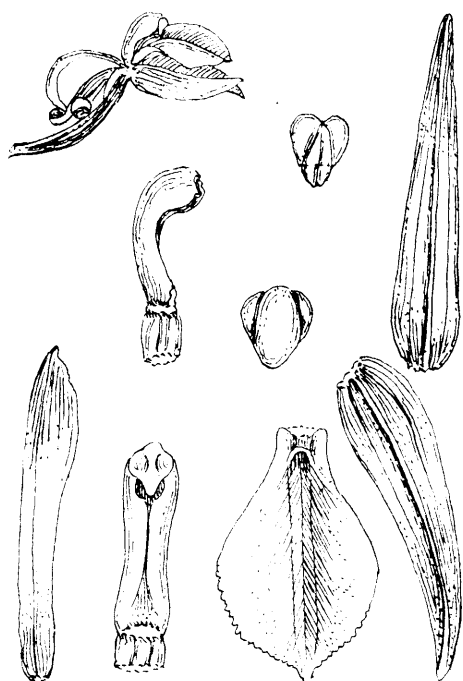
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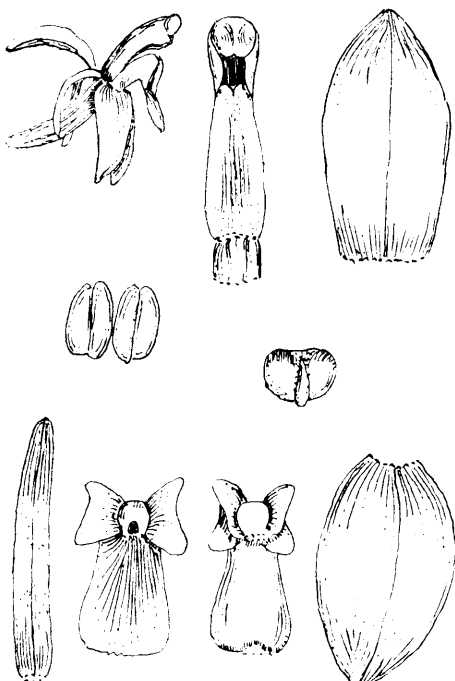
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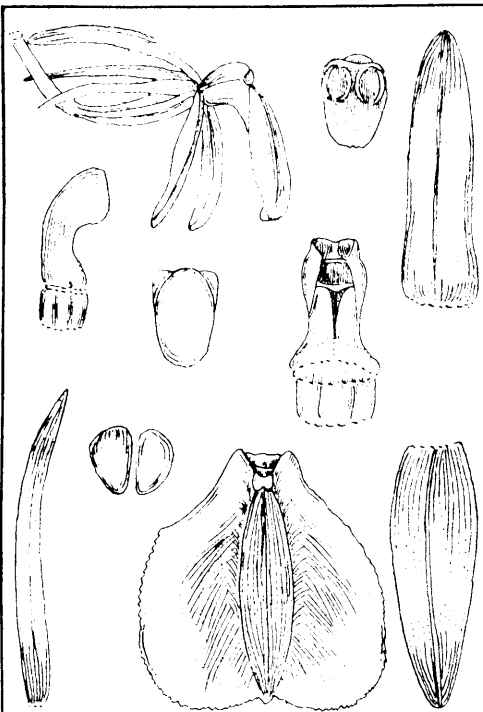
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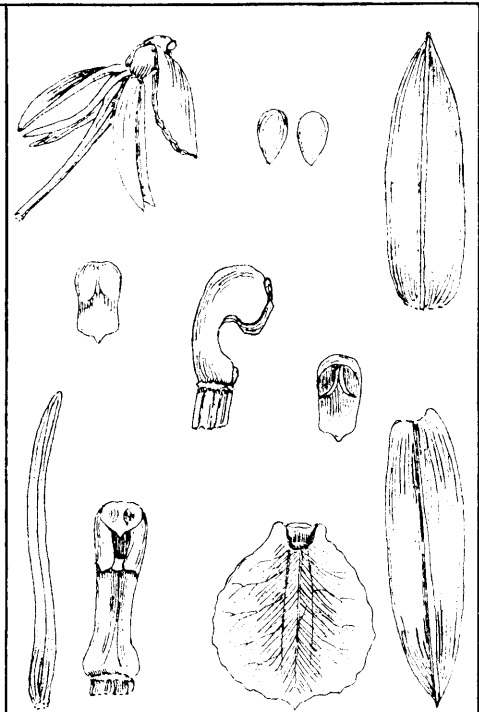
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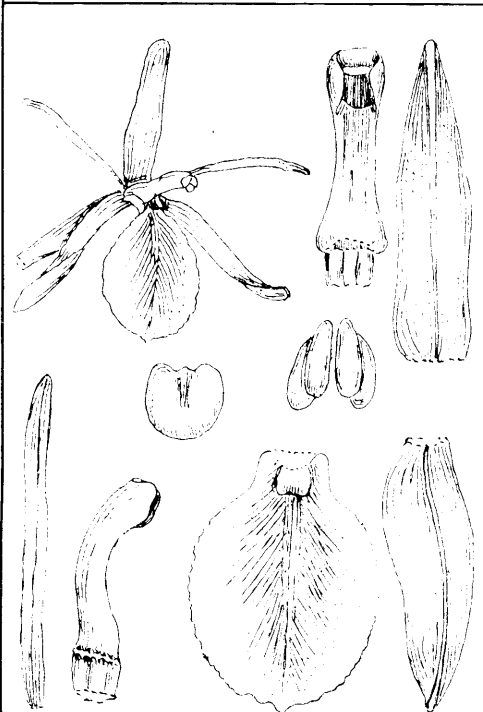
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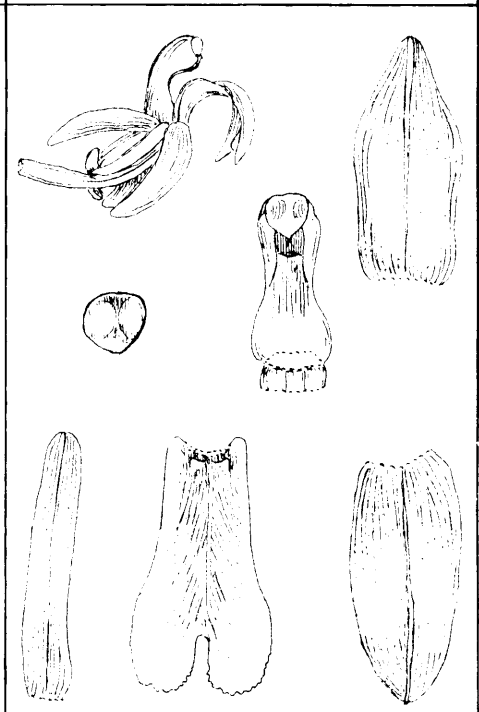
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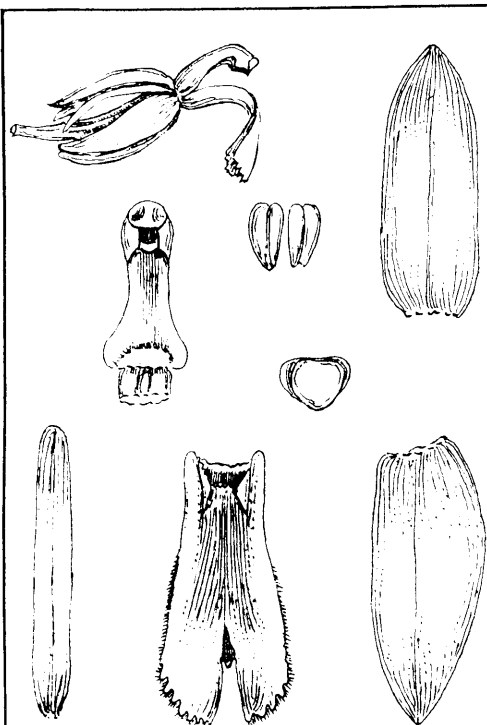
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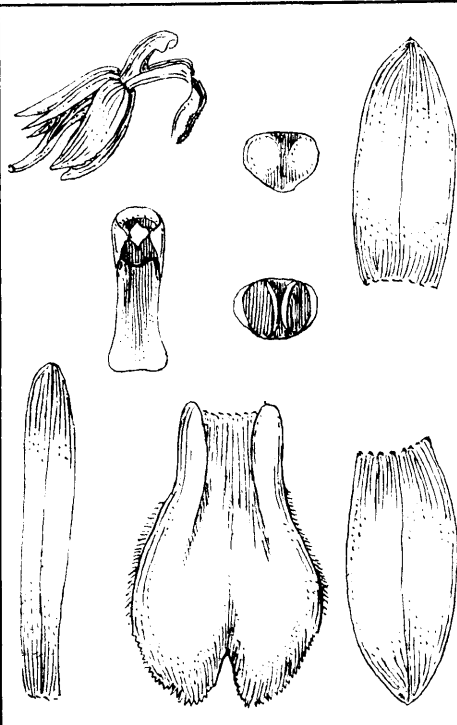
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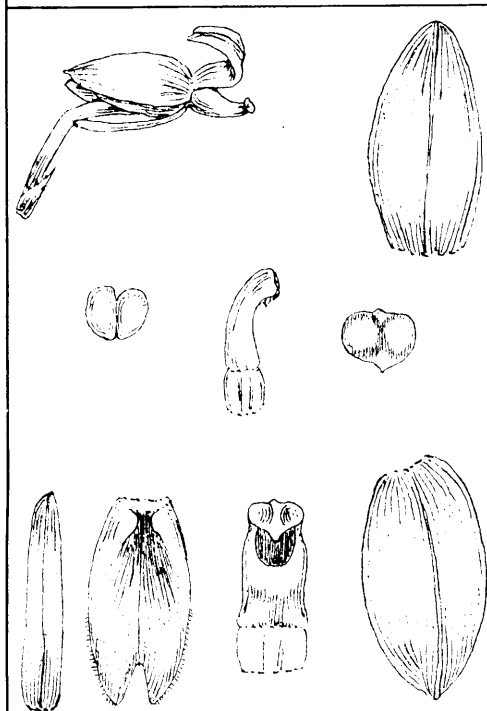
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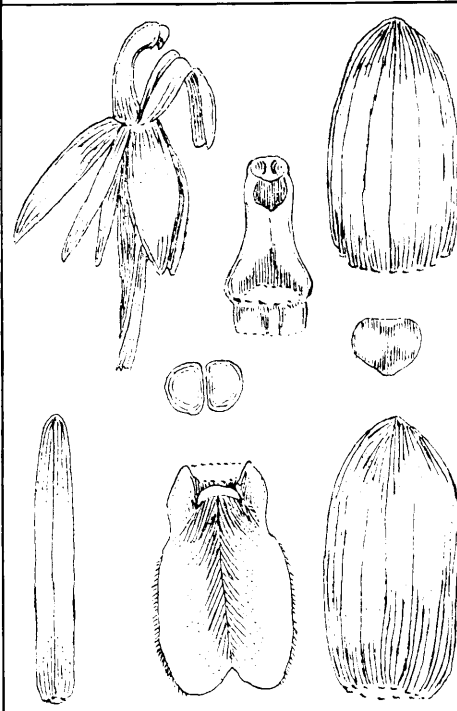
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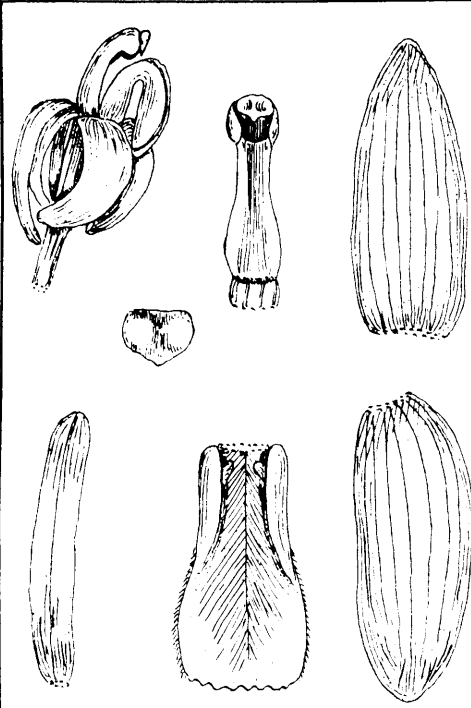
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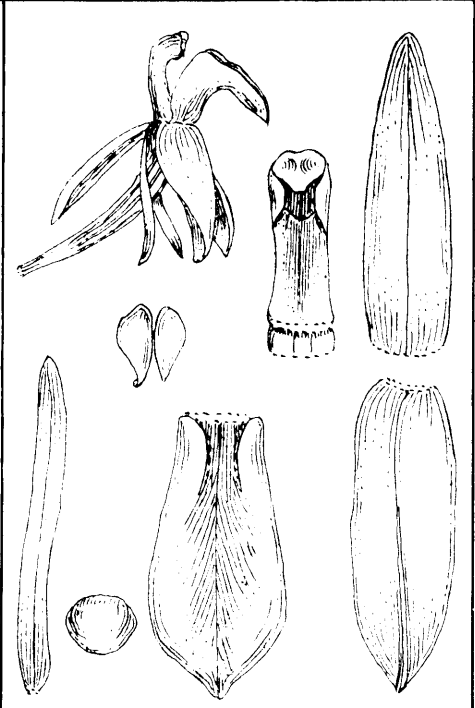
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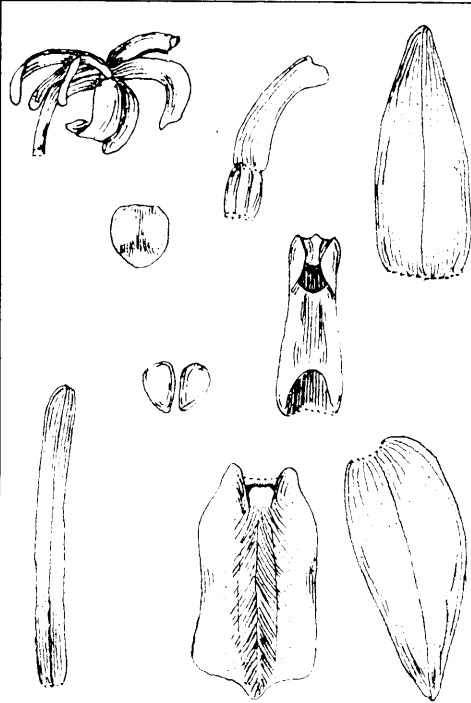
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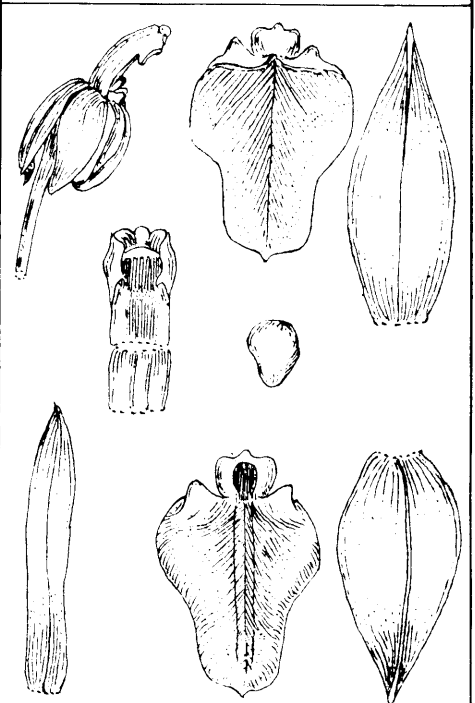
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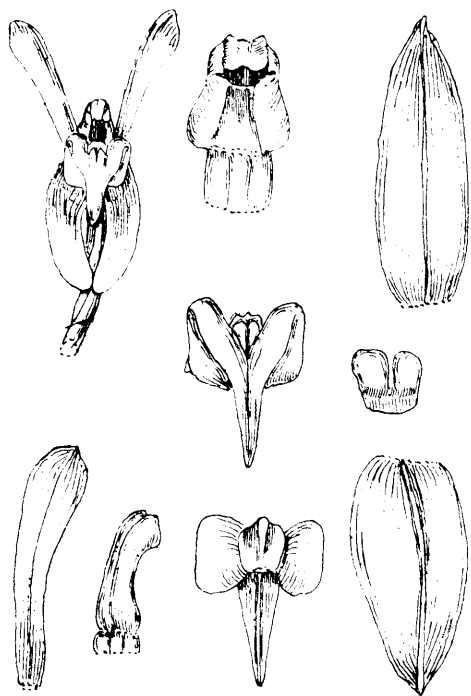
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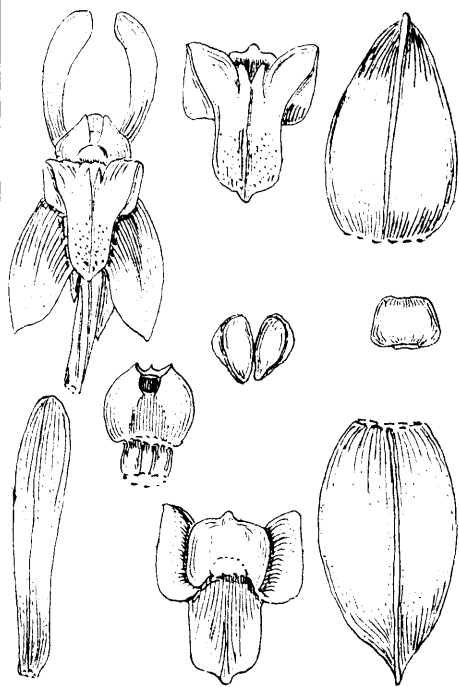
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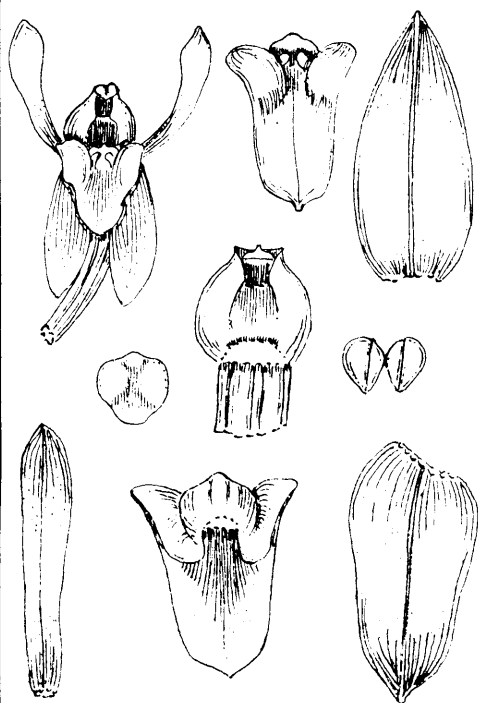
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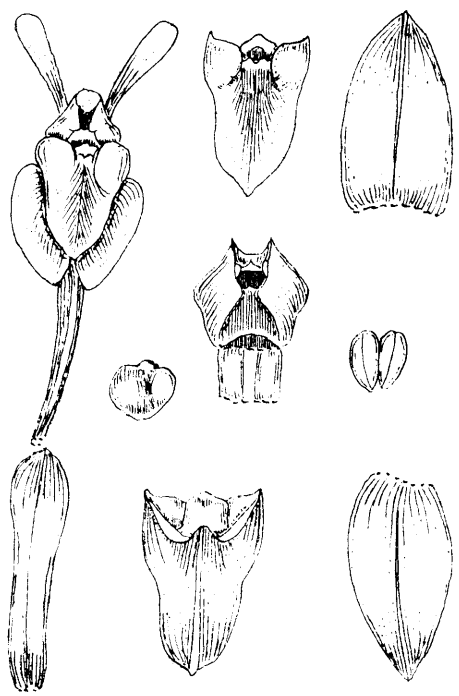
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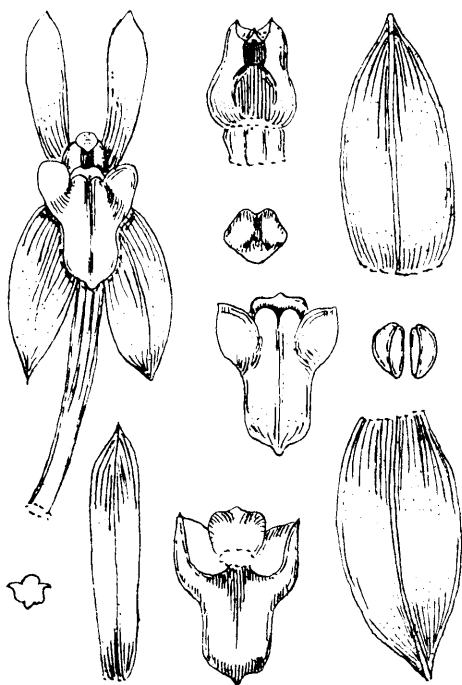
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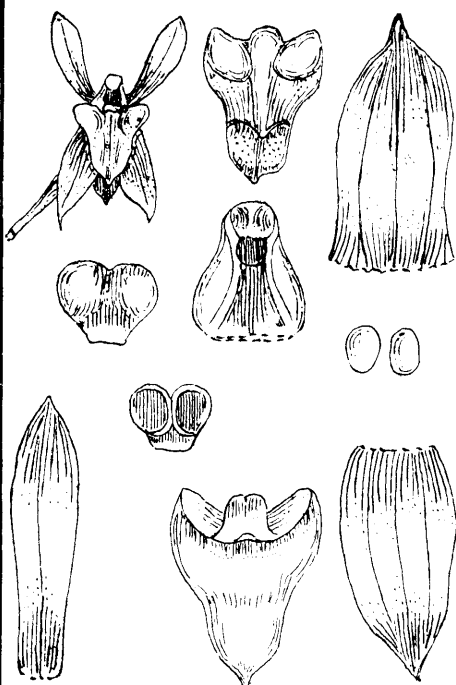
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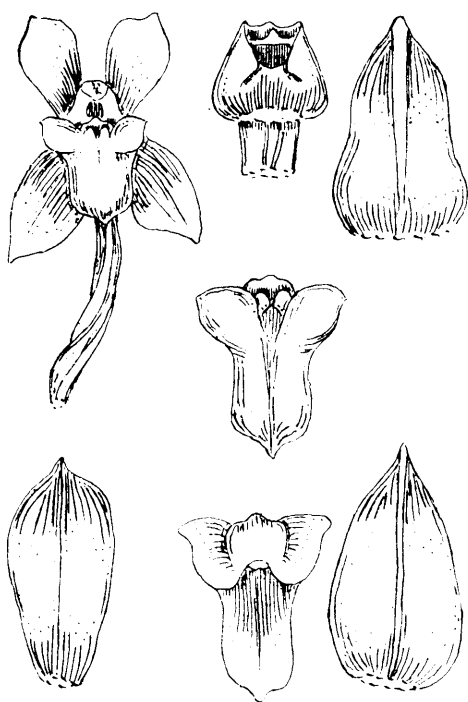
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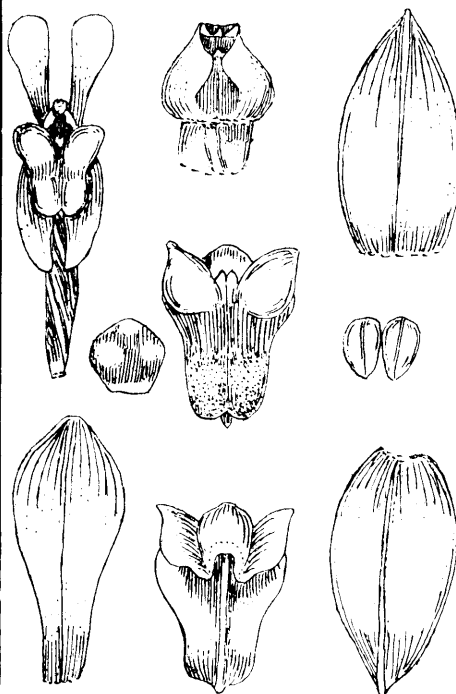
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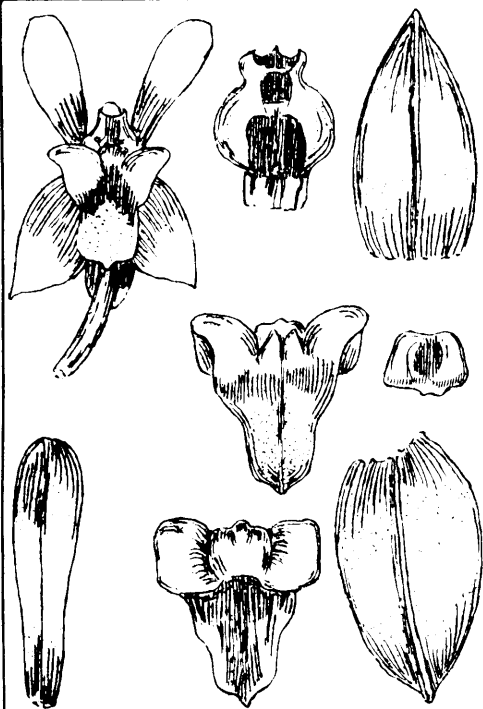
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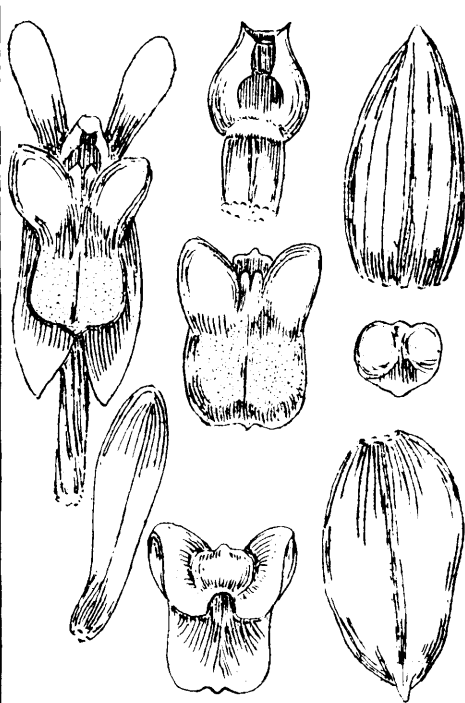
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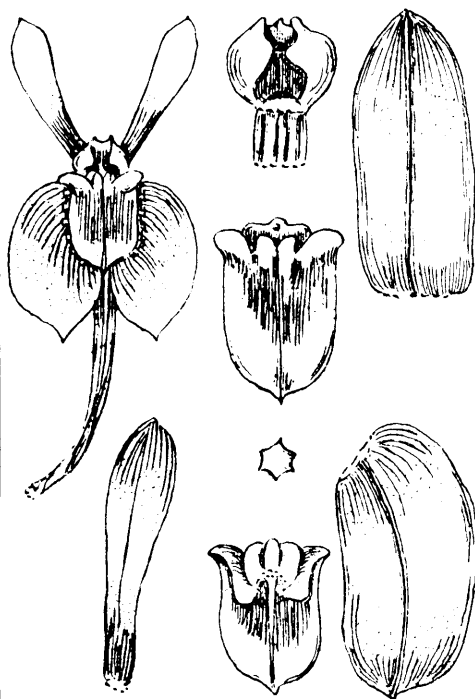
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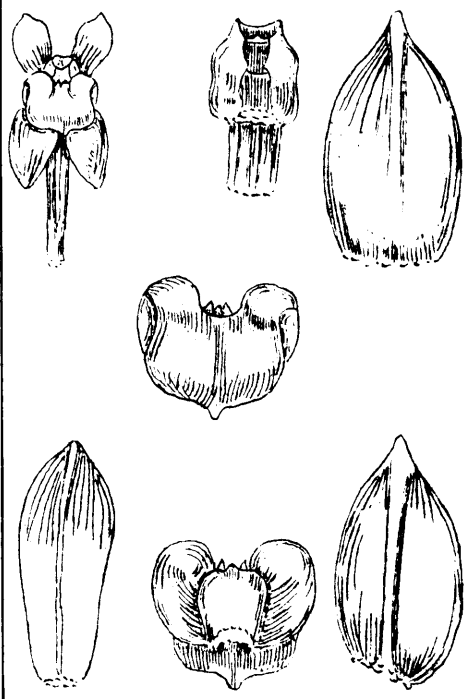
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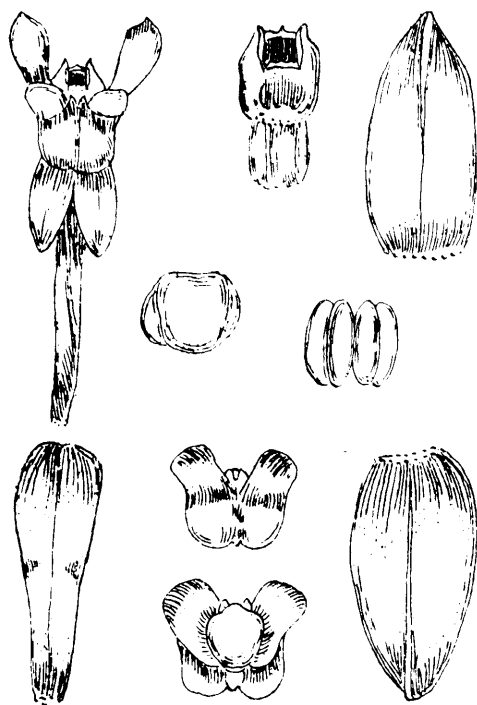
Liparis Govidjoae Schltr.



Liparis miniata Schltr.



Liparis glumacea Schltr.



Liparis lamproglossa Schltr.

Group XIV *Thuniinae*

When Pfitzer arranged this group he placed it at the beginning of those groups which I have placed together here as the sub-division *B. Kerosphaereae*. The four genera which he placed here were *Thunia* Rchb. f., *Arundina* Bl. (including *Dilochia* Lindl.), *Bletilla* Rchb. f. and *Trichosma* Lindl. Of these four genera, *Bletilla* Rchb. f., which has granular pollinia, certainly must be excluded and relegated to a relationship with *Arethusa* L. *Trichosma* Rchb. f. is also in a doubtful position and may, perhaps, be placed finally in the *Dendrobiinae*. *Claderia* Hook. f. may belong to this group, although its conspicuously folded leaves are unusual here. The group shows a certain approach to the *Polystachyinae*, but is distinguished easily by the pollinia which here have no caudicle and are usually very numerous. In this group the column evidently does not tend to develop an elongated foot as is often developed very strongly in the *Polystachyinae*.

The small group is to be considered as Indo-Malayan. The only representative now known in New Guinea is *Claderia papuana* Schltr., described here.

43. *Claderia* Hook. f.

I must candidly confess that I did not ever expect the appearance of a *Claderia* species in New Guinea, still more so since this monotypic genus has been recorded up to the present from the Peninsula of Malacca, Sumatra, and Borneo, but not from Java, which, botanically speaking, is the most thoroughly surveyed of the Sunda Islands, where the species appears to be missing.

Plant-geographically, this discovery in New Guinea is very remarkable. Later on, however, the matter became clearer to me when I was able also to establish traces of the genus in the Toli-Toli District of the Celebes, though, unfortunately, all my specimens were flowerless. It is, likewise, remarkable that the species described here, which is related closely to the western *C. viridiflora* Hook. f., is by no means rare in the eastern part of our Protectorate, though I have never seen it in the western part of the Territory. Curiously enough, in the Waria Valley, I found four other species which have a close relationship with species of the flora of the Malacca Peninsula, viz. *Zeuxine wariana* Schltr. which is related to *Z. strateumatica* (L.) Schltr., *Bromheadia pulchra* Schltr. and *B. falcifolia* Schltr. which approach *B. palustris* Lindl and *B. scirpoidea* Ridl. respectively, and, finally, a *Cirrhopetalum*, which is close to *C. psittacoides* Ridl. All these five species are known to me only from the extreme eastern part of Kaiser-Wilhelms-Land. Whether this is an accidental coincidence or not, will be decided only when the whole of my material from these regions has been dealt with. I thought it advisable, however, to emphasise here, the peculiar fact of the occurrence of five typical Malacca forms in a region where they may be least expected. It is especially remarkable that the genera *Claderia* and *Bromheadia* evidently are missing in Java.

The vegetative characters of the genus *Claderia* Hook. f. are very noticeable. The individual plants initially develop in the humus of the primary forest and require a location at the base of a tree or shrub for stronger development. They form long stolons which climb up the stems and often reach a height of 1.5 metres. I have observed frequently that the plants, when not thus supported, do not thrive and never flower. *C. papuana* Schltr. always seems to select such places where strong root-peat formation has occurred. However, in Borneo and Singapore I have found *C. viridiflora* Hook. f. mostly in leaf-soil, often even in muddy or gravelly soil.

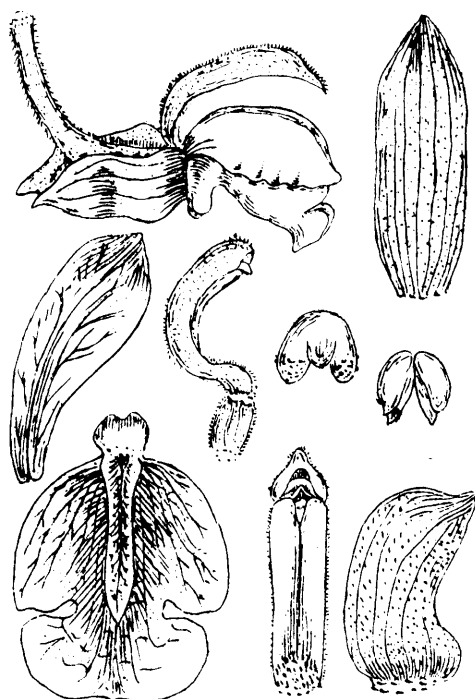
1. *C. papuana* Schltr., sp. nov.

Terrestris, longe repens, e basi interdum biramosa; rhizomate elongato, vaginis arctissime amplectentibus, obtusis oblecto, tereti, c. 0.5 cm diametiente; caulibus 10–20 cm distantibus, e basi

paucivaginata foliatis, mox conspicue attenuatis, usque ad 35 cm altis, parte apicali excepta vaginis foliorum striato-nervosis omnino obtectis; foliis 3–4 haud articulatis in parte inferiore caulis, ellipticis vel lanceolato-ellipticis, acuminatis, basin versus sensim in petiolum usque ad 10 cm longum angustatis, lamina 20–30 cm longa, medio vel infra medium 3.2–8.5 cm lata; inflorescentia demum pluri-ramosa, congesta, ad apicem caulis denudati, ramis laxe paucifloris, dense et breviter puberulis, succedaneae natis, rhachi c. 3 cm longa; bracteis patentibus, late ovalibus, obtusis, dense puberulis; floribus illis *C. viridiflorae* Hook. f. similibus, erectis vel suberectis; sepalis oblongis, subacutis, extus minute puberulis, intermedio 2.5 cm longo, lateralibus reflexis, falcato-obliquis, c. 2 cm longis; petalis falcatis, late oblongo-spathulatis, obtusis, glabris, 2.2 cm longis, supra medium 0.8 cm latis; labello circuitu subquadrato, supra medium trilobo, 1.5 cm longo, inter apices loborum lateralium 1.9 cm lato, lobis lateralibus triangulis, obtusis, antice truncato-abbreviatis, intermedio e isthmo brevi perlate reniformi, antice retuso cum apiculo minuto, 0.7 cm longo, supra basin 1.4 cm lato, carina duplici, antice conjuncta, acuta, puberula e basi labelli usque in basin lobi intermedii decurrente, sacco brevi, globoso, apice bilobulato, glabro, c. 0.4 cm longo; columna gracili, arcuata, semitereti, extus puberula, basi facie pulvino puberulo donata, c. 1.5 cm longa, clinandrio dorso in lobum triangulum obtusum producto; anthera reniformi-cucullata, antice profundius bilobulata et verruculis sparsis donata; pollinibus inaequimagnis in corpuscula 2 oblique ovoidea coalitis; ovario cylindrico, dense et breviter puberulo, cum pedicello brevi c. 2.5 cm longo.

Kaiser-Wilhelms-Land: In the hill-forests near Unu, on the Waria [River], alt. c. 170 m—R. Schlechter no. 17375, fruiting in Mar. 1908; in the mountain forests near Jaduna, on the Waria [River] alt. c. 250 m—R. Schlechter no. 19266, flowering and fruiting in Apr., 1909.

This species is related closely to the sole species, *C. viridiflora* Hook. f., known at present, but in its much broader petals, as well as in its different, broad labellum and its much bent column, possesses characters which justify its separation. The flowers are greenish white with green veins and a brownish white labellum with olive-green veins and pure white keels.

GROUP XIV *Thuniinae*

Claderia papuana Schltr.

Group XV *Glomerinae*

Few could have dared to surmise that this group could have developed to such an extent as has been the case in New Guinea. Only recently it numbered barely 50 species, but owing to the exploration of New Guinea it has increased suddenly to about 200 and it may be asserted safely that at least another 50 may still be expected from there. It is really astonishing what interesting forms have developed in our Territory and especially what a variety of vegetative characteristics has been established, especially in the large genera such as *Ceratostylis* Bl., *Agrostophyllum* Bl., *Glomera* Bl. and *Glossorhyncha* Ridl.

The floral characteristics evidently have not developed on parallel lines with the vegetative ones. For instance, the differences between species of genera such as *Mediocalcar* J.J. Sm., *Epiblastus* Schltr., *Ceratostylis* Bl. and *Glossorhyncha* Ridl., are very slight as regards the flowers; but very considerable in the vegetative characters. It may thus happen that the development of the species in one group occurs on the vegetative side, but in another group differentiation occurs by transformation and development of the floral organs. This results in the necessity of assessing the value of the individual characteristics quite differently in the different groups or genera; indeed sometimes within sections.

Pfitzer has later added to this group (which he had previously quite naturally circumscribed) a few really doubtful genera, which certainly do not belong here, viz. *Adrorhizon* Hook. f., *Josephia* Wight and *Callostylis* Bl. Of these, the first two are better classed as *Adrorhizinae*, related to the *Coelogykinae*. The inflorescence is pseudolateral in these two genera and the flower reminds one very much of *Coelogykinae*, from which they are separated by their habit. *Callostylis* Bl. is an *Eria*, which could be recognised eventually as a genus in *Dendrobiinae*. *Cryptochilus* Wall., which was occasionally placed by Pfitzer in the *Glomerinae*, may be better placed in *Dendrobiinae*, where it could be placed next to *Porpax* Lindl., on account of the peculiar hairiness of the flowers. *Ritaia* King et Pantl. is a *Ceratostylis* species. Besides the genera treated here, only one is left which has not been recorded from New Guinea, viz. *Earina* Lindl., which appears to be restricted to the islands of the Pacific Ocean.

The area of distribution of the *Glomerinae* extends from the Comoro Islands, where *Agrostophyllum* occurs as the most western representative of the group, to the Samoan and Viti [Fiji] Islands, as well as to Tahiti, where a few species of *Mediocalcar* J.J. Sm., *Epiblastus* Schltr., *Agrostophyllum* Bl. and *Earina* Lindl. have been found.

44. *Mediocalcar* J.J. Sm.

At present, six species of this genus have been described. After his publication of the genus, the author himself withdrew it and placed it under *Cryptochilus* Wall. Pfitzer and I agreed that it was quite different from this and that it belonged to *Glomerinae*. I have convinced myself that this is the case, by studies of the living material. There is no doubt that it is related closely to *Epiblastus* Schltr. The most western species is *M. bicolor* J.J. Sm. from Ambon, whilst *M. paradoxum* Schltr. from Samoa is the most eastern. All the other species are Papuan [Papuasian] and the following have been recorded, viz. *M. Lawesii* Schltr. from British Papua and *M. Versteegii* J.J. Sm., *M. Agathodaemonis* J.J. Sm. and *M. bifolium* J.J. Sm. from Dutch New Guinea.

In German New Guinea no less than thirteen species now occur. All these are typical mist-forest epiphytes, which never descend lower than about 800–900 metres altitude. They grow always on the thicker branches of the taller trees where some of them have a creeping habit, and others (e.g. those grouped around *M. diphyllum*

Schltr.) occur with erect and pendant fascicles. Although the species are fond of plenty of moisture, they usually grow in places where the branches are free of moss, and their thin roots may dry again soon after rain. The flowers are generally bright scarlet-red on the outside, with yellow-green or white tips and less frequently plain golden yellow or orange. I divide the species into three sections, which are distinguished easily by their habit.

§ 1. *Eu-Mediocalcar*. Pseudobulbs single-leaved, the rhizome mostly long-creeping.

§ 2. *Epicalcar*. Pseudobulbs one on top of another, two-leaved, flowers large and round as in *Eu-Mediocalcar*.

§ 3. *Microcalcar*. Rhizome long-creeping, pseudobulbs widely spaced, two-leaved. Flowers small, almost triangular.

§ 1. *Eu-Mediocalcar*

I have explained already the principal differences between this and the two other sections. In habit, the species differ from each other to the degree that in some the pseudobulbs are far apart, in others closer together. Their shape varies within wide limits from the simple cylindrical to wide, flattened, almost disc-like bodies (to enable them to rise freely from the rhizome), or they may be more-or-less intergrown with the rhizome length-wise. In all species, the leaves are rigid and of thick leathery consistence.

1. *M. robustum* Schltr., sp. nov.

Epiphyticum longe repens, usque ad 1 m longum; rhizomate elongato, decumbente, vaginis arcte amplexantibus, obtusis, imbricantibus, dense obtecto, c. 0.5 cm diametiente; radicibus tenuibus, filiformibus, elongatis, flexuosis, puberulis; pseudobulbis vulgo 7–8 cm distantibus, e basi depressa, rhizomati adnata erectis, forma oblique turbinatis, lateraliter paulo compressis, unifoliatis, 1–1.8 cm altis, 1.5–1.8 cm longis; foliis erectis, ligulatis, subacutis, basin versus e medio sensim angustatis, 14–17 cm longis, supra medium 2–2.9 cm latis, glabris; pedunculis geminatis, filiformibus, glabris, usque ad 4 cm longis, more generis unifloris; bractea minuta, squamiformi; floribus in genere inter majores, glabris; sepalis usque supra medium connatis, c. 1.3 cm longis, intermedio oblongo, obtuso, lateralibus oblique ovatis, obtusis, basi margine anteriore valde ampliata tubum subglobosum formantibus; petalis oblique et anguste lineari-ligulatis, acutis, c. 1.2 cm longis, supra medium paululo dilatatis; labello e ungue oblongo-quadrato, basi subauriculato, lamina suborbiculari, concava, apiculata, sacco perlate oblongoideo, obtusissimo, ungui aequilongo, labello toto, i. e. ungue incluso c. 1.2 cm longo, sacco 0.6 cm longo, ostio 0.5 cm lato, lamina 0.6 cm longa, infra medium 0.6 cm lata; columna semitereti, glabra, pede plus duplo brevior; anthera reniformi, glabra, obtusissima, dorso umbonata; ovario gracillimo, glabro, 2–2.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20278, flowering in Sept. 1909.

This and the two following species, *M. kaniense* Schltr. and *M. stenopetalum* Schltr., are related closely to each other. As the name signifies, *M. robustum* Schltr. is separated also by its robust growth. Moreover, the flowers are larger, the labellum distinctly broader and the lamina undivided. The flowers are scarlet on the outside with green tips, the petals and labellum whitish and the column white. Besides the species described here, the following also belong to the same section: *M. bicolor* J.J. Sm. from Ambon, *M. Versteegii* J.J. Sm. from Dutch New Guinea, *M. Lawesii* Schltr. from British Papua and *M. paradoxum* Schltr. from Samoa.

2. *M. kaniense* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 50 cm longum; rhizomate elongato, tereti, vaginis obtusis, imbricantibus, arcte amplexantibus obsesso, 0.4–0.5 cm diametiente; radicibus tenuissimis, filiformibus, elongatis, flexuosis, puberulis; pseudobulbis e basi depressa rhizomati adnata oblique turbinato-conicis lateraliter paulo compressis, 3–5 cm distantibus, 1–2.3 cm altis, basi (depressa) 0.8–1.2 cm longis, unifoliatis; foliis erectis, ligulatis, obtusiusculis, infra medium sensim angustatis, glabris, 6.5–15 cm longis, medio fere 1.5–2.3 cm latis; pedunculis germinatis, filiformibus, gracillimis,

usque ad 4 cm longis, glabris, unifloris; bractea minuta, squamiformi; floribus in genere inter majores, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique suborbicularem connatis, 1.3 cm longis, intermedio oblongo, obtuso, lateralibus oblique ovato-triangularibus, obtuse acuminatis, margine anteriore basin versus ampliatis; petalis oblique lanceolato-linearibus, acuminatis, basin versus paulo angustatis, 1.1 cm longis; labello e basi quadrato-unguiculata lamina circuitu ovato-triangulari acuminata, basi latere utrinque lobulo parvulo, auriculiformi, obtusiusculo aucta, 0.6 cm longa, basi 5.5 mm lata, sacco late oblongoideo, obtuso, unguem labelli 0.5 cm longum subexcedente, ostio 0.5 cm lato; columna semitereti, glabra, basin versus paulo angustata, pede perbrevis fere 6-plo brevior; anthera subreniformi, antice truncata; ovario cum pedicello gracillimo, cylindrico, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16714, flowering in Dec. [Ed.—possibly Oct.] 1907; no. 17715, flowering in May 1908.

M. kaniense Schltr. is, with *M. stenopetalum* Schltr., distinguished from *M. robustum* Schltr. by two small lateral lobes at the base of the lamina and by the very short column-foot. From *M. stenopetalum* Schltr. it may be distinguished easily by the broader petals and the claw of the lip, as well as by differences in the colour of the flowers; the latter being the same for both *M. kaniense* Schltr. and *M. robustum* Schltr.

3. *M. stenopetalum* Schltr., sp. nov. [Ed.—nom. nov.]

Epiphyticum, decumbens, usque ad 50 cm longum; rhizomate elongato, tereti, vaginis obtusis, imbricantibus, arcte amplexantibus oblecto, 3–4 cm diametiente; radicibus tenuibus, filiformibus, elongatis, flexuosis, puberulis; pseudobulbis 2.5–5 cm distantibus, e basi depressa erectis, cylindraceo-conicis, unifoliatis, lateraliter basi paulo compressis, 1.5–2.5 cm altis, basi 0.6–1 cm longis; foliis erectis, angustius ligulatis, obtusiusculis, 10–14 cm longis, medio fere 1–1.8 cm latis, basin versus sensim angustatis; pedunculis geminatis, gracillimis, filiformibus, glabris, usque ad 3 cm longis; bractea minuta, squamiformi, apiculata; floribus in genere vix inter majores, glabris; sepalis usque supra medium in tubum oblique urceolarem, antice supra basin inflatum connatis, c. 1 cm longis, intermedio ligulato, subacuto, apice recurvo, lateralibus oblique ovatis, subacutis, margine anteriore infra medium bene dilatatis; petalis anguste linearibus, acutis, falcato-obliquis, 0.9 cm longis; labello e ungue late ligulato, basi distincte auriculato in laminam circuitu ovatam, acuminatam, basi margine utrinque lobulo parvulo auctam, concavam expanso, 0.9 cm longo, sacco late oblongoideo, brevi, ungui 0.4 cm longo distincte brevior, lamina 0.5 cm longa, basi explanata c. 0.4 cm lata; columna semitereti, lobos laterales labelli paulo superante, pede subnullo; anthera suborbiculari, antice breviter acuminata, glabra; ovario cum pedicello gracili, cylindrico, glabro, c. 1.5 cm longo.

Mediocalcar bicolor Schltr., in K. Schum. et Laut., Nachtr. [1905] p. 137, (nec J.J. Sm.)

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20204, flowering in Sept. 1909.

In my description of *M. kaniense* Schltr. I have referred already to the differences which separate it from the other species. It should, however, be mentioned here that it may be recognised externally by the relatively tall pseudobulbs and by the narrower leaves. The flowers are scarlet-red on the outside, with yellow tips; the labellum and petals are whitish and the column white.

When, in my description, I write about the column-foot, I refer to that part which extends from the base of the column to the attachment of the claw of the labellum. Actually, the column-foot in this case is usually more elongated at the base than in *Epiblastus* and *Ceratostylis* Bl., but its exact extension is not always determined easily because of its close attachment to the lateral sepals.

4. *M. uniflorum* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 30 cm longum; rhizomate decumbente, tereti, vaginis imbricantibus, apiculatis, arcte amplexantibus oblecto, c. 0.3 cm diametiente; pseudobulbis suberectis, e basi paulo dilatata cylindraceis, unifoliatis, 1–2.5 cm longis, medio fere 1.5–2.5 mm diametro, 1–4 cm distantibus; foliis erectis, ligulatis, breviter et inaequaliter bilobulatis, basin versus paulo angustatis, 3–8 cm longis, medio fere 0.5–1.2 cm latis; pedunculis singulis, gracilibus, unifloris, 1–2 cm longis, teretibus, glabris; bractea minuta, squamiformi, apiculata; floribus in genere inter

maiores, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique urceolarem connatis, c. 1.1 cm longis, intermedio ligulato, obtuso, lateralibus oblique ovatis, subacutis; petalis subfalcato-obliquis, linearibus, acuminatis, c. 0.9 cm longis; labello e ungue subquadrato-ligulato in laminam late ovatam, apiculatam, basi subtrilobato-dilatatam expanso, 0.9 cm longo, sacco late oblongoideo, obtuso, unguem labelli distincte excedente, 0.5 cm longo, lamina 0.6 cm longa, basi 0.5 cm lata, ungue 0.3 cm longo; columna semitereti, glabra, apicem versus paulo dilatata, pede fere 3-plo brevior; anthera reniformi, antice obtusa, glabra; ovario cum pedicello gracili, cylindrico, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 20074 (TYPE), no. 20184, flowering in Sept. 1909; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18236, flowering in Sept. 1908; on trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18769, flowering in Nov. 1908.

This species is particularly well characterised in the section by its long, thin pseudobulbs and its flowers which appear singly. The flowers are scarlet-red with yellow tips.

var. *orientalis* Schltr., var. nov.

Differt a forma typica labelli ungue sacco aequilongo, floribus paulo minoribus, apice viridibus (haud aureis).

Kaiser-Wilhelms-Land: On trees in the mountain forests near Dschischungari (Waria District), alt. c. 800 m—R. Schlechter no. 19568, no. 19584, flowering in May 1909.

This variety agrees perfectly in habit with the Type and only differs in the long claw of the lip and in the colour of the flowers;

5. *M. latifolium* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 50 cm longum; rhizomate elongato, tereti, crassiusculo, vaginis ovatis, acutis, dorso alte carinatis, distichis obtecto, c. 0.6 cm diametiente; radicibus tenuibus, filiformibus, elongatis, flexuosis, glabris; pseudobulbis depressis, suborbicularibus, dorso alte rhizomati adnatis, unifoliatis, c. 2.5–4 cm distantibus, 1–1.5 cm longis et latis; foliis patentibus vel erecto-patentibus, oblongis, breviter acuminatis vel apiculatis, basi cuneatis, glabris, 5–9 cm longis, medio fere 1.7–3.2 cm latis; pedunculis geminatis, gracillimis, filiformibus, glabris, usque ad 4 cm longis; bractea minuta, squamiformi, lanceolata, acuminata; floribus in genere inter majores, glabris; sepalis usque ad tertiam partem superiorem in tubum oblique urceolarem connatis, 1.1 cm longis, intermedio oblongo-ligulato subacuto, lateralibus oblique ovatis, subacutis, antice basi dilatatis; petalis oblique lineari-ligulatis, acutis, glabris, c. 1 cm longis; labello e ungue subquadrato, lamina suborbiculari, apiculata vel breviter acuminata, sacco subquadrato, obtusissimo c. 5.5 cm longo, labello toto 1 cm longo, ungue 4.5 mm longo, lamina 5.5 mm longa, basi latitudine 0.6 cm subattingente; columna semitereti, glabra, pede brevi; anthera reniformi, obtusa, dorso umbonata; ovario cum pedicello glabro, gracili, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17281, flowering in Feb. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18981, flowering in Dec. 1908.

This species is recognised easily by its short, broad pseudobulbs and broad leaves. Whereas the other species mostly grow in colonies, in this case I have only found the specimens singly. The flowers are, likewise, scarlet-red outside with greenish tips; the petals and labellum are whitish with greenish tips; the column is white.

6. *M. angustifolium* Schltr., sp. nov.

Epiphyticum decumbens vel patulum, usque ad 40 cm longum; rhizomate elongato, tereti, primum vaginis amplexantibus, amplis vestito; radicibus tenuibus, filiformibus, elongatis, flexuosis, puberulis, pseudobulbis apice excepto omnino rhizomati adnatis, oblongoideis, depressis, unifoliatis, 0.5–1 cm longis, 0.3–0.4 cm medio latis; foliis anguste ligulatis vel ligulato-linearibus, subacutis vel obtusiusculis, basi subpetiolato-contractis, 4.5–9 cm longis, medio fere 0.5–1.3 cm latis; pedunculo singulo, abbreviato, unifloro, inter folium juvenile abscondito, c. 1 cm longo, tereti, glabro; bractea minuta, squamiformi, triangula, acuta; floribus in genere inter majores, glabris; sepalis usque supra

medium in tubum oblique urceolarem connatis, 1.2 cm longis, intermedio lineari-ligulato, obtusiusculo, lateralibus oblique ovato-lanceolatis, acutis; petalis anguste linearibus, acutis 1.1 cm longis, obliquis; labello e ungue oblongo-quadrato medio constricto in laminam circuitu ovato-lanceolatam, acuminatam, basi margine utrinque lobulo brevi erecto auctam expanso, 1.1 cm longo, sacco late ovato, antice truncato-obtusissimo, faucem versus sensim dilatato, c. 3.5 mm longo, ungue brevi, basi breviter auriculato, 3.5 mm longo, lamina 7.5 mm longa, basi 0.6 cm lata; columna semitereti, apice paulo dilatata, pede brevi; anthera reniformi-cucullata, antice obtusa; ovario cum pedicello glabro, cylindrico, 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19503, flowering in May 1909.

M. Lawesii Schltr., *M. Versteegii* J.J. Sm. and *M. abbreviatum* Schltr. may be regarded as most closely related to this species. The latter two are distinguished by the undivided lamina of the lip. *M. Lawesii* Schltr. is of more slender growth, with narrower pseudobulbs, smaller leaves and flowers and more lanceolate petals. The flowers of *M. angustifolium* Schltr. are scarlet-red outside in the lower half and golden yellow in the upper. The petals, labellum and column are whitish.

7. *M. abbreviatum* Schltr., sp. nov.

Epiphyticum, dependens vel patulum, usque ad 50 cm longum; rhizomate elongato, tereti, vaginis amplis, distichis, compressis primum obecto, 2–2.5 mm diametro; radicibus tenuibus, filiformibus, elongatis, flexuosis, puberulis; pseudobulbis usque ad imum apicem cum rhizomate connatis, cylindraceutis, unifoliatis, 0.7–1.4 cm longis, c. 2.5–5.3 mm diametentibus; foliis ligulatis, obtusis, basin versus sensim paulo angustatis, glabris, 3.5–6 cm longis, medio fere 0.5–0.8 cm latis; pedunculo singulo, abbreviato, unifloro, tereti, glabro, 0.5–1 cm longo; bractea minuta, squamiformi, ovata, subacuta; floribus in genere inter majores, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique urceolarem, basi antice inflatum connatis, c. 1.2 cm longis, intermedio ligulato, obtusiusculo, lateralibus oblique ovatis, obtusiusculis, antice basi conspicue dilatatis; petalis oblique linearibus, acuminatis, supra medium paululo dilatatis, glabris, 1 cm longis; labello e ungue late ligulata in laminam late ovatam, acuminatam, concavam expanso, 1 cm longo, sacco ovoideo, obtuso, unguem paulo superante, 0.5 cm longo, lamina 0.6 cm longa, basi explanata 0.5 cm lata, ungue 0.4 cm longo; columna gracili, ostium sacci bene superante, semitereti, glabra, pede fere triplo brevior; anthera reniformi, minute apiculata, glabra; ovario cum pedicello gracili, cylindrico, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20200, flowering in Sept. 1909.

This species is related to *M. Versteegii* J.J. Sm., but it is readily recognised externally by its distinctly shorter pseudobulbs and, in consequence, the closer foliage of the sympodia. The flower is characterised by the long column, which not only exceeds the opening in the sac, but even reaches the middle of the lamina. The flowers are scarlet-red outside, with green tips and flesh-coloured petals; the labellum with greenish tips and a white column.

§ 2. *Epicalcar*

The chief difference between the species of this section and *Eu-Medicalcar* is in the two-leaved pseudobulbs. In habit they agree entirely with the last forms of the previous section: e.g. *M. angustifolium* Schltr. and *M. abbreviatum* Schltr., in that the pseudobulbs are closely intergrown with the rhizome for almost its whole length, so that sympodia are formed with the habit of *Pholidota articulata* Lindl. The species are related closely to each other and chiefly differ in the characters of their lips and columns, which also are often accompanied by differences in the colour of the flowers.

Besides the four considered here, J.J. Smith has described two species from Dutch New Guinea, which evidently belong here, viz. *M. Agathodaemonis* J.J. Sm. and *M. bifolium* J.J. Sm.

8. *M. diphyllum* Schltr., sp. nov.

Epiphyticum, patulum vel dependens, usque ad 30 cm longum; rhizomate elongato, vaginis arcte amplexentibus, ovalibus, apiculatis, primum obecto, tereti, 2.5–3 mm diametro; radicibus tenuibus,

fili formibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, bifoliatis, vulgo usque ad imum apicem cum rhizomate connatis, 1–1.5 cm longis, medio fere 2.7–3.2 cm diametro; foliis erecto-patentibus, lineari-ligulatis, mucronulatis, basin versus sensim paulo angustatis, glabris, 2–4.5 cm longis, medio fere 3–6 mm latis; pedunculis ut videtur vulgo singulis, brevibus, 1–1.5 cm longis; gracilibus, teretibus, glabris; bractea minuta, squamiformi, apiculata; floribus in genere mediocribus, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique urceolarem connatis, 0.9 cm longis, apicibus liberis triangulis, obtusiusculis, intermedio ligulato, lateralibus oblique ovatis, antice basi dilatatis; petalis oblique linearibus, acutis, dimidio superiore antice paulo dilatatis, 0.8 cm longis; labello e ungue ligulato in laminam late ovalem, apiculatam, cucullato-concavam dilatato, 0.8 cm longo, sacco late quadrangulati, apice truncato, vix 0.2 cm longo, 0.4 cm lato, ungue 3.5 mm longo, lamina 4.5 mm longa et lata; columna semitereti, apice dilatata, glabra, pede pro genere abbreviato; anthera reniformi, apiculata, dorso umbonata; ovario cum pedicello cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17285, flowering in Feb. 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18227, flowering in Sept. 1908.

Usually the pseudobulbs are closely adnate with the rhizome to the apex, although I have seen pseudobulbs on younger specimens which were quite free at the extreme tip. However, this is not characteristic of the species, for even in quite young and imperfectly developed specimens, one can plainly see how the bulbs always show a tendency to become united with the rhizome. A very marked characteristic of this species is apparent in the breadth and shortness of the sac, a feature which distinguishes it from its relatives. The flowers are a pale scarlet-red, with snow-white tips and a white labellum.

9. *M. erectum* Schltr., sp. nov.

Epiphyticum, erectum, 10–16 cm altum; rhizomate cauliformi, erecto vel adscente, tereti, vaginis ovalibus, apiculatis, amplexantibus obtecto, c. 2 mm diametiente; pseudobulbis cylindraceis, apice ipso excepto cum rhizomate omnino connatis, bifoliatis, 1–1.8 cm longis, c. 2.25 mm diametientibus; foliis erectis vel erecto-patentibus, linearibus, apiculatis, 3–8 cm longis, medio fere 0.4–0.6 cm latis, basin sensim paulo angustatis, glabris; pedunculis vulgo singulis, brevibus, teretibus, glabris, gracilibus, 0.5 cm longis, unifloris; bractea minuta, squamiformi, apiculata; floribus in genere mediocribus, glabris, sepalis usque supra medium in tubum oblique urceolarem connatis, 0.9 cm longis, apicibus liberis ovatis, subacutis, sepalo intermedio oblongo-ligulato, lateralibus oblique ovatis, basi antice dilatatis; petalis oblique linearibus, breviter acuminatis, glabris, 0.8 cm longis; labello e ungue late ligulato, basi breviter auriculato in laminam cucullato-concavam, suborbicularem, breviter acuminatam dilatato, sacco semiorbiculari, obtuso, ungui duplo brevior, labello toto 0.8 cm longo, ungue 0.4 cm longo, lamina 0.4 cm longa, basi 0.5 cm lata; columna semitereti, glabra, pede perbrevis; anthera suborbiculari, dorso alte bilobata, antice truncata, cum apiculo minuto, umbone in medio; ovario cylindrico, gracili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20229, flowering in Sept. 1909.

The species is distinguished externally by its narrow leaves from *M. diphylum* Schltr., to which it is related most closely. It also has a differently shaped lip-claw and a shorter, semi-globular sac. Its anther differs from those of all related species. The flowers are scarlet-red with rose-red tips, rose-red petals and a labellum white at the base.

10. *M. monticola* Schltr., sp. nov.

Epiphyticum, dependens vel patulum, 8–20 cm longum; rhizomate flexuoso, tereti, glabro, vaginis ovalibus, apiculatis, arcte amplexantibus obtecto, 1.5–2 mm diametro; radicibus tenuibus, filiformibus, elongatis, flexuosis, puberulis; pseudobulbis imo apice excepto cum rhizomate arcte connatis, cylindricis, glabris, 0.8–1.5 cm longis, vix 0.2 cm diametientibus, bifoliatis; foliis ligulatis, apiculatis, basi sensim subpetiolato-angustatis, glabris, 4–6 cm longis, medio fere 0.4–0.8 cm latis; pedunculis vulgo singulis, teretibus, glabris, gracilibus, unifloris, c. 0.1 cm longis; bractea minuta, squamiformi, apiculata; floribus in genere inter mediocres, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique urceolarem antice inflatum connatis, obtusiusculis, c. 1 cm longis, intermedio oblongo-ligulato, lateralibus oblique ovato-oblongis; petalis anguste linearibus, acutis,

obliquis, 0.9 cm longis; labello e ungue basi auriculato-ligulato in laminam late ovalem acuminatam expanso, 0.9 cm longo, sacco semigloboso, obtuso, pro genere brevi, ungui fere triplo brevior, ungue 5.5 mm longo, lamina 3.5 mm longa, basi 0.3 cm lata; columna semitereti, glabra, apicem versus paulo dilatata, pede perbrevis; anthera subreniformi cum apiculo minuto; ovario cum pedicello cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18801, flowering in Nov. 1908.

The species evidently is related most closely to *M. bifolium* J.J. Sm. from Dutch New Guinea, but in consequence of the very short lip-sac, it also approaches *M. luteo-coccineum* Schltr. The colouring of its flowers is scarlet-red on the outside with snow-white tips; petals and labellum yellowish with white tips; column yellowish with a yellow anther.

11. *M. luteo-coccineum* Schltr., sp. nov.

Epiphyticum, dependens vel patulum, usque ad 35 cm altum; rhizomate flexuoso, tereti, vaginis ellipticis, apiculatis, arcte amplexantibus oblecto; radicibus tenuibus, filiformibus, elongatis, flexuosis, puberulis; pseudobulbis usque ad imum apicem cum rhizomate arctissime connatis, cylindraceis, bifoliatis, 1–1.5 cm longis, c. 0.2 cm diametentibus; foliis ligulatis, apiculatis, basi subpetiolato angustatis, 2.5–4.5 cm longis, medio fere 0.5–1 cm latis; pedunculis singulis, teretibus, glabris, gracilibus, c. 1 cm longis; bractea minuta, squamiformi, acuta, glabra; floribus in genere inter majores, glabris; sepalis usque ad quartam partem apicalem in tubum oblique urceolarem, antice inflatum connatis, obtusiusculis, 1.1 cm longis, intermedio ligulato, lateralibus oblique ovatis, basi antice dilatatis; petalis anguste linearibus, acutis, glabris, obliquis, c. 1 cm longis; labello e ungue basi minute auriculato, ligulato in laminam late ovalem, acuminatam, cucullatam producto, 1 cm longo, ungue 6 mm longo, lamina 0.4 cm longa, basi 0.3 cm lata; columna semitereti, glabra, apice paulo dilatata, pede fere 5-plo brevior; anthera subreniformi, obtusa, glabra; ovario cum pedicello glabro, cylindrico, c. 1.3–1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18803, flowering in Nov. 1908.

The species is distinguished from all others in the section by the marked shortening of the sac of the lip, so that it might be called simply a hooded-labellum. Apart from *M. Agathodoemonis* J.J. Sm., the species is the only one in the section in which the corolla is coloured scarlet-red on the outside with yellow tips. The petals and labellum are whitish with yellow tips, the column is white.

§ 3. *Microcalcar*

As far as I know, the only representatives of this section are the two described here. They all agree well in habit and are distinguished from the species of the other two sections by the formation of long-creeping sympodia which remind one of *Bulbophyllum* and which bear small, two-leaved, well-separated pseudobulbs. The flowers are appreciably smaller than in the other sections and form a narrow tube, the cross section of which is three-edged. The labellum has a long claw with only a very small sac, which, in *M. sigmoideum* Schltr., is reduced to a mere broad depression of the lamina.

Both species grow on exposed mountain ridges on trees where they are subjected to frequent fogs and cold winds in a moisture-saturated atmosphere.

12. *M. pygmaeum* Schltr., sp. nov.

Epiphyticum, pusillum, longe repens, usque ad 30 cm longum; rhizomate elongato, tereti, vaginis compressis, bifariis, amplexantibus oblecto; radicibus filiformibus, elongatis, flexuosis, glabris, tenuibus; pseudobulbis 1.3–2.5 cm distantibus, depressis, rhizomati dorso altius adnatis, oblongoideis, bifoliatis, 0.3–0.5 cm longis, medio fere 2.5–3 mm latis; foliis divaricantibus, oblongis, obtusis, 0.8–1.4 cm longis, 0.4–0.5 cm latis, glabris, textura crassius coriaceis; pedunculis singulis, unifloris, abbreviatis, c. 0.5 cm longis; bractea minuta squamiformi, apiculata; floribus in genere inter minores, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique ovatum, obtuse triquetrum connatis, 0.7 cm longis, intermedio lanceolato-ligulato, acuto, lateralibus oblique ovato-lanceolatis,

acutis; petalis oblique linearibus, acutis, 0.6 cm longis; labello e ungue cuneato-ligulato in laminam ovato-lanceolatam acuminatam, e basi obscure trilobatam expanso, sacco semioblongo, obtuso perbrevis, ungui fere 4-plo brevior; columna semitereti, apice dilatata, pede perbrevis; anthera subquadrato-semiglobosa, dorso excisa cum umbone parvulo, antice obtusa; ovario cylindrico, glabro, pedicello incluso c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees on the ridge of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19708, flowering in June 1909.

The species is distinguished from *M. sigmoideum* Schltr. by the conspicuous lip-sac and by the colour of the flowers.

var. *altigenum* Schltr., var. nov.

Differt a forma typica habitu brevior, petalis paulo latioribus, ungue labelli antice latiore lamina magis abbreviata distinctius trilobata, anthera reniformi.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18746, flowering in Nov. 1908.

Perhaps this variety may be regarded at a later time as a separate species. The colour of the flowers is the same as that of the Type; i.e. orange-yellow outside with golden yellow tips and paler petals and labellum.

13. *M. sigmoideum* Schltr., sp. nov.

Epiphyticum, pusillum, longe repens, usque ad 30 cm longum; rhizomate elongato, tereti, vaginis distichis, imbricantibus, amplexantibus oblecto; radicibus tenuibus, filiformibus, elongatis, flexuosis, glabris; pseudobulbis 1.3–2.5 cm distantibus, dorso rhizomati alte adnatis, oblongoideis, bifoliatis, 0.3–0.4 cm longis, medio 2–2.5 mm latis; foliis divaricatis, oblongis, obtusis, basi cuneatis, 0.7–1.2 cm longis, medio fere 0.3–0.5 cm latis; pedunculis singulis, abbreviatis, teretibus, glabris; bractea minuta, squamiformi, ovata, acuta; floribus in genere inter minores, glabris; sepalis usque ad tertiam partem apicalem in tubum oblique ovatum connatis, subacutis, extus medio carinatis, 0.6 cm longis intermedio ligulato, lateralibus oblique ovatis; petalis oblique lineari-ligulatis, acutis, glabris, 5.5 mm longis; labello petalis aequilongo, ungue cuneato-ligulato, basi minute et obtuse auriculato, antice sensim in laminam ovatam, acuminatam, medio subcucullato-foveatam, aequilongam transeunte; columna semitereti, glabra, apice incrassata, pede fere triplo brevior; anthera subreniformi, glabra, antice obtusa, umbone bene magno donata; ovario cylindraco, glabro, pedicello incluso 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the ridge forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19616, flowering in May 1909.

In habit this species possesses a striking similarity to *M. pygmaeum* Schltr., but has a different labellum and scarlet-red flowers with yellow tips, on the outside. The flowers appear acutely triangular since the sepals have a fairly sharp keel on the outside.

45. *Epiblastus* Schltr.

When I first recorded the genus *Epiblastus*, with the two species *E. ornithidioides* Schltr. and *E. sciadanthus* (F.v.M.) Schltr., in 1905, I did not think that it would reach its present, considerable size in such a short time. Besides the above-named species, J.J. Smith described a third, *E. cuneatus* J.J. Sm., in 1908 and I was able to add a fourth, *E. masarangicus* (Krzl.) Schltr., this year.

Now we have no less than seven more novelties, whereby the genus comprises a total of 11 species altogether. We know accordingly that its distribution begins in the Celebes, then extends over New Guinea, where the majority of the species occur, and is represented finally by its most eastern species, *E. sciadanthus* (F.v.M.) Schltr., in Samoa. In these three places, the species find their home in the mist-forests of the mountains. Only one species, *E. acuminatus* Schltr., descends to an altitude of about 300 m in the river valleys, its upper level being at about 600 m altitude. In contrast, *E. auriculatus* Schltr. has its habitat between 500 and 1000 metres. None of the others extend below the limits of the mist-forests. They have a preference for exposed

locations where, growing on thickly moss-covered tree-trunks, they are able to resist the wind and weather. *E. ornithidioides* Schltr. in particular I often found under such conditions, where the long leaves could be seen hanging downwards and whipped to-and-fro by the strong wind which is accompanied nearly always by dense fog in those regions. Apart from those species mentioned, *E. cuneatus* J.J. Sm. is so far recorded only from Dutch New Guinea.

While the remarks published here regarding *Mediocalcar* J.J. Sm. and *Epiblastus* Schltr. were already in press, Kränzlin's monograph on the genus *Eria* Lindl. appeared in Engler's 'Pflanzenreich'. Later on I will refer to this work, which, like his treatise on *Dendrobium*, does not meet the expectations which one might reasonably hope for and expect in a work of this kind. At present, I will only comment on what Kränzlin has published about *Mediocalcar* J.J. Sm. and *Epiblastus* Schltr.

It is evident from their flower structure that these two genera are related closely to *Ceratostylis* Bl. and do not belong to the *Dendrobiinae*, and, on account of their rigidly terminal inflorescences, should be allocated to the *Glomerinae*.

Unfortunately, Kränzlin has mistaken absolutely the systematic position of these two genera, and has united them with *Eria* Lindl. It seems to have escaped his memory entirely that these two genera are separated by their flower structure, because, under *Eria paradoxa* Krzl., which I have re-named *Mediocalcar paradoxum* (Krzl.) Schltr., he states: 'On this finding and the other known characteristics, it would have been easily understood if Schlechter had called the plant *Epiblastus bicolor*'. From this remark, it is evident that Kränzlin has never seen good material of *Mediocalcar*, although the differences between the two genera should have been sufficiently clear from the fair illustrations which have been published of *Epiblastus* and *Mediocalcar*. It also appears that Kränzlin intended to draw a peculiar wide generic boundary here, which is all the more surprising, seeing that he separates from *Eria* Lindl. a number of species such as *Trichotosia* Bl. which, until now, has never been thought of by any orchidologist after Blume himself had recognised his two former genera, *Trichotosia* and *Cylindrolobus*, as true *Erias*.

1. *E. basalis* Schltr., sp. nov.

Epiphyticus, erectus, 25–35 cm altus; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceutis, lateraliter paulo compressis, basin versus paulo dilatatis, 4–6 cm longis, basi 1.2–1.5 cm latis, unifoliatis; foliis erectis, lorato-ligulatis, obtusiusculis, cum apiculo minuto, 23–30 cm longis, medio fere 2–3.5 cm latis; inflorescentiis fasciculiformi-abbreviatis, pluri-(10–15)-floris; pedunculis filiformibus, usque ad 7 cm longis, glabris, unifloris; bracteis minutis squamiformibus, apiculatis; floribus illis *E. sciadanthi* Schltr. similibus, glabris, in genere mediocribus; sepalo intermedio ovato-lanceolato, obtuso, 0.8 cm longo, lateralibus oblique triangulis, obtusis, intermedio aequilongis; petalis oblique oblongo-ligulatis, obtusiusculis, sepalis paululo brevioribus; labello sepalis aequilongo, e basi quadrato-unguiculata in laminam cordato-ovatam, acutam, infra medium obscure bicallosam dilatato, petalis aequilongo, lamina basi 4.5 mm lata; columna brevi, labello plus duplo brevior, pede brevi, clinandrio dorso ampliato; anthera subreniformi-cucullata, antice minute tridentata, glabra; ovario cylindrico, glabro, subsessili, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18744, flowering in Nov. 1908.

In *E. basalis* Schltr., we have the only species in which new shoots appear side-by-side. This is caused by the marked shortening of the rhizome, whereas in all the other species the much elongated rhizome is adherent closely to the pseudobulbs, thus producing the very typical habit of the genus. The colour of the flowers is scarlet-red, with a black-violet anther and dark green pollinia.

2. *E. ornithidioides* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 137.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c.

1600 m—R. Schlechter no. 14017, flowering in Jan. 1902; no. 18822, flowering in Nov. 1908.

E. ornithidioides Schltr. is the only species from German New Guinea which is distinguished by dark, rose-red flowers. The usual colour is otherwise scarlet-red, more rarely pale rose-red to white. When I first described this species I placed it here together with the specimens from the Torricelli Range and those from Neu-Mecklenburg, since the differences seemed to me too slight at that time. I am now convinced that these represent other species since more importance is now attached to the differences in the genus than I originally thought.

In *Epiblastus*, for instance, the colouring of the flowers and the shape of the petals and labellum seem to constitute the chief characteristics in, otherwise, very similar flowers. To those must be added other vegetative characters dependent on size. The species are very difficult to distinguish in herbarium specimens, but are very consistent and never to be mistaken in the living state.

3. *E. lancipetalus* Schltr., sp. nov.

Epiphyticus, validus, usque ad 50 cm longus; rhizomate elongato, cum pseudobulbis omnino connato, abscondito; radicibus filiformibus elongatis, flexuosis, puberulis; pseudobulbis cylindraceis, paulo compressis, 6–10 cm longis, siccis usque ad 1.3 cm latis, unifoliatis, superpositis, i.e. junioribus semper infra apicem vetustorum natis; foliis lorato-ligulatis, acutis vel subacutis, usque ad 35 cm longis, medio fere usque ad 3.5 cm latis; inflorescentiis fasciculato-abbreviatis, 15–20-floris; pedunculis filiformibus, gracilibus, glabris, usque ad 6.5 cm longis; bractea minuta, squamiformi, deltoidea, acuminata; floribus in genere inter majores, vulgo incurvis, glabris; sepalo intermedio ovato, subacuto, c. 0.9 cm longo, lateralibus intermedio aequilongis, oblique triangularibus, subacutis; petalis oblique lanceolatis vel ovato-lanceolatis, acutis, 7.5 mm longis; labello e basi breviter cuneato-unguiculata rhombeo-ovali, subacuto, medio fere incrassationibus 2 semiorbicularibus donato, petalis aequilongo, medio fere 4.5 mm lato; columna crassiuscula, labello fere duplo brevior, clinandrio humili crenulato, pede brevi; anthera reniformi-cucullata, obtusa, glabra; ovario cylindraceo, subsessili, c. 1.7 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range alt. c. 1000 m—R. Schlechter no. 17834, flowering in June 1908; on trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 17103, flowering in Dec. 1907.

This is related closely to *E. ornithidioides* Schltr., but may be recognised by the shorter pseudobulbs from which the new shoots appear lower down than in the former, by the scarlet-red (not rose-red) flowers, by the lanceolate-tipped petals, and the rhombic labellum. I have hesitated as to whether I should describe here a new species or only set up a variety, but I believe it is better to describe a new species, since, in New Guinea, I never had the slightest difficulty in keeping the two apart.

At this point I should remark about the inflorescence of *Epiblastus*. The top of the pseudobulb consists of a cone-shaped, laterally compressed structure on which the peduncles are arranged in two rows, standing closely one above the other. These are true peduncles, not pedicels as one might believe, and is proved by the presence of a bract, which, in orchids, is always at the base of the pedicel. In *Mediocalcar* the conditions are quite similar, but usually two (more seldom one) peduncles are developed.

4. *E. torricellensis* Schltr., sp. nov.

Epiphyticus, dependens, validus, usque ad 70 cm longus; rhizomate elongato, cum pseudobulbis omnino connato, abscondito; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceis, paulo compressis, superpositis, unifoliatis, juvenilibus infra apicem vetustorum natis, c. 12 cm longis, siccis c. 1 cm latis; foliis amplis, lorato-ligulatis, subacutis, apice obliquis, basin versus paulo angustatis, glabris, 30–40 cm longis, medio fere 3.5–4 cm latis; inflorescentiis 10–15-floris, fasciculato-abbreviatis; pedunculis filiformibus, gracilibus, glabris, usque ad 8 cm longis, unifloris; bractea minuta, squamiformi, apiculata; floribus in genere mediocribus, glabris, illis *E. ornithidioidis* Schltr. similibus; sepalo intermedio ovato, obtusiusculo, 8.5 mm longo, lateralibus oblique ovatis,

obtuse acuminatis, intermedio aequilongis; petalis oblique lanceolato-ligulatis, obtusiuscule acutatis, glabris, sepalis paululo brevioribus; labello e basi anguste ligulata subito in laminam ovato-lanceolatam, valde acutam expanso, arcuato-decurvo, medio fere incrassationibus 2 semiorbicularibus parvulis donato, petalis aequilongo, medio fere 4.5 mm lato; columna brevi, glabra, apicem versus ampliata, brevi, pede breviusculo; ovario cylindrico, glabro, gracili, subsessili, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 14487, flowering in Apr. 1902.

I previously regarded this species as a form of *E. ornithidioides* Schltr., but I am convinced now that it represents a separate species, and that it is well distinguished from the others, not only by the scarlet-red colour of the flowers, but also by its petals and, above all, by the differently shaped labellum. It comes near to *E. lancipetalus* Schltr., but is distinguished clearly by the peculiar, clearly defined lamina of the labellum, an important character that justifies its establishment as a separate species. Its leaf measurements are larger than for all the others.

5. *E. acuminatus* Schltr., sp. nov.

Epiphyticus, validus, dependens, usque ad 60 cm longus; rhizomate elongato, cum pseudobulbis omnino connato, abscondito; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceutis, paulo compressis, 7–8 cm longis, siccis 0.8–1 cm diametientibus, unifoliatis, superpositis, juvenilibus juxta apicem vetustorum natis; foliis lorato-ligulatis, acutis cum apiculo, 23–30 cm longis, medio fere 2.2–2.5 cm latis; inflorescentia fasciculato-abbreviata, 15–20-flora; pedunculis filiformibus, gracillimis, glabris, usque ad 9 cm longis, unifloris; bractea minuta, squamiformi, lanceolata, acuminata; floribus in genere inter majores, glabris; sepalis ovatis, acuminatis, c. 9.5 mm longis, lateralibus obliquis, basi margine anteriore dilatatis; petalis oblique elliptico-lanceolatis, acuminatis, glabris, sepalis paulo brevioribus; labello e basi oblongo-ligulata in laminam suborbicularem, longius acuminatam dilatato, medio transverse bicalloso, petalis aequilongo, medio fere 0.5 cm lato; columna brevi, labello fere duplo brevior, apice ampliata, clinandrio dorso in lobulum producto, pede breviusculo; anthera reniformi-cucullata, antice excisa, glabra; ovario cylindraceuto, glabro, subsessili, 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 300 m—R. Schlechter no. 17546, flowering in Apr. 1908.

This species is distinguished easily from the others by the pointed perianth segments and their colour. In growth it perhaps most resembles *E. neo-hibernicus* Schltr., but it has differently shaped petals and labellum. The flowers are white, with a red mentum, the labellum pink in the middle, the anther is a dark violet-red. The new shoots appear close to the tip of the pseudobulbs.

6. *E. neo-hibernicus* Schltr., sp. nov.

Epiphyticus, dependens, usque ad 60 cm longus; rhizomate elongato, cum pseudobulbis omnino connato, abscondito; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceutis, paulo compressis, unifoliatis, superpositis, juvenilibus juxta apices vetustorum natis, 7– cm longis, siccis 0.5–0.8 cm diametientibus; foliis lorato-ligulatis, acutis cum apiculo, 25–35 cm longis, medio fere 2–2.3 cm latis; inflorescentiis fasciculato-abbreviatis, 15–20-floris; pedunculis gracilibus, filiformibus, glabris, usque ad 10 cm longis, unifloris; bractea minuta, squamiformi, apiculata; floribus in genere inter mediocres, glabris; sepalo intermedio ovato-lanceolato, subacuto, 0.8 cm longo, lateralibus intermedio aequilongis, oblique ovatis, subacutis; petalis oblique ligulatis, obtusiusculis, glabris, sepalis paulo brevioribus; labello e basi cuneata triangulo-ovato, acuto, medio fere transverse bilamellato, lamellis semiorbicularibus, haud bene distinctis, toto petalis aequilongo, medio fere 0.5 cm lato; columna brevi, labello fere duplo brevior, apice ampliata, pede brevi; ovario cylindraceuto, glabro, subsessili, c. 1.5 cm longo.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14670, flowering in July 1902.

If I rightly recollect, the flowers of this species were also scarlet-red. In habit the plant is very similar to *E. acuminatus* Schltr. but does not have the pointed sepals and has very narrow petals of a quite different shape. The labellum is triangularly pointed in front. Previously, I had looked also upon this plant as *E. ornithidioides* Schltr., from which I now consider it is quite different.

7. *E. pulchellus* Schltr., sp. nov.

Epiphyticus, patulus, usque ad 40 cm longus; rhizomate elongato, cum pseudobulbis omnino connato, abscondito; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, paulo compressis, unifoliatis, superpositis, juvenilibus infra apicem vetustorum natis, 4–5.5 cm longis, siccis 0.3–0.4 cm diametientibus; foliis linearibus, subacutis, apice obliquis, 10–13 cm longis, medio fere 0.8–1.2 cm latis; inflorescentiis fasciculato-abbreviatis, 5–10-floris; pedunculis gracilibus, filiformibus, glabris, usque ad 6 cm longis; bractea minuta, squamiformi, apiculata; floribus in genere inter majores, glabris; sepalo intermedio oblongo, obtuso, 1.1 cm longo, lateralibus oblique ovatis, obtusiusculis, intermedio aequilongis, extus nervo medio leviter carinatis; petalis oblique oblongo-ligulatis, subacutis, sepals paulo brevioribus; labello e basi quadrato-unguiculata ovali, obtuso, infra medium incrassationibus 2 semilunatis donato, petalis aequilongo, medio fere 0.5 cm lato; columna brevi, labello plus duplo brevior, pede brevi; anthera obreniformi-cucullata, antice trilobata, lobo intermedio minore; ovario cylindraceo, subsessili, glabro, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18783, flowering in Nov. 1908.

Amongst all the species known up to the present, this is the smallest in habit, but is distinguished by its larger, wider open flowers. Otherwise, in its narrow leaves, it agrees with *E. auriculatus* Schltr. The flowers are a beautiful scarlet-red with paler petals and labellum. The callosities of the labellum are dark purple, the anther is dark violet-red, as in most of the species.

8. *E. auriculatus* Schltr., sp. nov.

Epiphyticus, dependens, usque ad 50 cm longus; rhizomate elongato, cum pseudobulbis arcte connato, abscondito; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindricis, vix compressis, unifoliatis, superpositis, juvenilibus infra apicem vetustorum natis, 4.5–7 cm longis, siccis 0.3–0.4 cm diametientibus; foliis linearibus vel lineari-ligulatis, acutis, 12–26 cm longis, medio fere 1–1.3 cm latis; inflorescentiis fasciculato-abbreviatis, 8–12-floris; pedunculis filiformibus, gracilibus, glabris, usque ad 6 cm longis, unifloris; bractea minuta squamiformi, apiculata; floribus in genere mediocribus, glabris; sepalis ovatis, subacutis, 8.5 mm longis, lateralibus obliquis basi margine anteriore dilatatis; petalis oblique ligulato-lanceolatis, subacutis, glabris, sepalis paulo brevioribus; labello e basi breviter unguiculata, subcordato-auriculata late ovato, obtusiusculo, medio excavationibus 2 et incrassationibus 2 transversis ornato, petalis aequilongo, medio fere 0.4 cm lato, columna brevi, labello plus duplo brevior, pede satis longo; anthera reniformi-cucullata, antice truncata, dorso umbone humili donata, glabra; ovario cylindraceo, subsessili, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17882, flowering in June 1908; on trees in the forests at the foot of the Finisterre Range near Meireka, alt. c. 500 m—R. Schlechter no. 18065, flowering in July 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18151, flowering in Sept. 1908.

Apart from *E. pulchellus* Schltr., it is the most graceful species of the genus and is distinguished from all the others by the labellum being auriculate at the base. The flowers are cinnabar-red with paler tips, the anther dark violet.

46. *Ceratostylis* Bl.

Until recently, *Ceratostylis* Bl. was a small genus which received little consideration. In 1889, Pfitzer, in Engler and Prantl's 'Pflanzenfamilien', merely quoted: 'About 15 species in the East Indies, the Malay Archipelago and South Sea Islands'. Since then, however, our knowledge of the genus has increased considerably. In his 'Indian Flora', Hook. f. described a number of new species to which Ridley later added several others, followed by descriptions of a significant number from the Malayan Archipelago, south sea islands and New Guinea, by J.J. Smith and myself. Finally, Oakes Ames and Rolfe have published further species from the Philippines, so that the number at present exceeds 40 species. To these I now have to add approximately 20 more, so that the genus now will comprise about 60 species and has, thus, in the short period of hardly

20 years, increased four-fold. Not less than half the total number of known species occur in New Guinea.

Reichenbach f. divided the genus into two sections which he called *Acaules* and *Caulescentes* respectively. These sections depended on the vegetative characters and, at the present time, may be regarded as a useful division of the genus. On closer investigation, however, another characteristic should take precedence which, together with a more-or-less markedly elongated rhizome, will make the limitation of the sections more definite; that is the inflorescence. This is terminal in nearly all species which belong to the former section *Acaules*, whereas in most species of the *Caulescentes* it is lateral, or more correctly, pseudolateral. In these it protrudes from the side of the pseudobulbs below the leaves. This appearance is so characteristic that I shall therefore divide the genus as follows:—

§ 1. *Eu-Ceratostylis*. The rhizome always shortened; the flowers at the top of the pseudobulb or stem, from the axil of a single leaf.

§ 2. *Pleuranthemum*. The rhizome usually more-or-less elongated; the flowers from the side of the jointless pseudobulbs or stems, clearly arising below a single leaf.

Though my two sections correspond reasonably with those of Reichenbach f., I have deemed it advisable to give them new names, firstly to indicate that they have been established on the basis of other characters, and secondly to show that the limitations of the sections possibly may be different.

All the species from New Guinea belong, up to the present, to the first of these sections, which is by far the larger of the two. In *C. maboroensis* Schltr. we have the first species of the section *Pleuranthemum* from New Guinea.

As far as we are currently aware, the distribution of the genus extends from India, where *C. teres* (Griff.) Rehb. f. and *C. himalaica* Hook. f. (*Ritaia himalaica* King et Pantl.) were found as eastern [Ed.—surely 'western' is intended] species through the monsoon-regions as far as New Caledonia. From the latter, *C. micrantha* Schltr. has been recorded as the most eastern as well as the most southern species. Up to the present the Philippines are regarded as the most northern boundary, but it is not improbable that more thorough investigation of the flora of Hainan and Formosa may disclose further representatives of the genus, because the Philippines are still rich in peculiar endemic forms belonging chiefly to the section *Pleuranthemum*.

§ 1. *Eu-Ceratostylis*

The species of this section are characterised by a rhizome (representing the stem) which is so very much shortened, that the plants form thick, tufted or grass-like, usually single-jointed, pseudobulbs. The flowers arise from the top of the pseudobulbs in the axil of the foliage-leaves, usually in more-or-less large tufts. The species nearly always grow in colonies since, apparently, the germination of the exceedingly small seeds takes place much more easily in their native habitats. They are found at all altitudes within the Territory, but always as epiphytes, growing by preference on the branches of the taller trees of the primary forests; or (this especially applies to the species with broader leaves) on smaller trees along the creeks and rivers in the mountains, as well as at lower altitudes, but never directly near the coast. Besides the species here enumerated from German New Guinea the following have been recorded from the region:—

From Dutch New Guinea: *C. albiflora* J.J. Sm., *C. clavata* J.J. Sm., *C. formicifera* J.J. Sm., *C. humilis* J.J. Sm., *C. indifferens* J.J. Sm., *C. longifolia* J.J. Sm., *C. pugioniformis* J.J. Sm., *C. recurva* J.J. Sm. and *C. resiana* J.J. Sm.

From British Papua: Up to the present only *C. Sayeri* Schltr., but it is certain that a large number still await discovery.

1. *C. platychila* Schltr., in K. Schum. et Laut., Nachtr. [1905] p. 138.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000–1100 m—R. Schlechter no. 13990, flowering in Jan. 1902; no. 18534, flowering in Oct. 1908.

This species is distinguished by the broad labellum and the snow-white colour of the flowers. The specimens I have now brought with me have a slightly narrower labellum, according to my sketches, but the reason may be that the labellum was sketched without spreading it out flat. The column-foot is reduced noticeably in this species.

2. *C. dischorensis* Schltr., sp. nov.

Caespitosa, acaulis, pusilla, gracilis, usque ad 14 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis (i.e. caulibus), gracillimis, filiformibus, teretibus, glabris, basi vaginis lanceolatis, acuminatis, amplexantibus obtectis, unifoliatis, 3–11 cm altis, 0.75–1 mm diametentibus; folio erecto, subulato-filiformi, acuto, facie basi sulcato, tereti, glabro, 1.5–3 cm longo, pseudobulbo aequicrasso; floribus in fasciculis paucifloris, terminalibus, vaginis ovato vel ovali-lanceolatis, apiculatis, protectis, in genere inter minimos, niveis; bracteis brevibus, lanceolatis, acuminatis; sepalis ovatis, subacutis, basi sparsim puberulis, 1.75 mm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum, perbreve formantibus; petalis oblique lanceolatis, acutis, glabris, 1.5 mm longis; labello oblongo, basi angustato, superne carinulis 2 tenuibus, usque infra medium decurrentibus donato, antice conspicue incrassato, obtusissimo, 1.78 mm longo, glabro; columna perbrevis, brachiis bene evolutis, oblongis, obtusis, pede brevi sed distincto; anthera subquadrata, antice trilobulata, glabra; pollinibus oblique obpyriformibus, glandula minuta, rotundata; ovario cylindraceo-clavato, puberulo, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19672, flowering in June 1909.

Among the species previously described, this is related most closely to *C. platychila* Schltr., but it is distinguished easily by the sepals which are hairy on the outside at the base, by narrower petals, the shape of the lip and by the distinct column-foot. It appears to be restricted to the eastern part of Kaiser-Wilhelms-Land. The flowers are snow-white like those of *C. platychila* Schltr.

3. *C. flavescens* Schltr., sp. nov.

Epiphytica, gracillima, caespitosa, usque ad 25 cm alta; rhizomate valde abbreviato; pseudobulbis filiformibus, gracilibus, unifoliatis, basi vaginis lanceolatis, acuminatis obtectis, 10–20 cm longis, crassitudine vix 0.1 cm excedentibus, glabris; folio erecto, subulato-filiformi, acuto, glabro, usque ad 7 cm longo, crassitudine pseudobulborum; floribus in fasciculis terminalibus paucifloris, in genere inter minimos, flavescens, vaginis paucis, ovalibus, acutis, glabris, protectis; bracteis parvulis, acuminatis, ovario bene brevioribus, hyalinis; sepalis oblongis, obtusis, glabris, vix 0.3 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata mentum perbreve formantibus; petalis oblique lanceolatis, acuminatis, glabris, sepalis paulo brevioribus, margine anteriore infra medium paulo dilatatis; labello circuito anguste elliptico, apice carnosus, obtusus, lamellis 2 tenuibus parallelis e basi usque in medium decurrentibus, sepalis aequilongis, glabro; columna brevi, brachiis oblique oblongis, obtusis, bene longis, pede subnullo; anthera obreniformi-quadrata, obtusissima, glabra; pollinibus oblique clavatis, glandula minuta, oblonga; ovario cum pedello cylindraceo-clavato, puberulo, c. 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18685, flowering in Nov. 1908.

The most slender of all species known to me. In habit it reminds one of some very slender species of *Scirpus*, and possesses a good characteristic in the yellowish, almost sulphur-yellow flowers, with a golden yellow labellum, which is in contrast to other related species. The column-foot is reduced almost completely.

4. *C. nivea* Schltr., sp. nov.

Caespitosa, gracilis, usque ad 16 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracillimis, filiformibus, unifoliatis, basi vaginis paucis lanceolatis, acuminatis, amplexantibus obtectis, 7–12 cm longis, vix 0.1 cm crassitudine excedentibus; folio

erecto-patente subulato-filiformi, acuto, glabro, usque ad 5.5 cm longo, crassitudine pseudobulbi; floribus in fasciculis paucifloris, terminalibus, vaginis ovalibus, acutis, glabris protectis, niveis; bracteis parvulis, ovatis, apiculatis, hyalinis; sepalis oblongis, obtusiusculis, basi sparsim puberulis, 2.75 mm longis, lateralibus obliquis, intermedio paulo angustioribus, basi margine anteriore dilatata connatis, mentum breve obtusum, sed distinctum formantibus; petalis oblique lanceolatis, acutis, glabris, sepalis paulo brevioribus; labello e basi subunguiculato-angustata rhombeo-ovato, apice ipsa carnosio, obtuso, lamellis 2 tenuibus puberulis e basi usque supra medium decurrentibus, caeterum glabro, 0.3 cm longo; columna brevi, cum brachiis subquadratis labello plus duplo brevior, pede brevi, sed distincto; anthera quadrato-galeata, antice bidentata, glabra; ovario cum pedicello clavato, puberulo, vix 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees on the banks of Njonge Creek near Ambo, alt. c. 600 m—R. Schlechter no. 18121, flowering in Aug. 1908.

When I collected this plant, I was at first under the impression that it was *C. kaniensis* Schltr., but I soon discovered that the flowers showed several important differences. When I now compare the dried specimens of each, I see that they also differ in habit, since *C. nivea* Schltr. is much more slender and approaches *C. flavescens* Schltr. The species is, probably, nearest to *C. leucantha* J.J. Sm. in the structure of the flower.

5. *C. kaniensis* Schltr., sp. nov.

Epiphytica, caespitosa, pusilla, 8–12 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis filiformibus, gracilibus, basi vaginis paucis, lanceolatis, acuminatis, amplexantibus obtectis, unifoliatis, 4–9 cm longis, 1.25–1.50 mm diametentibus; foliis erecto-patentibus vel erectis, subulatis, acutis, glabris, superne sulcatis, 2–4.5 cm longis, crassitudine pseudobulbi; floribus niveis, in fasciculis paucifloris terminalibus, in genere inter minores, vaginis ovatis, acuminatis protectis; sepalis oblongis, obtusis, glabris, basi nunc sparsim puberulis, 3.5 mm longis, lateralibus obliquis basi margine anteriore dilatata mentum obtusum breve formantibus; petalis oblique lineari-ligulatis, acutis, glabris, sepalis paulo brevioribus; labello e basi subunguiculato-angustata obovato-spathulato, obtuso, apice carnosio-incrassato, lamellis 3 tenuibus parallelis e basi usque infra apicem decurrentibus, 3.75 mm longo, glabro; columna brevi, cum brachiis brevibus labello fere 3-plo brevior, pede subaequilongo; anthera subreniformi, glabra, obtusa, medio ample umbonata; ovario cum pedicello clavato, puberulo, vix 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16532, flowering in Sept. 1907.

As previously explained, this species is related to *C. nivea* Schltr., but certain differences are shown by the more compact habit and thicker pseudobulbs and leaves. By a closer examination it will be seen that the petals are much narrower and the labellum is provided with three (not two) lamellae, which are glabrous, whereas in *C. nivea* Schltr. they are hairy.

6. *C. brevipes* Schltr., sp. nov.

Epiphytica, erecta, caespitosa, 10–16 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; pseudobulbis erectis, gracilibus, teretibus, glabris, basi vaginis amplis, lanceolatis, cuspidato-acuminatis, amplexantibus obtectis, unifoliatis, 7–13 cm altis, 1.5–2 mm diametentibus; foliis erectis, vulgo leviter incurvis, subulatis, acutis, usque ad 4 cm longis, pseudobulbi crassitudine, facie leviter sulcatis; capitulis florum parvulis, plurifloris, vaginis pluribus apiculatis protectis; floribus in genere vix inter mediocres, rubescentibus cum labello antice flavo; bracteis parvulis, hyalinis, ovatis, apiculatis; sepalis oblongis, obtusis, 0.4 cm longis, intermedio glabro, lateralibus obliquis, basi sparsim puberulis, margine antice basi dilatata et connata saccum subglobosum, paulo inflatum, 0.1 cm diametentem formantibus; petalis e basi lineari oblique lanceolatis, acutis, glabris, sepalis paulo brevioribus; labello linguiformi, obtuso, antice carnosio-incrassato, basi paulo angustato, marginibus incurvulis ciliolato, 0.4 cm longo, lamellis 2 parallelis, puberulis, e basi usque in tertiam partem basilem decurrentibus; columna brevi, cum brachiis oblique oblongis vix dimidium labelli excedente, glabra, pede perbrevis; anthera suborbiculari-ovata, antice minute apiculata, glabra; ovario sessili cylindraco, puberulo, c. 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18506, flowering in Oct. 1908.

In contrast to other related species with an appreciably reduced column-foot, this species differs in its thicker leaves and pseudobulbs and in the globular-shaped sac, formed by the lateral sepals. The column-foot is here noticeably small and this induced me to call the plant 'brevipes'. The flowers are a muddy reddish colour, with the labellum yellow in front.

7. *C. lancipetala* Schltr., sp. nov.

Epiphyticum, erectum caespitosum, 20–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis gracilibus, teretibus, basi vaginis pluribus amplis, lanceolatis, acuminatis, tenuiter reticulato-nervosis, amplexantibus obtectis, 10–22 cm longis, 1.75–2 mm crassis, unifoliatis; foliis erectis, subulatis, facie sulcatis, acutis, glabris, pseudobulbi crassitudine, 3–4 cm longis; capitulis plurifloris, terminalibus, vaginis apiculatis protectis; floribus in genere inter mediocres, erecto-patentibus; sepalis oblongo-ligulatis, obtusiusculis, extus basi puberulis, 0.5 cm longis, lateralibus obliquis, basi margine anteriore conspicue producta et connata saccum oblongum obtusum 1.75 mm longum formantibus; petalis lanceolatis; acuminatis, paulo obliquis, glabris, sepalis paulo brevioribus; labello e basi unguistiore cuneato-ligulato, in tertia parte apicali subito paulo constricto et in apicem carnosio-incrassatam subglobosam ampliato, dimidio inferiore margine minute ciliolato, lamellis 2 parallelis, quartam partem labelli haud excedentibus, ciliolatis superne basi ornato, 0.6 cm longo, infra apicem 2.5 mm crasso, supra medium 0.3 cm lato; columna brevi, glabra, cum brachiis oblongo-quadratis dimidium labelli vix attingente, pede pro magnitudine floris perbrevis, apice incurvo; anthera quadrato-cucullata, glabra, apiculata; ovario subsessili, cylindraceo, puberulo, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19528, flowering in May 1909.

This species is fairly isolated by the shape of the lip, but in its short column-foot has connections with *C. brevipes* Schltr. and with which it shares in common the short lamellae at the base of the lip. The flowers are a muddy red, as with the latter, but the labellum is golden yellow in front. A specimen, no. 19691, which I collected on the Dischore Range in 1909, may also belong here; it has thicker, more swollen stems which may have undergone this change by fungal mycelium.

8. *C. ficinioides* Schltr., sp. nov.

Epiphytica, erecta, gracilis, caespitosa, 18–23 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, hispidulis; pseudobulbis filiformibus, gracillimis, basi vaginis lanceolatis, acuminatis, amplexantibus obtectis, 13–18 cm longis, 1–1.25 mm diametentibus, unifoliatis; folio erecto, subulato-filiformi, acuto, glabro, tereti, superne leviter sulcato, 4–6 cm longo; capitulis terminalibus, plurifloris, vaginis lanceolatis, apiculatis protectis; floribus in genere inter minores, erecto-patentibus; bracteis brevibus, ovalibus, apiculatis, glabris; sepalis oblongis, obtusis, extus basi tantum sparsim puberulis, 3.25 mm longis, lateralibus basi margine anteriore conspicue producta et connata saccum oblongum obtusum, 0.2 cm longum formantibus; petalis oblique et angustius lanceolatis, acutis, glabris, sepalis paulo brevioribus; labello e basi subunguiculato-angustata oblongo-spathulato, obtuso, antice carnosio-incrassato, basi margine minutissime et dense ciliolato, lamellis 2 parallelis, ciliolatis e basi usque in medium superne ornato, 3.75 mm longo; columna brevi, glabra, cum brachiis oblique oblongis obtusis dimidium labelli paulo superante, pede brevi, apice incurvulo; anthera semiglobosa, dorso umbonata, antice obtusissima; ovario subsessili, cylindraceo, puberulo, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20218, flowering in Sept. 1909.

A very slender and fairly tall species, which somewhat resembles *C. lancipetala* Schltr. in its flowers, but differs from it in its more slender habit, smaller flowers, narrower petals and the entirely differently shaped lip. These species all resemble each other in the colour of the flowers; thus this one also has the reddish flowers with white petals and the pale yellow front to the lip. In habit the species reminds one of some South African *Ficinia* species.

9. *C. oreophila* Schltr., sp. nov.

Epiphytica, caespitosa, c. 15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis,

flexuosis, villosulis; pseudobulbis gracilibus, teretibus, unifoliatis, basi vaginis brunneis, acuminatis, alte amplexantibus obtectis, 8–11 cm longis, 1.5–2 mm diametiente; foliis erectis, filiformi-subulatis, acutis, facie leviter sulcatis, teretibus, 5–6 cm longis; capitulis plurifloris, mediocribus, terminalibus, vaginis ovalibus acutis protectis; bracteis minutis, ovatis, acutis; floribus in genere inter mediocres, erecto-patentibus; sepalis oblongis, obtusis, extus sparsim puberulis, 0.4 cm longis, lateralibus obliquis, basi margine anteriore productis et connatis, saccum breve oblongum c. 0.2 cm longum formantibus; petalis lineari-lanceolatis, acuminatis, glabris, sepalis paulo brevioribus; labello e basi angustata ligulato-oblongo, obtuso, apice carnosio-incrassato, 0.6 cm longo, basi marginibus incurvulis, lamellis 2 superne e basi labelli usque ad tertiam partem basilem decurrentibus, minute ciliolatis; columna brevi, brachiis quadratis, dimidium labelli haud attingentibus, pede brevi; anthera subglobosa, glabra, apice minute excisa; ovario subsessili, puberulo, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17164, flowering in Jan. 1908.

A well defined species which may be recognised easily by its sepals slightly hairy on the outside, up to the apex. The plant may be distinguished also from the other species by its relatively long leaves. The flowers are of a plain pale yellow colour.

10. *C. inflata* Schltr., sp. nov.

Epiphytica, erecta, gracilis, caespitosa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis gracilibus, teretibus, glabris, unifoliatis, basi vaginis paucis, pro genere parvulis, lanceolatis, acuminatis, amplexantibus obsessis, 5–20 cm longis, 1.25–1.50 mm diametientibus; foliis erectis, brevibus, subulatis, acutis, teretibus, facie leviter sulcatis, usque ad 3 cm longis, pseudobulbo crassitudine subaequalibus; capitulis pluri-vel paucifloris, parvulis, vaginulis ovato-lanceolatis, acuminatis protectis; floribus in genere inter minores, erecto-patentibus; bracteis minutis, ovatis, acutis, glabris; sepalis ligulato-oblongis, obtusis, basi sparsim puberulis, 3.5 mm longis, lateralibus obliquis, nunc subacutis, basi margine anteriore producta et connata saccum oblique obturbato-inflatum 1.5 mm longum formantibus; petalis oblique lineari-ligulatis, acutis, glabris, sepalis paulo brevioribus; labello e basi angustiore oblongo-ligulato, obtuso, quarta parte anteriore carnosio-incrassato, lamellis 2 parallelis, tenuibus, ciliolatis, superne e basi usque in medium decurrentibus, 0.4 cm longo, supra medium 1.25 mm lato; columna brevi, cum brachiis oblique oblongis, obtusis, amplis dimidium labelli vix attingente, pede perbrevis; anthera quadrata, obtusissima, glabra; ovario subsessili, cylindraceo, villosulo, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19361, flowering in May 1909.

One might conclude, by a superficial examination of the species, that one is dealing with a small-flowered variety of *C. lancipetala* Schltr., but an examination of the flowers soon shows that both species must be kept separate. The sac formed by the petals is an inverted cone-shape and obliquely inflated. The petals are rather narrow. The flowers, likewise, are reddish on the outside, inside they are whitish with the labellum yellow towards the apex.

11. *C. phaeochlamys* Schltr., sp. nov.

Epiphytica, erecta, caespitosa, pro genere bene valida, 20–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, teretibus, glabris, unifoliatis, basi vaginis amplis brunneis, reticulato-nervosis, acuminatis, alte amplexantibus obtectis, 15–27 cm altis, 2–2.25 mm diametientibus, unifoliatis; foliis erectis, subulatis, acutis, facie leviter sulcatis, teretibus, glabris, pseudo bulbi crassitudine, 4–6.5 cm longo; capitulis pro genere multifloris, terminalibus, vaginis lanceolatis acuminatis protectis; floribus in genere inter mediocres, rubescentibus; bracteis minutis, ovatis, acutis, glabris; sepalis ligulato-oblongis, obtusiusculis, dimidio inferiore sparsim puberulis, 6.5 mm longis, lateralibus basi margine anteriore producta et connata saccum oblique ovatum, obtusum 0.4 cm longum formantibus; petalis anguste rhombeo-lanceolatis, acutis, obliquis, glabris, sepalis paulo brevioribus; labello ligulato, antice carnosio-incrassato, obtuso, dimidio inferiore marginibus incurvulis, in quarta parte inferiore paulo constricto, 7.5 mm longo, supra medium 2.25 mm lato, lamellis 2 tenuibus, minute ciliolatis e basi labelli usque infra medium superne decurrentibus; columna brevi cum brachiis amplis oblique oblongis dimidium labelli attingente, pede mediocri; anthera subquadrata, antice minute bidentata; ovario subsessili, cylindraceo, puberulo, 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c.

800 m—R. Schlechter no. 20046, flowering in Sept. 1909.

This species is the most robust amongst its relatives and is distinguished by the multiplicity of the flower heads. In this respect it approaches *C. capitata* Zoll. et Rchb. f., which it also somewhat resembles externally. Very characteristic in the species are the large brown sheaths at the bases of the pseudobulbs. The flowers are a muddy reddish colour.

12. *C. longipes* Schltr., sp. nov.

Epiphytica, caespitosa, 13–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis gracilibus, teretibus, unifoliatis, basi vaginis lanceolatis, acuminatis, amplexantibus obtectis, 9–14 cm longis 1.50–1.75 mm diametientibus; foliis erectis subulatis, acutis, 2.5–4 cm longis, pseudobulbi crassitudine; capitulis parvulis, plurifloris, vaginis ovato-lanceolatis, acuminatis protectis; floribus in genere vix inter mediocres, erecto-patentibus; bracteis minutis, ovatis, apiculatis; sepalis oblongis, subacutis, dimidio inferiore puberulis, lateralibus basi margine anteriore valde producta et antice basi connata saccum oblongum obtusum 2.5 mm longum formantibus; petalis linearibus, breviter acuminatis, obliquis, glabris, sepalis paulo brevioribus; labello tertia parte inferiore ligulato, deinde in laminam oblongam, obtusam quarta parte apicali carnosio-incrassatam dilatato, basi marginibus incurvulis, 0.4 cm longo, lamellis 2 tenuibus parallelis, e basi usque supra medium labelli decurrentibus, minute ciliolatis; columna brevi, brachiis amplis, oblique oblongis, dimidium labelli paulo superantibus, pede columnae distincte longiore; anthera subquadrata, glabra, antice 2 dentata; ovario cum pedicello brevi puberulo, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 150 m—R. Schlechter no. 18469, flowering in Oct. 1908.

All species of the genus, previously described and enumerated, had a short column-foot. In contrast to these, *C. longipes* Schltr. is distinguished (together with some of the following) by its long column-foot. The flowers are yellowish white, with a reddish spur and a golden yellow apex to the lip.

13. *C. rivularis* Schltr., sp. nov.

Epiphytica, erecta, caespitosa, 13–16 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; pseudobulbis gracilibus, teretibus, glabris, unifoliatis, basi vaginis elliptico-lanceolatis, acuminatis, reticulato-nervosis obtectis, 8–13 cm longis, 1.75–2 mm diametientibus; foliis brevibus, subulatis, acutis, facie leviter sulcatis, erectis, vulgo paulo incurvulis, 2–3.5 cm longis; capitulis parvulis, paucifloris, terminalibus, vaginulis apiculatis, ellipticis protectis; floribus in genere inter minores, erecto-patentibus; sepalis oblongis, obtusiusculis, dimidio inferiore sparsim puberulis, lateralibus obliquis, basi margine anteriore valde producta et connata saccum oblongum, obtusum, 2.5 mm longum formantibus; petalis oblique lanceolatis, acutis, glabris, sepalis subaequilongis; labello e basi angustiore ovali, obtusissimo, antice carnosio-incrassato, basi marginibus incurvulis, 3.25 mm longo, lamellis 2 parallelis e basi labelli usque ad tertiam partem apicalem decurrentibus, ciliolatis; columna brevi, glabra, brachiis amplis, oblongis, dimidium labelli attingentibus, pede columnae aequilongo; anthera late conica, antice truncata, bilobulata, glabra; ovario breviter pedicellato, cylindraceo, puberulo, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees on the Mudjene [River] near Wobbe, alt. c. 300 m—R. Schlechter no. 16595, flowering in Sept. 1905. [Ed.—possibly 1907].

This can be regarded without doubt as most closely related to *C. longipes* Schltr., with which I would not care to unite it, because it differs in its broader petals, the lip broader in front, a shorter column-foot, and differently shaped anther. The flowers have the muddy red colour frequently seen in the genus, with the labellum golden yellow at the apex.

14. *C. spathulata* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 139.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900–1000 m—R. Schlechter no. 14365, flowering in Apr. 1902.

With the appreciably better material now available, I could establish that my initial description requires some additions and corrections. Specimens of the size first described by me are, evidently, very rare, and the usual height of the species should be

given as only 15–18 cm. The sepals are slightly hairy on the outside at the base; the petals narrow-lanceolate, pointed; the labellum has two keels on its upper surface which are covered with very fine, hardly noticeable hairs and extend beyond the middle, diverging slightly in front. As stated previously, the species is related closely to *C. scirpoides* Schltr.

var. *tenerrima* Schltr., var. nov.

Differt a forma typica floribus minoribus, labello non distincte spathulato antice longius carnosocrassato, habitu tenuiore et humiliore.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20243, flowering in Sept. 1909.

It is possible that this variety may, later, be proved to be a species, even though it agrees perfectly in habit with the Type. Particularly in the labellum and in the column there are differences which made me very doubtful, in my observation on living material, as to whether it belongs to *C. spathulata*.

15. *C. calcarata* Schltr., sp. nov.

Epiphytica, erecta, caespitosa, 10–15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, sparsim puberulis; pseudobulbis gracilibus, subfiliformibus, teretibus, glabris, basi vaginis lanceolatis, aristato-acuminatis, glabris, alte et arcte amplexantibus obtectis, 6–11 cm longis, 1.25–1.50 mm diametro, unifoliatis; foliis erectis brevibus, subulatis, acutis, teretibus, facie minute sulcatis, glabris, 1.5–2 cm longis, crassitudinem pseudobulbi subaequantibus; fasciculis florum paucifloris, terminalibus, vaginulis lanceolatis, apiculatis protectis; floribus in genere inter minores, erecto-patentibus; bracteis minutis ovatis, apiculatis, hyalinis; sepalis ovatis, obtusiusculis, basi sparsim puberulis, 0.2 cm longis, lateralibus basi margine anteriore maxime producta et connata, calcar obtusum, cylindricum, puberulum, 2.5–3 mm longum formantibus; petalis oblique elliptico-lanceolatis, acutis, glabris, sepalis paulo brevioribus; labello e basi lineari-ligulata, dimidio superiore obovato, antice carnosocrassato, obtusissimo, dimidio inferiore marginibus leviter incurvulis minute ciliolatis, 2.5 mm longo, lamellis 2 parallelis, apice leviter divergentibus, minute ciliolatis, e basi labelli superne usque in medium decurrentibus; columna brevi, brachiis ovalibus, obtusis dimidium labelli longe superantibus, pede perlongo, columnae bene longiore; anthera subreniformi, apiculata, ovario cylindraceo, puberulo, cum pedicello c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19641 (TYPE), flowering in May 1909; on trees in the forests of the Maboro Range, alt. c. 1100 m—R. Schlechter no. 19858, flowering in June 1909.

This interesting small species is reminiscent of *C. kaniensis* Schltr. in habit, but is quite different in the structure of its flowers. The spur formed by the sepals is much elongated and brings this species close to *C. ampullacea* Krzl. from Sumatra, *C. sima* J.J. Sm. from the Celebes and *C. clavata* J.J. Sm. from Dutch New Guinea. The colour of the flowers is reddish with white petals and a golden yellow apex to the lip. The specimens from the Maboro Range have a somewhat longer spur than those from the Dischore Range.

16. *C. scirpoides* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 138.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900–1000 m—R. Schlechter no. 14359, flowering in Apr. 1902; no. 20230, flowering in Sept. 1909.

This species forms a direct transition between the forms with terete leaves and those with flat leaves, in that its leaves are flattened out above and are narrowly linear. It is well characterised from the rest by the long spur which is formed by the lateral sepals. I have also found some specimens which are probably hybrids between this species and *C. spathulata* Schltr.

17. *C. hydrophila* Schltr., sp. nov.

Epiphytica, caespitosa, 10–17 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis gracilibus, teretibus, unifoliatis, basi vaginis brunneis, ovalibus, apiculatis, amplexantibus obtectis, 5–10 cm longis, c. 1.5 mm diametientibus; folio angustius ligulato obtuso, basi in petiolum brevem angustato, glabro, coriaceo, petiolo incluso 4.5–9 cm longo, medio fere 0.4–0.7 cm lato; capitulis plurifloris, terminalibus, vaginulis lanceolatis, acuminatis protectis; bracteis minutis ovatis, apiculatis, hyalinis; floribus in genere inter minores, erecto-patentibus; sepalis oblongis, obtusiusculis, basin versus puberulis, 3.5 mm longis, lateralibus obliquis, basi margine anteriore bene ampliatis et connatis, saccum subglobosum puberulum c. 1.5 mm diametientem formantibus; petalis oblique ligulato-lanceolatis, acuminatis, glabris, sepalis paulo brevioribus; labello e basi breviter unguiculato in laminam late ovalem obtusissimam dilatato, antice carnosio-incrassato, lamellis 2 tenuibus, ciliolatis, antice leviter divergentibus e basi usque supra medium decurrentibus, marginibus basi leviter incurvulis, vix 0.4 cm longo; columna brevi, cum brachiis quadratis dimidium labelli attingente, pede brevi; anthera subquadrato-cucullata, grabra; ovario cylindraco subsessili, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Mudjene [River] not far from Panebo, alt. c. 450 m—R. Schlechter no. 16940, flowering in Dec. 1907.

This, and the following species of this section, are distinguished from all those enumerated and described above by the flat leaves and the distinctly developed lamina. The present species resembles, in structure of flower and size, most of the species with terete leaves. The flowers are whitish, with a golden yellow apex to the labellum.

18. *C. glabriflora* Schltr., sp. nov.

Epiphytica, caespitosa, erecta, 18–39 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis erectis, gracilibus, unifoliatis, teretibus, glabris, basi vaginis acuminatis, amplexantibus obtectis, 12–22 cm longis, 1.75–2 mm diametientibus; foliis erectis, linearibus, longius acuminatis, basi in petiolum 1–1.5 cm longum angustatis, glabris, textura coriaceis, petiolo incluso 8–11 cm longis, medio fere 2–3.5 cm longis; capitulis terminalibus paucifloris, vaginis lanceolatis, acuminatis protectis; bracteis parvulis, ovatis, apiculatis, hyalinis; floribus in genere inter majores, ovario excepto glabris; sepalis oblongis, obtusiusculis, glabris, c. 0.7 cm longis, lateralibus obliquis, basi margine anteriore dilatatis et connatis, mentum oblongum, obtusum, 2.5 mm longum formantibus; petalis obliquis, anguste lanceolatis, acuminatis, glabris, sepalis paulo brevioribus; labello circuitu oblanceolato-ligulato, tertia parte anteriore carnosio-incrassato obtuso, 0.9 cm longo, medio fovea subrotunda excavato, lineis vel lamellis tenuibus 2 e basi usque in medium decurrentibus, parallelis; columna brevi, glabra, cum auriculis oblique oblongis medium labelli haud attingente, pede mediocri; anthera galeato-cucullata, minute apiculata, glabra; ovario cylindraco, puberulo, vix 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18747, flowering in Nov. 1909 [Ed.—probably 1908].

This may be recognised easily from all related species by the narrow, long tapering leaves and with the labellum deeply grooved in the middle. The plant also possesses considerably larger flowers than usual for a species of this section. The flowers are reddish with the labellum golden yellow in front.

19. *C. acutifolia* Schltr., sp. nov.

Epiphytica, erecta, caespitosa, 30–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, puberulis; pseudobulbis gracilibus, teretibus, glabris, erectis, basi vaginis acuminatis, reticulato-nervosis, alte amplexantibus protectis, 17–27 cm longis, 2–2.25 mm diametientibus, unifoliatis; foliis erectis, linearibus, acutis, basi sensim subpetiolato-angustatis, glabris, textura coriaceis, 12–16 cm longis, medio fere 0.5–0.7 cm latis; capitulis pluri-multifloris, terminalibus, vaginis ovatis, obtusis vel apiculatis protectis; bracteis parvulis ovatis, apiculatis, hyalinis; floribus in genere inter majores, erecto-patentibus; sepalis oblongis, obtusiusculis, extus puberulis, 5.5 mm longis, lateralibus obliquis, basi margine anteriore conspicue ampliatis et connatis, mentum oblongum obtusum, 3.5 mm longum formantibus; petalis oblique elliptico-lanceolatis, acuminatis, glabris, sepalis paulo brevioribus; labello e basi paulo angustiore anguste oblongo-ligulato, tertia parte apicali carnosio-incrassato, glabro, 7.5 mm longo, glabro; columna brevi, cum brachiis quadrato-oblongis tertiam partem inferiorem labelli vix superante, glabra, pede satis longo; anthera subreniformi, antice truncata, dorso umbonata, glabra; ovario cylindraco, puberulo, subsessili, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18748, flowering in Nov. 1908.

A superficial examination of this species shows the great resemblance to *C. glabriflora* Schltr., but it has broader, simple, pointed leaves. The whole plant is also taller than *C. glabriflora* Schltr., the flowers are smaller, hairy on the outside and in the individual parts altogether different, being red-brown with the labellum yellow in front.

20. *C. triloba* Schltr., sp. nov.

Epiphytica, erecta, caespitosa, 30–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus erectis, gracilibus, teretibus, glabris, basi vaginis amplis, acuminatis, nervis reticulatis pulchre brunneo-pictis, alte amplexentibus obsessis, unifoliatis, 15–20 cm longis, 2.25–2.50 mm diametentibus; foliis erecto-patentibus, lineari-ligulatis, acutis, basi in petiolum brevem angustatis, glabris, textura coriaceis, 11–16 cm longis, medio fere 0.5–0.9 cm latis; capitulis terminalibus, plurifloris, vaginis lanceolatis, acutis vel acuminatis protectis; bracteis parvulis, ovatis, apiculatis, hyalinis; floribus in genere inter majores, erecto-patentibus; sepalis ligulato-oblongis, obtusiusculis, basi sparsim puberulis, 6.5 mm longis, lateralibus obliquis, basi margine anteriore conspicue dilatatis et connatis saccum oblique oblongum, obtusum, puberulum, vix 0.3 cm longum formantibus; petalis oblique lineari-lanceolatis, acutis vel acuminatis, glabris; sepalis paulo brevioribus; labello e basi cuneato-ligulata, margine minute ciliolata supra medium trilobo, 0.9 cm longo, lobis lateralibus parvulis, abbreviatis, dentiformibus, obtusis, intermedio multo majore, oblongo, obtuso, dimidio anteriore carnosio-incrassato, lamellis 2 tenuibus, parallelis, e basi labelli usque ad basin lobi intermedii decurrentibus, minute ciliolatis; columna brevi, glabra, cum auriculis amplis, oblique oblongis, obtusis tertiam partem basilem labelli vix excedentibus, pede brevi; anthera reniformi, minute apiculata, glabra; ovario cylindraceo, puberulo, subsessili, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18595, flowering in Nov. 1909 [Ed.—probably 1908].

A very interesting species, at once recognisable by its involucre, beautifully marked by a brown network of veins at the base of the pseudobulbs, but well distinguished in its floral characteristics, from all other species in the Territory, by its three-lobed labellum. The flowers are reddish with whitish petals and the lip yellow in front.

§ 2. *Pleuranthemum*

Indisputably, this is the smaller of the two sections into which I divided the genus. The first species of the section were recorded by Blume from Java. Subsequently, more were published, especially by Hooker f., Ridley, J.J. Smith and myself, from the Malayan Peninsula and Archipelago. Now that the Philippine flora is better known, thanks to the excellent work of American collectors and botanists, it would appear that the most peculiar species of the section occur in those islands in not insignificant numbers. *C. vagans* Schltr., lately described by me from the Celebes, must be regarded as the most eastern species. No representative of this section has, hitherto, been recorded from New Guinea.

Whereas species of the section *Eu-Ceratostylis* are, very often, found fairly low down on the plains in our Territory, species of *Pleuranthemum* are exclusively mountain epiphytes, which are hardly ever found below the mist-forest zone. They usually grow in colonies, very often hanging in tufts from trees in the mist-forest, in particular those species belonging to the relationship described here.

In the 'Flora der Deutschen Schutzgebiete in der Südsee', Kränzlin records *Ceratostylis papuanus* Krzl. As anyone may be convinced by consulting the original citation, this plant was published erroneously as *Ceratostylis* in the above work, instead of *Ceratochilus papuana* Krzl. As a matter of fact it has even less affinity with *Ceratochilus* than it has with *Ceratostylis*. It is, in fact, a *Glossorrhyncha* species, as I was able to assure myself by an examination of the Type specimen.

21. *C. maboroensis* Schltr., sp. nov.

Epiphytica, dependens, usque ad 30 cm longa, plus minus ramosa; rhizomate elongato, flexuoso, vaginis lanceolatis vel elliptico-lanceolatis, acuminatis, amplexantibus dense vestito, tereti, glabro, c. 0.2 cm diametiente; radicibus filiformibus elongatis, flexuosis, dense puberulis; pseudobulbis 1–1.5 cm distantibus, cylindraceutis, unifoliatis, basi vaginis lanceolatis acuminatis obtectis, c. 1 cm altis, 0.2 cm diametientibus; foliis linearibus, acutis vel subacutis, basi sensim petiolato-angustatis, glabris, texture carnosae, 6–8 cm longis, medio fere 3.5–5 mm latis; floribus in fasciculis lateralibus, infra apicem pseudo-bulborum natis, paucifloris, vaginulis lanceolatis, acutis protectis; pedunculo brevi, puberulo; bractea minuta, ovata, apiculata, hyalina; sepalis intermedio ovato, obtusis, extus puberulis, 0.4 cm longo, lateralibus oblique triangularibus, obtusiusculis, puberulis, intermedio aequilongis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique linearibus, obtusiusculis, basin versus paulo dilatatis, glabris, sepalis paululo brevioribus; labello circuitu oblongo-ligulato, infra medium marginibus incurvis leviter constricto, medio paulo dilatato, supra medium sursum paulo angustato et in apicem oblongum obtusum carnosum-incrassatum, apice ipsa excepta puberulum productum, medio superne toris 2 semilunatis, carnosis, basi puberulis ornato, 4.5 mm longo; columna perbrevis, brachiis valde abbreviatis incurvis, apiculatis, pede elongato basi intus puberulo; anthera late cordata, apice excisa; ovario cylindrico, villosulo, sessili, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19525, flowering in May 1909.

The species is related to *C. pendula* Hook. f. from Perak, *C. vagans* Schltr. from the Celebes and *C. philippinensis* Rolfe from the Philippines. In all these species the arms of the column are reduced considerably and not bent inwards at the margin. By this means, the stigma lies more exposed and the column assumes the shape reminiscent of that in *Sarcostoma* Bl.

Among the three above-mentioned species *C. maboroensis* Schltr. comes nearest to *C. vagans* Schltr. However, both species are well distinguished by the lip. All these species have snow-white flowers.

47. *Agrostophyllum* Bl.

As a result of the exploration of the Malay-Papuan flora, this genus has, in recent years, increased considerably at a greater rate than *Ceratostylis* Bl. In the year 1889, Pfitzer stated that it then consisted of five species. Since that date, in little more than 20 years, 28 more species have been published and I have now to describe here 23 more novelties, so that the total number of species now in the genus approaches 60. We thus see what surprises can be expected in connection with some of the floral regions. It is evident also that New Guinea is to be regarded as the richest of all areas in species of this genus, because more than two-thirds of the total number are endemic to the island. The genus is distributed from the Seychelles through Ceylon, India, the Malay Archipelago to New Guinea and the south-sea islands, and extends as far east as Samoa (*A. megalurum* Rchb. f.). Towards the north some species have penetrated as far as the Philippines, and, as in the case of *Ceratostylis* Bl., I surmise that a closer investigation of the flora of China and Formosa also would disclose the occurrence of the genus there. Here I have endeavoured to divide the genus into sections, and in doing so have encountered some difficulties, because, although the flowers afford sufficiently distinctive characteristics for the separation of the species, they are unsuitable for the division into sections of this rather large genus. I had, therefore, to fall back on the characters to be found in the inflorescence and the leaves, and I consider the following division to be practical.

§ 1. *Dolichodesme*. Species with a very much elongated inflorescence, which, partly, may represent an apparent spike, as in *A. spicatum* Schltr. and *A. megalurum* Rchb. f., and partly a rather wide and branched panicle, as in *A. paniculatum* J.J. Sm.

§ 2. *Eu-Agrostophyllum*. Species with more-or-less long leaves, and flowers compressed into a shortened capitulum or head. In a few species, e.g. *A. uniflorum*

Schltr., this is composed of one or a few flowers; in others, e.g. *A. macrocephalum* Schltr., it may contain upwards of one hundred flowers. The actual investigation of these heads is not so simple as in the ordinary capitate inflorescence. The flowers in such cases occur on small, short-stemmed spikes consisting of one to three flowers, which are so compressed that an apparent head is formed. This section, comprising the major portion of the species belonging to the genus, also contains the Types on which Blume founded the genus.

§ 3. *Oliganthe*. The only species so far known is distinguished by its much elongated rhizome, which forms long, pendant sympodia with the stems. The leaves and flowers resemble those of *Eu-Agrostophyllum*.

§ 4. *Appendiculopsis*. Species with slightly elongated, short creeping rhizomes, and the inflorescence of *Eu-Agrostophyllum*, but which bear conspicuously crowded small leaves, forming a right angle with the axis of the stem, which are abruptly truncated at the base and also possess a small petiole. These species have been regarded previously as belonging in part to *Appendicula* Bl., although they definitely belong more correctly to *Agrostophyllum* Bl., as J.J. Smith could prove on living material. There are some species of the section *Eu-Agrostophyllum* which also have relatively short leaves, but these never show the peculiar petiole-like contraction at the base of the lamina.

§ 1. *Dolichodesme*

The first species of this section with which I became acquainted was the plant I described as *A. spicatum* Schltr. In the meantime I had received material of the little-known *A. megalurum* Rchb. f. from Samoa and was able to decide that this species was related closely to the, apparently, very aberrant *A. spicatum* Schltr.

In the year 1908, two more species were described by J.J. Smith, viz. *A. mucronatum* J.J. Sm., related to *A. spicatum* Schltr., and *A. paniculatum* J.J. Sm., which, with its spreading branches, represented a new form of the section.

A species, *A. lamellatum* J.J. Sm., described in the year 1910, also may belong to this section, but the preliminary description, with which J.J. Smith desired the right to preserve authorship, was detailed insufficiently to allow this point to be settled. Thus, with certainty, at least four species could be included in this section and to those I now add five more.

These species are distributed in the Territory at different altitudes. Thus, *A. mucronatum* J.J. Sm. and *A. paniculatum* J.J. Sm. seem by preference to grow on trees along rivers and in the lower hill-country. *A. spicatum* Schltr. grows at about 600 m altitude and rises into the mist-forest formation. The other species are found only in the mist-forest and evidently prefer high humidity. While *A. mucronatum* J.J. Sm. and *A. paniculatum* J.J. Sm. grow mostly on thick tree-trunks with cracked bark and hardly ever any moss covering, the species of the mist-forest are found mostly on the branches of trees densely covered with pads of moss. In the case of the first two species mentioned there is the possibility of the exposed roots drying-out quickly after rain, but the roots of the mist-forest species are covered always with sodden moss. Further up the mountains, at above 2000 m altitude, I no longer observed any species of this section.

1. *A. stenophyllum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, crassiusculis, flexuosis, villosulis; caulibus gracilibus simplicibus, teretibus, dense foliatis, vaginis foliorum persistentibus omnino obtectis, 2.5–3 cm diametientibus; foliis erecto-patentibus, linearibus, apicem versus attenuatis, acutissimis, glabris, 10–15 cm longis, infra medium 3–5 mm latis, vaginis apice utrinque in dentem anguste linearem, acutum, stipuliformem, usque ad 7 mm longum productis, glabris; inflorescentia compressa, elongata, usque ad 20 cm longa, cum fasciculis florum

plus minus appressis, vaginis mox fissis protectis; pedunculis vulgo 2–3-nis abbreviatis, vaginulis paucis obtectis, unifloris; bractea minuta hyalina, apiculata; floribus erectis, in genere inter minores; sepalis ovalibus, acuminatis, glabris, c. 0.5 cm longis, lateralibus obliquis; petalis ligulato-oblongis, apiculatis, glabris, sepalis paulo brevioribus, obliquis, labello oblongo, apiculato, dimidio anteriore margine paulo undulato, glabro, sepalis aequilongo, sed paulo longiore; columna crassiuscula, supra medium utrinque latere gibbo amplo obtuso subbrachiiformi donata, 0.3 cm alta, infra stigma squama carnosa subreniformi adscendente ornata, clinandrio trilobo, lobis lateralibus truncatis, dorsali dentiformi majoribus; anthera quadrato-cucullata, obtusissima; pollinibus oblique clavatis, inaequimagnis; ovario sessili, cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20231, flowering in Sept. 1909.

The plant described here is evidently a pelorial form of a species, of which the normal flowers are unknown at present. The labellum is transformed into a simple undivided floral segment somewhat similar to the petals, the rostellum is suppressed. Whether still further changes have taken place in the column is, naturally, impossible to decide without a knowledge of the normal flower, but in this case, it is quite improbable. Further on I will consider another pelorial form.

In habit this species is nearest to *A. mucronatum* J.J. Sm. but has much narrower leaves and a rigid, more wiry stem. The flowers are white, yellowish towards the base.

2. *A. mucronatum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 2.

Kaiser-Wilhelms-Land: On trees on the Waria [River] near Pema, alt. c. 200 m—R. Schlechter no. 17468, flowering in Mar. 1908.

Originally, this species was described from Dutch New Guinea where it was found also on river banks. Furthermore, I possess a fragment of the same species from British Papua, kindly sent to me from the Melbourne Herbarium by the late Mr. Luehmann. The accompanying label states: 'S.E. N. Guinea—1885.—Rev. Chalmers.' It thus appears to be a widely distributed species.

3. *A. spicatum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 129.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14528, flowering in Apr. 1902; on trees in the forests of the Kani Range, alt. c. 600 m—up to 1000 m—R. Schlechter no. 17262, flowering in Jan. 1908; no. 17497, flowering in Mar. 1908.

Whereas the related *A. mucronatum* J.J. Sm. usually appears to occur singly, during my last journey I found *A. spicatum* Schltr. growing in the Kani Range in massed colonies.

4. *A. torricellense* Schltr., sp. nov.

Epiphyticum, erectum, c. 50 cm altum; rhizomate valde abbreviato; radicibus crassiusculis, elongatis, flexuosis, puberulis; caule compresso, glabro, elongato, omnino vaginis foliorum abscondito, dense foliato; foliis erecto-patentibus, linearibus, apice distincte bicuspidatis, basi paulo angustatis, glabris, usque ad 23 cm longis, medio fere 0.8–1.1 cm latis; vaginis longis, apice oblique truncatis, utrinque dentem brevem obtusum formantibus; inflorescentia compressa elongata, 15–20 cm longa cum fasciculis florum plus minus appressis, vaginis compressis protectis; pedunculis 2–3-nis. abbreviatis, unifloris, vaginulis paucis imbricantibus obtectis; bractea hyalina parvula, apiculata; floribus in genere vix inter mediocres, erectis; sepalis intermedio ovato, acuminato, glabro, 4.5 mm longo, lateralibus obliquis, oblongis, acuminatis, basi decurrentibus, 5.5 mm longis; petalis oblique ligulato-oblongis, subacutis, glabris, leviter undulatis; labello e basi breviter saccata, trilobo, lobis lateralibus, brevibus, abbreviatis parvulis, intermedio amplo, suborbiculari, apice minute apiculato, obscure trilobulato, margine irregulari, 0.4 cm longo et lato, ligula oblonga, adscendente, puberula, apice emarginata ad ostium calcaris, sacco c. 0.2 cm longo; columna crassiuscula, glabra, juxta stigma latere utrinque gibbo obtuso carnoso ornata, infra stigma callo concavo decurvo donata, basi facie pulvinato-incrassata, clinandrio trilobo, lobis brevibus obtusis, dorsali paululo majore; anthera ovali-cucullata, obtusa, glabra; ovario cylindrico, glabro, c. 0.5 cm longo, sessili.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20205, flowering in Sept. 1909.

This and the following species are distinguished from the other members of the section *Dolichodesme* by the long leaf-sheaths. Likewise, the leaf-lamina has undergone a marked elongation. Compared with the others the species has a hairy ligule. The flowers are snow-white, with the lamina of the lip yellowish at the base.

5. *A. dischorens* Schltr., sp. nov.

Epiphyticum, erectum, c. 60 cm altum; rhizomate valde abbreviato; radicibus crassiusculis, flexuosis, elongatis, puberulis; caule compresso, elongato, dense foliato, vaginis foliorum omnino abscondito; foliis erecto-patentibus, lineari-ligulatis, apicem versus acutatis, apice ipso distincte bicuspidatis, basi attenuatis, 15–20 cm longis, medio fere 1.3–1.5 cm latis, vaginis longis, apice utrinque in dentem triangulum, acutum, usque ad 0.4 m longum productis; inflorescentia elongata, usque ad 30 cm longa, compressa, cum floribus plus minus appressis, vaginis compressis, mox fissis protectis; pedunculis 2–3-nis, abbreviatis, unifloris, vaginulis paucis imbricantibus obtectis; bractea parvula, apiculata, hyalina; floribus in genere inter mediocres, erectis; sepalis ovalibus, apiculatis, glabris, 5.5 mm longis, lateralibus obliquis, basi decurrentibus; petalis oblongis, subapiculatis, glabris, obliquis, sepalis paulo brevioribus; labello e basi oblongoideo-saccata obscure trilobato, lobis lateralibus vade abbreviatis, vix conspicuis, lobo intermedio e basi semiorbiculari-cuneata supra medium trilobulato, 4.5 mm longo et lato, lobulis margine irregulariter et minute crenulatis, lateralibus obtusissimis, brevibus, intermedio semiorbiculari, apiculato, duplo longiore, labello toto 0.6 cm longo, ligula transversa, apice incurvula obtuse bidentata ad ostium sacci, c. 0.2 cm longi; columna crassiuscula, glabra, labello plus duplo brevior, juxta stigma latere utrinque gibbo amplo obtuso ornata, infra stigma callo quadrato carnosio instructa, dimidio inferiore facie incrassata; anthera semigloboso-cucullata, apiculata glabra; polliniis oblique clavatis, 4 anterioribus posterioribus paulo brevioribus, glandula minuta rotundata; ovario cylindrico, glabro, sessili, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19657, flowering in June 1909.

This is a near-relative of *A. torricellense* Schltr., but is distinguished from the latter by broader petals, by the labellum, column and the anther. Moreover, the lateral teeth at the apex of the long sheath are longer and sharper. In other respects the snow-white flowers have a golden yellow spot at the base of the middle lobe of the labellum.

6. *A. earinoides* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 90 cm altum; rhizomate valde abbreviato; caule valido, stricto, elongato, tereti, vaginis foliorum omnino oblecto, bene foliato; foliis erecto-patentibus, lineari-ligulatis, apicem versus sensim paulo angustatis, apice obtuse bilobulatis, usque ad 35 cm longis, medio fere 1.5–1.8 cm latis, vaginis longis arcte amplexantibus, edentatis, sensim in laminam transeuntibus; inflorescentia elongata, c. 40 cm longa cum floribus patentibus vel erecto-patentibus, vaginis decrescentibus primum oblectis, pedunculis fasciculatis, pluribus, abbreviatis, vaginulis imbricantibus paucis omnino oblectis; bractea parvula apiculata, hyalina; floribus in genere inter mediocres, erecto-patentibus; sepalis, ovalibus, apiculatis, glabris, vix 0.6 cm longis, lateralibus obliquis, basi decurrentibus; petalis oblique latiligulatis, obtusis, sepalis paulo brevioribus, supra basin paululo dilatatis; labello e basi subcalcarato-saccata, trilobo, lobis lateralibus erectis, parvulis, abbreviatis, intermedio e basi angustata suborbiculari antice obscure trilobulato, 0.5 cm longo, 0.6 cm lato, glabro, ligula transversa brevi, apice acute bidentata cum sinu obtuso, sacco a dorso paulo compresso oblongoideo, c. 0.3 cm longo; columna crassiuscula glabra, apicem versus incrassata, dimidium labelli excedente, callo decurvo quadrato obtusissimo in facie infra stigma, clinandrio humili; anthera subgloboso-cucullata, antice in lobulum triangulum obtusum producta; ovario cylindrico glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18796, flowering in Nov. 1908.

Within the section this plant is the most slender and has the most flowers. Indeed *A. paniculatum* J.J. Sm. is sometimes larger, but it always has a broader growth and the divaricate branches are single-flowered only. From the three other related species *A. earinoides* Schltr. may be recognised quickly by the obtuse leaves. The flowers are white with a golden yellow spot at the base of the labellum.

7. *A. Finisterrae* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 80 cm altum; rhizomate valde abbreviato; radicibus filiformibus, crassiusculis, elongatis, flexuosis, puberulis; caule paulo compresso, laxius foliato, vaginis perlongis omnino abscondito; foliis erecto-patentibus, linearibus, apice inaequaliter bidentatis, basi paulo angustatis, glabris, 15–20 cm longis, medio 1–1.3 cm latis, vaginis perlongis apice utrinque in dentem triangularem, acutum, stipuliformem exeuntibus; inflorescentia elongata, usque ad 18 cm longa cum floribus erecto-patentibus, primum vaginis mox fassis protectis; pedunculis erecto-patentibus, abbreviatis, unifloris, vaginulis paucis, latis, imbricantibus omnino obtectis, unifloris; bractea parvula, hyalina, apiculata; floribus in genere vix inter mediocres, erecto-patentibus; sepalis intermedio ovato, obtuso, glabro, 3.5 mm longo, lateralibus oblique ovatis, acuminatis, glabris, intermedio fere aequilongis, basi antice decurrentibus; petalis oblique oblongis, obtusis cum apiculo minuto, glabris, sepalis paulo brevioribus; labello e basi saccata trilobo, lobis lateralibus erectis parvulis, abbreviatis, intermedio suborbiculari obtusissimo, margine undulato, glabro, c. 3 mm longo et lato, lamella humili transversa, glabra, obscure bilobulata ad ostium sacci 1.5 mm longi; columna crassiuscula, glabra, apicem versus vix dilatata, facie infra stigma lamella carnosae suborbiculari decurva ornata, labello plus duplo brevior; anthera late ovata, apiculata, glabra; ovario cylindrico, sessili, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17973, flowering in July 1908.

This species is recognised easily in the section by the shape of the lip. Like *A. earinoides* Schltr. it has a very loosely leaved stem. The middle lobe of the labellum is undivided and crescentic. The flowers are snow-white.

8. *A. paniculatum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX, p. 2.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 400 m—R. Schlechter no. 16710, flowering in Oct. 1907; on trees in the forests [of the] Waria [River] near Jaduna, alt. c. 200 m—R. Schlechter no. 19329, flowering in Apr. 1909.

This extremely interesting species is recognised easily from all others in the section by the spreading, lateral branches of the inflorescence which attain 5 cm in length and are not single-flowered as in the other species, but bear up to four flowers. The flowers are white with a red-margined column.

§ 2. *Eu-Agrostophyllum*

This section, which includes about two-thirds of the total species in the genus, has developed many forms in New Guinea, which no one could have expected in a genus previously consisting only of a few species and was little known. I must confess that when I went to New Guinea the second time I did expect to find a few interesting forms or genera, especially in the mountains, but I never anticipated the large number of species which have come to our knowledge from a more thorough investigation of some regions. It was found that, with few exceptions, the species (especially those belonging to the mountain-flora) have only a local distribution, and that those species which are characteristic of larger regions are found almost exclusively at lower elevations. I have not been able to ascertain what species occur outside of New Guinea. The species of this section grow by preference on thick tree-trunks, or in the forks of thick branches. This is related to the fact that a considerable time is needed for the development of their flowers. I have, for example, observed two rather small specimens of *A. kaniense* Schltr. for two years and have been able to notice only a very slow growth, while other orchids, e.g. *Dendrobium* species, have developed considerably during the same time.

My remarks concerning the species of the lower altitudes belonging to the section *Dolichodesme* apply here also. As a habitat they prefer those trunks which, in consequence of their cracked bark, are almost free of moss; but this is quite different in

the case of those species which inhabit the mist-forest. There are several, for instance, related to *A. kaniense* Schltr. which always grow on very thick moss-free trunks (usually 3–7 m above the ground), while others, e.g. nearly all the species with narrow leaves and those related to *A. dolichophyllum* Schltr. (the species with short stems), are found almost exclusively on trees with a dense covering of moss.

The heads (capitate inflorescences) of the species vary much in size within the section, and one may find all the transitional stages between the one to three-flowered heads of *A. uniflorum* Schltr. and the large heads of *A. macrocephalum* Schltr., with more than one hundred flowers.

It is remarkable that, up to the present, no species of the genus have been reported from British Papua, whilst from Dutch New Guinea *A. brachiatum* J.J. Sm. and *A. parviflorum* J.J. Sm. have been described, both belonging to this section. I have not seen the specimen of *A. longifolium* described by Kränzlin in K. Schum. et Laut., 'Fl. Dtsch. Schutzg. Süds.' p. 243. It certainly will not be *A. longifolium* Rchb. f., but perhaps one of the species described here.

9. *A. uniflorum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 129.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600–1800 m—R. Schlechter no. 14057, flowering in Jan. 1902; no. 18689, flowering in Nov. 1908; on trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19867, flowering in June 1909.

I think it probable that the plant illustrated by J.J. Smith ('Nova Guinea' VIII, [1909], t. XV, p. 47) under this name represents another species, provided that it is sketched accurately. The lamella at the opening of the lip-sac, as I am now convinced, is finely papillose-hairy, but the petals depicted by J.J. Smith are in the condition found in my species. Moreover, since the lip-lamina and column are evidently somewhat different, it is possibly only a variety.

10. *A. oliganthum* Schltr., sp. nov.

Epiphyticum, erectum, pluricaule, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus paulo compressis, gracilibus, dense foliatis, vaginis foliorum arcte appressis omnino absconditis; foliis erectis, anguste linearibus, apicem versus sensim paulo attenuatis, apice ipso valde inaequaliter bicuspidatis, 5–7 cm longis, 0.2–0.3 cm latis, vaginis arcte amplexantibus, edentatis, sensim in laminam transeuntibus; capitulis terminalibus 3–6-floris, vaginis paucis protectis, pedunculis, abbreviatis, vaginulis paucis lanceolatis, acutis, obtectis, unifloris; bracteis parvulis, apiculatis; floribus in genere inter mediocres, erectis; sepalis oblongis, apiculatis, glabris, 6.5 mm longis, lateralibus obliquis, basi paulo decurrentibus; petalis ligulatis, breviter acuminatis, glabris, sepalis paulo brevioribus; labello e basi oblongoideo-saccata vix trilobo, lobis lateralibus valde abbreviatis vix conspicuis, intermedio circuito suborbiculari apiculato, supra medium obscure trilobulato, 0.5 cm longo et lato, squama porrecta, quadrata, transversa, apice obscure bilobulata, minute papillosa ad ostium sacci 2.5 mm longi; columna glabra, recta, labelli dimidium superante, infra stigma latere utrinque dilatata, facie squama orbiculari, carnosa, ornata, dimidio inferiore pulvinato-incrassata; anthera late ovato-cucullata, apice breviter apiculata, glabra; ovario cylindrico, glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17232, flowering in Jan. 1908.

For some time I have been doubtful whether this plant should be considered a separate species or a variety of *A. uniflorum* Schltr. However, after repeated revision of my abundant material I concluded that it should be treated as a separate species. The differences usually are not very sharp, but they are naturally different. *A. oliganthum* Schltr. is, throughout, a taller plant. The leaves are longer and narrower, the flower heads three-to-five-flowered, the petals are not contracted in the middle, but relatively broad and more pointed. The lip has a longer sac with blunt, two-lobed lamella (not three-pointed, nor recurved) stretching forward. Towards the apex, the

middle lobe is slightly tripartite. The flowers are white with a yellow spot at the base of the labellum; the anther is yellowish brown.

11. *A. montanum* Schltr., sp. nov.

Epiphyticum, erectum, 18–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus erectis, paulo compressis, dense foliatis, vaginis foliorum omnino obtectis, gracilibus; foliis erecto-patentibus, linearibus, apice distincte bicuspidatis, 4–6 cm longis, 2.5–3.5 mm latis, vaginis arcte amplexantibus, sensim in laminam transeuntibus, edentatis, glabris; capitulis leviter incurvis, plurifloris, vaginis pluribus protectis, 1.3–1.5 cm diametientibus; pedunculis abbreviatis, unifloris, vaginulis paucis imbricantibus obtectis; bractea parvula, apiculata; floribus erecto patentibus, in genere mediocribus; sepalis ovato-oblongis, acuminatis, glabris, 6.5 mm longis, lateralibus, obliquis, paulo decurrentibus; petalis oblique ligulatis, obtusis, glabris, sepalis, paulo brevioribus; labello e basi semigloboso-saccata trilobo, lobis lateralibus erectis abbreviatis, obtusissime rotundatis, intermedio amplo circuitu perlate rhombeo, tertia parte anteriore trilobulato, lobulis semiorbicularibus, obtusissimis, marginibus leviter undulatis, intermedio laterales bene superante, labello toto 7.5 mm longo, lobo medio 6 mm longo, medio 0.7 cm lato, lamella transversa, humili, glabra, obtuse bilobulata ante ostium sacci brevis; columna recta, glabra infra stigma latere utrinque gibbo carnosio patente ornata, facie callo reniformi, mediusulcata, carnosio aucta, dimidium labelli paulo superante; anthera ovato-cucullata, antice obtusiuscula, glabra; ovario cylindraceo, glabro, 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter, no. 18201, flowering in Sept. 1908.

A typical species from the mountains resembling *A. leucocephalum* Schltr. somewhat in habit, but which is more compact in its growth and different in its floral parts. Unfortunately, I found only a single flowering specimen of this evidently rare species. The most common colouring of the flowers in this genus is white with a golden spot at the base of the lip.

12. *A. leucocephalum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 128.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400–1850 m—R. Schlechter no. 13998, flowering in Jan. 1902; no. 18598, flowering in Nov. 1908.

It appears to be restricted to the Bismarck Range.

A. montanum Schltr. may be regarded as its nearest relative, but the leaves of this species are shorter and less pointed. It has a transverse, bi-lobed lamella in front of the lip-sac and a comparatively long stem.

13. *A. graminifolium* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 60 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus usque ad 50 cm altis, laxe foliatis, compressis, vaginis foliorum perlongis omnino obtectis; foliis erectis, anguste linearibus, apice acute bilobulatis, vel bicuspidatis, usque ad 45 cm longis, superioribus caulem longe superantibus, medio 0.4–0.6 cm latis, vaginis perlongis, apice edentatis; capitulis multifloris, usque ad 2.5 cm diametientibus, vaginis pluribus acuminatis, protectis; pedunculis abbreviatis, vaginulis paucis imbricantibus omnino obtectis, unifloris; bractea parvula, apiculata, hyalina; floribus in genere mediocribus, erectis; sepalis ovato-oblongis, obtusiusculis, glabris, c. 7 cm longis, lateralibus obliquis, basi paulo decurrentibus; petalis oblique oblongis, obtusis, glabris, margine leviter undulatis, sepalis paulo brevioribus; labello e basi saccata vix trilobato, lobis lateralibus vix conspicuis valde abbreviatis, lobo medio circuitu subreniformi, supra medium trilobulato, lobulis semiorbicularibus, margine minute undulatis, obtusissimis, intermedio conspicue longiore, minute apiculato, ligula oblongoquadrata, erecta, apice tridentata, papilloso-puberula ad ostium sacci; sacco suborbiculari a facie depresso, c. 2.5 mm longo; columna crassiuscula, infra stigma latere utrinque in gibbum acutum patentem carnosum productum, facie squama carnosia, orbiculari, decurva ornata, dimidio inferiore facie incrassata; ovario cylindrico, sessili, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18594, flowering in Nov. 1908.

In the structure of its flowers, this species is related to *A. leucocephalum* Schltr.,

but is distinguished from all relatives by the long grass-like leaves. In size the flower heads vary considerably, I have specimens in which some of them are 1.0 cm and others 2.5 cm in diameter. The flowers are snow-white with a golden yellow spot in the centre of the labellum.

14. *A. niveum* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus paulo compressis, erectis, strictis, dense foliatis, vaginis foliorum omnino obtectis; foliis erectis, lineariligulatis, apice inaequaliter bicuspidatis, glabris, 12–27 cm longis, medio fere 1.2–1.4 cm latis, superioribus caulem multo superantibus, vaginis apice latere utrinque obtuse angulatis (vix auriculatis), edentatis; capitulis pluri-multifloris, leviter incurvis, c. 2.2 cm diametientibus, vaginis pluribus apiculatis protectis; pedunculis abbreviatis vaginulis amplectentibus, paucis obtectis, unifloris; bractea parvula, apiculata, hyalina; floribus in genere inter mediocres, erectis; sepalo intermedio late ovato, obtusiusculo, glabro, 5.5 mm longo, lateralibus obliquis, oblongis, apiculatis, 6.5 mm longis, basi paulo decurrentibus; petalis ligulato-oblongis, obtusis, glabris, margine leviter undulatis; labello e basi oblongo-saccata, 0.4 cm longa lobis lateralibus fere omnino suppressis in laminam subreniformem, margine leviter undulatam, brevissime et obtuse subapiculatam, 0.3 cm longam, 0.4 cm medio latam dilatato, ligula ad ostium sacci adscendente apice incurvula obtuse bilobulata, glabra; columna brevi, crassiuscula, ovarii dimidium vix superante, infra stigma latere utrinque gibbo obtuso ornata, facie squama subreniformi, antice retusa, carnosa, decurvula donata, basin versus facie incrassata; anthera suborbicularis-cucullata, obtuse apiculata, glabra; ovario cylindrico, glabro, sessili, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17967, flowering in Sept. [Ed.—possibly July] 1908.

This species is one of those long-leaved ones which are separated easily from those related in flower structure, by their habit and the less densely leaved stem. *A. pelorioides* Schltr. might prove to be the nearest to it in its normal form, when it becomes known. The flowers are pure white.

15. *A. pelorioides* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 40 cm altum; rhizomate valde abbreviato; radicibus crassiusculis, filiformibus, elongatis, flexuosis, villosulis; caulibus paulo compressis, erectis, strictis, c. 30 cm longis, laxe foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus lineari-ligulatis, apice inaequaliter et acute bilobulatis, usque ad 28 cm longis, medio fere 1–1.2 cm latis, superioribus caulem superantibus, vaginis apice latere utrinque in dentem parvulum acutum triangulum productis; capitibus c. 2.5 cm diametientibus multifloris, vaginis pluribus mox fissis protectis; pedunculis abbreviatis, unifloris, vaginulis paucis imbricantibus obtectis; bractea hyalina, parvula, apiculata; floribus erectis, in genere inter mediocres; sepalo intermedio late ovato, 0.6 cm longo, apiculato, glabro, lateralibus oblique ovatis, acuminatis, glabris, intermedio vix longioribus; petalis oblique oblongis, acutiusculis, glabris, sepalis lateralibus paulo brevioribus; labello ovali, subacuto, concavulo, glabro, petalis latiore; columna brevi, crassa, subquadrata, infra stigma lateraliter utrinque gibbo decurvo obtuso donata, antice callo orbiculari, incrassato-marginato ornata; anthera obreniformi, cum apiculo obtuso; ovario cylindrico, glabro, sessili, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18700, flowering in Nov. 1908.

The plant closely resembles *A. niveum* Schltr. in habit, I do not believe that it is a *pelorioides* form of this species, but a plant still unknown to us in the normal form. This is indicated by the differences in the leaves and sheath. In *A. pelorioides* Schltr. the leaves are shorter with a short two-lobed apex. The leaf-sheaths are extended into a distinct tooth on each side, whereas in *A. niveum* Schltr. they are rounded. In both species the flowers are snow-white. The typical form of the species has yet to be discovered.

16. *A. parviflorum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 3.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20294, flowering in Sept. 1909; on trees in the forests on the upper Djamu [River], close to the Djamu Gorge, alt. c. 300 m—R. Schlechter no.

16623, flowering in Oct. 1907; on trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17507, flowering in Mar. 1908; on trees in the forests near the Saugueti Base, alt. c. 400 m [Ed.—no citation], flowering in Oct. 1908; on trees in the forests of the Finisterre Range, alt. c. 700 up to 900 m—R. Schlechter no. 19132, no. 19175, flowering in Jan. 1909; on trees in the forests of [Mount] Goromia on the Waria [River], alt. c. 300 m—R. Schlechter no. 17386, flowering in Mar. 1908; on trees in the forests near Dschischungari, alt. c. 800 m—R. Schlechter no. 19839, flowering in June 1909.

Evidently, this is one of the most widely distributed species in the Territory. It was described originally by J.J. Smith from Dutch New Guinea. The specimen numbers stated here generally agree, but there are certain differences in the shape and breadth of the petals and labellum and I am still undecided on their constancy. I was, therefore, compelled to regard them all as *A. parviflorum* J.J. Sm.

17. *A. bimaculatum* Schltr., sp. nov.

Epiphyticum, erectum, 30–45 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus paulo compressis, erectis, strictis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, lineari-ligulatis, obtuse bilobulatis, apicem versus e basi paulo angustatis, 9–14 cm longis, medio fere 0.8–1 cm latis, vaginis apice latere utrinque in auriculum lobuliformem subacutum productis; capitibus terminalibus, multifloris, 2–2.5 cm diametientibus; pedunculis abbreviatis, vaginulis imbricantibus, paucis obtectis, pauci-(1–3)-floris; bracteis parvulis, apiculatis, hyalinis; floribus in genere vix inter mediocres, erectis, vel erecto-patentibus, glabris; sepalis oblongis, obtusiusculis, cum apiculo minuto, c. 0.5 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusiusculis, basi paulo dilatatis, sepalis paulo brevioribus; labello e basi semigloboso-saccata trilobo, lobis lateralibus erectis, parvulis, obtusis, intermedio circuitus subreniformi, trilobulato, margine leviter undulato-crenulato, 0.4 cm longo, infra medium 4.5 mm lato, lobulis rotundatis, obtusis, intermedio laterales bene superante, lamella humili, bilobulata, transversa ante ostium sacci; columna pro genere longa, apicem versus paulo ampliata, apice facie in gibbos 2 obtusos porrectos producta, dimidio inferiore facie leviter incrassata; anthera ovato-cucullata, glabra, obtusiuscula; ovario cylindrico, glabro, sessili, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on Waube Creek, alt. c. 400 m—R. Schlechter no. 19435, flowering in May 1909.

At first I believed that this was *A. brachiatum* J.J. Sm., but was soon convinced that both species differ considerably in various respects, e.g. in the column and labellum. The flowers are white with two red spots on the middle lobe of the lip. The column is white with a red transverse band and red auricles or protruberances. The latter are, evidently, the earliest representatives of the development of arms, since they are definitely present in *A. brachiatum* J.J. Sm. and *A. kaniense* Schltr.

18. *A. elatum* Schltr., sp. nov.

Epiphyticum, elatum, usque ad 110 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus erectis, strictis vel substrictis, teretibus, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, subacutis, basi vix angustatis, 9–16 cm longis, 1.7–2 cm latis, vaginis apice latere utrinque in auriculum triangulam subacutam, brevem productis; capitibus multifloris, subglobosis, c. 2 cm diametientibus, vaginulis pluribus protectis; pedunculis abbreviatis 1–2-floris, vaginulis paucis imbricantibus obtectis; bracteis parvulis, hyalinis, apiculatis; floribus in genere mediocribus, erectis vel suberectis; sepalis oblongis, acuminatis, glabris, 5.5–6 mm longis, lateralibus obliquis, paulo decurrentibus; petalis oblique oblongis, subacutis, glabris, sepalis paulo brevioribus; labello e basi cucullato-saccata oblongoidea, trilobo, lobis lateralibus erectis, abbreviatis, obtusissimis, parvulis, intermedio reniformi, apiculato, concavo, margine leviter undulato, 3.5 mm longo, infra medium 5 mm lato, ligula transversa apice obtuse et breviter bilobulata, glabra, adscendente ante ostium sacci, 3.5 mm longi; columna stricta, juxta stigma paulo incrassata, infra stigma squama parvula semiglobosa, carnosa ornata, dimidium labelli superante; anthera ovato-rhombea, subacuta, glabra; ovario cylindrico, sessili, glabro 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 18543, flowering in Oct. 1908.

This is one of the tallest species in the genus. I have seen specimens (which were not in flower) reaching the height stated here and which may be expected to exceed this when in flower. It is characterised by a spatulate, concave middle lobe of the labellum, which is comparatively short. The flowers are white.

19. *A. macrocephalum* Schltr., sp. nov.

Epiphyticum, erectum, robustum, usque ad 100 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis vel substrictis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, lineari-lanceolatis vel lanceolato-ligulatis, acutatis, cum apiculo minuto, usque ad 27 cm longis, infra medium 2.5–3 cm latis, vaginis apice latere utrinque obtuse angulatis; capitibus usque ad 8 cm diametentibus permultifloris, vaginis pluribus protectis; pedunculis usque ad 3 cm longis, vaginulis obtectis, paucifloris; bracteis parvulis, hyalinis, apiculatis; floribus in genere inter majores, erectis vel erecto-patentibus; sepalis ovatis, apiculatis vel breviter acuminatis, glabris, 7.5 mm longis, lateralibus obliquis, paulo decurrentibus; petalis oblique oblongis, obtusis, glabris, margine apicem versus subdenticulatis; labello e basi semigloboso-saccata trilobo, lobis lateralibus valde abbreviatis, obtusissimis, erectis, intermedio amplo, circuitu subreniformi, supra medium trilobulato, marginibus irregulariter serrato-dentato, 5 mm longo, infra medium 0.7 cm lato, lobulis rotundatis, intermedio laterales bene superante semiorbiculari, apice breviter exciso; lamella transversa margine denticulata humili ante ostium sacci 0.4 cm longi; columna crassiuscula, juxta stigma paulo incrassata, infra stigma squama decurva, carnosa, semiorbiculari ornata, glabra, dimidio inferiore facie leviter incrassata; anthera late rhomboideo-ovata, cucullata, apiculata, glabra; ovario cylindrico, glabro, sessili, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19060, flowering in Jan. 1909.

This is recognised easily from all known species by the very large flower heads and by the robust growth. The flowers are particularly characteristic with a labellum that is sharply toothed on the margin; they are white with a golden spot at the base of the labellum.

20. *A. crassicaule* Schltr., sp. nov.

Epiphyticum, erectum yel patulum, usque ad 50 cm longum, robustum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus crassis, paulo compressis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, obtusis, cum apiculo brevi, basi rotundatis, apicem versus sensim paululo angustatis, 9–13 cm longis, infra medium 2–2.5 cm latis, vaginis arte amplectentibus, apice latere utrinque in auriculam parvulam, brevem, falcato-incurvam obtusam exeuntibus; capitibus semiglobosis, multifloris, 2.5–3 cm diametentibus, vaginis pluribus mox fissis protectis; pedunculis brevibus, vaginulis paucis imbricantibus obtectis, 1–2-floris; bracteis parvulis hyalinis, apiculatis; floribus in genere inter mediocres, erectis vel erecto-patentibus; sepalis ovatis, acuminatis glabris, c. 6.5 mm longis, lateralibus obliquis, basi paulo decurrentibus; petalis ovato-lanceolatis, obtusiuscule acuminatis, glabris, sepalis paulo brevioribus, demum recurvis; labello e basi subgloboso-saccata obscure trilobo, lobis lateralibus erectis, valde abbreviatis, obtusissimis, intermedio e basi subreniformi obscure trilobulato, obtuso, 0.4 cm longo, infra medium 5.5 mm lato, sacco c. 2.5 mm diametente, lamella transversa humili, apice breviter et obtuse bidentata ante ostium sacci; columna recta, apicem versus paulo dilatata, juxta stigma gibbis 2 brevibus, obtusis, porrectis, ornata, dimidio inferiore facie paulo incrassata, medio paululo constricto, dimidium labelli paulo sed distincte excedente; ovario cylindrico, glabro, sessili, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17036, flowering in Dec. 1907.

A very robust species, somewhat reminiscent of *A. kaniense* Schltr., but entirely different in the shape of the leaves. Here also the leaf-sheaths are very characteristic, being provided on each side of the apex with a very small, recurved and falcate auricle. The flowers are white with two red spots on the labellum.

var. *bismarckiense* Schltr., var. nov.

Differt a forma typica habitu paulo graciliore, foliis longioribus, auriculis vaginarum magis evolutis, floribus minoribus, petalis basi angustioribus, labelli lobo intermedio distinctius trilobulato, margine leviter undulato et columnae gibbis minus evolutis.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18545, flowering in Oct. 1908.

This is distinguished from the Type in a great many respects so that, for a long time, I was doubtful whether it should not be regarded better as a separate species. My material, however, is not sufficient to decide whether these characteristics are really constant. I therefore preferred to regard it as a variety.

21. *A. potamophila* Schltr., sp. nov.

Epiphyticum, erectum, robustum, usque ad 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus erectis, paulo compressis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, obtusis, usque ad 14 cm longis, medio fere vel infra medium 1.3–1.7 cm latis, vaginis apice margine utrinque rotundatis, exauriculatis; capitulis densifloris, c. 3–3.7 cm diametientibus, vaginis pluribus primum protectis; pedunculis brevibus, vaginulis paucis obtectis, pauci-(1–3)-floris; bracteis parvulis, apiculatis, hyalinis; floribus in genere vix inter mediocres, erectis vel erecto-patentibus; sepalis ovato-lanceolatis, acutis vel acuminate, glabris, c. 5.5 mm longis, lateralibus obliquis, basi paulo ampliatis; petalis oblique ovato-lanceolatis, dimidio superiore attenuatis, apiculatis, glabris sepalis paululo brevioribus; labello e basi globoso-saccata trilobo, 0.6 cm longo, lobis lateralibus erectis obliquis, rotundatis, parvulis, lobo intermedio e istmo brevi reniformi, apiculato, 3.5 mm longo, 5 mm medio fere lato, ligula adscendente transversa, apice breviter et obtuse bidentata ante ostium contractum sacci, 0.2 cm diametientis; columna gracili, pro genere satis longa, labello paulo brevior, apice antice latere utrinque in gibbum porrectum late conicum producta; anthera subgloboso-cucullata, glabra, apice subexcisa; ovario cylindrico, glabro, sessili, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Schibruba [Creek], alt. c. 250 m—R. Schlechter no. 18944, flowering in Dec. 1908.

This is distinguished from the closely related *A. crassicaule* Schltr. by the absence of the auricles on the leaf-sheaths, by its smaller flowers, by the labellum and the long column. The flowers are white with two red spots on the labellum, and a red-spotted column.

22. *A. acutum* Schltr., sp. nov.

Epiphyticum, erectum, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus strictis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus lanceolato-ligulatis, acutis, apice vulgo obliquis, basi paulo angustatis, 10–15 cm longis, medio fere 1.2–1.7 cm latis, vaginis arcte amplexantibus, apice latere utrinque in dentem brevem triangulum acutum productis; capitibus dense multifloris, semi-globosis, usque ad 4 cm diametientibus, vaginis pluribus, primum protectis; pedunculis abbreviatis, vaginulis paucis imbricantibus obtectis, 1–2-floris; bracteis parvulis, hyalinis, apiculatis; floribus in genere inter mediocres, erectis vel erecto-patentibus; sepalis ovatis, apiculatis vel acuminate, glabris, 4.5 mm longis, lateralibus decurrentibus, obliquis; petalis oblique oblongis, minute apiculatis, glabris, sepalis paulo brevioribus; labello e basi subgloboso-saccata trilobo, lobis lateralibus erectis, oblique rotundatis, abbreviatis, parvulis, intermedio late reniformi, margine irregulariter subcrenulato-dentato, minute apiculato, 3.5 mm longo, 4.5 mm lato, lamella transversa apice paucidentata ante ostium sacci 0.2 cm longi; columna crassiuscula, glabra, juxta stigma dilatata, infra stigma ligula brevi, deflexa, carnosa ornata, labelli dimidium excedente; anthera late ovato-elliptica, cucullata, acuta, glabra; ovario cum pedicello glabro, sessili, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19548, flowering in May 1909.

This species is distinguished from the other broad-leaved species in the Territory by the pointed, very dense, thin leaves, and also by the unusually thin roots. The flowers resemble those of *A. macrocephalum* Schltr.; their colour is white.

23. *A. papuanum* Schltr., in K. Schum. et Laut., Nachr. [1905], p. 128.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000–1100 m—R. Schlechter no. 13970, flowering in Jan. 1902; no. 18616, flowering in Nov. 1909 [Ed.—probably 1908].

This species is distinguished from its relatives by the very constricted leaves above

the sheaths. The flowers are yellowish white with white petals and labellum. The latter has two red-brown spots; the column a pale brown transverse band.

24. *A. kaniense* Schltr., sp. nov.

Epiphyticum, robustum, erectum vel patulum, 40–60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosis, crassiusculis; caulibus validis, paulo compressis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis, obtusis, nunc inaequaliter bilobulatis, basi distincte angustatis, glabris, 16–20 cm longis, medio fere 3–5 cm latis, vaginis apice rotundatis, edentatis; capitibus subglobosis, multifloris, usque ad 5.5 cm diametientibus, vaginis pluribus primum protectis; pedunculis brevibus, vaginulis imbricantibus obtectis, 2–3-floris; bracteis parvulis, hyalinis, apiculatis; floribus in genere inter mediocres, erectis vel erecto-patentibus; sepalis intermedio ovato, breviter acuminato, glabro, 4.5 mm longo, lateralibus oblique ovato-lanceolatis, acuminatis, glabris, 5 mm longis, basi paulo decurrentibus; petalis e basi ovato-lanceolata attenuato-acuminatis, obtusiusculis, obliquis, glabris, sepalis paulo brevioribus; labello e basi subgloboso-saccata subtrilobo, lobis lateralibus erectis, perbrevis, obtusissimis, intermedio amplo reniformi, obtuso, glabro, 0.3 cm longo, 0.5 cm lato, sacco vix 0.2 cm diametro; columna recta, labello subduplo brevi apicem versus dilatata, infra stigma latere utrinque brachio brevi, obtuso, porrecto donata, dimidio inferiore facie leviter incrassata; anthera subreniformi-cucullata, minute apiculata, glabra; ovario cylindrico, glabro, sessili, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17134, flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18995, flowering in Dec. 1908.

In habit the species closely resembles *A. papuanum* Schltr. The flowers show a strong approach to this species, but *A. kaniense* Schltr. has a column with the distinctly developed arms which are characteristic of *A. brachiatum* J.J. Sm. In contrast to the latter, the middle lobe of the lip is undivided and the whole plant is more robust and has broader leaves which are very constricted at the base, similar to *A. papuanum* Schltr. The flowers are white, the labellum with two pale pink short stripes, the column with red spots.

25. *A. dolichophyllum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 127.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400–1800 m—R. Schlechter no. 14006, flowering in Jan. 1902; no. 18596, flowering in Nov. 1908.

The sketches which accompanied the specimens of my last journey agree quite well with my previous sketches and specimens. The flowers are snow-white, with a pale brown-spotted lip-sac. These species, and the following two, are distinguished from the other species by the much shortened stems. It may perhaps be advisable, therefore, to form them into a separate section.

26. *A. grandiflorum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 25 cm longum, rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus compressis, laxe 6–8-foliatis, vaginis foliorum amplectentibus omnino obtectis; foliis erecto-patentibus, anguste lanceolatis vel lanceolato-ligulatis, acutis, basi in petiolum brevem c. 1 cm longum attenuatis, 7.5–16 cm longis, medio fere 1.2–1.6 cm latis, vaginis arcte amplectentibus, apice latere utrinque in dentem brevem triangulum, acutum, parvulum productis; capitibus usque ad 20-floris, 2–3 cm diametientibus, vaginis pluribus protectis, subcernis; pedunculis brevibus, vaginulis imbricantibus obtectis, unifloris; bractea parvula apiculata, hyalina; floribus in genere inter majores, erectis; sepalis ovatis, apiculatis, glabris, 0.7 cm longis, lateralibus obliquis, paulo decurrentibus; petalis oblique oblongoligulatis, obtusiusculis, basi paulo dilatatis; labello e basi quadrato-saccata, lobis lateralibus valde suppressis, vix trilobo, lobo intermedio suborbiculari-cuneato, apice retuso, margine minute undulato, 6.5 mm longo, medio fere 0.8 cm lato ligula apice incurvula, breviter 4-dentata ad ostium sacci 0.4 cm longi; columna brevi, labelli dimidium haud attingente, infra stigma callo disciformi suborbiculari, carnoso instructa; anthera ovato-cucullata, acuta; ovario cylindrico, glabro, sessili, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18558, flowering in Oct. 1908.

A very interesting, large-flowered species which is related closely to *A. compressum* Schltr. It differs in the smaller and narrower distinctly stemmed leaves, the narrower petals, more circular (crescentic) labellum and the column. The flowers are snow-white, with a golden yellow spot on the labellum.

27. *A. compressum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 45 cm longum; rhizomate valde abbreviato; radicibus filiformibus elongatis flexuosis, villosulis; caulibus compressis, subdense 7–10-foliatis, vaginis foliorum amplexantibus omnino obtectis; foliis erecto-patentibus vel erectis, elliptico-lanceolatis, acuminatis, basi sensim subpetiolato-angustatis, glabris, 12–20 cm longis, medio fere 2–3 cm latis, vaginis arcte amplexantibus, apice latere utrinque in dentem parvulum, triangulum, acutum, erectum productis; capitulis multifloris, semiglobosis, erectis, 3–4 cm diametentibus, vaginis pluribus primum protectis; pedunculis abbreviatis vaginulis paucis imbricantibus obtectis, unifloris; bractea parvula, apiculata hyalina; floribus in genere inter majores, erectis vel suberectis; sepalo intermedio late ovali apiculato, glabro, 6.5 mm longo, lateralibus oblique oblongis, apiculatis, basi decurrentibus, 7 mm longis; petalis oblique oblongis, obtusis, basin versus paulo dilatatis, glabris, sepalis paulo brevioribus; labello e basi quadrato-cucullata, obtusissima, 3.5 mm longa lamina perlate cuneata antice rotundata, apice leviter excisa, cum apiculo minuto intersecto, 5.5 mm longa supra medium 0.8 cm lata, ligula apice bifida erecta ante ostium sacci; columna glabra recta, infra stigma latere utrinque callo obtuso decurvo aucta, facie callo carnosio disciformi, rotundato ornata, dimidium labelli vix attingente; ovario cylindrico, glabro, sessili, c. 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 18669, flowering in Nov. 1908.

As previously mentioned under *A. grandiflorum* Schltr., the two species are related closely. The one described here has larger stems and larger, broader leaves which can hardly be said to be stemmed. The flowers have broader petals, a broad cuneate labellum with completely suppressed lateral lobes and a fairly deep, bipartite, transverse lamella. The column is provided with two callosities below the stigma which are absent in *A. grandiflorum* Schltr. The colour of the flowers is the same in both species.

28. *A. fragrans* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 35 cm longum; rhizomate valde abbreviato, radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus plus minus flexuosis, paulo compressis, dense foliatis, vaginis foliorum omnino obtectis, foliis erecto-patentibus, ligulatis, apicem versus paulo angustatis, obtusis, subbilobulatis, 2.5–3.7 cm longis, infra medium 0.7–0.9 cm latis, vaginis arcte amplexantibus, apice latere utrinque dente lineari subincurvulo parvulo ornatis; capitulis subglobosis, 2–2.5 cm diametentibus, primum vaginis pluribus protectis; pedunculis abbreviatis, vaginulis paucis, imbricantibus obtectis, unifloris; bractea parvula apiculata, hyalina; floribus erectis, in genere inter majores; sepalis oblongis, apiculatis, glabris, intermedio 5.5 mm longo, lateralibus 6 mm longis, obliquis basi paulo decurrentibus; petalis sepalis paulo minoribus, oblique ligulato-oblongis, obtusis, glabris; labello integro, e basi ligulato-unguiculata, in laminam flabellato-reniformem apice subretusam dilatato, basi subsaccato-cucullato, 0.8 cm longo, ungue 0.3 cm lato, lamina supra basin 7.5 mm lata; columna brevi crassiuscula, glabra, infra stigma latere subalato-dilatata, dimidio inferiore facie distincte incrassata, stigmati margine inferiore incrassata; anthera ovato-cucullata, glabra, acuta, dorso gibbo parvulo ornata; ovario cylindrico, sessili, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18691, flowering in Nov. 1908.

All species in the section *Eu-Agrostophyllum* previously described have more or less large leaves. However, this species and *A. verruciferum* Schltr. have leaves rarely exceeding 3.5 cm in length. In this way they form a certain connection with the section *Appendiculopsis*, but otherwise they have all the typical characteristics of the section *Eu-Agrostophyllum*. The highly fragrant flowers of this species are white, with a golden yellow spot at the base of the lip.

29. *A. verruciferum* Schltr., sp. nov.

Epiphyticum, patulum, 30–40 cm longum; rhizomate valde abbreviato; radicibus filiformibus,

flexuosis, glabratibus; caulibus vulgo haud flexuosis, paulo compressis, perdense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis, apicem versus vix angustatis, brevissime bilobulatis vel obtusis, basi rotundatis, 2.5–3.5 cm longis, medio fere 8–12 cm latis, vaginis arcte amplexantibus apice latere utrinque in dentem linearem parvulum productis; capitulis plurifloris, c. 2 cm diametientibus, vaginis pluribus protectis; pedunculis abbreviatis, vaginulis paucis imbricantibus obtectis, unifloris; bractea parvula, apiculata, hyalina; floribus erectis in genere inter majores; sepalis late ovalibus, breviter apiculatis, glabris, intermedio 5 mm longo, lateralibus 6 mm longis, basi paulo decurrentibus; petalis oblique oblongis, valde obtusis, glabris, sepalis paulo brevioribus; labello e basi subsaccato-cucullata, breviter ligulato-unguiculata, subito in laminam late reniformem apice excisam margine undulato-crenulatam dilatato, glabro, ligula erecta transversa, apice breviter et obtuse bilobulata ante ostium sacci, labello toto 0.8 cm longo, ligula vix 0.2 cm latitudine excedente, lamina 4.5 mm longa supra basin 7.5 mm lata; columna pro genere perbrevis, juxta stigma latere utrinque in gibbum obtusum patentem incrassata, stigmatibus margine inferiore-incrassata, parte inferiore columnae abbreviata; anthera suborbiculari cum apiculo obtuso, verrucis amplis semi-globosis dense obtecta; ovario cylindrico, glabro, sessili, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17487, flowering in Mar. 1908.

Undoubtedly, this is a close relative of *A. fragrans* Schltr., so that I hesitated initially to describe here another new species, but I was influenced eventually by the anther thickly covered with large warts, which, as yet, has never been observed elsewhere in the genus. The other differences from *A. fragrans* Schltr. are found in the broader leaves, broader sepals and petals, shorter and narrower lip-claw, with a larger lamina, and in the shorter, broader column. The flowers are pure snow-white without a yellow spot on the labellum.

30. *A. appendiculoides* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, humile, usque ad 30 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus perdense foliatis, paulo compressis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis patentibus vel erecto-patentibus oblongo-ligulatis, apice breviter bilobulatis, glabris, basi paulo angustatis, 1.4–2 cm longis, medio fere 0.4–0.6 cm latis, vaginis apice latere utrinque in dentem parvulum linearem, acutum productis; capitulis pluri-(6–10)-floris, semiglobosis, c. 1.5 cm diametientibus, vaginis latis obtusis, pluribus primum protectis; pedunculis abbreviatis, erectis vel erecto-patentibus, vaginulis paucis imbricantibus obtectis, vulgo unifloris; bractea parvula, hyalina, apiculata; floribus in genere mediocribus, erectis vel erecto-patentibus; sepalis ovatis, acutis vel apiculatis, glabris, intermedio 4.5 mm longo, lateralibus obliquis, basi paulo decurrentibus, 5.5 mm longis; petalis oblique ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi oblongoideo-saccata vix trilobato, lobis lateralibus in dentem obtusum, minutum reductis, intermedio e ungue brevi, quadrato, in laminam circuitu reniformem trilobulatam apice breviter excisam dilatato, lobulis rotundatis, intermedio lateralibus longiore, labello toto (sacco incluso) 7.5 mm longo, lamina lobi intermedii supra basin 0.5 cm lata, ligula papillosa, apice emarginata, transversa ante ostium sacci; columna brevi crassiuscula, labello fere duplo brevior, juxta stigma latere utrinque in lobum carnosum brevem dilatata, infra stigma facie disco marginibus incrassato carnosae ornata, dimidio inferiore facie incrassata; anthera semigloboso-cucullata, breviter apiculata, glabra; ovario cylindrico, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19537, flowering in May 1909.

A transition to the section *Appendiculopsis* is produced by the small leaves of this species, but the characteristic form of the latter is absent, and the rhizome is not elongated. In the flowers this species resembles *A. fragrans* Schltr. The flowers are snow-white.

§ 3. *Oliganthe*

This section is in perfect accord with the previous one in the structure of the flowers, but it differs considerably from the latter in habit. The rhizome is elongated very much and stem-like. The new shoots always appear from the axils of one of the involucre

bracts of the rhizome, so that a widely creeping or pendant sympodium is formed. The shoots are short and covered with long, erect or slightly spreading leaves, which resemble in shape those of *Eu-Agrostophyllum*. The inflorescences consist of a few (two to five) capitate, compressed, one-flowered spikes, which are surrounded by bracts. The flowers resemble those of the common form of the larger-flowered *Eu-Agrostophyllum* species.

The only species of the section known to me up to the present is *A. superpositum* Schltr., described here. It grows in the eastern part of the Territory as an epiphyte on tall trees in the mist-forest. The specimens, often 50 cm long, hang swinging from the dripping moss-covered branches, or are found creeping along the same, striking roots where possible on the elongated rhizome and so fastening themselves there.

31. *A. superpositum* Schltr., sp. nov.

Epiphyticum, decumbens vel dependens, usque ad 50 cm longum; rhizomate elongato cauliformi, vaginis arcte amplexantibus, acutis, dorso carinatis omnino oblecto, tereti, glabro; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus paulo compressis, laxe foliatis, vaginis foliorum longis omnino oblectis, usque ad 10 cm longis; foliis erecto-patentibus, linearibus, apicem versus paululo angustatis, setaceo-bicuspidatis, glabris, 4–11 cm longis, 3.5–7 mm latis, vaginis apice latere utrinque in dentem lineari-subulatum, acutissimum exeuntibus; capitulis paucifloris, vaginis paucis, protectis; pedunculis 2–5, erectis, unifloris, abbreviatis, vaginulis paucis imbricantibus oblectis; bractea parvula apiculata, hyalina; floribus in genere inter majores, erectis, niveis; sepalis ovalibus vel latius oblongis, apiculatis, glabris, 0.6 cm longis, lateralibus obliquis, basi paulo decurrentibus; petalis lineari-ligulatis, obtusiusculis, medio paululo angustatis, obliquis, sepalis paululo brevioribus; labello vix trilobo lobis lateralibus fere omnino suppressis, basi cucullato-subsaccato, lamina e basi angusta subito reniformi-dilatata, leviter trilobulata, lobulis rotundatis, margine subcrenato-irregularibus, intermedio lateralibus distincte longiore, labello toto 8.5 mm longo, lamina infra medium 6.5 mm lata, lamella transversa altius emarginata latere utrinque inaequaliter bidentata, ante ostium sacci, callo triplo parvulo anteposito; columna brevi, crassiuscula, glabra, labello duplo brevior, juxta stigma latere utrinque in callum brevem obtusum dilatata, infra stigma facie disco incrassato suborbiculari ornata, dimidio inferiore facie incrassata; anthera late ovato-subcordata, obtuse apiculata, glabra; ovario cylindrico, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19534, flowering in May 1909.

As the only species in the section it is quite isolated. With the leaves and flowers of section *Eu-Agrostophyllum* it also combines the elongated rhizome of *Appendiculopsis*. The flowers are snow-white.

§ 4. *Appendiculopsis*

Only a few species belong to this section, viz. *A. stipulatum* (Griff.) Schltr., *A. Hasseltii* (Bl.) J.J. Sm., *A. sumatranum* Schltr. et J.J. Sm., *A. trifidum* Schltr., *A. costatum* J.J. Sm. and *A. celebicum* Schltr. Of these, *A. costatum* J.J. Sm. was, until now, the only one known from New Guinea.

The section has the capitate inflorescence of *Eu-Agrostophyllum* species, but may be recognised by its habit; its rhizome being elongated and its densely leaved stems being inclined to branch, which never happens in *Eu-Agrostophyllum*. The shape of the leaves is very characteristic and permits the species to be distinguished easily from the small-leaved species of *Eu-Agrostophyllum*, for example *A. appendiculoides* Schltr. The leaf-lamina is abruptly truncated at a right angle at the base, and contracted into a more-or-less distinct petiole. The flowers are usually smaller than those of *Eu-Agrostophyllum* species.

The species appear to prefer the less elevated hill-country and riverbeds to the mountain ranges, which is probably due to their preference for a certain degree of humidity in the atmosphere, without direct moisture. Thus we find them nearly always on trees of which the branches have little or no moss vegetation.

32. *A. costatum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 1.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 16931, flowering in Nov. 1907; on trees in the forests of the Finisterre Range, alt. c. 400 m—R. Schlechter no. 19147, flowering in Jan. 1909; on trees in the hill forests near Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter no. 19239, flowering in Apr. 1909; on trees close to the Waria [River], near Pema, alt. c. 120 m—R. Schlechter no. 17399, flowering in Mar. 1908; on trees in the hill forests of Pema on the Waria [River], alt. c. 250-300 m—R. Schlechter no. 19429, flowering in May 1909.

Superficially, the species resembles the Javanese *A. Hasseltii* (Bl.) J.J. Sm., but is well separated by its flowers. The sepals are yellowish, the petals and labellum white with the column red towards the apex.

var. *concavum* Schltr., var. nov.

Differt a forma typica vaginis foliorum apice latioribus, caulem omnino amplexentibus, floribus extus magis lepidotis, petalis latioribus, acutis, labelli lobo intermedio ovato apiculato, marginibus incurvis concavo, columna crassiore.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20092, flowering in Sept. 1909.

This variety may, perhaps, be regarded later as a species. The leaf-sheaths surrounding the stem to the top are very characteristic. The colour of the flowers is the same as in the Type, but the column has a red margin only at the apex.

48. *Chitonochilus* Schltr.

At present this genus remains monotypic. I have had the opportunity to re-check, on living material, my original diagnosis. On the Kani Range I was able to observe some plants for several weeks and found that at certain times the flowers were more open. The petals then spread out from the column and the labellum tip, which is bent over the column, stands erect. The column is very slender and footless. The number of pollinia is not four, but eight. Without doubt we are dealing here with a near relative of the genus *Agrostophyllum*, but it differs, as I have explained already, in the concave labellum (which is not divided into hypochilum and epichilum) and in the absolutely footless, slender column which is not decurrent downwards.

The only representative grows in the mist-forest of the mountains in Kaiser-Wilhelms-Land. No specimens of the genus have, as yet, been reported from the Dutch or English part of the island.

1. *C. papuanum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 134.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14420, flowering in Apr. 1902; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17153, flowering in Jan. 1908.

All specimens of this species which I found grew on thick trunks of trees at a height of from two to seven metres above the ground. The flowers are white and of a pale cream colour on the outside.

49. *Glomera* Bl.

This genus was described by Blume in the year 1825 in his 'Bijdragen tot de Flora van Java', p. 372, and was illustrated, t. 68. For a long time *G. erythrosma* Bl. remained the only (and indeed little known) species until 1861 when Reichenbach f. published (in 'Bonplandia' IX, p. 260), a second species, *G. montana* Rchb. f., from the Viti [Fiji] Islands. 36 years had elapsed before this second species of the genus became known,

and 38 more passed until, in the year 1899, a third one, *G. papuana* Rolfe, was recorded in 'Kew Bull', p. 111). In the year 1877 the Brazilian *G. brasiliensis* Rodr. ('Orch. Nov'. I, p. 147) had been published, but as might be expected, it proved to belong not to *Glomera* Bl., but to be really *Elleanthus brasiliensis* Rchb. f. Up to this time it seemed as if the genus would consist merely of a few species, but this surmise was soon to change. After my first visit to New Guinea, I was able to publish two more species in the year 1905, viz. *G. neo-hibernica* Schltr. and *G. torricellensis* Schltr. Thereafter followed a progressive exploration of the flora of the south-sea islands, and especially of New Guinea, at comparatively short intervals. In the year 1908 Rolfe recorded *G. samoensis* Rolfe, which has since been renamed *G. Reineckea* (Krzl.) Schltr., since it proved to have been described previously by Kränzlin and placed by him in the wrong genus, *Agrostophyllum*. Likewise in 1908 *G. dentifera* J.J. Sm. was described from Dutch New Guinea. Two more species, *G. subracemosa* J.J. Sm. and *G. manicata* J.J. Sm., were reported from there in 1910. At the same time as J.J. Smith described *G. dentifera* he tried to prove that the genus *Glossorhyncha* Ridl. should be united with *Glomera* Bl. and transferred all *Glossorhyncha* species to that genus. I do not agree with him. I consider that the two genera are distinct, and cannot see the practical value of their unification, since *Glossorhyncha* then has to be considered a sub-genus within *Glomera*, according to Smith. I think that he can hardly have seen a living *Glossorhyncha* and not more than one or two *Glomera* species. I have examined, in the living state, 15 *Glomera* species and more than double this number of *Glossorhyncha* species and have formed the opinion that the genera should be kept separate. My reasons for this will be explained later on when dealing with *Glossorhyncha* Ridl. Recently J.J. Smith has described four more species from Dutch New Guinea, viz. *G. Dekockii* J.J. Sm., *G. goliathensis* J.J. Sm., *G. palustris* J.J. Sm. and *G. triangularis* J.J. Sm. Thus, up to the present, by excluding the *Glossorhyncha* species, we have in the genus 13 species, the distribution area of which extends (as far as is known) from Java across New Guinea to Samoa and the Viti [Fiji] Islands. The addition of the species described here has increased the number to 26, and it is highly probable that a considerable number still will be found in the Territory.

All *Glomera* species are typical mountain orchids, which appear to grow most frequently at altitudes above 1500 metres. I have not found a single specimen below the formation of the mist-forest. This shows that all require considerable moisture for their healthy development, and can bear no great heat. They generally grow on trees where their roots and often the whole lower part of the stems are embedded in dense moss. Some species, like *G. acicularis* Schltr., *G. flammula* Schltr. and *G. grandiflora* Schltr., grow in the high regions, where the night temperature in the cold season (which is also the wet season there), drops to 5°C and even lower.

1. *G. platypetala* Schltr., sp. nov.

Epiphytica, erecta, ramosa, usque ad 35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus ramisque rigidulis, bene foliatis, vaginis foliorum omnino obtectis, gracilibus; foliis erecto-patentibus, linearibus, acutis, basi breviter petiolato-angustatis, glabris, carnosius, dorso-carinatis 1.5–2.5 cm longis, medio fere 2–3.5 mm latis, vaginis more generis arctissime amplectentibus, apice oblique truncatis, leviter rugulosis, compressis, latere utrinque carinatis; capitulis nutantibus plurifloris, vagina mox decidua primum protectis; floribus in genere inter medioceres, glabris; sepalis intermedio ovali, apiculato 0.7 cm longo, lateralibus ima basi tantum connatis, breviter apiculatis, intermedio fere aequilongis; petalis e basi subunguiculato-cuneata, suborbicularibus, obtusissimis, obliquis, sepalis aequilongis, supra medium 0.6 cm latis; labelli lamina late ovata, obtusa, 2.25 mm longa, supra basin 1.75 mm lata, sacco subquadrato-oblongoideo, 0.3 cm longo, 2.5 mm lato, obtusissimo; columna brevi, labello fere 3-plo brevior, clinandrio denticulato; anthera antice leviter emarginata, glabra; pollinibus oblique clavatis, glandulis dorso bilobulatis; ovario cylindrico, sessili glabro, 5.5 mm longo.

Kaiser-Wilhelms-Land: On solitary trees in the open slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18197, flowering in Sept. 1908.

As the name implies, the species is distinguished by strikingly broad petals. Amongst all the species of the Territory, it has the least connate lateral sepals. The flowers are white, the labellum green with a black apex; the anther pale brown with white appendage.

2. *G. acicularis* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 40 cm longa, ramosa; caulibus ramisque rigidulis, lateraliter paulo compressis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis linearibus, acutis, pungentibus, crasse carnosius, basi breviter petiolato-attenuatis, glabris 1.5–2 cm longis, medio 2–2.5 mm latis, dorso carinatis, vaginis apice truncatis, sparsim verruculoso-rugulosis; capitulis nutantibus, plurifloris, vagina mox decidua primum protectis; bracteis minutis; floribus in genere inter mediocres, glabris; sepalis ovalibus, apiculatis, c. 0.7 cm longis, lateralibus obliquis, basi quarta parte inferiore connatis, petalis e basi cuneato-subunguiculata suborbicularibus, obtusissimis, sepalis aequilongis, supra medium 0.5 cm latis; labelli lamina suborbiculari-quadrata, obtusissima, 2.5 mm longa et lata, sacco obtusissimo 2.5 mm longo, labello aequilato; columna brevi, labello plus duplo brevior, clinandrio trilobulato, lobulo dorsali amplo, subdentato, lateralibus parvulis inaequaliter bidentatis; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18815, flowering in Nov. 1908.

A close relative of *G. platypetala* Schltr., but differing in its thicker leaves, narrower petals, shorter labellum with the lamina shorter than the sac, and in the column. The colour of the flowers is similar to *G. platypetala* Schltr.

3. *G. obtusa* Schltr., sp. nov.

Epiphytica, erecta vel patula, ramosa, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule ramisque rigidis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis, inaequaliter et obtuse bilobulatis, glabris, textura crassius coriaceis, 1.8–2.5 cm longis, medio fere 0.5–0.7 cm latis, vaginis apice truncatis, dense verruculoso rugulosis; capitibus nutantibus, vaginis demum deciduis primum obtectis, 10–20-floris; bracteis hyalinis, apiculatis, ovario plus duplo brevioribus; floribus in genere inter minores, glabris; sepalis oblongis, obtusis, 4.5 mm longis, lateralibus obliquis, quarta parte inferiore connatis, minute apiculatis; petalis spathulato-oblongis, obtusis, sepalis paulo brevioribus, obliquis; labello subquadrato, apiculato, ima basi medio gibbo parvulo ornato, c. 2 mm longo, 1.5 mm lato, sacco quadrato-oblongoideo, obtusissimo, 3.5 mm longo, c. 2 mm lato; columna brevi, labello fere duplo brevior, clinandrio trilobulato, lobulo intermedio majore; ovario cylindrico, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range in the Waria District, alt. c. 1200 m—R. Schlechter no. 19695, flowering in June 1909.

A very well marked species, which is distinguished, together with the two previous species, from all the rest by the relatively free lateral sepals. The flowers are white, the lamina of the labellum black.

4. *G. aurea* Schltr., sp. nov.

Epiphytica, erecta vel decumbens, usque ad 50 cm longa, ramosa; rhizomate cauliformi, decumbente, radicante vel abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caule ramisque lateraliter paulo compressis, bene foliatis, rigidulis, vaginis foliorum omnino obtectis; foliis erectis vel erecto-patentibus, lineari-lanceolatis, valde inaequaliter et obtuse bilobulatis, basi cuneato-angustatis, 4–7.5 cm longis, infra medium 0.3–0.5 cm latis, vaginis arctissime amplexantibus, apice oblique truncatis, obtusatis, dense rugosis; racemis nutantibus, secundis, primum vaginis mox caducis protectis, dense multifloris, c. 2 cm longis; bracteis hyalinis mox caducis; floribus in genere inter mediocres, glabris; sepalis oblongis, apiculatis, 6.5 mm longis, lateralibus usque ad medium fere connatis obliquis, petalis oblongo-ligulatis, obliquis, sepalis subaequilongis; labello subquadrato-ovali, obtuso, glabro, c. 3 mm longo, medio fere 1.75 mm lato, calcare oblongoideo-saccato, obtuso, labelli laminae paulo brevior et angustior; columna brevi, glabra, labello plus duplo brevior, clinandrio sublobulato-dentato; anthera cucullata cum umbone obtuso, antice truncata; ovario cylindrico, glabro, c. 6.5 mm longo.

Kaiser-Wilhelms-Land: On trees on open slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18202, flowering in Sept. 1908.

Undoubtedly, this species will be placed alongside *G. subracemosa* J.J. Sm. from Dutch New Guinea since it possesses distinctly elongated inflorescences in common with the latter. It may be distinguished from it by the toothless leaf-sheaths, smaller flowers and smaller lip-sac. In *G. aurea* Schltr. the colour of the flowers is golden yellow with a scarlet-red apex to the lip in front and a pale brown anther with white appendage.

5. *G. grandiflora* Schltr., sp. nov.

Epiphytica, patula, usque ad 50 cm longa, parum ramosa; caulibus teretibus, saepius superpositis, teretiusculis, vaginis foliorum omnino obtectis, bene foliatis; foliis erecto-patentibus, anguste lanceolatis, apice subacutis, valde obliquis, basi cuneatis, glabris, textura pro genere crassis; 5–8 cm longis, infra medium 0.7–1.2 cm latis, vaginis arctissime amplexantibus, apice in lobum obtusum, folio oppositum, brevem productis, densius ruguloso-verruculosis, usque ad 3.5 cm longis; capite terminali, semigloboso, 3–3.4 cm diametiente, vaginis latis, apiculatis protecto, dense multifloro; bracteis hyalinis, parvulis; floribus in genere inter majores, glabris; sepalis oblongis, obtusis, c. 1.2 cm longis, lateralibus obliquis, usque ad quartam partem apicalem connatis, basi saccato-concavis; petalis oblique ligulato-oblongis, obtusis, sepalis paulo brevioribus; labello late obovato, obtusissimo, 0.4 cm longo, supra medium 0.3 cm lato, sacco cylindraceo-oblongoideo, obtusissimo, labelli laminae fere aequilongo, c. 0.2 cm lato; columna brevi, labello subtriplo brevior, clinandrio trilobulato; ovario cylindrico, glabro, c. 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18749, flowering in Nov. 1908.

A both beautiful and excellent species with rather large flowers. The sac formed by the lateral sepals is very short and small. The flowers are white with the lip-lamina cinnabar in front. Amongst all the species of the Territory this is most reminiscent of the Javanese species *G. erythrosma* Bl.

6. *G. melanocaulon* Schltr., sp. nov.

Epiphytica, patula, e basi parum ramosa, usque ad 40 cm longa; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabratibus; caulibus vulgo curvatis, leviter compressis, rigidulis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, apice valde inaequaliter bilobulatis, obtusis, basi cuneatis, glabris, textura carnosulis, 5–8.5 cm longis, medio fere 0.7–0.9 cm latis, vaginis atrobrunneis, arctissime caulem vaginantibus, apice oblique truncatis, extus apicem versus verrucis sparsis ornatis, 1–1.5 cm longis; florum capitibus subglobosis, subelongatis, 2 cm latis, 3 cm longis, vaginis latis, apiculatis extus protectis; bracteis parvulis hyalinis; floribus in genere mediocribus glabris; sepalis oblongis, obtusis, c. 1 cm longis, lateralibus obliquis, usque ad tertiam partem apicalem connatis, basi breviter saccato-concavis; petalis oblique ligulato-oblongis, obtusis, glabris, basi paululo angustatis, sepalis paulo brevioribus; labelli lamina late ovali, basi subangustata, obtusissima, 0.3 cm longa, medio fere 2.5 mm lata, sacco decurvo oblongoideo, laminae paulo longiore et latiore, obtuso; columna perbrevis, glabra, labello fere 4-plo brevior, clinandrio 5-lobulato; anthera late cucullata, cum umbone obtuso, antice retusa, glabra; ovario cylindrico, glabro, 0.6 cm longo, subsessili.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19058 (TYPE), flowering in Jan. 1909.

A plant which I collected on the Torricelli Range probably belongs here (no. 14465 collected in Apr. 1902), but its flowers were too damaged by insects to permit a careful examination.

The species has a great resemblance to *G. fruticulosa* Schltr., described below, but differs in its broader petals, shape of the lip, and colour of the flowers. The latter are pure white with a rose-red lip. The anther, as in the case of all species, is pale brown with a white appendage.

7. *G. fruticulosa* Schltr., sp. nov.

Epiphytica, petula vel erecta, fruticulosa, usque ad 45 cm alta; rhizomate decumbente, elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, glabratibus; caule ramoso, dense foliato, paululo

compresso, rigidulo, vaginis foliorum lucidis omnino obtectis; foliis erecto-patentibus, lanceolato-ligulatis, apice valde inaequaliter bilobulatis, lobulis obtusiusculis, basi rotundatis, 4–6 cm longis, infra medium 0.5–0.8 cm latis, carnosulis, vaginis arctissime amplexantibus, lucidis, apice obtuse truncatis, edentatis, 1–2 cm longis; capitibus nutantibus subglobosis, vaginis latis, apiculatis, protectis; bracteis hyalinis, parvulis; floribus in genere inter mediocres, glabris; sepalis oblongis, 1 cm longis, intermedio obtuso, lateralibus apiculatis, obliquis, usque ad tertiam partem apicalem connatis, basi saccum obtusum a dorso depressum formantibus; petalis oblique ligulatis, oblique truncato-obtusissimis, sepalis subaequilongis; labello subrhomboideo-quadrato, obtusissimo, 2.5 mm longo, supra medium subaequilato, sacco ovali obtuso, laminae longiore et medio latiore; columna brevi, glabra, labello duplo fere brevior, clinandrio trilobato cum lobis crenulato-dentatis; anthera late cucullata, obtuse umbonata, antice retusa, glabra; ovario cylindrico, glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19593, flowering in May 1909.

As already mentioned, this species is related closely to *G. melanocaulon* Schltr., but has yellowish flowers and a lip cinnabar-red in front. The sac formed by the lateral sepals is also larger. The petals are narrower and the labellum is differently shaped.

8. *G. neo-hibernica* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 135.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14661, flowering in July 1902.

Since I had no opportunity during my last visit to New Guinea of collecting again on the islands of the Bismarck Archipelago, I found neither this, nor any other orchid endemic there, again. *G. neo-hibernica* Schltr. is, probably, related most closely to *G. subpetiolata* Schltr., but has smoother stems and differently coloured flowers.

9. *G. subpetiolata* Schltr., sp. nov.

Epiphytica, erecta, ramosa, usque ad 35 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, glabris; caulibus ramosis, paulo compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus ligulatis, apice obtuse et inaequaliter bilobulatis, basi subpetiolato-contractis, 3–5.5 cm longis, infra medium 0.4–0.7 cm latis, vaginis arcte amplexantibus, apice truncatis, lucidis, striatis, nunc subrugulosis, 1.5–2 cm longis; capitibus nutantibus, semiglobosis, vaginis demum deciduis primum protectis; bracteis parvulis, hyalinis; floribus in genere inter minores, glabris; sepalo intermedio late ovali, obtuso, 0.4 cm longo, lateralibus oblique ovatis, obtusis, usque ad tertiam partem apicalem connatis, basi cucullato-concavis, intermedio aequilongis; petalis oblique ovalibus, obtusis, sepalis paulo minoribus; labello late ovato, obtuso, glabro, 0.2 cm longo, basi medioque subaequilato, sacco subquadrato obtusissimo, laminae aequilongo et aequilato; columna brevi, glabra, labello subtriplo brevior; anthera late cucullata, obtuse umbonata, antice retusa, glabra; ovario cylindrico, glabro, vix 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17777, flowering in May 1908.

Probably the smallest-flowered species of the genus. It is related to *G. neo-hibernica* Schltr., but is distinguished by the leaf-form and the colour of the flowers. The latter are white with a black-green lip-apex. The anther is brown with a white appendage.

10. *G. verrucifera* Schltr., sp. nov.

Epiphytica, erecta vel adscendens, fruticulosa, usque ad 40 cm alta; caulibus plus minus ramosis, bene foliatis, paulo compressis, vaginis foliorum omnino obtectis; foliis ligulatis, valde inaequaliter et obtuse bilobulatis, glabris, 5.5–9 cm longis, medio fere 1.2–1.5 cm latis, vaginis arctissime amplexantibus, dense verrucis granuliformibus amplis obtectis, apice in dentem triangulum brevem folio oppositum exeuntibus, margine annulo valde incrassato, verrucoso circumdatis, 1.5–2.5 cm longis; capitibus nutantibus, dense multifloris, suborbicularibus, c. 2 cm diametentibus, vaginis latis apiculatis circumdatis; floribus in genere inter mediocres, glabris; sepalo intermedio oblongo, obtuso, vix 1 cm longo, lateralibus obliquis, obtusiusculis, usque infra apicem connatis, basi saccum brevem, obtusum formantibus; petalis oblique ligulatis, obtusis, sepalis paulo brevioribus; labello ovali, obtusissimo, c. 0.3 cm longo, sacco subgloboso, laminae brevior et latior; columna perbrevis, glabra, clinandrio trilobato; ovario cylindrico, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18171, in fruit in Sept. 1908.

This species is one of the most peculiar orchids which I brought back from my last expedition. The leaf-sheaths are covered thickly with conspicuous warts and, at the upper margin, they are surrounded by a thick, hard ring. Unfortunately, all my material is fruiting, and from the fragments left, I have tried to reconstruct the flower. Despite this I thought it warranted to establish this striking species from the available material.

11. *G. flammula* Schltr., sp. nov.

Epiphytica, dependens, usque ad 65 cm longa; caulibus paulo compressis, rigidulis, ramosis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus lineari-lanceolatis, obtusiusculis, apice valde obliquis, 4–8 cm longis, infra medium 0.4–0.8 cm latis, basi cuneatis, vaginis arctissime amplexantibus, praesertim apicem versus verrucis minutis, transversis rugosis, apice oblique truncatis et in lobum brevem obtusum, folio oppositum exeuntibus; capitibus subglobosis, plurifloris, vaginis latis apiculatis, ut videtur demum caducis primum protectis, c. 2 cm diametentibus; bracteis hyalinis; floribus in genere inter minores, glabris; sepalis late oblongis, obtusis, c. 0.6 cm longis, lateralibus obliquis, usque ad quartam partem apicalem connatis; petalis oblique oblongo-ellipticis, obtusiusculis, sepalis paululo-brevioribus; labello late obovato, antice subretuso, c. 2.5 mm longo, supra medium 2 mm lato, sacco subgloboso, obtusissimo, c. 1.5 mm longo et lato; columna perbrevis, labello plus duplo brevior, clinandrii lobis lateralibus crenulatis, amplis; anthera late cucullata, umbone obtuso donata, antice retusa; ovario cylindrico, glabro, 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18751, flowering in Nov. 1908.

One of the taller species, but with small flowers, which make a charming impression with their round heads. The leaf-sheaths are always very characteristic in the individual species of the genus, so also here where they are covered with fine small warts, or rows of warts. The flowers are golden yellow with a lip cinnabar-red in front.

12. *G. rugulosa* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 45 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabratibus; caulibus rigidulis, paulo compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus ligulatis vel lineari-ligulatis, valde inaequaliter et obtuse bilobulatis, glabris, 5–10 cm longis, medio fere 0.5–1.3 cm latis, vaginis arctissime amplexantibus, minute et densissime rugulosis, apice in dentem triangulum folio oppositum exeuntibus, 2–2.5 cm longis; capitibus nutantibus, subglobosis, 2.5–3 cm diametentibus, vaginis latis, apiculatis, protectis; bracteis hyalinis; floribus in genere inter mediocres, glabris; sepalo intermedio oblongo, obtuso, 0.9 cm longo, lateralibus obliquis, oblongis apiculatis, usque infra apicem connatis, intermedio aequilongis; petalis sepalo intermedio subaequilongis et similibus, paulo angustioribus et obliquis; labello quadrato-oblongo, valde obtuso, c. 0.3 cm longo, sacco subquadrato, obtusissimo, laminae fere aequilongo sed paulo latiore; columna perbrevis, labello plus triplo brevior, clinandrio trilobato, lobis lateralibus inaequaliter bidentatis; anthera late cucullata, altius et obtuse umbonata, antice retusa, glabra; ovario cylindrico, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in open slopes of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 18200, flowering in Sept. 1908.

This species comes close to *G. flammula* Schltr., but has broader stems and leaves, with sheaths differently shaped and finely wrinkled at the apex. Furthermore, the larger flowers are white (not golden yellow) with a lip-apex pale cinnabar-red. Again, the anther is brown with a white appendage.

13. *G. bambusiformis* Schltr., sp. nov.

Epiphytica, gracilis, patula, usque ad 65 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis, caulibus demum rigidulis, primum compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, lineari-lanceolatis, apice valde obliquis, subacutis, basi rotundatis, glabris, textura pro genere tenuioribus, 5–9 cm longis, infra medium 0.4–0.7 cm latis, vaginis arctissime amplexantibus, minute et sparsim verruculoso-rugulosis, apice oblique truncatis et lobum perbrevem, obtusum, folio oppositum formantibus, 2–3 cm longis; capitibus nutantibus,

subglobosis, dense multifloris, 2–2.5 cm diametientibus, vaginis latis apiculatis, protectis; bracteis hyalinis; floribus in genere inter minores, glabris; sepalis oblongis, obtusis, 5.5 mm longis, lateralibus obliquis, usque ad tertiam partem apicalem connatis, basi saccum brevem obtusissimum formantibus; petalis oblique ellipticis obtusis, medio dilatatis, sepalis subaequilongis; labello subquadrato, obtusissimo, vix 0.2 cm longitudine excedente, sacco late oblongoideo obtuso 2.25 mm longo, 2 mm lato; columna perbrevis, labello triplo brevior, clinandrio trilobulato, lobulis irregulariter crenulatis; anthera late cucullata, obtuse umbonata, antice retusa; ovario cylindrico, glabro, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18207, flowering in Sept. 1908.

This, and the following species, *G. kaniensis* Schltr., are distinguished by their long, narrow leaves. Herbarium material of this species strikingly resembles certain bamboos, the more so since the stems are surrounded closely by the yellow sheaths. The differences between the two species will be referred to below. In both of them the flowers are white with a lip cinnabar-red at the apex, a brown anther with a white appendage.

14. *G. kaniensis* Schltr., sp. nov.

Epiphytica, gracilis usque ad 70 cm longa; caule ramoso, gracili, paulo compresso, demum rigidulo, vaginis foliorum omnino oblecto, bene foliato; foliis erecto-patentibus, lineari-lanceolatis, apice valde obliquis, subacutis, basi cuneatis, 8–12 cm longis, infra medium 0.7–1 cm latis, vaginis arctissime amplexantibus, striatis, lucidis, vix rugulosis, apice oblique truncatis, vix lobum formantibus, 1.5–2.5 cm longis; capitibus nutantibus, subglobosis, dense multifloris, 2–2.5 cm diametientibus, vaginis latis apiculatis, protectis; bracteis hyalinis; floribus in genere inter minores, glabris; sepalo intermedio ovato-lanceolato, subacuto, 0.7 cm longo, lateralibus, obliquis, apiculatis, usque infra apicem connatis, intermedio aequilongis, basi cucullato-concavis; petalis oblique oblongo-ligulatis, obtusis, sepalis subaequilongis; labello oblongo-quadrato, antice truncato, 2.5 mm longo, c. 2 mm lato, sacco subgloboso, 2 mm longo, c. 2.5 mm lato; columna brevi, labello duplo brevior, glabra, clinandrio trilobato, lobis lateralibus brachiiiformibus, oblique quadratis, intermedio irregulariter paucidentato; anthera late galeata, obtuse umbonata, glabra, retusa; ovario cylindrico, antice glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17758, flowering in May 1908.

A close relative of *G. bambusiformis* Schltr., but well separated in all details of the flowers and also recognised externally by the less flat stems and the larger leaves. The entire plant has a rigid appearance. The colour of the flowers, as already mentioned, is the same as in *G. bambusiformis* Schltr. In *G. kaniensis* Schltr. the cinnabar-red colour of the apex of the lip may perhaps be more intense and brighter.

15. *G. torricellensis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 136.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14464, flowering in Apr. 1902.

In habit this species is distinguished from all others in the Territory by its broad spreading leaves, which furthermore are much closer together than in other species. Unfortunately, I did not find this plant again during my last visit to the Torricelli Range.

50. *Glossorhyncha* Ridl.

This is a comparatively recent genus, and was described in the year 1891 in the 'Journ. Linn. Soc. Lond.' XXVIII, p. 341, t. 44, by H.N. Ridley, the celebrated explorer of the Malay flora. For some time it was difficult to know what to do with it, for to those acquainted with the orchid genera of the Moluccas, it was apparent that it could not possibly belong to the relationship where Ridley had placed it, viz. in the *Sarcanthinae*. When later on, in 1902, I found in New Guinea plants unknown to me and belonging to a genus of the *Agrostophyllinae*, I was fairly certain that, in the species under

examination, I was dealing with *Glossorhyncha* Ridl. and felt that Ridley's drawing of the flowers made from dry material could not be correct in several essential points. After examination of the material by J.J. Smith and myself, this view was confirmed. I have, therefore, published under this name these five new *Glossorhyncha* species along with my first New Guinea orchids. (In K. Schumann & Lauterbach, 'Nachträge zur Flora der Deutschen Schutzgebiete in der Südsee' (1905), p. 130 ff.)

In the following year 1905 [sic.] I described another new species, *G. MacDonaldii* Schltr. from the New Hebrides, whereby the distribution area of the genus was extended considerably towards the east. In the meantime J.J. Smith has tried to prove that *Glossorhyncha* Ridl. should not be regarded as a genus, but should be united with *Glomera* Bl. I cannot agree with him in this view, even if it were only for the reason that he has placed all *Glomera* species and all *Glossorhyncha* species in two well-defined sections, which also, correctly, separate the species of the two genera without any examination. He proposes for his sections two quite new names, entirely avoiding the old name *Glossorhyncha*. Later on I will describe the differences between the two genera. Up to the present, the species of the genus *Glossorhyncha* Ridl., described by J.J. Smith as *Glomera*, number 13–14. I have described recently *G. celebica* Schltr. from the Celebes, so that at present the genus includes 48–49 species. Of these, only three can be regarded as non-Papuan [Papuan] species, viz. *G. amboinensis* Ridl. from the Moluccas, *G. celebica* Schltr. from the Celebes and *G. MacDonaldii* Schltr. from the New Hebrides.

I will now explain the reasons which induced me to keep these two genera separate. First of all, in all the living material which I have collected (and that is a very considerable quantity) I have never been in doubt, even before examination, under which of the two genera the species should be placed. All *Glomera* species have a compressed capitate inflorescence which is surrounded by a single or many-leaved covering under which, in the latter case, one leaf develops to an unusual breadth. All *Glossorhyncha* species are single-flowered, and surrounded in the bud by a two-leaved covering, of which the outer leaf corresponds with *Glomera*; the inner is a bract tightly enclosing the ovary. The flowers of *Glossorhyncha* are nearly always conspicuously large and, with the exception of two species, widely spreading. The petals especially are striking and generally larger than the lateral sepals. The latter approximate to one another, especially at the apices where they are connate. In *Glomera*, the flowers are always small and in all the living specimens examined by me the lateral sepals are adherent at the base, and usually beyond this, and often almost to the apices; at the base they are sac-like and concave; with this sac they entirely embrace the spur of the labellum. At this point I may mention that, on my last visit to Buitenzorg, J.J. Smith showed me some flower-material of *Glomera erythrosma* Bl., where the lateral sepals appeared to be free to the base. It may be stated, however, that such examinations are very difficult to conduct accurately on dry material, since it is not easy to say where the column-foot ends and the sepals begin, but in future no such isolated case of transition would deter me from keeping these genera separate. Where would it lead if we were to be influenced by such minute details? The large family of *Orchidaceae* could thus be reduced comfortably to a dozen genera. I need only remind you of *Miltonia*, *Oncidium*, *Odontoglossum* and its relatives, *Pleurothallis* and *Restrepia* with their relatives, *Epidendrum*, *Cattleya* and the other *Epidendrinae*, and so on.

It is often difficult to delimit a genus well and sharply, and yet one's own feelings tell you that it is better to separate them than to throw everything together. Formerly, I very often proceeded too strictly, but subsequently realized that it is better to allow certain concessions in the delimitation of genera, otherwise all our systems of

classification would collapse. In *Glossorhyncha* we thus see that in entire contrast to *Glomera* (in which the base of the lip is embraced by the sac-like formation of the sepals), there is a tendency to keep the spur or lip-sac quite free, owing to the flattening at the base of the lateral sepals, which even when adherent at the apices are never connate (but always free) at the base, thus allowing the spur or lip-sac to project.

Now to another difference that I always found in living material, but which is largely effaced on dried specimens. All *Glomera* species which I have examined had an abruptly truncate labellum from the lip-sac or spur at the base. In all *Glossorhyncha*, however, the lamina passed gradually into the sac or spur, so that in the living material it was impossible to distinguish where the lamina ended. A further difference concerns the pollinia; in *Glomera* I have always found that the viscid masses had, in front on the outer side, a sharp lateral tooth or lobe, which I have never seen in *Glossorhyncha* species. Furthermore, all *Glossorhyncha* species, with one or two exceptions, are furnished with cilia or slits at the top of their leaf-sheaths, while all the *Glomera* species I saw are provided with sheaths which have at most, a single tooth or lobe. However, J.J. Smith describes a *Glomera* with split sheaths, but this, like his *Glomera* with entirely free lateral sepals, may be an exception.

May it not be possible that such intermediate stages are due to hybridization? I have to describe here three rather aberrant forms showing a certain tendency towards *Glomera*; which have the principal characteristics of *Glossorhyncha*, yet, nevertheless, I do not regard this as a reason for uniting these rather extensive genera.

The division of the genus *Glossorhyncha* thereby becomes a little difficult, because the different characters in individual species gradually become in stages weaker or stronger both in habit and floral characters. Only in the shape of the spur or sac of the lamina do I appear to have found a certain basis for division. I therefore divide the genus as follows:

§ 1. *Eu-Glossorhyncha*. Species with a very elongated, thin spur, which is appressed closely to the ovary, and usually enveloped by bracts.

§ 2. *Thylacoglossum*. Species with a sac-like elongated labellum. Unfortunately, the name *Glossorhyncha* is as inappropriate for the genus as it could possibly be, because the character on which Ridley founded the genus is absent. However, in accordance with the rule of priority, the name must remain and in future must be applied to the genus.

There is little to be said about the conditions under which the species of this interesting genus grow, because, with a few exceptions, all are epiphytes of the mist-forest formations. Only two species, viz. *G. acutifolia* Schltr. and *G. retusa* Schltr., have been found by me below these altitudes. As high as I have penetrated into the mountains (approximately 2500 m altitude), I have found the various representatives of the genus in striking abundance between the 1600–2500 m levels. It is, furthermore, remarkable that the area over which most of the species are distributed is only small and that the majority of species are always restricted to certain mountain ranges.

The greater number of them grow semi-erect or slightly overhanging, usually on more-or-less horizontal branches of trees, but some, e.g. *G. pensilis* Schltr., *G. gracilis* Schltr. and *G. pungens* Schltr. are pendant as many-branched slender fascicles, often more than a metre long, hanging loosely from the branches and tossed to-and-fro in the cold, wet winds. All species, therefore, prefer a very moist atmosphere and rain, and are very sensitive to continuous heat, as I could prove by the attempt to cultivate them at lower altitudes.

§ 1. *Eu-Glossorhyncha*

This section (to which also belongs *G. amboinensis* Ridl., the Type of the genus according to the description of J.J. Smith, and confirmed by my investigations), is by far the smaller of the two groups. Besides *G. amboinensis* Ridl., just mentioned, and the two species described here, it also includes *G. celebica* Schltr. from the Celebes, *G. carnea* (J.J. Sm.) Schltr. (*Glomera carnea* J.J. Sm.), *G. grandiflora* (J.J. Sm.) Schltr. (*Glomera grandiflora* J.J. Sm.) and *G. fruticula* (J.J. Sm.) Schltr. (*Glomera fruticula* J.J. Sm.) from Dutch New Guinea. Of the latter two *G. carnea* (J.J. Sm.) Schltr. is supposed to be terrestrial. We have, therefore, seven species in the section.

I have explained already the differences which distinguish this section from the section *Thylacoglossum*. It was possible for me to examine only four of the species precisely, but these are separated sharply from all species of the other section. It would appear, however, from the descriptions of J.J. Smith, that in Dutch New Guinea some species occur which are less characteristic. For instance, I am not quite clear from his description whether *G. compressa* (J.J. Sm.) Schltr. (*Glomera compressa* J.J. Sm.) should be included here or not. However, concerning it J.J. Smith writes that the lateral sepals are longly connate (sepala lateralalia longius connata), and yet this species has a spur 1.27 cm long and the length of the sepals is 1.35 cm. I cannot visualize this unless the spur is stretched out towards the front, a condition which I have never observed in any *Glossorhyncha* species known to me. In all species of the genus, the sepals at the column-foot have a downward tendency, but I have never known a species in which they were connate. At one time I believed that in *G. squamulosa* Schltr. I had found lateral sepals which were connate, but in the meantime I am convinced that this was due to a false observation. In species of *Eu-Glossorhyncha*, with the spur firmly pressed against the ovary, it is obvious that the lateral sepals cannot be connate, unless it is towards the apex, for how else could the spur protrude?

1. *G. adenandroides* Schltr., sp. nov.

Epiphytica, erecta vel patula, gracilis, 18–30 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, dense foliatis, vaginis foliorum omnino obtectis; gracilibus, vulgo paulo flexuosis, paulo compressis; foliis erecto-petentibus, lanceolato-linearibus, apice valde inaequaliter bilobulatis, basi subpetiolato-contractis, glabris, carnosulis, 1.2–2.7 cm longis, infra medium 2.5–3.5 mm latis, vaginis arctissime amplexantibus, sparsim verruculosi, striatis, apice margine setis subulatis, inaequilongis dense ciliatis; inflorescentia uniflora, vagina arcte amplexante, nervosa, obtusa protecta; bractea hyalina, more vaginae ovarium arcte amplexante, sed minore; floribus in genere inter maximos, glabris; sepalis oblongis, obtusis, apiculatis, c. 1.6 cm longis, lateralibus obliquis, base margine anteriore dilatatis, decurrentibus; petalis e basi subunguiculato-cuneata, suborbicularibus, obtusissimis, c. 1.7 cm longis, sepalis conspicue latioribus; labelli lamina suborbiculari, apiculata, cochleari-concava, c. 0.4 cm longa, explanata medio 3.5 mm lata, calcare filiformi, apice minute bilobulato, c. 1.3 cm longo; columna perbrevis, glabra, c. 0.3 mm longa; anthera late cucullata, gibbo obtusa ornata, obtusa, glabra; ovario cylindrico, glabro, 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19578, flowering in May 1909.

A pretty species most closely related to *G. stenocentron* Schltr., described below. I was impressed, on a superficial examination of the plant, with the resemblance of some species to the South African *Rutaceae* genus of *Adenandra* Willd. so much that I felt inclined to give it this species name. The flowers are snow-white, only the anther being golden yellow.

2. *G. stenocentron* Schltr., sp. nov.

Epiphytica, erecta vel patula, c. 20 cm longa; rhizomate valde abbreviato; caulibus vulgo parum

ramosis, gracilibus, bene foliatis, vaginis foliorum omnino obtectis, paululo compressis; foliis erecto-patentibus linearibus vel lineari-ligulatis, obtusis, apice obliquis, basi subpetiolato-contractis vel in petiolum perbreve transeuntibus, glabris, crassius carnosius, 1.2–1.8 cm longis, medio fere 1.5–2.5 cm latis, vaginis dense verruculoso-rugulosis, apice dense setis fimbriiformibus ciliatis; floribus singulis, in genere inter majores, niveis, glabris; sepalis oblongis apiculatis, 1.2 cm longis, lateralibus basi margine anteriore in lobum linearem, 0.4 cm longum productis, decurrentibus; petalis oblique obovato-ellipticis, obtusissimis, 1.3 cm longis, medio 0.9 cm latis; labelli lamina marginibus columnae usque supra medium adnata, late rhombea, apiculata, cucullato-concava, 4.5 mm longa, calcare tenui, filiformi, subacuto, ovario aequilongo, 1.3 cm longo; columna 2.5 mm alta, glabra, clinandrio integro, oblique truncato; anthera late cucullata, gibbo exciso brevi donata, glabra, antice truncata; ovario cylindrico, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18757, flowering in Nov. 1908.

The species is related closely to *G. adenandroides* Schltr., but has smaller leaves with more-warty sheaths, smaller flowers and differently shaped flower parts. *G. grandiflora* (J.J. Sm.) Schltr. evidently is related also, but is said to have flowers double the size. Unfortunately, I have not seen this species, which must be the most beautiful in the genus.

§ 2. *Thylacoglossum*

It has not been possible for me to divide this section further (which is increasing to unexpected dimensions), so that it will remain rather difficult to find a way amongst the numerous species which resemble each other more-or-less in one or other of their characteristics.

Beyond the island region of New Guinea, I know of only one species, viz. *G. MacDonaldii* Schltr. from the New Hebrides. I have, however, observed a species in New Caledonia which almost certainly belongs here, but from which, up to the present, no flower-material could be obtained, although on some of the higher mountains (e.g. Mt. Mou), it is by no means rare in the uppermost forests.

No species as yet has been described from British Papua, but the following have been published by J.J. Smith from Dutch New Guinea as *Glomera* species: *G. uniflora* (J.J. Sm.) Schltr., *G. subuliformis* (J.J. Sm.) Schltr., *G. retusa* (J.J. Sm.) Schltr., *G. latilinguis* (J.J. Sm.) Schltr., *G. fimbriata* (J.J. Sm.) Schltr., *G. acuminata* (J.J. Sm.) Schltr., *G. brevipetala* (J.J. Sm.) Schltr., *G. conglutinata* (J.J. Sm.) Schltr., *G. rhombea* (J.J. Sm.) Schltr., *G. sarcosepala* (J.J. Sm.) Schltr., *G. scandens* (J.J. Sm.) Schltr. and *G. terrestris* (J.J. Sm.) Schltr. Of these, *G. latilinguis* (J.J. Sm.) Schltr. has been transferred by J.J. Smith to his *Glomera* group, *Capitatae*, but this is decidedly an error because he himself describes the species as single-flowered and compares it with *G. elegantula* Schltr., which certainly belongs to the section *Thylacoglossum* of the genus *Glossorhyncha*, whereas all other species of the *Capitatae* of J.J. Smith are pure *Glomera* species.

So far as I know, this section contains 42 species, including the ones described here.

I have stated already that the species of the genus usually have a very local distribution and this may account for my having to describe such a strikingly large number of species. Each mountain range has its own species, and it is rare that a large degree of variation in the shape of the floral parts occurs. In many hundreds of specimens which I have examined, it was hardly possible to establish any individual differences between the flowers of the species. Only in one species, *G. hamadryas* Schltr., have I felt inclined to adopt a wide view, since here either a variable species is concerned or else a series of closely related ones. In spite of my abundant material, unfortunately I have been unable to decide this question, and therefore have been compelled to

establish several varieties in order to keep the concept of the species as discreet as possible.

As to the conditions under which the individual species occur, I have very little further to add. Nearly all of them grow in colonies, very often closely covering whole branches of large trees in the mist-forest. Only a few occur as separate individuals and unfortunately this is the case with the interesting *G. glomeroides* Schltr. which, in its flower structure, approaches more closely the genus *Glomera* Bl. than any other species.

3. *G. hamadryas* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 130.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1200–2000 m—R. Schlechter no. 18673, flowering in Nov. 1908; no. 14015, flowering in Jan. 1902; no. 18786, flowering in Nov. 1908.

This species, one of the first described by me, now apparently is more difficult to circumscribe than all the rest. The specimens from Neu-Mecklenburg, which I previously placed here, belong, according to my present opinion, to *G. verruculosa* Schltr. The differences in habit between the numbers [18673, 14015, 18786] enumerated above, are fairly important.

var. *foliosa* Schltr., var. nov.

Differt a forma *typica*, caulibus pallidioribus, robustioribus, foliis majoribus vulgo lineari-ligulatis, floribus paulo majoribus petalisque latioribus.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16911, flowering in Nov. 1907.

This variety has a rather different appearance from the Type, but there is no reason to regard it as a separate species. By looking at the living plant, I was almost certain that it was a different species.

var. *phaeotricha* Schltr., var. nov.

Differt a forma *typica* ramis magis foliatis, foliis lanceolato-linearibus, magis acutatis, vaginarum apicibus altius setulis fulvis dense fimbriato-ciliatis, floribus fere duplo majoribus, petalis multo latioribus obovato-subspatulatis.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17152, 17212, flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 19014, flowering in Dec. 1908.

I may pass the same remarks about this as about the previous variety—I also believe that both numbers [17152 and 17212] will later on have to be separated from the Type. [Ed.—a strange statement, since Schlechter has separated these as Syntypes of his var. *phaeotricha*.] These flowers attain almost the same size as those of *G. pulchra* Schltr., and in colour they are also similar.

4. *G. pulchra* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 40 cm alta; rhizomate plus minus abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus plus minus ramosis, gracilibus, paulo compressis, vaginis foliorum omnino obtectis, bene foliatis; foliis erecto-patentibus vel suberectis, anguste lanceolatis vel lineari-lanceolatis, valde inaequaliter bilobulatis, lobulo longiore obtusiusculo, basi rotundatis, glabris, 1.5–2.5 cm longis, infra medium 2.75–4 mm latis, vaginis arctissime amplexantibus striato-nervosis, striis saepius verruculosus, apice margine dense setis tenuibus fimbriato-ciliatis, 0.7–0.9 cm longis; floribus singulis in genere inter majores, glabris; vagina elliptica, obtusa, convoluta, nervosa; bractea simili, hyalina, ovario brevior; sepalis ligulato-oblongis, obtusis, extus cum apiculo minuto, 1.2 cm longis, lateralibus obliquis, basi margine anteriore decurrentibus; petalis e basi unguiculato-angustata late ellipticis, obtusissimis, paulo obliquis, 1.3 cm longis, supra medium 0.7 cm latis; labelli lamina ovali, breviter et obtuse acuminata, glabra, 4.5 mm longa, medio fere 3 mm lata, sacco quadrato apice retuso, a dorso depresso, 0.2 cm longo et lato; columna perbrevis,

labello fere 3 plo brevior, clinandrio denticulato, circuito late triangulo; anthera perlate cucullata, umbone humili donata, antice adscendente, obtusissima, glabra; ovario cylindrico, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2200 m—R. Schlechter no. 18730, flowering in Nov. 1908.

A very pretty, large-flowered species having a certain resemblance to *G. hamadryas* Schltr. var. *phaeotricha* Schltr. from which, however, it is distinguished by the clawed petals, the larger lamina of the lip and by the more lanceolate shape of the broader leaves. Similar as both may appear in description, they are entirely dissimilar when side-by-side in the living state. The flowers are snow-white with a roundish spot of fine, green-grey dots at the apex of the lip and a pale brown anther with a whitish appendage.

5. *G. acutifolia* Schltr., sp. nov.

Epiphytica, erecta vel suberecta, 10–15 cm alta; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, glabris; caulibus valde ramosis, paulo compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis suberectis vel erecto-patentibus, lanceolato-linearibus, apice obliquis, obtusiusculis, basi subpetiolato-angustatis, 0.8–1.5 cm longis, infra medium 0.2–0.3 cm latis, vaginis arctissime amplexantibus, nervis paucis incrassatis striatis, apice margine altius fimbriato-ciliatis, ciliis subulatis; floribus singulis in genere mediocribus, glabris; vagina ovali, convolutata, apiculata, nervis incrassatis; bractea hyalina simili, ovario brevior; sepalis ovato-oblongis, obtusis, glabris, 0.8 cm longis, lateralibus falcato-obliquis, apiculatis, basi margine anteriore conspicue dilatatis; petalis subfalcatis e basi subungiculato-angustata late obovatis, subretusis, 0.9 cm longis; labelli lamina late ovali, obtuse et perbreviter acuminata vel potius apiculata, 0.3 cm longa, 0.2 cm medio lata, sacco semi-oblongo obtusissimo, 1.5 mm longo et lato; columna brevi, clinandrio serrulato; anthera subquadrata, dorso emarginata, antice adscendente obtusa; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18005, flowering in July 1908.

A rarer species of which I have found only two flowering specimens. The plant is also reminiscent of *G. hamadryas* Schltr., but has different leaves which are much narrower towards the base and which are almost stalked. It also differs in habit with its conspicuous branching. The flowers also exhibit good characteristics in their individual parts. The colour is, as usual, snow-white with a spot on the lip-apex, consisting of small, black-green points.

6. *G. dischorensis* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 35 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus plus minus ramosis, gracilibus, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, linearibus vel lineari-ligulatis, valde inaequaliter et obtuse bilobulatis, basi subpetiolato-angustatis, glabris, 0.8–1.5 cm longis, medio fere 1.5–2.25 mm latis, vaginis arctissime amplexantibus, nervis incrassatis, nunc verruculosus, paucistriatis, apice margine setis pluribus subulatis fimbriato-ciliatis, 0.3–0.7 cm longis; floribus singulis in genere inter majores, glabris; vagina late ovali, apiculata, amplexante, nervosa; bractea hyalina, ovario brevior; sepalis ligulato-oblongis, obtusiusculis, 8.5 mm longis, lateralibus obliquis, basi margine anteriore dilatatis; petalis e basi unguiculato-angustata oblique spatulato-ellipticis, obtusissimis, 1 cm longis, supra medium 4.5 mm latis; labelli lamina late ovata antice rotundata, cum apiculo bene evoluto, margine basi columnae adnata, 4.5 mm longa, infra medium 3.5 mm lata, sacco semi-oblongoideo, obtuso, 1.5 mm longo et lato; columna perbrevis, labello plus duplo brevior, glabra, clinandrio dorso paucidentato, apice truncato; anthera late cucullata, umbone apice submarginato ornata, antice adscendente, obtusissima; ovario cylindrico, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19670, flowering in June 1909.

At first sight this species bears also a certain resemblance to *G. hamadryas* Schltr. var. *phaeotricha* Schltr., but in its almost-stalked leaves it more closely approaches *G. subpetiolata* Schltr. The shape of the petals, as well as the labellum, distinguishes it from both. The snow-white flowers have a densely grey-spotted apex to the lip, and an anther pale brown in front.

7. *G. adenocarpa* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, paulo compressis, valde ramosis, bene foliatis, vaginis foliorum omnino obtectis; foliis linearibus vel lineari-lanceolatis, apice obliquis, subacutis, basi subpetiolato-angustatis, 1–1.4 cm longis, medio fere 1.5–2 mm latis, vaginis artissime amplexantibus, lucidis, nervis paucis elevatis, ornatis, apice margine setis pluribus subulatis fimbriatis, 0.5–0.8 cm longis; floribus singulis, in genere mediocribus, glabris; vagina amplexante, ovali, subacuta, extus sparsim lineis nigris donata; bractea simili, hyalina, ovario brevior; sepalis oblongis, apiculatis, 0.9 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis oblique elliptico-spathulatis, obtusis, vix 1 cm longis; supra medium 0.4 cm latis; labelli lamina obovata, antice rotundata cum apiculo brevi, 0.4 cm longa, supra medium 0.3 cm lata; sacco quadrato, 0.2 cm longo, apice leviter emarginato; columna brevi, glabra, labello plus duplo brevior, clinandrio late triangulo, obtuso, medio utrinque denticulo obtuso ornato; anthera late cucullata, obtuse umbonata, antice adscendente, obtusa, glabra; ovario cylindrico, glandulis sessilibus ornato, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19128, flowering in Jan. 1909.

This species evidently is related to *G. subpetiolata* Schltr., but has narrower leaves and differently shaped floral parts which are characterized by the sessile glands secreting a slimy substance. An examination of a living flower showed the ovary to be covered evenly with this substance. The flowers are snow-white, the labellum densely spotted, grey-green at the apex, the otherwise-white anther a pale brown in front, a recurring colour in the genus.

8. *G. acutifolia* Schltr., sp. nov.

Epiphytica, erecta vel suberecta, usque ad 30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramosis, paulo compressis, bene foliatis; foliis lanceolato-linearibus, apice oblique acutis, basi cuneatis, 2–3.7 cm longis, infra medium 2.5–4 mm latis, vaginis artissime amplexantibus, apicem versus leviter verruculosus, apice margine perdense fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina ovali, subapiculata, extus sparsim striolata, amplexante; bractea hyalina, ovario brevior; sepalis late oblongis vel ovalibus, minute apiculatis, 0.5 cm longis, lateralibus obliquis, basi margine anteriore dilatata decurrentibus; petalis latius oblongis, obtusissimis, basin versus paulo angustatis, obliquis, sepalis aequilongis; labelli lamina late ovali, obtusiuscula, 3.5 mm longa, medio fere 2.5 mm lata, sacco quadrato, apice bilobulato, a dorso depresso, extus leviter concavulo, 2 mm longo et lato; columna brevi, apice incurvula, labello fere duplo brevior, clinandrio semiorbiculari, inaequaliter crenulato-dentato; anthera perlate cucullata, obtuse umbonata, antice adscendente, obtusissima; ovario cylindrico, glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17713, flowering in May 1908.

One of the few species in the Territory occurring below the mist-forest region, it grows only on very large trees of the primary forest, mostly on the thick branches close to the trunk and then always in colonies. The species is recognisable by the rather pointed, long leaves and has somewhat characteristic petals which are of a thicker consistence than the sepals.

9. *G. polychaete* Schltr., sp. nov.

Epiphytica, erecta, rigidula, 15–20 cm alta; rhizomate abbreviato, nunc paulo decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus plus minus ramosis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, linearibus vel ligulato-linearibus, apice obliquis, subacutis, basi subpetiolato-angustatis, glabris, crassius carnosius, 2.5–5 cm longis; medio fere 2–3.5 mm latis, vaginis artissime amplexantibus, nervis leviter incrassatis, verruculosus ornatis, apice margine setulis numerosis dense fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, acuminata, extus muricato-papillosa, amplexante; bractea hyalina, ovario brevior; sepalis oblongis, apiculatis, c. 8.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata decurrentibus; petalis oblique oblongo-spathulatis, obtusis, sepalis aequilongis; labelli lamina late obovata, antice abrupte submucronulato-apiculata, 4.5 mm longa, supra medium 3.5 mm lata, sacco oblongoideo-quadrato, obtusissimo, c. 2.5 mm longo, 2 mm lato; columna brevi, labello subtriplo

breviore, clinandrio trilobato, lobis-lateralibus brevibus, intermedio majore, triangulo, irregulariter crenulato; ovario cylindrico, glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19551, flowering in May 1909.

A very non-variable and characteristic species, which is recognised easily by its long, narrow, thick fleshy leaves. In habit it is somewhat reminiscent of *G. uniflora* (J.J. Sm.) Schltr., but differs from this in its leaf-sheaths, flower involucre, and the separate floral details. The flowers are snow-white and the apex of the labellum an intense black.

10. *G. verruculosa* Schltr., sp. nov.

Epiphytica, erecta vel patula, 20–30 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramosis, primum paulo compressis, demum teretiusculis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus vel subpatentibus, linearibus, apice oblique obtusis, textura carnosulis, glabris, 2–3.5 cm longis, 2–2.5 mm latis, vaginis arctissime amplexantibus, verrucis transversis sparsim ornatis, lucidis, apice margine fimbriis inaequilongis ciliatis; floribus singulis, in genere mediocribus, glabris, vagina ovali, apiculata, cucullato-amplexante, extus sparsim punctata; bractea minore hyalina, ovario subaequilonga; sepalis oblongis, obtusis cum apiculo minuto, 0.7 cm longis, lateralibus obliquis, basi margine anteriore dilatata decurrentibus; petalis oblique obovatis, obtusissimis, sepalis aequilongis; labelli lamina late ovata, obtusa, 3.5 mm longa, supra basin 3 mm lata, sacco oblongoideo, obtuso, 2 mm longo, medio 1.5 mm lato; columna brevi, labello fere duplo brevior, clinandrio leviter crenulato-dentato; ovario cylindrico, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17210, flowering in Jan. 1908.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 500 m—R. Schlechter no. 14647, flowering in July 1902.

The narrow leaves place this plant also near *G. uniflora* (J.J. Sm.) Schltr. The species can be recognised by the transversely placed warts of the leaf-sheaths, the margins of the latter being covered with fewer and shorter bristles, as is elsewhere the case in this group of species. Furthermore, the labellum is rounded conspicuously and blunt. It was very interesting to find that the specimens from Neu-Mecklenburg, which I had regarded previously as *G. hamadryas* Schltr., agreed perfectly with the abundant material which I brought from the Kani Range. I initially carried out only a simple analysis of the two specimens and subsequently found that their vegetative characteristics were identical. The flowers are snow-white with a spot of fine green dots on the apex of the lip, and a yellow-brown anther.

11. *G. pilifera* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 131.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14557, flowering in Apr. 1902.

This species is quite characteristic with its peculiar leaf-sheaths and their conspicuous, outstanding bristles. Unfortunately, I had collected only a single specimen of this interesting plant and, while on my recent visit to the Torricelli Range, I did not see it again. The *Glossorhyncha* species of the Territory all have a definite blooming time so it thus becomes clear why, on my first journey to New Guinea, I collected various species which I did not find again when I visited the Territory at another time of the year. If anyone were to visit the same locality at the opposite time of the year I am almost convinced that in my 'happy hunting grounds' many novelties which escaped my notice would be found.

12. *G. squamulosa* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 132.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14556, flowering in Apr. 1902.

This is, likewise, a species which I did not see again on my second journey to New Guinea. As such it is very characteristic and easily recognised by the peculiar protruberances on the outside of the flower-sheaths. This character is certainly common to various other species, but the latter have a different habit or different leaf shape.

13. *G. kaniensis* Schltr., sp. nov.

Epiphytica, erecta vel erecto-patens, humilis, usque ad 15 cm alta; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, glabris; caulibus erecto-patentibus vel patentibus, valde ramosis, compressis, dense foliatis, vaginis foliorum omnino obtectis; foliis patentibus, oblongis vel oblongo-ligulatis, inaequaliter et obtuse bilobulatis, glabris, 7–7.5 cm longis, medio 3–6 mm latis, vaginis arctissime caulem amplexentibus, compressis, lucidis, subinconspicue nervosis, margine apice, dense fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, apiculata vel breviter acuminata, cucullato-amplexente, extus densius muricato-papillosa; bractea hyalina, vaginae simili sed minore; sepalis oblongis, obtusis, glabris, 0.6 cm longis, lateralibus obliquis, basi margine anteriore dilatata decurrentibus; petalis obovato-oblongis, obtusissimis, subfalcatis, sepalis aequilongis; labelli lamina late elliptica, subacuta, 0.4 cm longa, 0.3 cm sublata, sacco oblongo-quadrato, 2.5 mm longo, 2.25 mm lato; columna brevi, glabra, labello plus duplo brevior, clinandrio rotundato, irregulariter dentato; anthera perlate cucullata, obtuse umbonata, antice adscendente obtusissima, glabra; ovario cylindrico, glabro, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16720, flowering in Oct. 1907.

In this species we have a typical example of local distribution in certain orchids of the Territory. It is one of the most common species on the Kani Range. Occasionally, I found it on the adjacent Ibo Range, where the flora otherwise is very similar to that on the Kani Range, but further away it was, apparently, absent entirely. Naturally, I cannot assert that the plant may not be found in other places, since occasionally certain species have been observed in isolated locations. I merely record the fact that this is an example of a common, local species which is extremely rare in the surrounding country. *G. kaniensis* Schltr. is related to *G. squamulosa* Schltr., but may be distinguished easily at first glance by the entirely different shape of the leaf. It is separated also by its spreading habit, its flat stems and branches, as well as by the very characteristically dense foliage.

14. *G. latipetala* Schltr., sp. nov.

Epiphytica, suberecta vel erecto-patens, humilis, 10–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramosis, compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, apice valde obliquis, obtusis, basi subcuneatis, glabris, 1.3–2.5 cm longis, 2.5–3 mm latis, vaginis arctissime amplexentibus, compressis, longitudinaliter striatonervosis, apice dense fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, apiculata, extus sparsim nigro-punctata, cucullato-amplexente; bractea hyalina, vaginae simili sed minore; sepalis oblongis, obtusis cum apiculo minuto, 0.6 cm longis, lateralibus obliquis, basi margine anteriore dilatata decurrentibus; petalis e basi angustiore late obovatis, retusis, obliquis, 0.7 cm longis; labello perlate ovali, obtusiuscule subacuminato, 0.3 cm longo, medio fere 2.5 mm lato, sacco oblongoideo, obtuso, 0.2 cm longo, 1.5 mm lato; columna brevi, labello plus duplo brevior, glabra, clinandrio triangulo inaequaliter pluridentato; anthera perlate cucullata, obtuse umbonata, antice leviter adscendente, obtusissima, glabra; ovario cylindrico, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Mimi on the Waria [River], alt. c. 600 m—R. Schlechter no. 19470, flowering in May 1909.

Certainly a near relative of *G. kaniensis* Schltr., and therefore it is doubly interesting to note how it deviates from the latter in every possible character. It has in common with *G. kaniensis* Schltr., the habit, the flat stem and the leaf-sheaths, but the leaves are longer and narrower, the flower-sheaths are not covered with protruberances, the petals are very large and strikingly broad above; likewise the lip and column are different. The spot on the apex of the lip consists of minute, greyish

green dots, but in other respects the flower is snow-white, with the exception of a pale brown anther.

15. *G. brachychaete* Schltr., sp. nov.

Epiphytica, dependens, usque ad 80 cm longa, rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus compressis, bene foliatis, vaginis foliorum omnino obtectis, ramosis; foliis erecto-patentibus, anguste lanceolatis, apice obliquis, subacutis, basi subpetiolato-angustatis, glabris, 3–6.5 cm longis, infra medium 4.5–8 cm latis, vaginis compressis, lucidis, apice obtuse truncatis et setis brevibus fimbriato-ciliatis, usque ad 2 cm longis; floribus singulis, in genere inter mediocres, glabris; vagina cucullato-amplexante, obtusa, laevi; bractea vaginae simili, hyalina, minore; sepalis oblongis, obtusis cum apiculo minuto, basin versus paulo dilatatis, 5.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata paulo decurrentibus; petalis oblique quadrato-oblongis, apice truncato-obtusissimis, sepalis aequilongis; labelli lamina subquadrata, antice truncato-obtusissima cum apiculo parvulo, vix 0.3 cm longa et lata, sacco oblongoideo-subquadrato, antice retuso, 2.5 mm longo, subaequilato; columna brevi, labello plus duplo brevior, clinandrio dentato, circuitu late triangulo; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17881 [Ed.—possibly no. 17581], flowering in Apr. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17985, flowering in July 1908.

This species is distinguished very easily by its pendant stems, from all the others with flat, broad stems and large leaves. The species is so extremely characteristic that it can never be confused with others. The flowers are snow-white with two spots on the tip of the lip, consisting, as in other species, of very close, minute dots. In the Bismarck Range, at an altitude of approximately 2500 m, I saw a species which evidently was related to this, but which had more than double the size broader leaves and leaf-sheaths; this, likewise, hung down from the tree-trunks in the same manner as *G. brachychaete* Schltr. Unfortunately, the species in the Bismarck Range was not in flower, so that I neglected to collect material from it.

16. *G. flaccida* Schltr., sp. nov.

Epiphytica, dependens, usque ad 50 cm longa, flaccida; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus filiformibus, ramosis, gracillimis, bene foliatis, teretiusculis, vaginis foliorum omnino obtectis; foliis linearibus, acutis, basi vulgo subpetiolato-angustatis, 3–6 cm longis, medio fere 2.25–2.75 mm latis, vaginis arcuissime amplexantibus, tenuiter nervoso-striatis, apice margine dense fimbriato-ciliatis, ciliis subulatis; floribus singulis, in genere vix inter mediocres, glabris; vagina late ovali, apiculata, cucullato-amplexante, laevi; bractea hyalina, vaginae simili sed minore; sepalis oblongis, obtusis, c. 5.5 mm longis, lateralibus subapiculatis, obliquis, intermedio paululo angustioribus, basi margine anteriore paulo dilatatis; petalis oblongo-spathulatis, apice subtruncato-obtusissimis, obliquis, sepala paululo superantibus, basin versus paulo angustatis; labelli lamina pro genere magna, ovali, obtusa, 3.5 mm longa, medio fere 2.5 mm lata, sacco quadrato-oblongoideo, apice retuso-truncato, a dorso compresso, 2.5 mm longo, c. 2 mm lato; columna brevi, glabra, labello plus duplo brevior, clinandrio trilobato, lobis irregulariter dentato-crenulatis, lateralibus brevibus, intermedio majore, subquadrato; anthera late cucullata, obtuse umbonata, antice adscendente, obtusa, glabra; ovario cylindrico, glabro, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema, alt. c. 800 m—R. Schlechter no. 19415, flowering in May 1909.

The Territory provides a series of species which usually hang down from the trees in long, loose fascicles. Whereas *G. brachychaete* Schltr., and the above-mentioned broader species from the Bismarck Range, i.e. those with flat stems, grow by preference on thick tree-trunks, *G. flaccida* Schltr. and its related species with thin filiform stems are found only on horizontal branches and twigs. This species differs from the related ones by its long, linear leaves.

17. *G. longa* Schltr., sp. nov.

Epiphytica, longo dependens, usque ad 60 cm longa; rhizomate valde abbreviato; radicibus

filiformibus, elongatis, flexuosis, glabris; caulibus ramosis gracilibus ramisque elongatis, flexuosis, bene foliatis, vaginis foliorum omnino obtectis; foliis linearibus vel ligulato-linearibus, breviter et obtuse bilobulatis, basi cuneatis, glabris, 1.5–2 cm longis, 1.5–2.5 mm latis, vaginis arctissime amplexentibus, densius striato-nervosis, sparsim verruculosi, margine apice setulis pluribus inaequilongis fimbriato-ciliatis, 0.6–0.9 cm longis; floribus singulis, in genere vix inter mediocres, glabris; vagina late ovali, subacuta, cucullato-amplexente, extus sparsim nigro-punctata; bractea hyalina, vaginae simili sed minore; sepalis oblongis, apiculatis, 5.5 mm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis oblongo-spathulatis, dimidio inferiore bene angustatis, apice obtusissimis, obliquis, 6 mm longis, labelli lamina obovata, obtusa, c. 3.5 mm longa, supra medium 3 mm lata, sacco brevi semioblongo, obtuso, c. 0.2 cm longo et lato; columna brevi, glabra, labello subtriplo brevior, clinandrio semiorbiculari, irregulariter dentato-crenulato; anthera perlate cucullata, obtuse umbonata, antice adscendente, obtusa, glabra; ovario cylindrico, glabro, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19139, flowering in Jan. 1909.

A further one of the many species apparently peculiar to the Finisterre Range. It differs less in its floral characters than in habit. The stems seem to branch with fair regularity and, together with the strikingly long branches which appear to branch infrequently, are twisted snake-like to a small degree. In none of the larger species of the genus have I observed this character and regularity. The leaves are shorter than those of the species following. The floral parts afford few characteristics; their colour is snow-white with a densely grey-pitted spot at the apex of the lip. The anther is pale brown with a white appendage.

18. *G. dependens* Schltr., sp. nov.

Epiphytica, dependens, gracilis, usque ad 50 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde ramosis ramisque filiformibus, dense foliatis, vaginis foliorum omnino obtectis; foliis ligulato-vel lanceolato-linearibus, sub-acutis, basi subpetiolato-angustatis, glabris, 0.8–1.2 cm longis, c. 1.5 mm latis, vaginis arctissime amplexentibus, striato-nervosis, apice margine setulis pluribus fimbriato-ciliatis, 2–3 mm longis; floribus singulis in genere inter minores, glabris; vagina late ovali, apiculata, cucullato-amplexente, laevi; bractea hyalina, vaginae simili sed paulo minore; sepalis oblongis, apiculatis, 5.5 mm longis, lateralibus obliquis, basi margine anteriore bene dilatatis; petalis e basi unguiculato-angustata obovato-spathulatis, obtusissimis, obliquis, 6.5 mm longis; labello late ovali, obtuso, c. 2.5 mm longo, sacco oblongoideo, obtuso, 3 mm longo, 2 mm lato; columna perbrevis, glabra, labello plus duplo brevior, clinandrio subintegro, perlate triangulo; anthera subreniformi-cucullata, leviter umbonata, antice adscendente, obtusissima, glabra; ovario cylindrico, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range in the Waria District, alt. c. 1300 m—R. Schlechter no. 19652, flowering in June 1909.

This species is related most closely to the two following, *G. pensilis* Schltr. and *G. gracilis* Schltr. and, on superficial inspection, resembles certain *Rutaceae* from the group *Diosmeae*, rather than orchids. It is remarkable that this ericoid form, as it has been called commonly, and which, in other floral regions, appears chiefly in the *Ericaceae*, *Myrtaceae* and *Rutaceae*, has been transferred in the mountain flora of New Guinea to the orchids, which have experienced here the greatest development, compared with all plant families.

Not only in its lax habit, thinner stems and densely set leaves, but also in the flowers, with their much narrower petals, does the species differ from *G. pensilis* Schltr. and approach more closely *G. gracilis* Schltr., whereas *G. pensilis* Schltr. inclines more towards *G. longa* Schltr.

The flowers of *G. dependens* Schltr. are snow-white with a roundish spot of green-grey dots at the apex of the lip and a pale brown anther.

19. *G. pensilis* Schltr., sp. nov.

Epiphytica, pensilis, gracilis, usque ad 40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus bene ramosis ramulisque dense foliatis, vaginis

foliorum omnino obtectis; foliis lanceolato-linearibus vel ligulato-linearibus, apice obliquis, obtusiusculis, basi cuneatis, glabris, 0.6–1.2 cm longis, medio fere vel infra medium 1.25–1.75 mm latis, vaginis arctissime amplexantibus, striato-nervosis, apice setis subulatis pluribus fimbriato-ciliatis, 4–6 mm longis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, apiculata, cucullata-amplectente, laevi; bractea hyalina, vaginae simili sed minore; sepalis ovalibus, obtusis, 5.5 mm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis e basi cuneato-subunguiculata late obovatis, apice retusis, subfalcato-obliquis, 0.7 cm longis; labelli lamina suborbiculari, obtuse subapiculata, 0.3 cm longa, 3.25 mm supra basin lata, sacco oblongoideo-conico, obtuso, a dorso depresso, vix 2.5 mm longo; columna brevi, glabra, labello fere duplo brevior, apice incurva, clinandrio circuitu semiorbiculari, irregulariter crenulato-denticulato; anthera perlate cucullata, obtuse umbonata, antice adscendente obtusissima, glabra; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18613, flowering in Nov. 1908.

This species is distinguished easily from its near relatives by its remarkably large, broad, wing-like petals with narrow margins at the apex. In some respects it more closely approaches *G. longa* Schltr., in others *G. dependens* Schltr. The column is incurved above in all species, but here it is more so than I have observed it in any other species up to the present. The colour of the flowers is the usual snow-white with a densely grey-green dotted lip apex and a pale brown anther.

20. *G. gracilis* Schltr., sp. nov.

Epiphytica, gracilis, usque ad 80 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramosissimis ramisque filiformibus, tenuissimis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis; foliis anguste linearibus, acutis, basi subpetiolato-angustatis, glabris, textura leviter carnosulis, 1–1.8 cm longis, 0.75–1 mm latis, vaginis arctissime amplexantibus, lucidis, apice margine setis subulatis, fimbriato-ciliatis; floribus singulis, in genere inter minimos, glabris; vagina lato ovali, apiculata, cucullato-amplectente, laevi; bractea hyalina, vaginae simili sed minore; sepalis intermedio ligulato-oblongo, obtusiusculo, 0.3 cm longo, lateralibus subfalcato-triangularibus, subapiculatis, c. 2.5 mm longis, basi margine anteriore conspicue ampliatis, margine anteriore leviter cohaerentibus; petalis oblique oblongo-spathulatis, obtusis, sepalis intermedio sublongioribus; labelli lamina subquadrato-ovata, minute et obtuse subapiculata, c. 1.5 mm longa, basi 1.25 mm lata, sacco conico, obtuso, a dorso depresso, c. 1.25 mm longo; columna perbrevis, glabra, labello plus duplo brevior, clinandrio triangulo, lobulato; anthera suborbiculari-cucullata, leviter umbonata, antice adscendente, obtusa, glabra; ovario cylindrico, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 18135, flowering in Sept. 1908.

I found the branches of several trees covered over and over with these peculiar orchids. The specimens hang vertically in lengths up to about 80 cm and swing to-and-fro in every breeze. I am firmly convinced that most botanists, on superficial inspection, would mistake the species in the dry state for anything other than an orchid. The species is distinguished by the very narrow, fine leaves and has easily the smallest flowers of all the species in the genus known to me up to the present. The colour of the flowers is snow-white with a small, roundish spot composed of dense, black-green dots at the apex of the lip, and a pale brown anther.

21. *G. diosmoides* Schltr., sp. nov.

Epiphytica, gracillima, erecta vel patula, 15–30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus plus minus ramosis, filiformibus, foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, filiformi-aciculatis, acutis, glabris, 1.5–3 cm longis, vix 1 mm diametentibus, vaginis arctissime amplexantibus, nervis paucis (4–5) elevatis, apice margine setis subulatis pluribus ciliatis; floribus singulis, in genere inter mediocres, glabris; vagina cucullato-amplectente, late ovali, apiculata; bractea hyalina, vaginae simili sed minore; sepalis ligulato-oblongis, apiculatis, 5.5 mm longis, lateralibus falcatis, basi margine anteriore vix dilatatis; petalis oblanceolato-spathulatis, subapiculatis, obliquis, sepalis intermedio aequilongis; labelli lamina latissime obovata, antice obtusissima, c. 3 mm longa; supra medium 3.5 mm lata, sacco brevi semioblongo, obtuso, laminae plus duplo brevior; columna brevi, glabra, labello duplo fere brevior,

glabra, clinandrio integro, semiorbiculari, apiculato, anthera perlate cucullata, obtuse umbonata, antice adscendente, glabra; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200–1300 m—R. Schlechter no. 19637, flowering in May 1909; no. 19711, flowering in June 1909.

Up to the present, I know of only one species which may be compared with this one, viz. *G. acicularis* Schltr. described below. Both species have in common a lax growth and thin needle-shaped leaves, but are entirely different in their flowers, so that no doubt can arise that they should be kept separate. The flowers of this species are white with a spot composed of grey-green dots on the apex of the lip, and a pale brown anther.

22. *G. acicularis* Schltr., sp. nov.

Epiphytica, erecta vel patula, gracillima, usque ad 40 cm longa; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus bene ramosis, gracilibus, laxe foliatis, vaginis foliorum omnino obtectis; foliis subulato-acicularibus, acutis, teretibus, glabris, 2.5–6 cm longis, c. 1 mm diametentibus, vaginis arctissime amplexantibus, nervis paulo elevatis striatis, apice margine setis paucis fimbriato-ciliatis, floribus singulis, in genere inter minores, glabris; vagina late ovali, apiculata, cucullato-amplectente; bractea vaginae simili sed minore, hyalina; sepalis oblongis, apiculatis, 0.5 cm longis, lateralibus obliquis, basi margine anteriore dilatatis; petalis oblique obovatato-oblongis, apice obtusissimis, retusis, sepalis aequilongis; labelli lamina subquadrato-concavata, antice obtusissima, subtruncata, 2.5 mm longa, sacco late oblongoideo, obtusissimo, c. 2.5 mm longo, 2 mm lato; columna brevi, labello plus duplo brevior, glabra, clinandrio rotundato, inaequaliter crenulato, anthera subquadrato-cucullata, obtuse umbonata, glabra, antice adscendente, ovario cylindrico, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the upper Waube [Creek] (Waria District), alt. c. 700 m—R. Schlechter no. 19463, flowering in May 1909.

This species is distinguished from the only one which resembles it, *G. diosmoides* Schltr., by its more rigid and more vigorous growth, by the longer leaves and especially by its different flowers. Here the flowers vary somewhat in colour from that which prevails in almost all species. They are whitish, flesh-coloured with a yellowish tip to the labellum. This colour is not known to me in any other species in the entire genus.

23. *G. subulata* Schltr., sp. nov.

Epiphytica, erecta, humilis, c. 15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, pro genere perdense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus vel suberectis, subulato-linearibus, obtusiusculis vel subacutis, glabris, crassius carnosius, 0.7–1 cm longis, 1–1.25 mm latis, vaginis arctissime amplexantibus, nervis pluribus leviter incrassatis, striatis, apice margine setis satis longis fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, apiculata, cucullato-amplectente, laevi; bractea hyalina, vaginae simili sed paulo minore; sepalis oblongis, subacutis vel apiculatis, 0.6 cm longis, lateralibus obliquis, basi margine anteriore dilatata decurrentibus; petalis oblique elliptico-spathulatis, obtusissimis, sepalo intermedio paululo-longioribus, c. 6.5 mm longis; labelli lamina late elliptica, obtusiuscula, c. 3.5 mm longo, medio 3 mm lata, sacco oblongoideo-subquadrato, 0.2 cm longo, subaequilato, apice obtusissimo; columna perbrevis, labello subtriplo brevior, clinandrio late triangulo, inaequaliter paucidentato; anthera late cucullata, obtuse umbonata, antice adscendente, obtusissima, glabra; ovario cylindrico, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19494, flowering in May 1909.

This species also could have been placed near *G. hamadryas* Schltr., to which it is closely related in its floral characters. I have placed it here on account of its narrow, subulate leaves which it has in common with the two species described above. The plant is remarkable for its dense foliage. The colour of the flowers is again, as in almost all species of the genus, pure white with a round spot composed of green-grey dots on the lip, and a pale brown anther.

24. *G. torricellensis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 132.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–800 m—R. Schlechter no. 14558, flowering in Apr. 1902; no. 20206, flowering in Sept. 1909.

I had brought back from my first journey a small plant of this species, so that I was pleased to complete my material by the discovery of two more plants. The recently found specimens agree quite well with the Type [Ed.—assumed no. 14558], but in one the leaves are somewhat longer. It would appear that this species is moderately rare. It grows by preference on the exposed tops of tall trees.

25. *G. obovata* Schltr., sp. nov.

Epiphytica, erecta val patula, usque ad 17 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus plus minus ramosis, compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis patentibus, lanceolato-ligulatis, apice obliquis, acutis, basi cuneatis, 1.2–1.8 cm longis, infra medium 3–4.5 mm latis, vaginis compressis, arctissime amplexantibus, nervis paucis incrassatis striatis, verrucis sparsis ornatis, apice margine setis subulatis dense fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, apiculata, cucullato-amplexante, laevi; bractea hyalina vaginae simili paulo minore; sepalis oblongo-ellipticis, apiculatis, intermedio 5.5 mm longo, lateralibus obliquis, paulo minoribus, basi margine anteriore dilatatis; petalis oblique obovato-oblongis, obtusis, 0.6 cm longis; labello late obovato, antice obtuse apiculato 3.5 mm longo, supra medium 3.5 mm lato, sacco conico, apice truncato, retuso, 0.2 mm longo; columna perbrevis, labello duplo brevior, clinandrio late triangulo, obscure crenulato; anthera late cucullata, obtuse umbonata, antice adscendente, obtusa, glabra; ovario cylindrico, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19056, flowering in Jan. 1909.

This species shows a certain approach to *G. squamulosa* Schltr. as well as to *G. papuana* (Krzl.) Schltr. and *G. elegantula* Schltr., but differs from both in its larger leaves and in the shape of the floral parts of which especially the labellum, with its broad, obovate lamina and the almost-spherical spur, is significant. The flowers are snow-white, the labellum with a round spot composed of minute green-black dots and the anther is a pale brown.

26. *G. papuana* (Krzl.) Schltr., nom. nov. [Ed.—comb. nov.]

Ceratochilus papuanus Krzl. ex Warbg., in Engl. Bot. Jahrb. XVI (1893), p. 19.

Ceratostylis papuana Krzl. ex K. Schum. et Laut., Fl. Deutsch. Schutzg. Süds. (1901), p. 249.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000–1100 m—R. Schlechter no. 17995, flowering in July 1908; no. 18213, flowering in Aug. [Ed.—possibly Sept.] 1908; [Ed.—no location cited], alt. c. 2300 m—Hellwig no. 324 (TYPE), flowering in Oct. 1888; on the Gelu River—Dr. Werner, no. 52, flowering in July 1907.

This plant has been known for a long time in the literature, but no one knew what was to be done with it, since it was placed (perhaps only erroneously) for the second time in *Ceratostylis*. An examination of the Type in the Berlin Botanical Museum has now shown that we are dealing, undoubtedly, with a *Glossorhyncha* species which is related closely to *G. elegantula* Schltr. from the Bismarck Range. A third species from the Kani Range, which also is related closely, I will describe below.

27. *G. elegantula* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 130.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1700 m—R. Schlechter no. 14038, flowering in Jan. 1902.

I have kept this species separated from *G. papuana* (Krzl.) Schltr., since it has a distinctly narrower labellum. The large, broad petals are the same as in *G. papuana* (Krzl.) Schltr.

28. *G. imitans* Schltr., sp. nov.

Epiphytica, pusilla, depressa vel erecto-patens, c. 5–10 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramosis, gracilibus, teretiusculis, bene foliatis, vaginis foliorum omnino obtectis; foliis patentibus, ligulatis, apice obliquis, obtuse apiculatis, 3.5–6.5 mm longis, medio fere 1.25–1.75 mm latis, vaginis arctissime amplexantibus costato-nervosis, costis sparsim verruculosi, apice margine setis paucis fimbriato-ciliatis, 2–3 mm longis; floribus singulis, in genere inter minores, glabris; vagina late ovali, apiculata, laevi, cucullato-amplexante; bractea hyalina, vaginae simili sed paulo minore; sepalis oblongis, acutis, glabris, intermedio 5.5 mm longo, lateralibus falcatis, paulo brevioribus, antice margine leviter cohaerentibus, basi paululo margine anteriore dilatatis; petalis oblique ligulatis, obtusis, sepalo intermedio fere aequilongis, sed paulo angustioribus; labelli lamina suborbiculari, breviter apiculata, c. 0.3 cm longa, et lata, sacco cylindrico, obtuso, c. 2 mm longo, 1 mm diametiente; columna perbrevis, glabra, labello c. 3-plo brevior, clinandrio late triangulo, apiculato, irregulariter denticulato; anthera late cucullata, obtuse umbonata, antice adscendente, obtusissima, glabra; ovario cylindrico, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17685, flowering in May 1908.

From a superficial inspection it could be believed that one was observing a smaller-leaved specimen of *G. papuana* (Krzl.) Schltr., but on closer examination it will be seen that the petals are considerably narrower than in that species. Since this characteristic constitutes a particularly good distinction in the *Glossorhyncha* species, I think it advisable to regard this plant as a separate species which I will place beside *G. papuana* (Krzl.) Schltr. and *G. elegantula* Schltr. The species is distinguished also from the latter two by the narrow petals and, moreover, by the broad labellum. *G. latilinguis* (J.J. Sm.) Schltr. from Dutch New Guinea is evidently a fourth species in this relationship. The flowers of *G. imitans* Schltr. are snow-white with two spots, composed of dense green-grey dots on the apex of the lip.

29. *G. nana* Schltr., sp. nov.

Epiphytica, nana, erecta vel suberecta, usque ad 7 cm alta, e basi ramosa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramosis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ellipticis vel lanceolato-ellipticis, obtusis, basi cuneatis, 0.3–0.4 cm longis, medio fere 1.5–2 mm latis, vaginis arctissime amplexantibus, nervoso-striatis, apice margine setis numerosis foliis subaequilongis erecto-patentibus fimbriato-ciliatis, 1.5–2 mm longis; floribus singulis, in genere inter minores, glabris; vagina late ovali, apiculata, laevi, cucullato-amplexante; bractea hyalina, vaginae simili sed minore; sepalis oblongis, apiculatis, vix 3.5 mm longis, lateralibus obliquis, basi margine anteriore conspicue dilatata decurrentibus; petalis oblique ligulato-oblongis, obtusatis, basin versus sensim paulo angustatis, sepalis vix longioribus; labelli lamina late ovali, minute apiculata, concava, vix 2.25 mm longa, sacco oblongoideo, obtuso c. 1.25 mm longo; columna brevi, glabra, labello plus duplo brevior; clinandrio semiobiculari, subcrenulato; anthera late cucullata, obtuse umbonata, antice adscendente, glabra; ovario cylindrico, glabro, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the upper Waube [Creek] (Waria District), alt. c. 900 m—R. Schlechter no. 19446, flowering in May 1909.

A charming little species which more closely resembles *Selaginella* or a small *Lycopodium* than an orchid. It is the smallest in the genus and is recognised easily by the long, obliquely spreading bristles of the leaf-sheaths which are sometimes almost as long as the leaves. The whole plant thus has the appearance of the leaves also being covered with hair, but are, as a matter of fact, quite glabrous, as in all other species of the genus. The flowers are snow-white with a pale brown anther.

30. *G. leucomela* Schltr., sp. nov.

Epiphytica, pusilla, erecta vel suberecta, c. 5 cm alta; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, parvulis, teretibus, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus vel patentibus, ligulatis, obtusis, basi subpetiolato-angustatis, carnosius, glabris, 0.5–0.7 cm longis, medio fere 1.25–1.5 mm

latis, vaginis arctissime amplexantibus, nervoso striatis, obscure verrucosis, apice margine setis pluribus appressis fimbriato-ciliatis; floribus singulis, in genere mediocribus, glabris; vagina late ovali, apiculata, cucullato-amplectente, laevi; bractea vaginae simili sed minore, hyalina; sepalis oblongis, subacutis, glabris, c. 0.8 cm longis, lateralibus obliquis, basi margine anteriore paululo dilatatis; petalis late ellipticis, acutis, glabris, sepalis vix longioribus, sed medio distincte latioribus, obliquis; labelli lamina obovata, obtusa, c. 3.5 mm longa, supra medium 2.5 mm lata, sacco oblongoideo, obtuso, c. 3 mm longo; columna brevi, labello fere duplo brevior, glabra, clinandrio late triangulo, apiculato, sublobulato; anthera obovato-cucullata, dorso gibbo conico ornata, glabra, antice breviter bilobulata; ovario cylindrico, glabro, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18725, flowering in Nov. 1908.

The specimen is very small in habit but it has a beautiful large flower. I have, unfortunately, found only a single flower which I sketched, so that the description may have to be modified a little when better material is available. The plant, in a certain way, forms a transition from the typical *Glossorhyncha* species to the two following, which are two aberrant forms of the genus. The flowers are whitish, the apex of the labellum black. I am not quite sure whether this small plant perhaps represents a badly developed piece of an otherwise luxuriantly growing species.

31. *G. pungens* Schltr., sp. nov.

Epiphytica, dependens, usque ad 20 cm longa, ramosissima; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis glabris; caulibus valde ramosis, filiformibus, teretiusculis, bene foliatis, vaginis foliorum arctissime appressis omnino obtectis; foliis subulatis, pungentibus, acutis, carnosius, basi attenuatis, glabris, 2.5–3.5 cm longis, medio fere 1.5–2.5 mm diametentibus, vaginis lucidis, laevibus, vix striatis, sparsim punctatis, apice oblique truncatis, efimbriatis; floribus singulis in genere vix inter mediocres, glabris; vagina late ovali, apiculata, cucullato-amplectente, sparsim punctata; bractea hyalina, vaginae simili sed paulo minore; sepalis ovalibus, obtusis, minute apiculatis, 0.5 cm longis, lateralibus basi margine anteriore dilatatis, decurrentibus; petalis obliquis, late ovalibus, obtusissimis, sepalis fere aequilongis; labelli lamina quadrato-oblongo, obtusissima, 0.3 cm longa, c. 0.2 cm lata, sacco quadrato obtusissimo 0.2 cm longo et lato; columna brevi, labello fere duplo brevior, glabra, clinandrio triangulo, obtuso, sublobulato; anthera late cucullata, obtuse umbonata, antice leviter excisa; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18024, flowering in July 1908.

This, as well as *G. glomeroides* Schltr. described below, are two aberrant species which are distinguished by the absence of bristles on the upper margin of the leaf-sheaths and by the lip-sac bent a little forward. Of all the species in the genus, it approaches *Glomera* most closely, but both of them have the singly appearing flowers and the free lateral sepals of *Glossorhyncha* and therefore are better placed here. *G. pungens* Schltr. is one of the most remarkable species of the genus. In dense clusters over a metre long, it hangs vertically from the thick branches of large primary forest trees. The leaves are needle-shaped and sharp-pointed. Unfortunately, I found only a single flower which enabled me to establish the species. The colour of the flower is greenish white with a black spot on the apex of the lip.

32. *G. glomeroides* Schltr., sp. nov.

Epiphytica, erecta, vel suberecta, parvula, c. 15 cm alta; rhizomate vulgo abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus erectis vel adscendentibus, basi nunc radicanibus, bene ramosis, teretibus, bene foliatis, vaginis foliorum omnino obtectis; foliis patentibus vel erecto-patentibus, ligulatis vel oblongo-ligulatis, inaequaliter et obtuse bilobulatis, glabris, 1–1.5 cm longis, medio fere 2.25–2.75 mm latis, vaginis arctissime amplexantibus, densius verrucosis, nunc subcarunculatis, apice margine truncatis, efimbriatis, 0.6–0.8 cm longis; floribus singulis, in genere inter minimos, glabris; vagina late ovali, apiculata, cucullato-amplectente, nervosa; bractea hyalina, vaginae simili sed paulo minore, ovarium superante; sepalis ovatis, acuminato-apiculatis, c. 3.5 mm longis, lateralibus obliquis, basin versus margine anteriore sensim paulo dilatatis, decurrentibus; petalis oblique rhombo-oblongis obtusis, sepalis paulo brevioribus, glabris; labelli lamina perlate

ovata, obtusa, vix 1 mm longitudine excedente, sacco late oblongoideo, obtusissimo, 1.5 mm longo; columna perbrevis, labello subduplo brevior, clinandrio trilobato, lobis lateralibus parvulis, intermedio majore, triangulo, obtuso; anthere late cucullatae, obtuse umbonatae, glabrae, antice adscendentes, obtusissimae; ovario cylindrico, glabro, 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16924, flowering in Nov. 1907.

Also an aberrant species of the genus, which in its characteristics appears to approach *Glossorhyncha* more closely than *Glomera*. Unfortunately, I have also only a single specimen of it with two flowers, so that I had hardly sufficient material for investigation. The flowers, moreover, are rather small and fairly well concealed beneath the sheath. The colour also is somewhat unusual, for the sepals and petals are white, but the labellum is a vivid green with a red apex.

51. *Giulianettia* Rolfe

It required a lot of consideration before I decided that this genus should stand next to *Glossorhyncha* Ridl. I previously was of the opinion that it would be better to unite them and in a sense J.J. Smith adopted the latter view by including it under *Glomera*, with which he also unites *Glossorhyncha*. However, I cannot agree to extend the limits of the latter genus by admitting *Giulianettia*. I concede that the differences between the two genera are very insignificant, but these fleshy, widely spreading green flowers, with their narrow petals and long spur, convey a very different impression from the delicate white flowers of *Glossorhyncha* with their constantly conspicuous broad petals. Since the genus had been established already by Rolfe, I felt inclined to thus designate the plant described here, because not only does it evidently possess all the characteristics of Rolfe's genus, but if placed elsewhere would have to be regarded as a very divergent form of *Glossorhyncha*.

Up to the present, *G. tenuis* Rolfe from British Papua is the only species recorded. Similarly, the only species growing in our Territory is an inhabitant of the mist-forests of the higher mountains, where it occurs as an epiphyte on tall trees, with its roots embedded in dense moss pads. The species is evidently very rare, since I have found it only once.

1. *G. viridis* Schltr., sp. nov.

Epiphytica, erecta, fruticosa, ramosa, usque ad 60 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramisque paululo compressis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, oblique oblongo-ligulatis, apice inaequaliter et obtuse bilobulatis, glabris, textura coriaceis, 1.7–3.5 cm longis, infra medium 0.6–0.8 cm latis, vaginis arctissime amplexantibus dense verrucis parvulis obtectis, apice margine setulis pluribus fimbriato-ciliatis, 1–2.5 cm longis; floribus ad apices ramulorum singulis, erectis; vagina cucullato-amplectente, apiculata, extus minute verruculosa; bractea vaginae simili, sed minore et tenuiore; sepalis ligulatis, minute apiculatis, extus sparsim punctatis, c. 1.8 cm longis, lateralibus basi margine anteriore paulo ampliatis, decurrentibus; petalis sublineari-ligulatis, apiculatis, obliquis, supra medium margine anteriore paulo dilatatis, glabris, sepalis subaequilongis; labello marginibus columnam amplexante, late rhombeo, obtuso, medio carina apicem versus paulo dilatata ornato, glabro, 0.7 cm longo, medio fere 1 cm lato, calcare cylindrico, obtuso, 1.6 cm longo, ovario appresso; columna brevi, glabra, clinandrio amplo, semiorbiculari, apice obtuse trilobulato, pede bene evoluto; anthera late cucullata, antice adscendens, dorso obtuse umbonata, glabra; pollinibus 4 semioblongoideis, obliquis, glandula singula, rotundata, bene lata; ovario cylindrico, glabro, 1.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18756, flowering in Nov. 1908.

This conspicuous plant is well distinguished from *G. tenuis* Rolfe by its broader leaves, more robust growth and the shape of the floral parts. Whether the presence of only one viscid disc for the four pollinia is characteristic of the genus I cannot state

with certainty, since the pollinia are not known in *G. tenuis* Rolfe. In *Glossorhyncha* Ridl. there are two coherent viscid discs as in *Glomera* Bl.

52. *Sepalosiphon* Schltr.

The flora of New Guinea has produced a series of very peculiar forms of *Glomerinae*, and amongst these, some deserve special attention owing to their flower structure.

One of these forms is the new genus *Sepalosiphon* Schltr. described here for the first time. The only species known up to the present, *S. papuanum* Schltr., resembles *Giulianettia viridis* Schltr. in habit, but is rather smaller in its dimensions.

Like most of the *Glomerinae*, the plant is an inhabitant of the mist-forests of the mountains above an altitude of 1000 m where it occurs as an epiphyte on the thickly moss-covered trunks of trees and then always only singly.

Sepalosiphon Schltr., gen. nov.

Sepala angusta, erecto-patentia, lateralibus obliquis, basi margine anteriore valde elongata inter se et cum labelli calcare arctissime connata. Petala angusta, obliqua, sepalis plus minus similia, glabra. Labelli lamina parvula, late rhombea, obscure trilobulata, obtusiuscula, superne lamellis 2 obscuris medio ornata, glabra, calcare filiformi, subacuto, ovario appresso cum appendicibus sepalorum arctissime connato. Columna brevis glabra, clinandrium bene evoluto, pede producto, rostello erecto, bilobulato. Stigma basi more generis *Glossorhyncha* marginatum. Anthera subquadrato-cucullata, antice adscendens. Pollinia 4 oblique obovoidea, glandula singula. Herbae epiphyticae erectae, ramosae, bene foliatae; foliis patentibus oblongis, vaginis arcte amplexentibus, dense verrucosis, apice margine fimbriato-ciliatis; floribus ad apices ramulorum singulis, vagina ampla protectis, virescentibus, carnosulis; bractea hyalina. Species unica adhuc nota, montium Papuae incola, epiphytica.

This genus is the only one in the group in which the formation of the spur takes place at the base of the thick extended lateral sepals in conjunction with the closely attached lip-spur.

The spur is formed through the fusion of the lateral sepals, as in *Ceratostylis* species, although the labellum is completely free in this genus. In the more closely related genera, however, the spur is always attached to the labellum only.

1. *S. papuanum* Schltr., sp. nov.

Epiphyticum, erectum, ramosum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramisque bene foliatis, teretiusculis, paulo compressis, vaginis foliorum omnino obtectis; foliis patentibus, oblongis vel oblongo-ellipticis, apice minute et inaequaliter bilobulatis, textura crasse coriaceis, 0.8–1.3 cm longis, medio fere 0.3–0.5 cm latis, vaginis arctissime amplexentibus, dense verrucis parvulis obtectis, apice margine setulis pluribus fimbriato-ciliatis, usque ad 0.8 cm longis; floribus ad apices ramulorum singulis, olivaceo-viridibus, glabris; vagina ovali, apiculata, cucullato-amplectente, extus minutissime verruculosa; bractea hyalina, vaginae simili sed minore; sepalis lineari-ligulatis, 1.7 cm longis, intermedio obtuso, lateralibus obliquis, obtusiuscule acuminatis, basi margine anteriore productis et connatis, cum pede columnae et ungui labelli calcar filiforme, subacutum, 1.7 cm longum formantibus, petalis oblique linearibus, obtusiusculis, glabris, sepalis fere aequilongis; labelli lamina late rhombea obscure trilobulata, obtusa, medio carinis obscuris, curvatis ornata, 0.6 cm longa et lata, calcare filiformi 1.6 cm longo cum sepalis omnino connato columnae generis; anthera glabra, dorso obtuse bigibba, antice obtusissima; ovario cylindrico, glabro, calcar paululo excedente.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17251, flowering in Jan. 1908.

The spur is so closely attached with the extension of the lateral sepals, that it is impossible to separate them completely without tearing the entire structure. In habit the plant is reminiscent of *Giulianettia viridis* Schltr., but the colour of the flowers is more olive-green. The plant is certainly very rare and I was able only to find two specimens, of which only one was in flower.

53. *Ischnocentrum* Schltr.

In *Ischnocentrum* Schltr. I have described here for the first time another remarkable form of the *Glomerinae*. The genus shows a certain approach to *Giulianettia* Rolfe and *Glossorhyncha* Ridl., but had to be described as new, because the column is quite footless. Until now I have been able to describe only one species of the genus, although I suspect there are two. Unfortunately, the material of what is presumed to be a second species, and which comes from the east of our Territory, is fruiting, so that it cannot be decided definitely whether it is really different from the one described here. *Ischnocentrum myrtillus* Schltr., the Type of the genus, is not rare in the mist-forests of some mountains in the centre of Kaiser-Wilhelms-Land, at an altitude of about 1000 m. It always grows on fairly thick branches of very tall, fairly moss-free primary trees, and especially on a species of *Sloanea*. It is found always in colonies, often covering the branches rather densely. If one has the good fortune to find them in abundant flower, they afford a beautiful sight with their delicate, dark salmon-brown blossoms. As in the case of many of the *Glomerinae*, it is restricted to a definite flowering time, occurring at about March or April, but quite occasionally producing a small, shy flower in October.

Ischnocentrum Schltr., gen. nov.

Sepala patentis, oblonga vel ovalia, glabra, lateralibus intermedio paulo angustiora, obliqua. Petala sepalis lateralibus similia, sed paulo minora, glabra, patentia. Labellum deflexum, planum, late ovatum vel suborbiculare, subcordatum, parvulum, calcar filiforme, elongatum, subacutum, ovarium aequilongo adpressum. Columna brevis, omnino apoda, clinandrio bene evoluto, lobulato, rostello triangulo, humili; anthera late cucullata, glabra, antice valde truncata, dorso umbone obtuso donata. Pollinia 4 oblique pyriformia, lateraliter paulo compressa, glandula rotundata, singula. Ovarium sessile, cylindricum. Suffrutex epiphyticus, parvulus, erectus vel suberectus, ramosus, bene foliatus; foliis parvulis, ellipticis vel oblongis, erecto-patentibus, vaginis arctissime amplexantibus, minute verruculosis, apice margine fimbriato-ciliatis; floribus singulis ad apices ramulorum, parvulis, vagina ovarium amplexante, sed distincte breviora, bractea apiculata, ovarii dimidium vix attingente. Species singula adhuc nota, montium Papuae incola, epiphytica.

The genus comprises a miniature form of *Giulianettia viridis* Schltr., but has, however, dark salmon-brown flowers. It is distinguished from the related genera by the complete absence of a column-foot. Apart from that, the flat lip-lobes are bent downwards at a sharp angle towards the spur and are sharply offset.

1. *I. myrtillus* Schltr., sp. nov.

Epiphyticum, gracile, pusillum, bene ramosum, usque ad 7–15 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramisque gracilibus, teretiusculis, bene foliatis, vaginis foliorum omnino obtectis; foliis oblongis vel elliptico-oblongis, apice oblique et minute apiculatis, basi subpetiolato-angustatis, glabris, 0.5–0.9 cm longis, medio fere 2–3.5 mm latis, vaginis arctissime amplexantibus, dense verruculis parvis ornatis, apice margine setulis pluribus fimbriato-ciliatis, usque ad 0.8 cm longis; floribus ad apices ramulorum singulis, erectis, glabris; vagina ovarium arcte amplexante, ovali, apiculata, sparsim verruculosa, ovario fere duplo breviora, bractea parvula vaginae minora; sepalis patentibus, intermedio ovali, obtuso, 0.5 cm longo, lateralibus oblique oblongis, breviter apiculatis, intermedio aequilongis; petalis sepalis lateralibus similibus, tamen paulo angustioribus et brevioribus; labello plano, suborbiculari-ovato, obtuse apiculato, basi subcordato, c. 2.5 mm longo et lato, calcare filiformi, obtusiusculo, ovario aequilongo appresso, c. 0.7 cm longo; columna et anthera generis; ovario gracili, cylindrico, glabro, 1.6 cm longo; capsula fusiformi, tereti, c. 1.2 cm longa, vix 0.2 cm diametro.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16657, flowering in Oct. 1907; no. 17488, flowering in Mar. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18022, fruiting in July 1908.

Perhaps some fruit-bearing specimens which I collected under no. 19676 in Apr. 1909 in the Dischore Range, alt. c. 1300 m are different from this species. They have

longer, narrower leaves, which are arranged more closely than in *I. myrtillus* Schltr. The flowers of the above species are dark salmon-brown. The foliage is generally brownish, sometimes even reddish.

54. *Aglossorhyncha* Schltr.

This genus was founded by me in 1905 from a plant discovered on trees in the mountain forests of Punam in Neu-Mecklenburg and was published and illustrated in the 'Nachträge zur Flora der Deutschen Schutzgebiete in der Südsee' as *A. aurea* Schltr. I separated this genus from *Glossorhyncha* Ridl. for the following reasons: the upper border of the leaf-sheaths is not ciliated, the shape of the labellum is different and the column is slender and perfectly bare. Another species of the genus, *A. biflora* J.J. Sm., has been described recently from Dutch New Guinea and is distinguished by two-flowered inflorescences.

During my last travels to New Guinea, I paid special attention to this genus, which showed that, in addition to *A. aurea* Schltr., various other closely related species occur in our Territory; of these I have four new species to describe. The first, *A. serrulata* Schltr., is a very isolated form which is distinguished by its thin, finely serrated, cabbage-like leaves. The other species are related closely to one another, but are separated by the characters of the lip, or column, and above all by the clinandrium.

Concerning the occurrence of the individual species, my remarks regarding the genus *Epiblastus* Schltr. apply here also. With one exception they are all epiphytes of the mist-forest. They grow there on thick branches of very tall primary trees (never on smaller trees) and only in those places which are surrounded by thick moss, a proof that their roots require an even degree of moisture. The only species which I have found below the mist-forest zone is *A. lucida* Schltr., which occurs on large moss-clad trees in the Waria Valley, at an altitude of between 300–500 m, showing that it tolerates more warmth than the other species. This species I can only separate now as a variety, but not specifically from the specimens collected in the Kani Range and the mountains in the Waria Valley, and I therefore assume that it has been transported there into the damp river valley by wind or birds, and has found the living conditions for its growth sufficiently favourable. Cases like this are, however, not common in New Guinea.

1. *A. serrulata* Schltr., sp. nov.

Epiphytica, erecta; usque ad 20 cm alta, simplex vel subsimplex; rhizomate longe decumbente, elongato, vaginis arcte amplexentibus, imbricantibus oblecto; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus erectis, vulgo simplicibus, perdense foliatis, strictis, vaginis foliorum omnino oblectis; foliis erecto-patentibus, ligulatis, apice obliquis, subacutis, margine apicem versus serrulatis, glabris, textura tenuibus, 3–5 cm longis, medio fere 0.5–0.9 cm latis, vaginis arctius amplexentibus, paulo compressis, apice margine integris, usque ad 1 cm longis; floribus ad apices caulium singulis, flavidis, in genere inter majores, glabris; sepalis ovalibus, acuminatis, intermedio 1.8 cm longo, lateralibus obliquis 1.6 cm longis; petalis obliquis, anguste ligulatis, acuminatis, sepalo intermedio subaequilongis; labello more generis columnam amplexente, haud explanato circuitu oblongo, acuminato, intus nervis 3 medianis incrassatis, 1.1 cm longo, medio fere (haud explanato) 0.4 cm lato; columna gracili, subrecta, apicem versus dilatata, glabra, 0.9 cm longa, clinandrio 4-lobato, lobis margine irregulariter serrulatis, anterioribus rotundatis, quam posteriores duplo brevioribus; ovario subcylindrico, glabro, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17771, flowering in May 1908; on trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter [Ed.—no number cited], without flowers in Nov. 1908.

Unfortunately, I have found this interesting species in flower only once and, in order to establish the genus, I had to dissect this solitary flower, since I was still

doubtful whether I was dealing with an *Aglossorhyncha*, because the appearance of the plant, with its finely serrated leaves, was so strange. Its pale yellow flowers are somewhat larger than in the other species.

2. *A. viridis* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 20 cm alta, rigida; rhizomate decumbente, elongato, vaginis obtecto; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, bene foliatis, rigidis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, linearibus, apice obliquis, acutis, basi cuneatis, glabris, rigidis, 3.5–5 cm longis, medio vel infra medium 2.5–3.75 mm latis, vaginis arctissime amplexantibus, striato-nervosis, apice subrecte truncatis, usque ad 0.7 cm longis; floribus ad apices caulium vel ramorum singulis, glabris, decurvis; vagina ovali, apiculata, cucullato-amplectente, ovarium superante; bractea ovario brevior, oblonga; sepalis oblongis, obtusiusculis, intermedio 1.2 cm longo, lateralibus obliquis, intermedio distincte latioribus, c. 1 cm longis, margine interiore altius conglutinatis; petalis oblique ligulatis, obtusis, sepalis lateralibus aequilongis, c. 3.5 mm latis; labello cucullato-concavo, circuito anguste oblongo, obtuso, glabro, intus nervis 3 medianis incrassatis parallelis, 1 cm longo, medio fere vix 3.25 mm latitudine excedente; columna leviter curvata, semitereti, glabra, 0.8 cm longa, apicem versus dilatata, clinandrio 4-lobato, lobis rotundatis, margine minute serrulatis, rostello amplo; ovario brevi, obconico, c. 0.5 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range in the Waria District, alt. c. 1200 m—R. Schlechter no. 19606, flowering in May 1909.

This species is distinguished from all others in the Territory by the green flowers and the narrower and more rigid leaves, which are often somewhat curled at the edges. The labellum is rather narrow and long and the broad rostellum is conspicuously large, so that viewed from the side it exceeds the lateral lobes of the clinandrium, by double the length.

3. *A. lucida* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 35 cm alta; rhizomate decumbente, elongato, vaginis obtecto, gracili; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, bene foliatis, leviter compressis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, apice valde obliquis, obtusiuscule acutatis, basi subpetiolato-angustatis, glabris, subtus lucidis, 2.8–4.5 cm longis, medio vel infra medium 0.4–0.7 cm latis, vaginis striato-nervosis, apice oblique truncatis, usque ad 1.5 cm longis; floribus singulis, in genere mediocribus, aureo-sulplureis, glabris; vagina ovali, apiculata, cucullato-amplectente, ovarium superante; bractea linearis, apiculata, parvula; sepalis oblongis, obtusiusculis, intermedio 0.9 cm longo, lateralibus obliquis, altius margine interiore conglutinatis, 0.8 cm longis, intermedio paululo latioribus; petalis oblique oblongo-ligulatis, obtusis, 0.8 cm longis, medio fere 2.5 mm latis; labello cucullato concavo, oblongo, obtusiusculo, nervo medio bene incrassato, 6.5 mm longo, medio fere 3.25 mm lato; columna leviter arcuata, glabra, semitereti, 0.5 cm longa, clinandrio 4-lobato, lobis quadratis, margine superiore truncatis, serrulatis, subaequilongis, rostello medio, transverso; anthera umbonata, antice truncata, medio leviter excisa, glabra; ovario subcylindrico, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17130, flowering in Jan. 1908.

I have placed this plant as the Type in contrast to the two varieties, since I consider it possible that they will later have to be separated as species. Both in the species and the two varieties, a striking feature is the markedly shining appearance of the leaves on the underside. In the Type the flowers are golden sulphur-yellow.

var. *wariana* Schltr., var. nov.

Differt a forma typica floribus aureis, labello latiore, columna magis arcuata, crassiore, clinandrii lobis majoribus.

Kaiser-Wilhelms-Land: On trees in the forests on the Waria [River] near Gobi, alt. c. 350 m—R. Schlechter no. 19849, flowering in June 1909; on trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19358, flowering in May 1909.

This plant shows certain differences from the Type, which appear to me advisable

to regard it as a variety and not simply place it with the Type of the species, since I consider it is possible that it will later be regarded perhaps as a separate species. The flowers are golden yellow.

var. *dischorensis* Schltr., var. nov.

Differt a forma typica habitu elatiore et robustiore, foliis vulgo paulo latioribus, floribus paulo majoribus, labello medio nervis 5 incrassatis ornato, columna paulo longiore, clinandrii lobis majoribus, inferioribus quam posteriores brevioribus, magis rotundatis.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19674, flowering in June 1909.

As in the previous variety, I have resisted not combining this plant with the Type of the species, since it also will perhaps have to be regarded as a species later on. The flowers are golden yellow.

4. *A. torricellensis* Schltr., sp. nov.

Epiphytica, erecta, humilis, 8–15 cm alta; rhizomate valde elongato, decumbente, vaginis appressis obiecto; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, paulo compressis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ligulatis, apice paulo obliquis, obtusis vel obtuse apiculatis, basi subpetiolato-angustatis, 2–3.5 cm longis, medio fere 0.4–0.6 cm latis, vaginis arctissime amplexantibus, striato-nervosis, apice margine oblique truncatis, longitudine vulgo vix 0.5 cm excedentibus; floribus singulis ad apices ramorum vel caulium, in genere mediocribus, glabris, aureo-sulphureis; sepalis oblongis, obtusiusculis, intermedio 1.2 cm longo, lateralibus obliquis, 1 cm longis, intermedio paulo latioribus; petalis oblique elliptico-ligulatis, subacutis, 1 cm longis, medio fere c. 3 mm latis; labello circuitu oblongo, cucullato-concavo, obtusiuscule apiculato, nervo medio leviter incrassato apicem versus callosio-incrassato, 0.9 cm longo, supra medium 0.4 cm lato; columna gracili, glabra, semitereti, apicem versus paulo dilatata, 0.7 cm longa, clinandrio 4-lobato, lobis crenulato-dentatis, anterioribus abbreviatis, rotundatis, posterioribus anteriores duplo superantibus, subquadratis; anthera subquadrata, antice excisa, dorso umbonata, glabra; ovario cylindraceo, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20191, flowering in Sept. 1909.

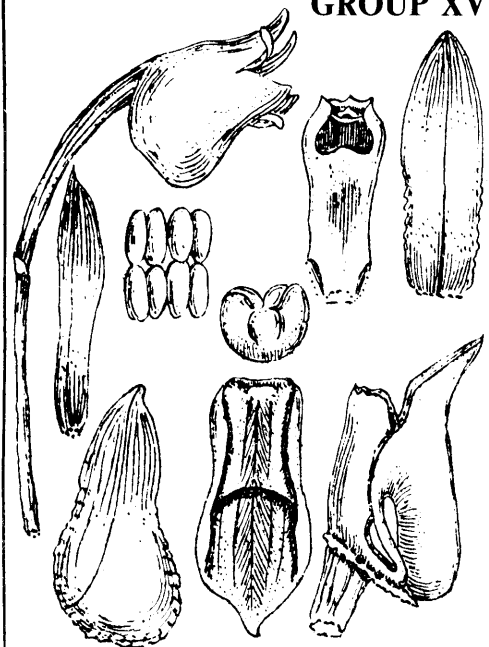
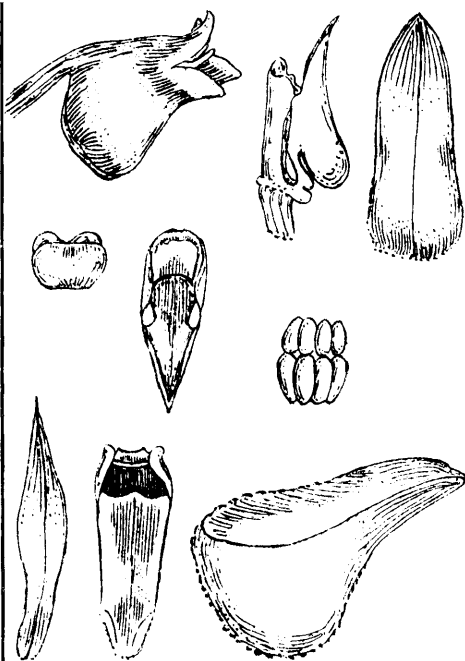
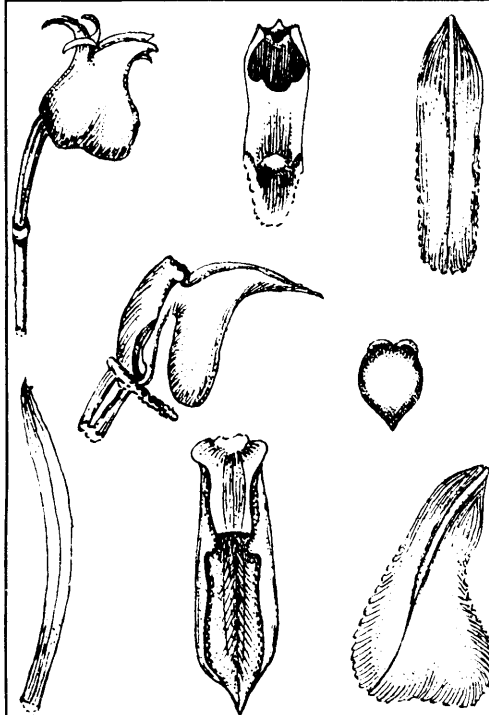
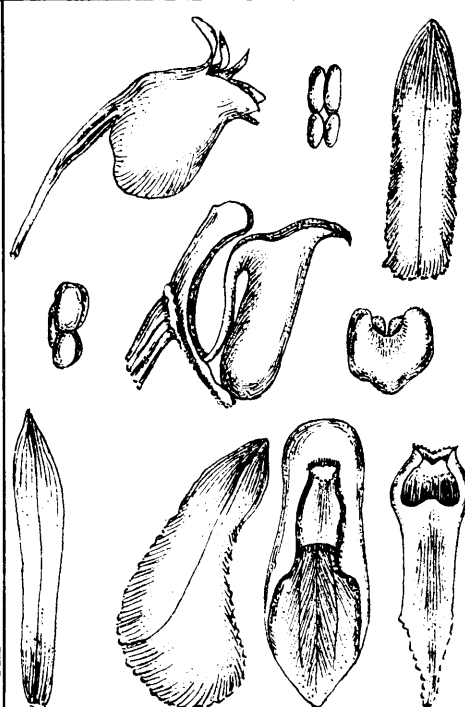
This species is recognised externally by its very dense foliage. The leaves are most similar to those of *A. aurea* Schltr., but are shorter and much denser. The flowers are golden sulphur-yellow, the labellum is relatively large and characterised by a much-thickened central keel near the apex. The column is very slender and the clinandrium less definitely four-lobed.

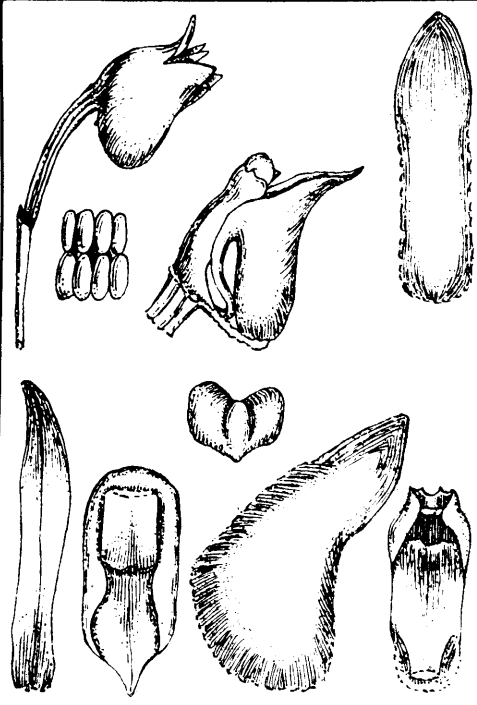
5. *A. aurea* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 133.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14651, flowering in July 1902.

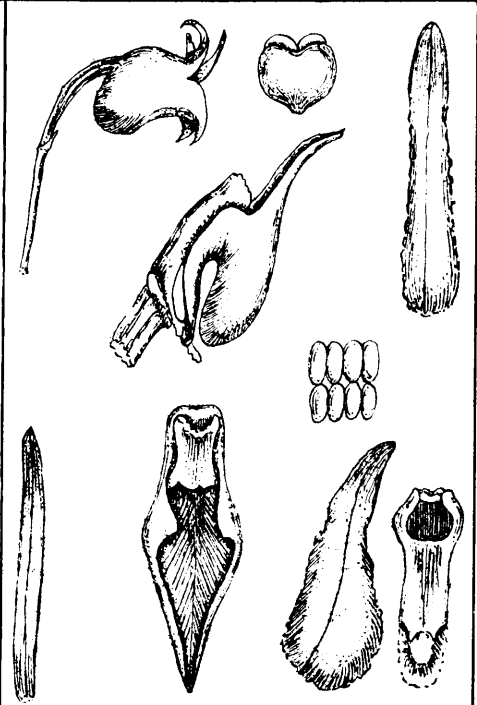
This species appears to be restricted in its distribution to the Bismarck Archipelago. It is recognised externally from all related species by its long stem and long, blunt leaves. In other respects, the arrangement of the teeth of the clinandrium is very characteristic and different from that of other species. The colour of the flowers is sulphur-yellow.

GROUP XV

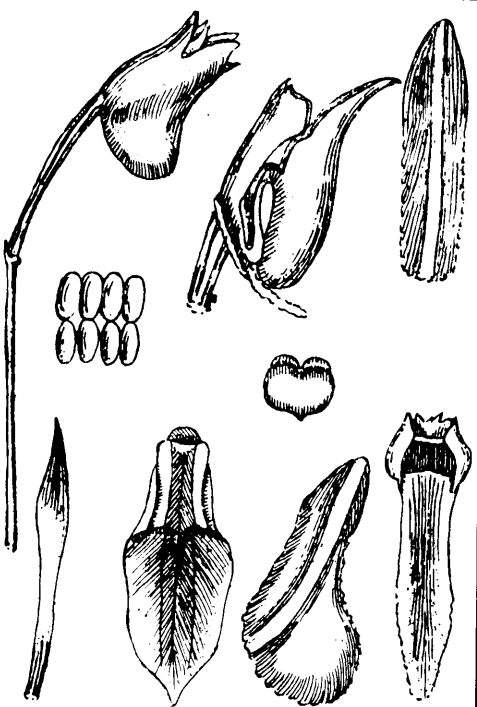
Glomerinae*Mediocalar robustum* Schltr.*Mediocalar kaniense* Schltr.*Mediocalar stenopetalum* Schltr.*Mediocalar uniflorum* Schltr.



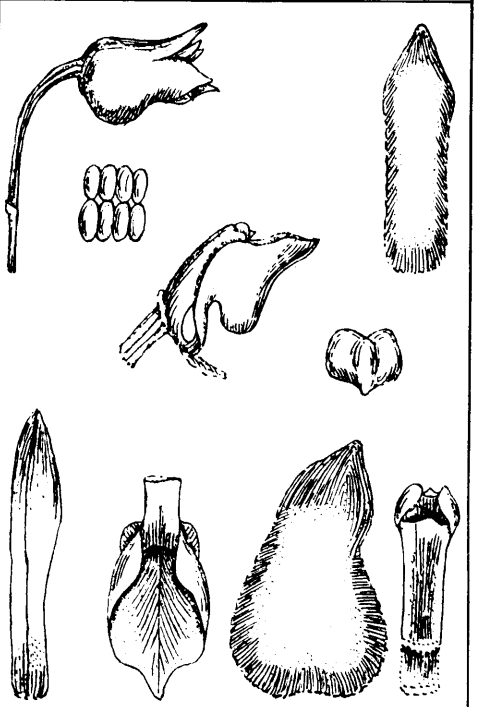
Mediocalar latifolium Schltr.



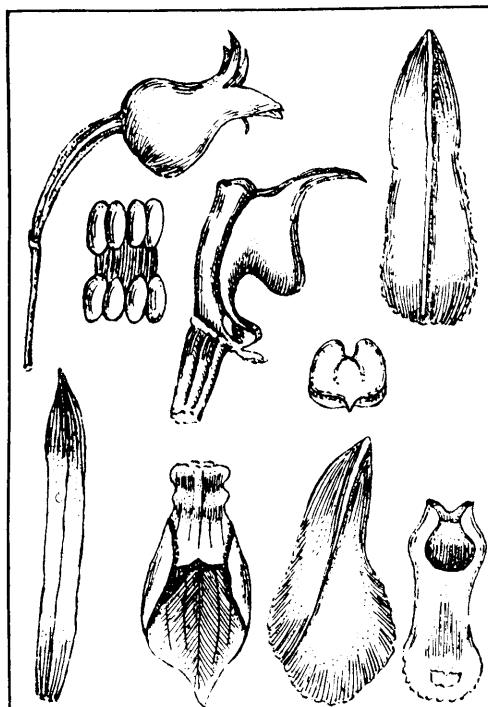
Mediocalar angustifolium Schltr.



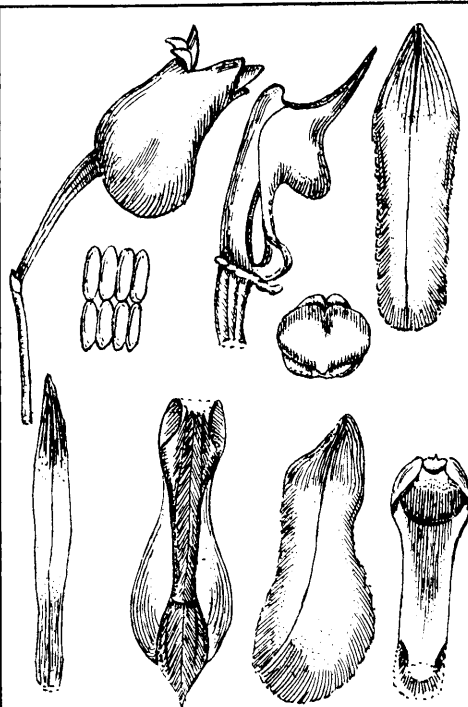
Mediocalar abbreviatum Schltr.



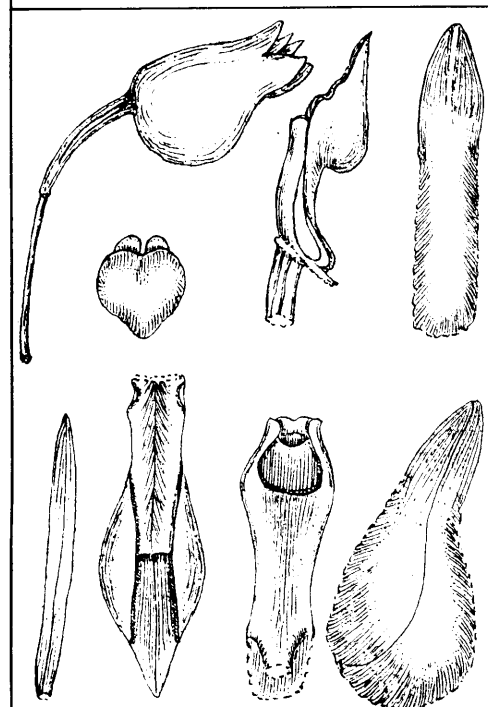
Mediocalar diphyllum Schltr.



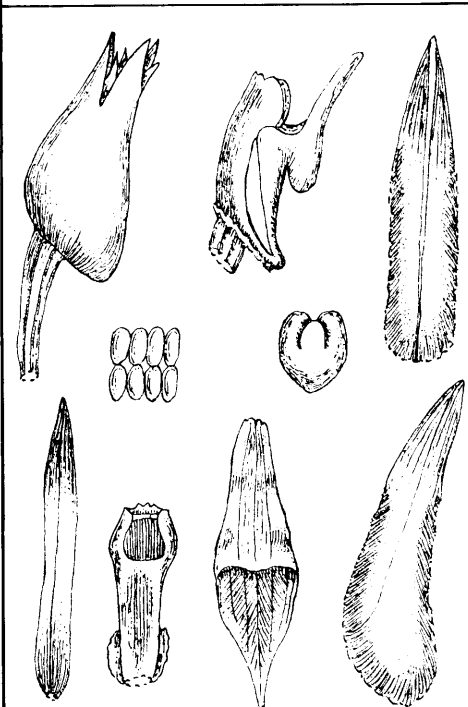
Mediocalar erectum Schltr.



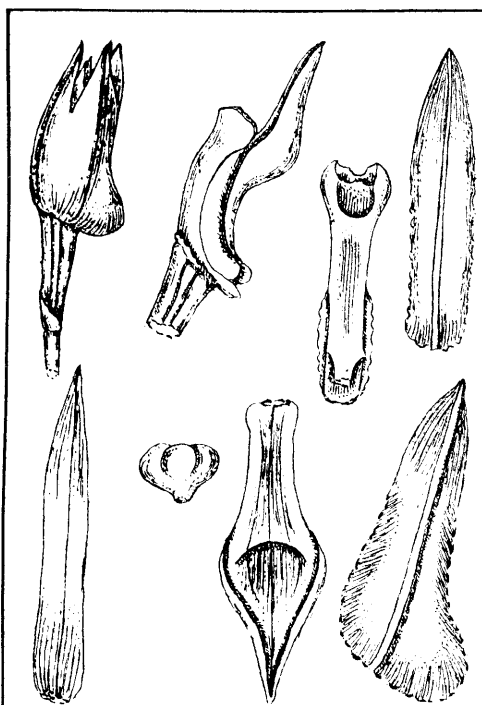
Mediocalar monticola Schltr.



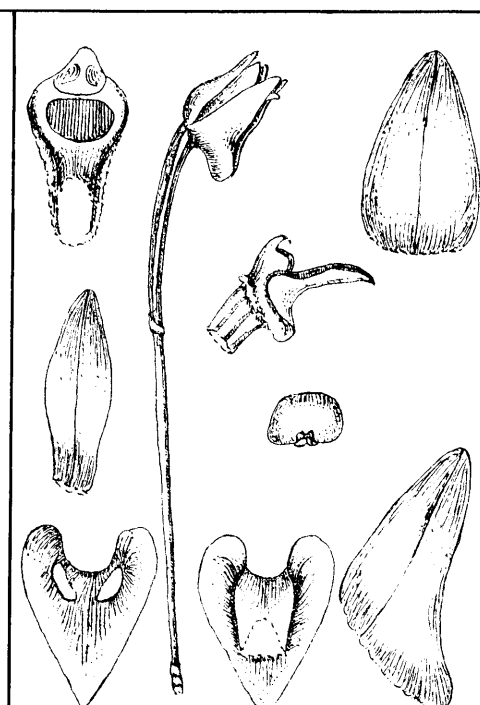
Mediocalar luteo-coccineum Schltr.



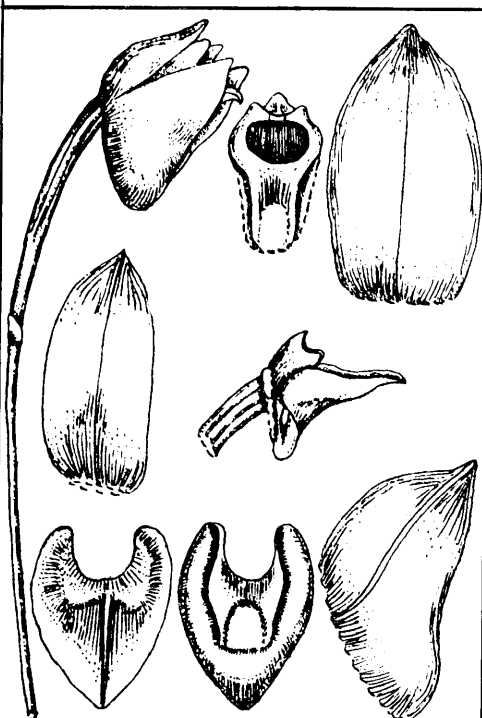
Mediocalar pygmaeum Schltr.



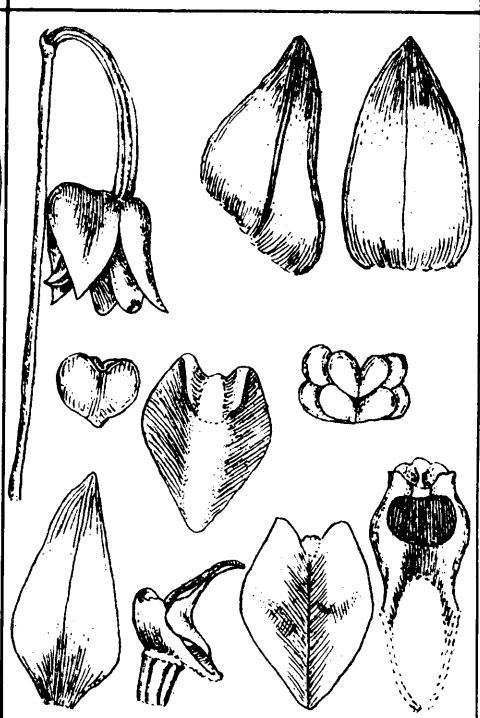
Mediocalcar sigmoideum Schltr.



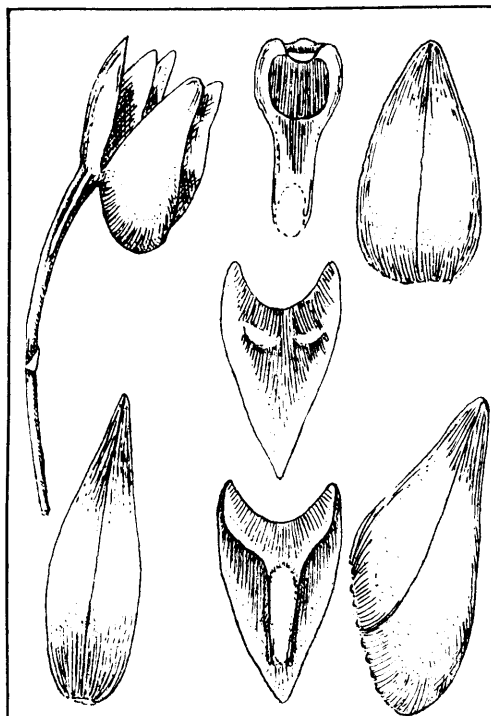
Epiblastus basalis Schltr.



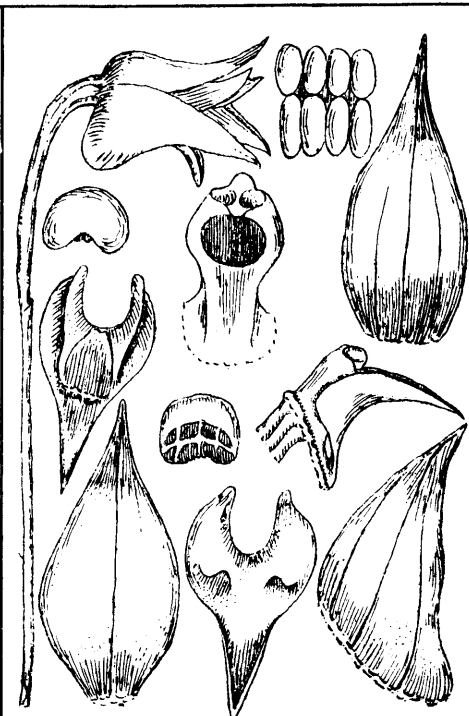
Epiblastus ornithidioides Schltr.



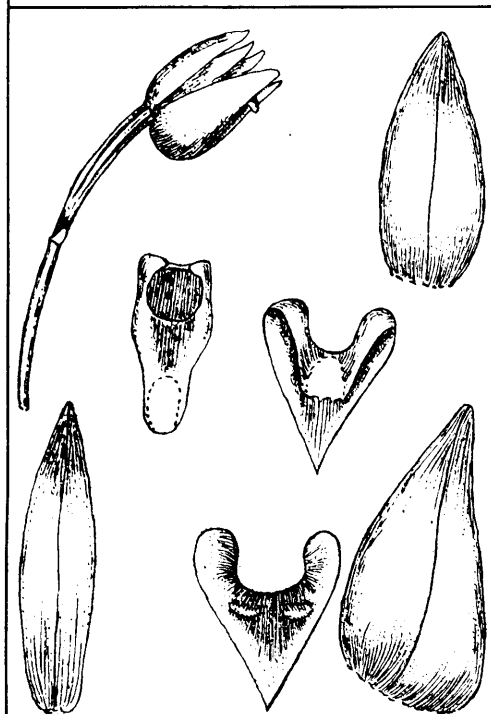
Epiblastus lancipetalus Schltr.



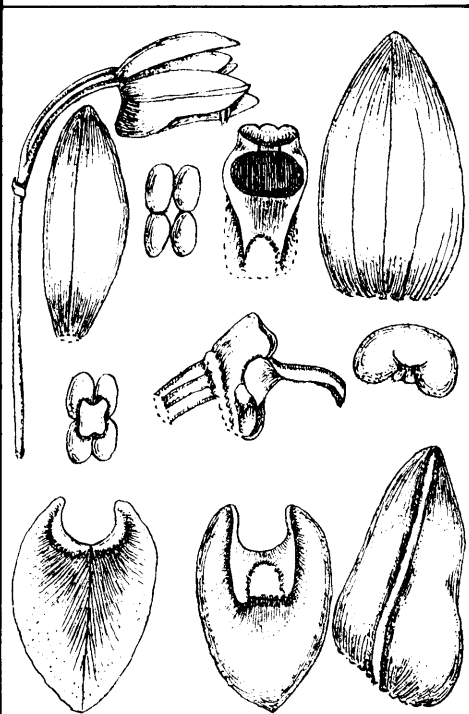
Epiblastus torricellensis Schltr.



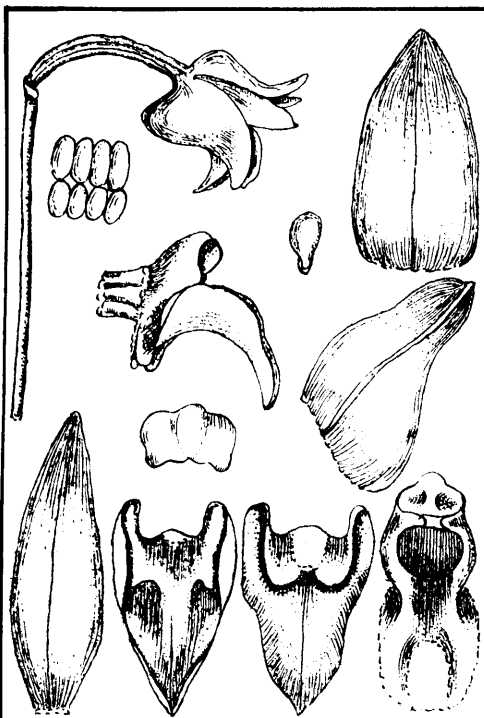
Epiblastus acuminatus Schltr.



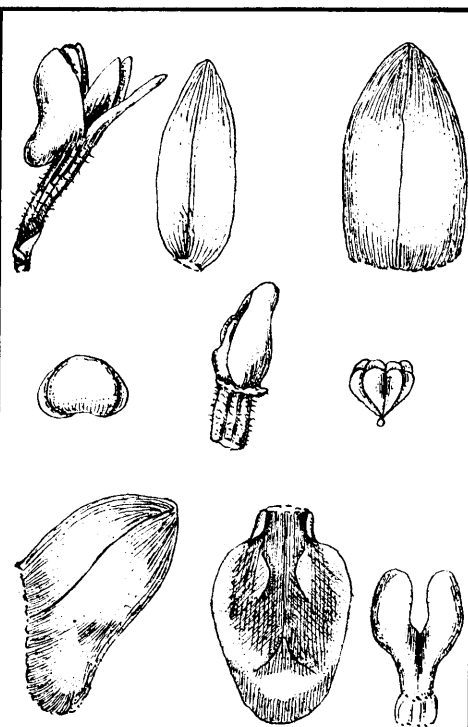
Epiblastus neo-hibernicus Schltr.



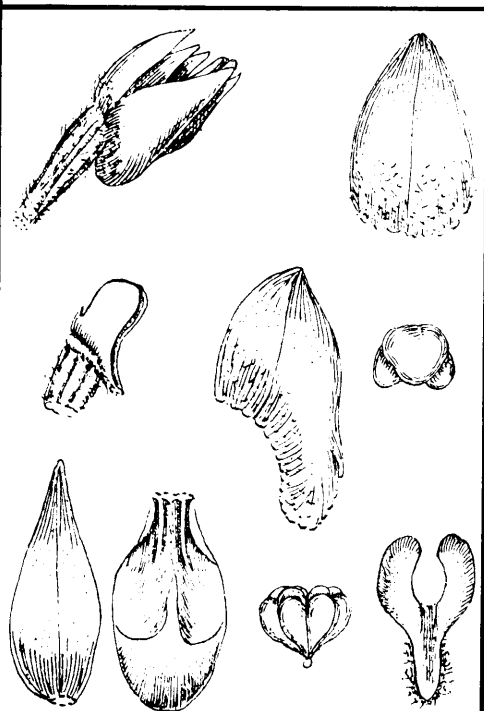
Epiblastus pulchellus Schltr.



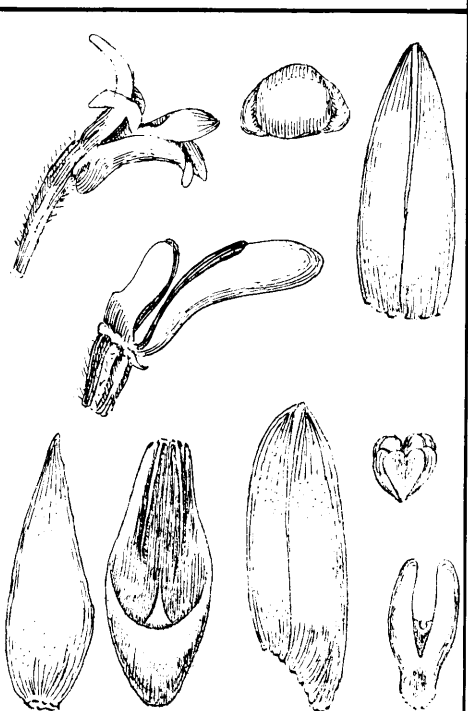
Epiblastus auriculatus Schltr.



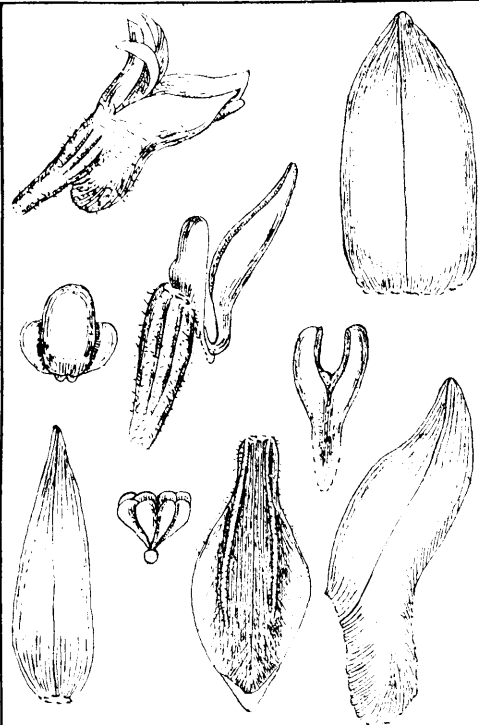
Ceratostylis platychila Schltr.



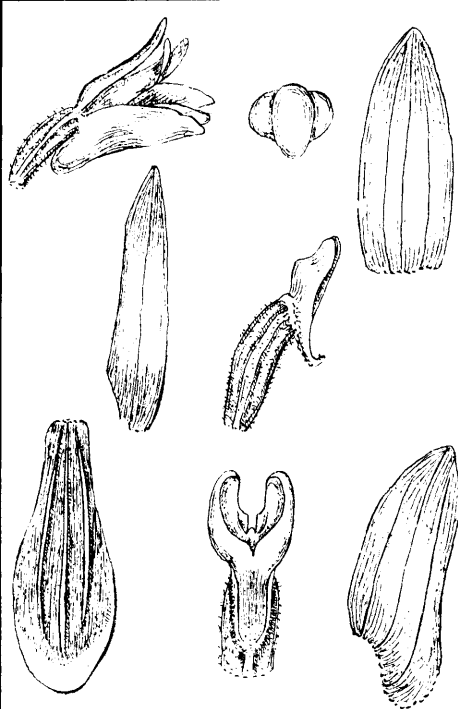
Ceratostylis dischorensis Schltr.



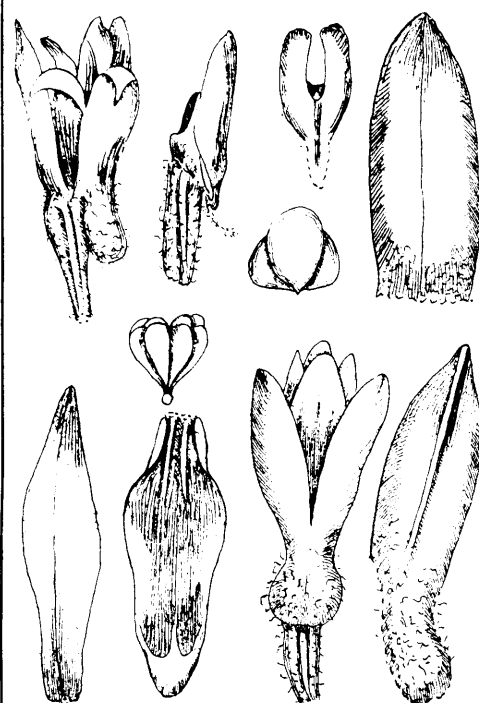
Ceratostylis flavescens Schltr.



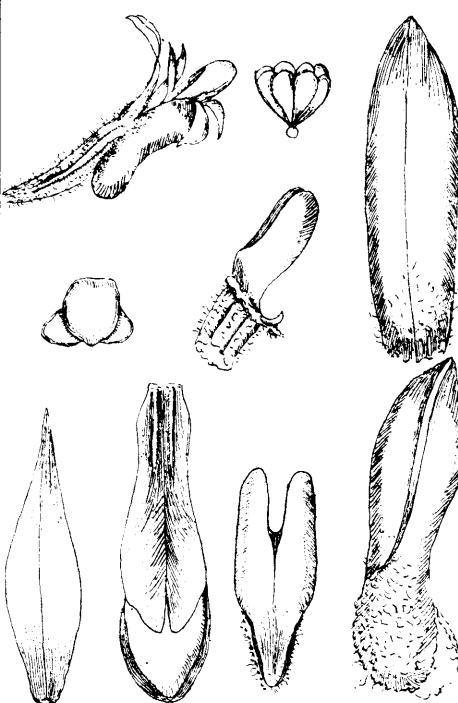
Ceratostylis nivea Schltr.



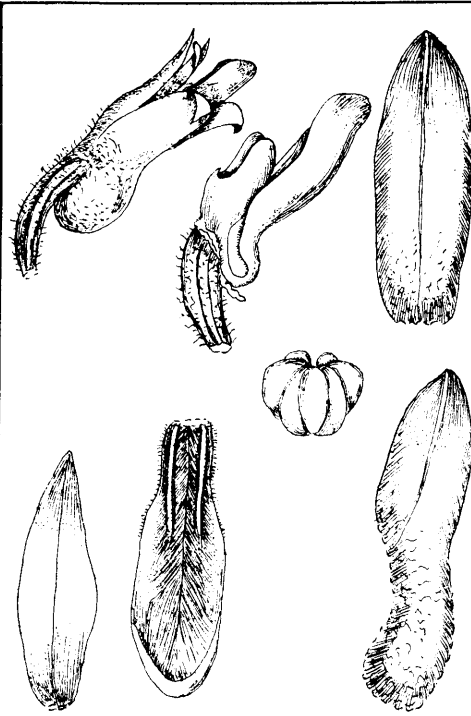
Ceratostylis kaniensis Schltr.



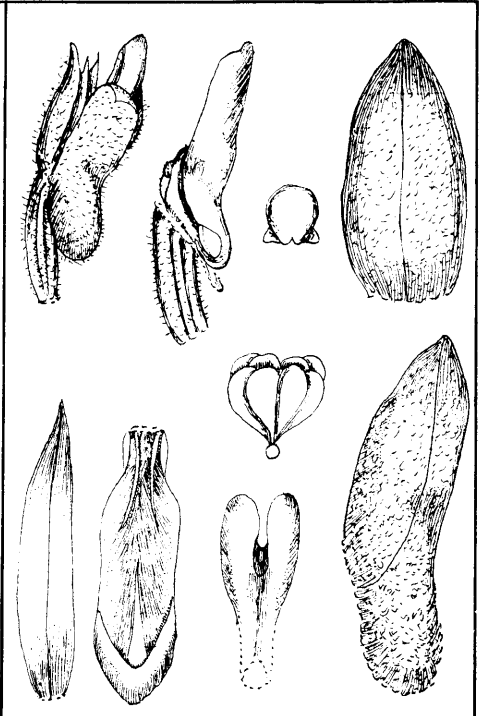
Ceratostylis brevipes Schltr.



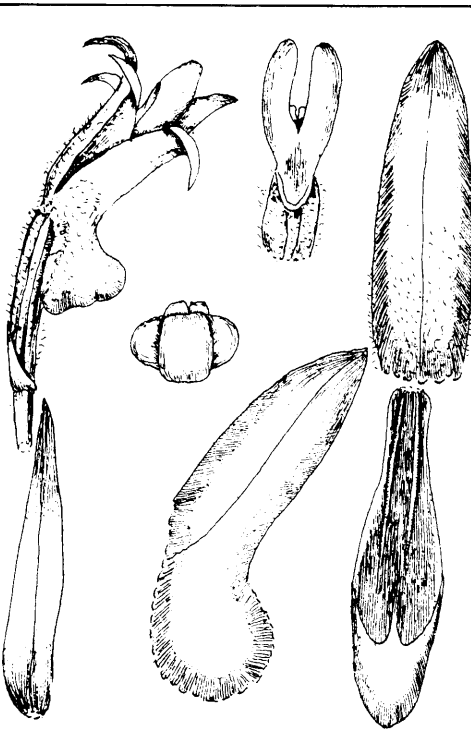
Ceratostylis lancipetala Schltr.



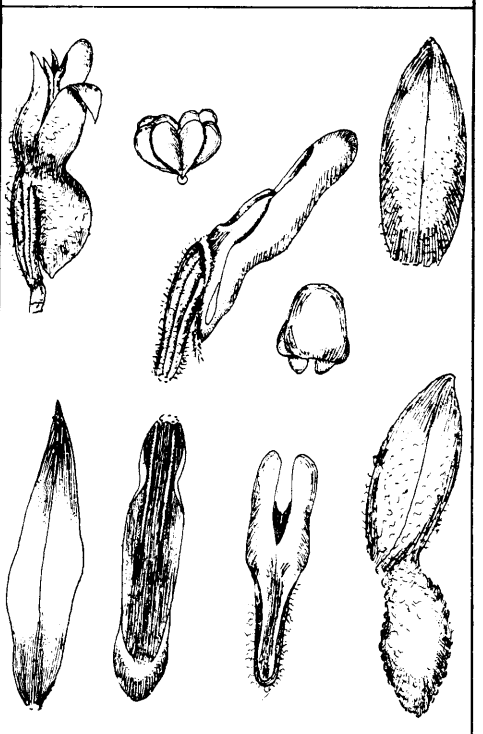
Ceratostylis ficinioides Schltr.



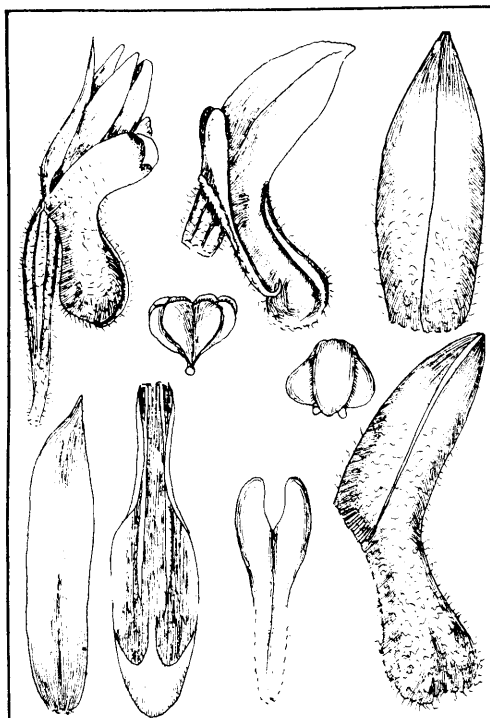
Ceratostylis oreophila Schltr.



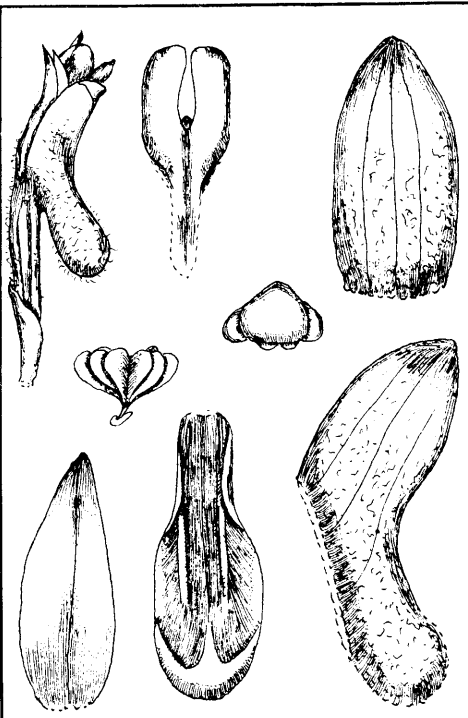
Ceratostylis inflata Schltr.



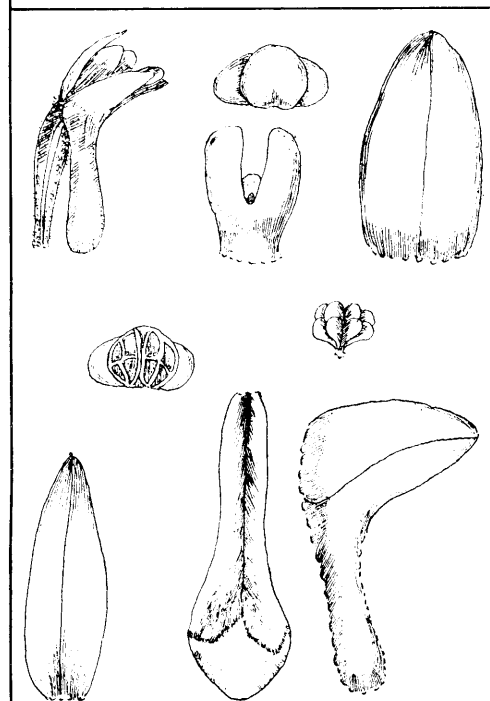
Ceratostylis phaeochlamys Schltr.



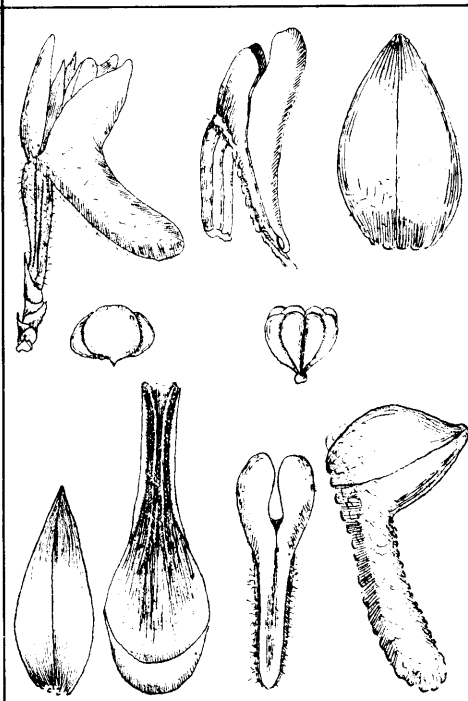
Ceratostylis longipes Schltr.



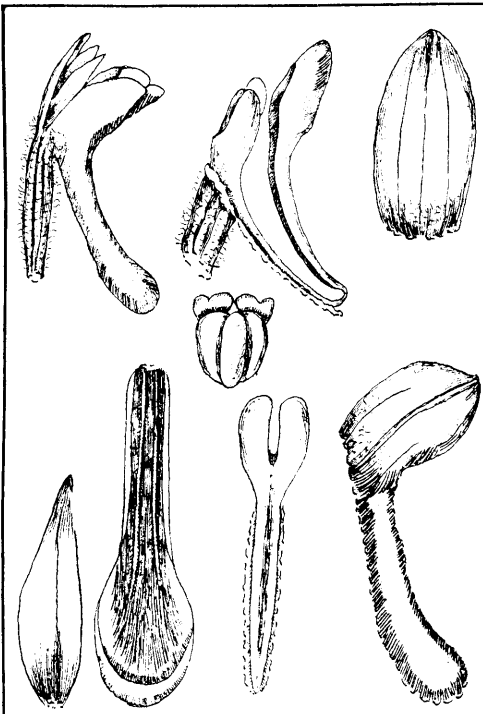
Ceratostylis rivularis Schltr.



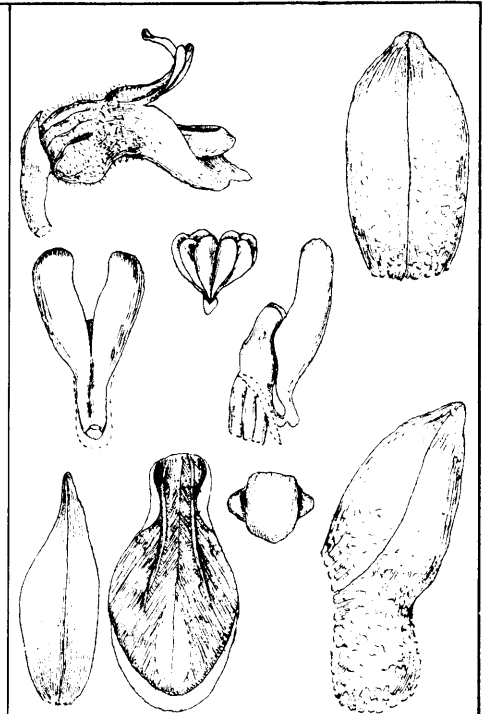
Ceratostylis spathulata Schltr.



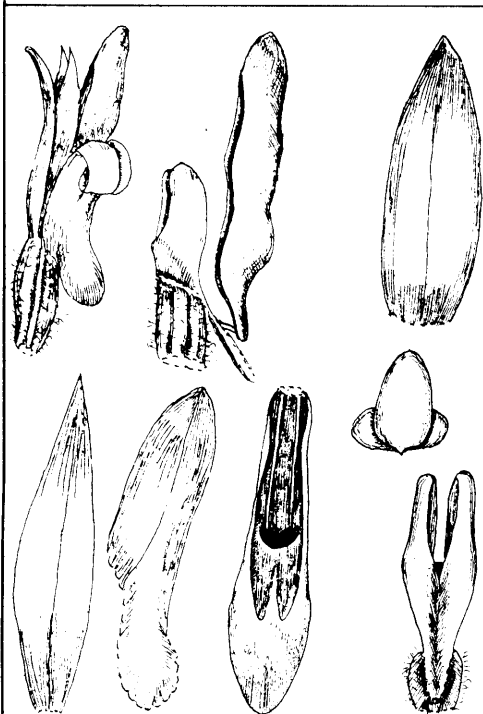
Ceratostylis calcarata Schltr.



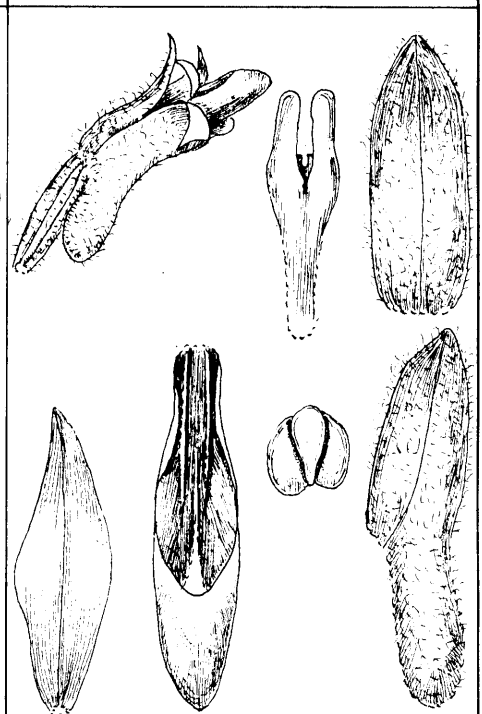
Ceratostylis scirpoides Schltr.



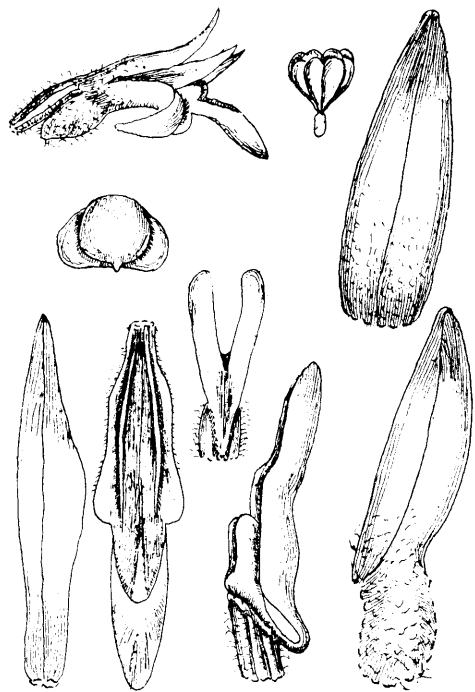
Ceratostylis hydrophila Schltr.



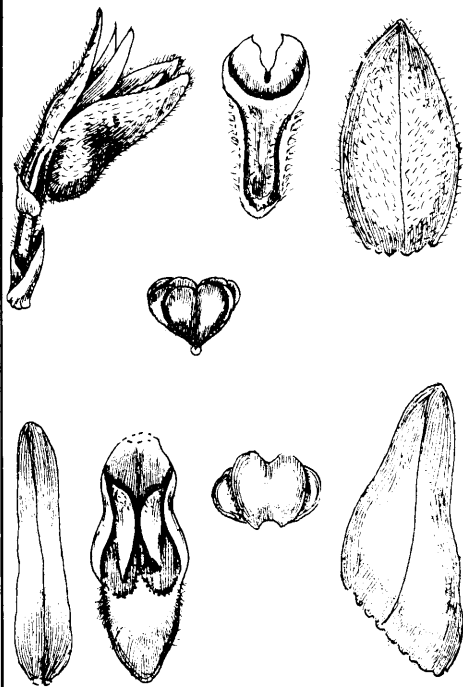
Ceratostylis glabriflora Schltr.



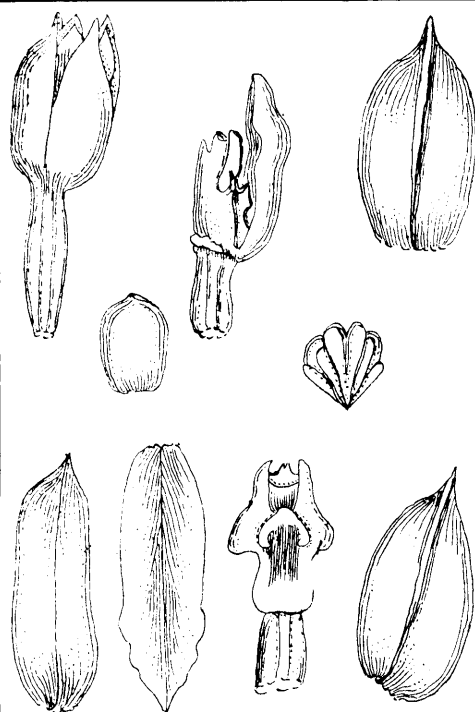
Ceratostylis acutifolia Schltr.



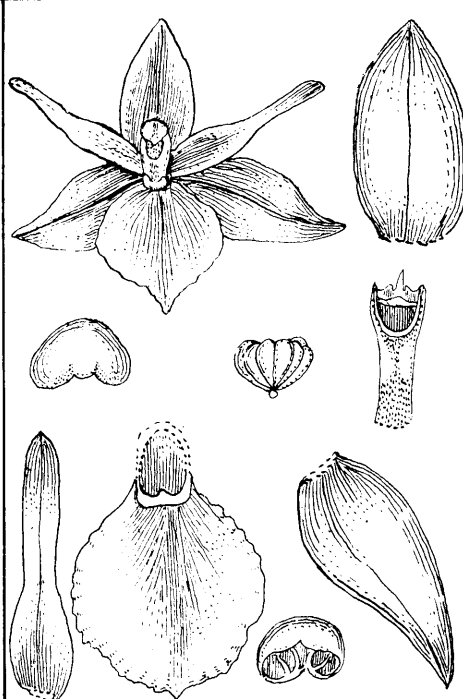
Ceratostylis triloba Schltr.



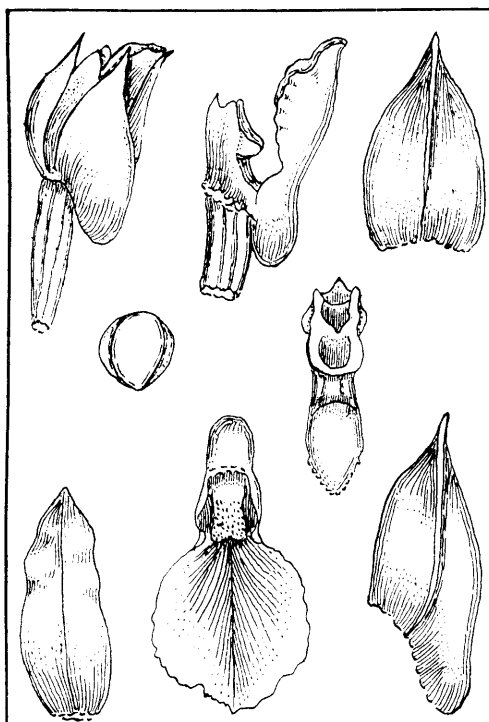
Ceratostylis maboroensis Schltr.



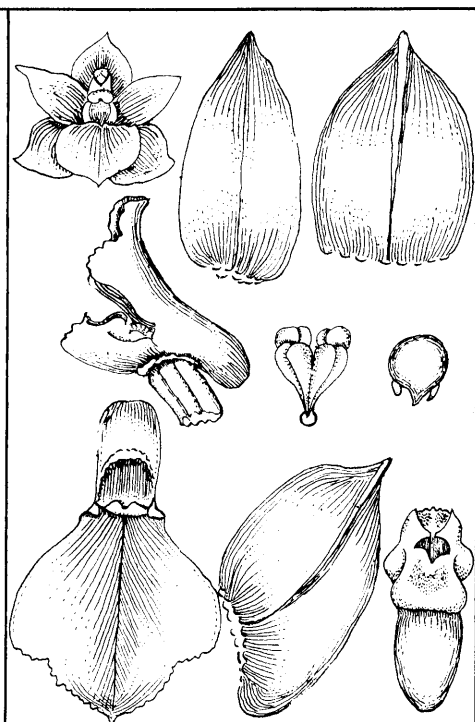
Agrostophyllum stenophyllum Schltr.



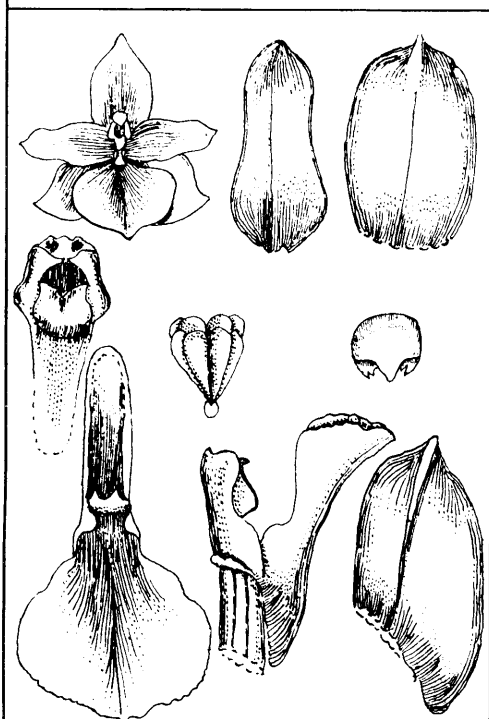
Agrostophyllum spicatum Schltr.



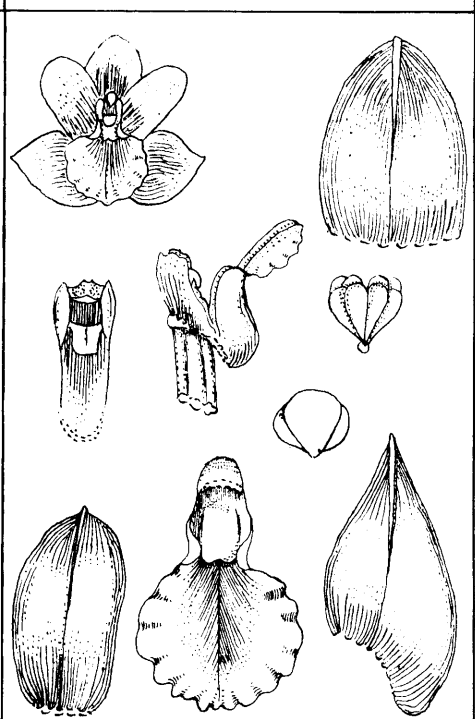
Agrostophyllum torricellense Schltr.



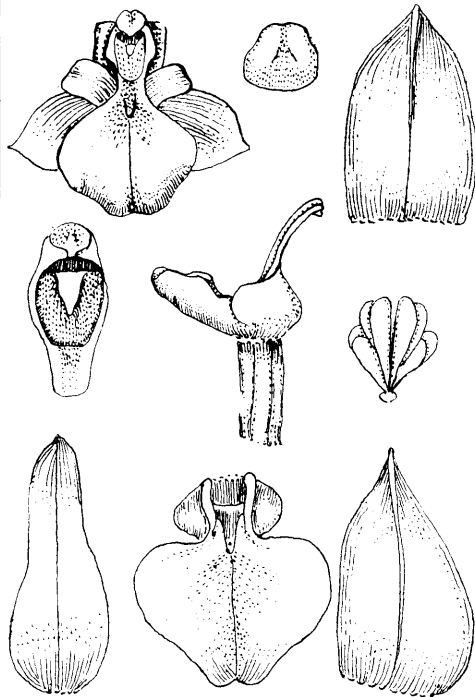
Agrostophyllum dischorensense Schltr.



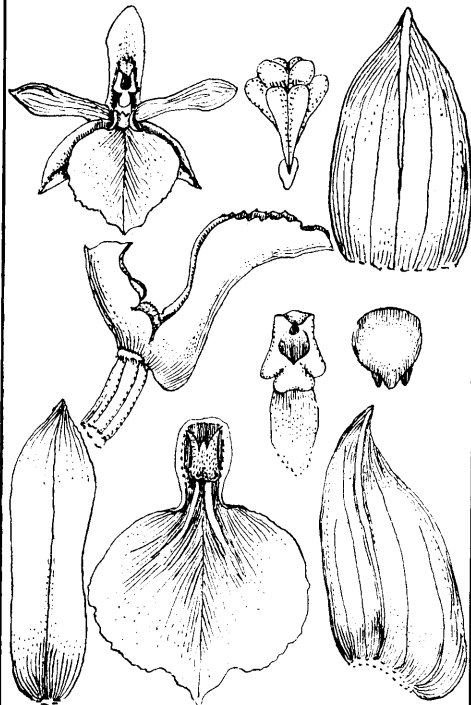
Agrostophyllum earinoides Schltr.



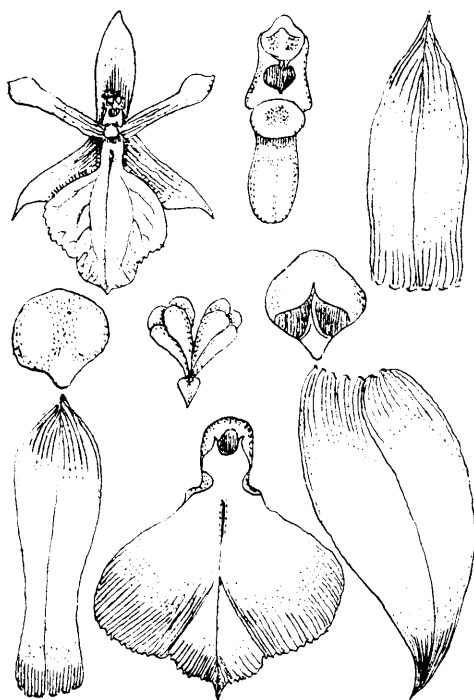
Agrostophyllum Finisterrae Schltr.



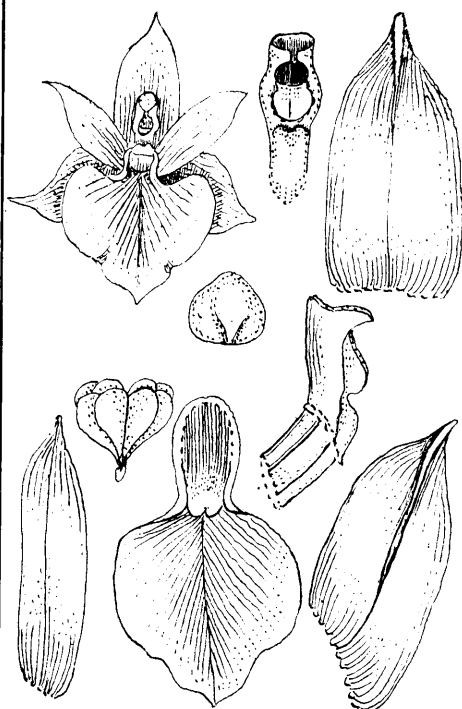
Agrostophyllum paniculatum J.J. Sm.



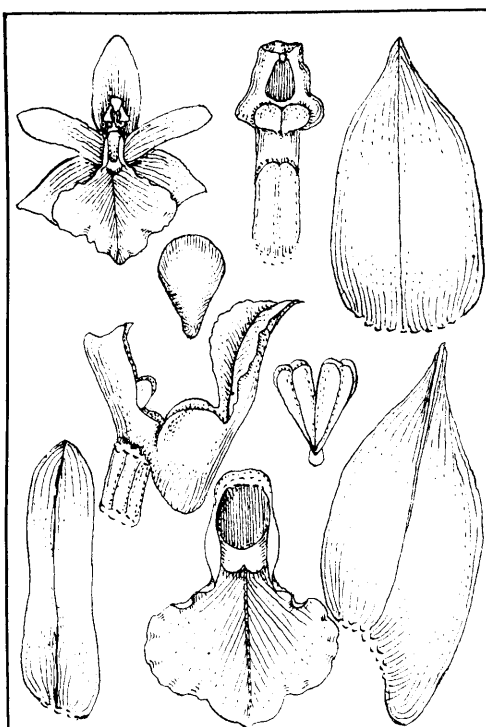
Agrostophyllum uniflorum Schltr.



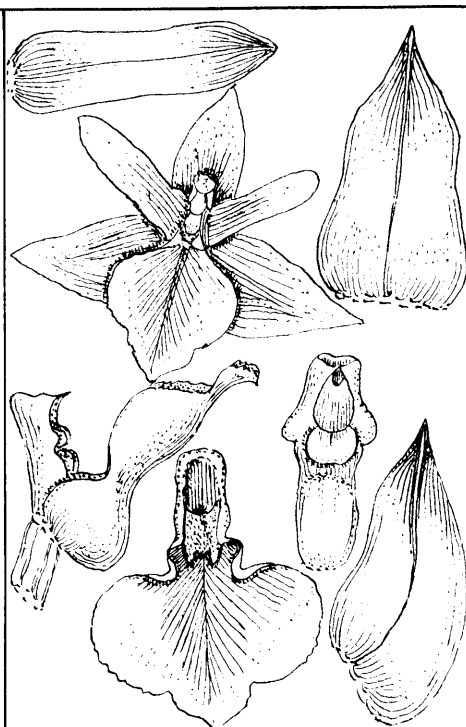
Agrostophyllum uniflorum Schltr.



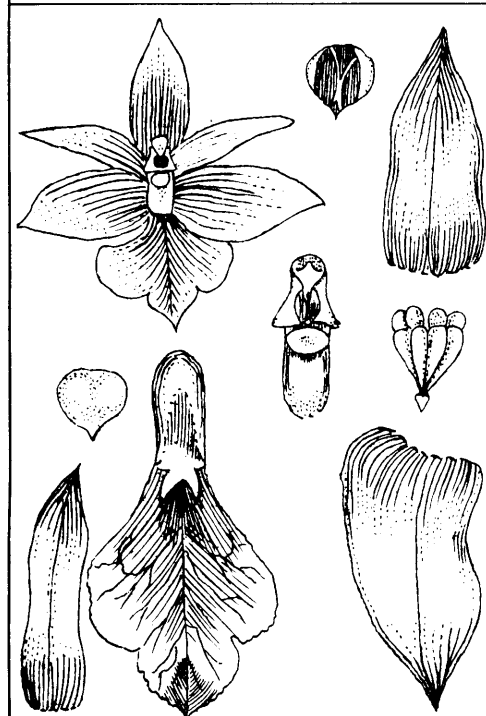
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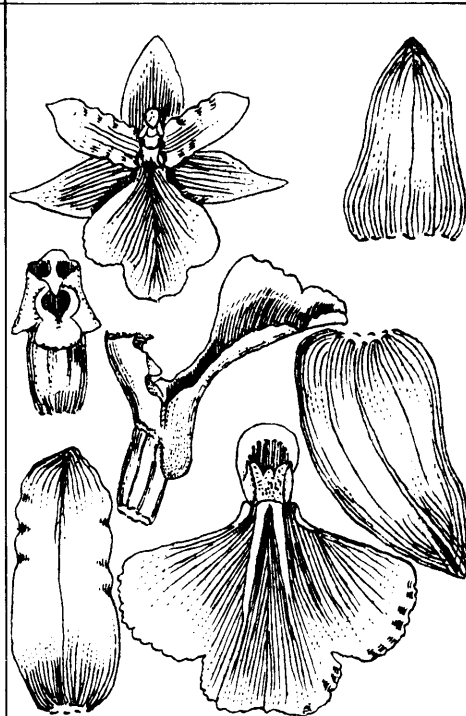
Agrostophyllum montanum Schltr.



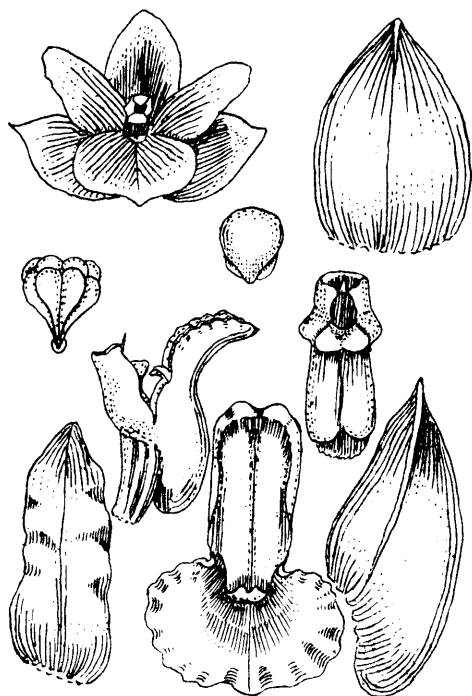
Agrostophyllum leucocephalum Schltr.



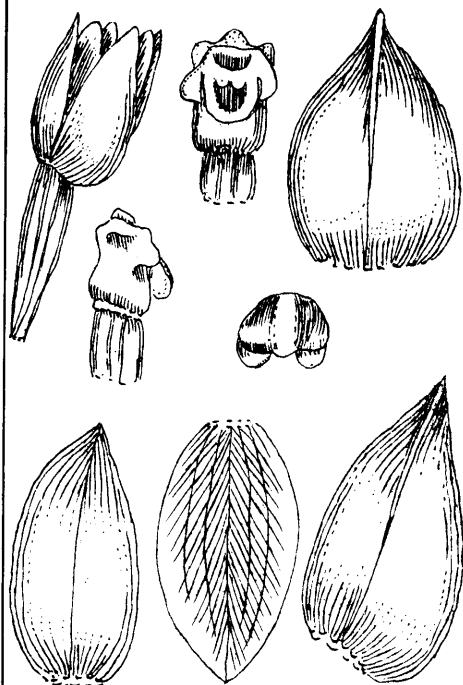
Agrostophyllum leucocephalum Schltr.



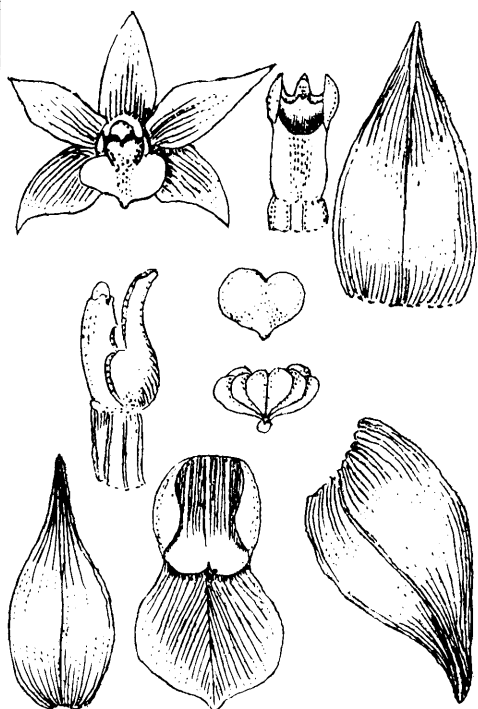
Agrostophyllum graminifolium Schltr.



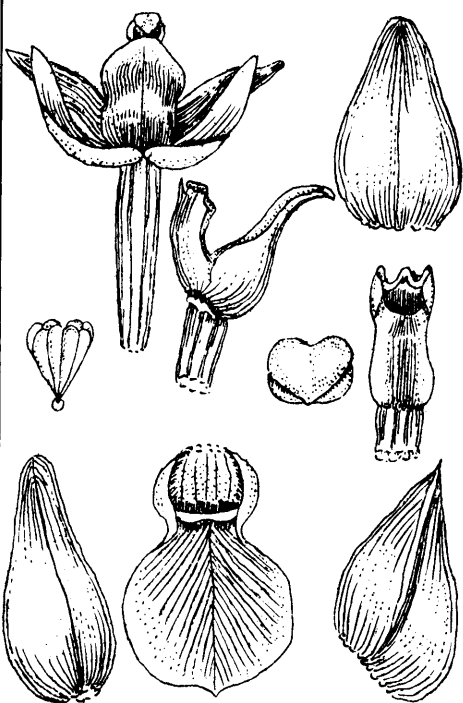
Agrostophyllum niveum Schltr.



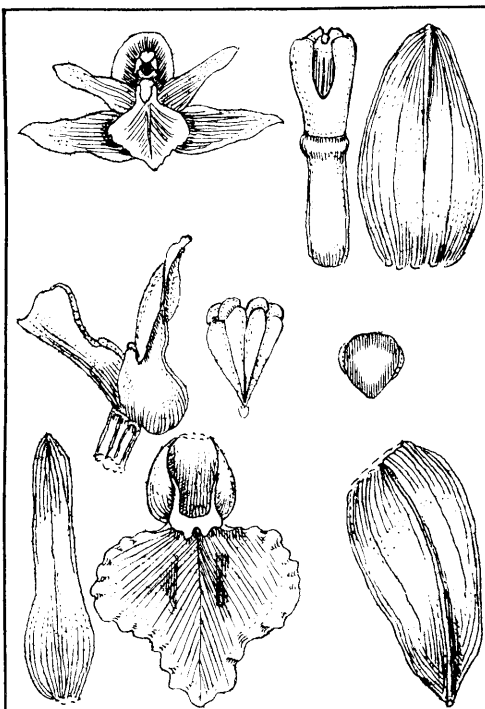
Agrostophyllum pelorioides Schltr.



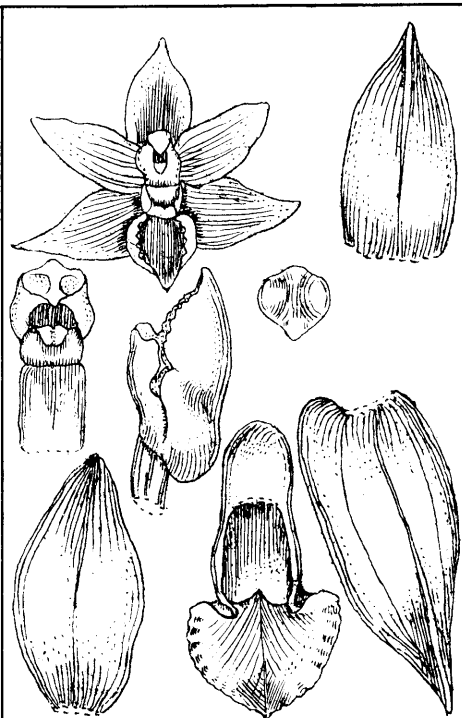
Agrostophyllum parviflorum J.J. Sm.



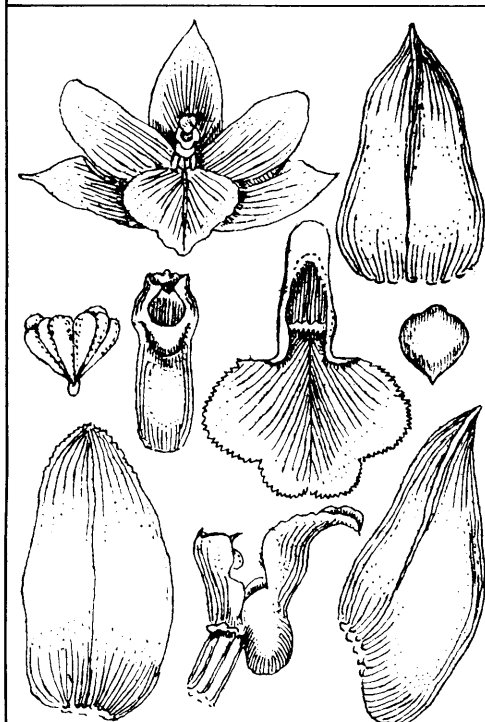
Agrostophyllum parviflorum J.J. Sm.



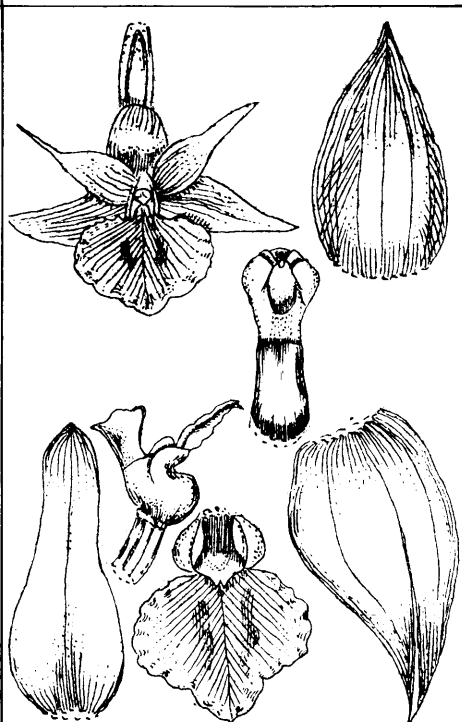
Agrostophyllum bimaculatum Schltr.



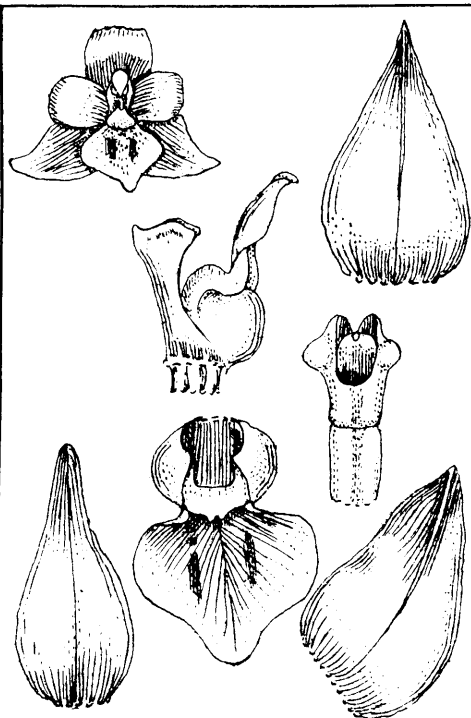
Agrostophyllum elatum Schltr.



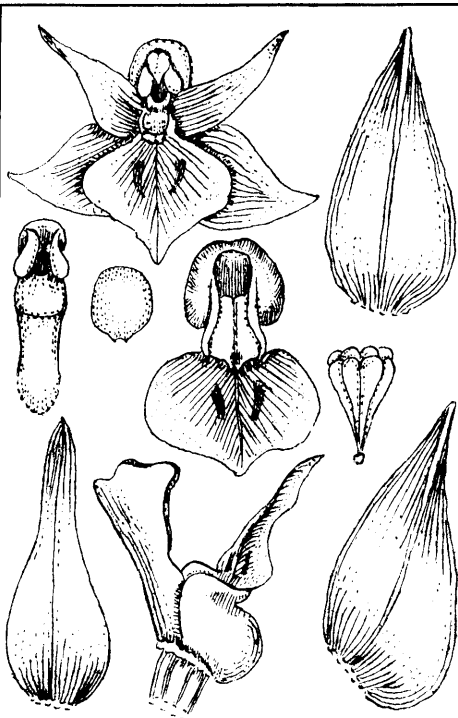
Agrostophyllum macrocephalum Schltr.



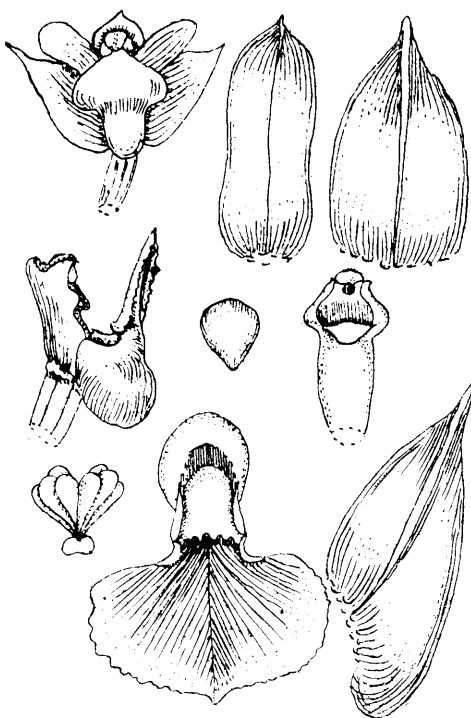
Agrostophyllum crassicaule Schltr.



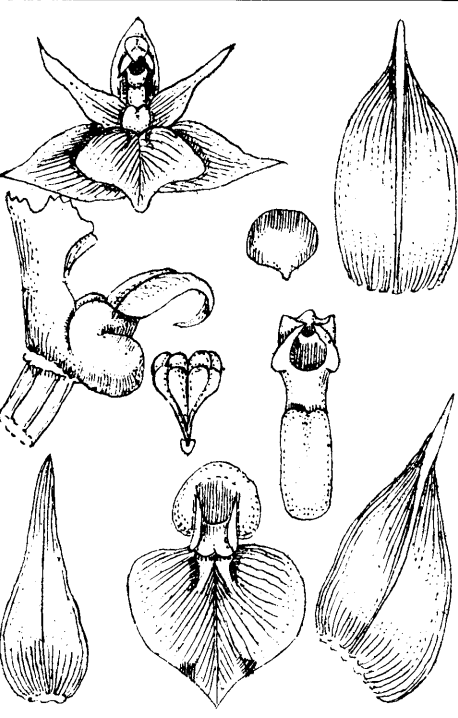
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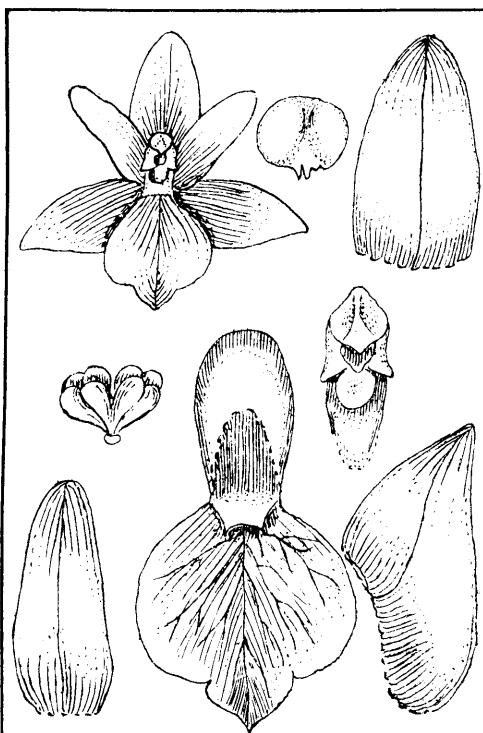
Agrostophyllum potamophila Schltr.



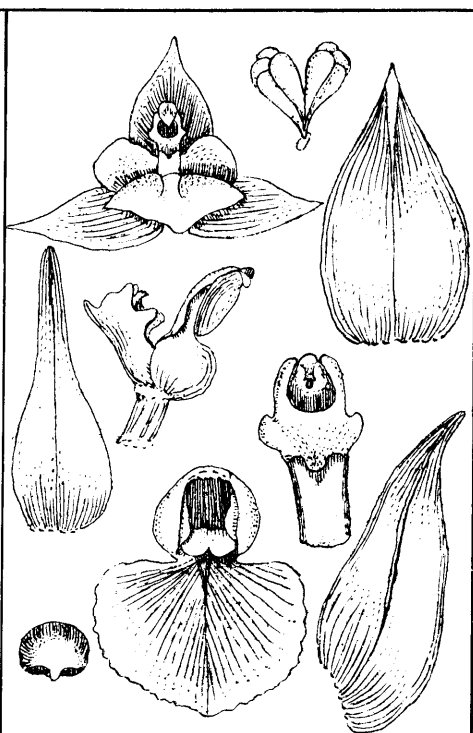
Agrostophyllum acutum Schltr.



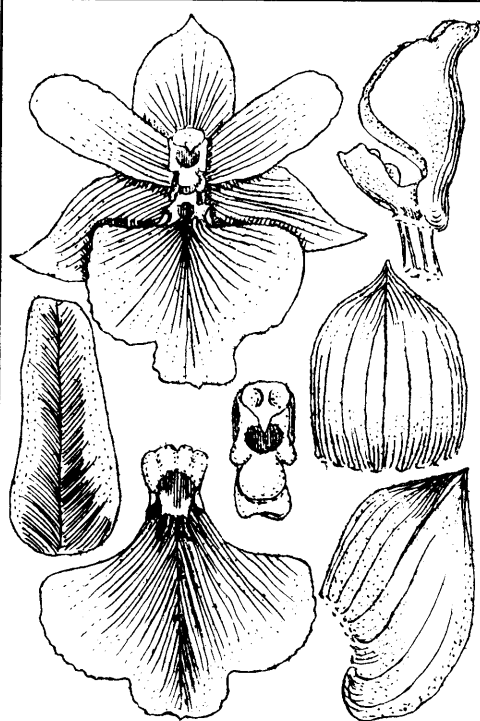
Agrostophyllum papuanum Schltr.



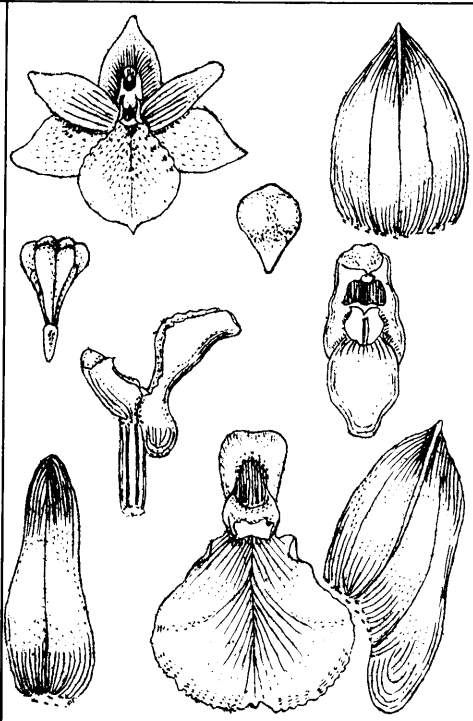
Agrostophyllum papuanum Schltr.



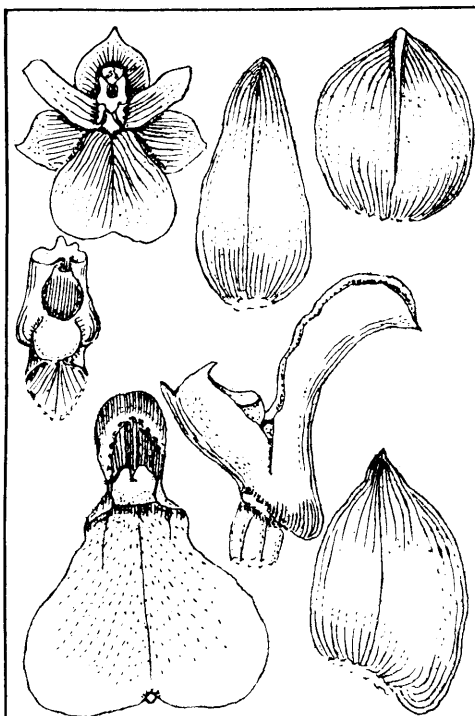
Agrostophyllum kaniense Schltr.



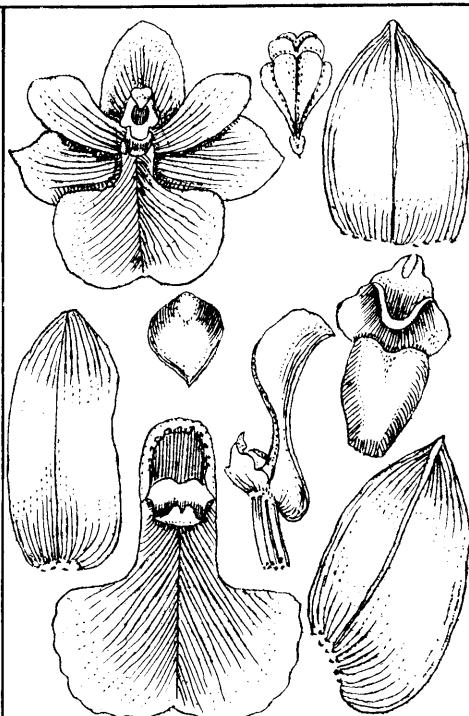
Agrostophyllum dolichophyllum Schltr.



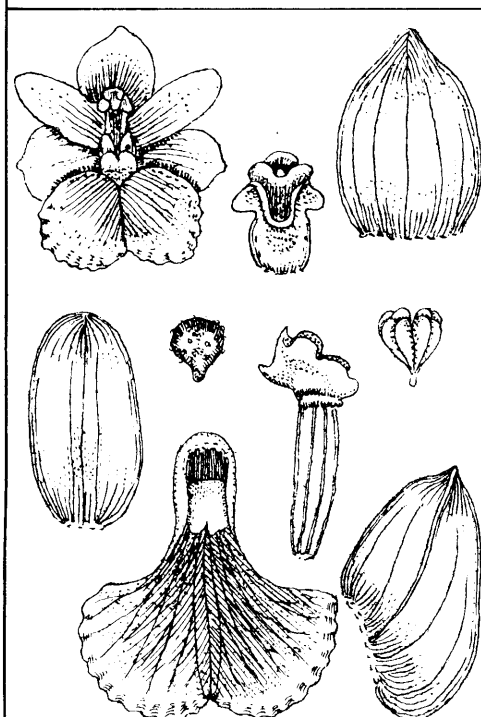
Agrostophyllum grandiflorum Schltr.



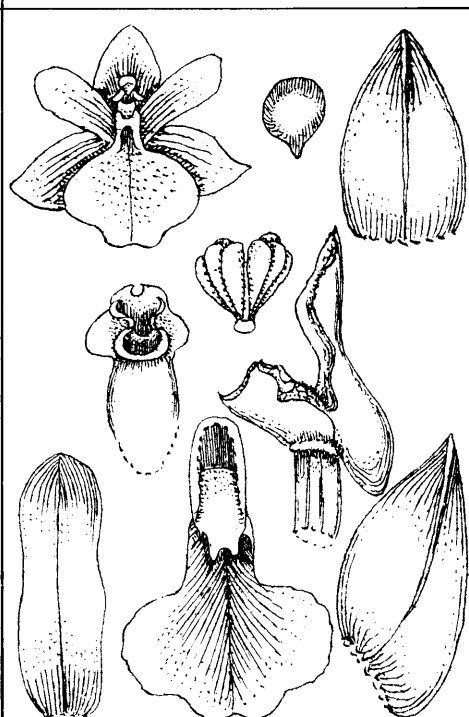
Agrostophyllum compressum Schltr.



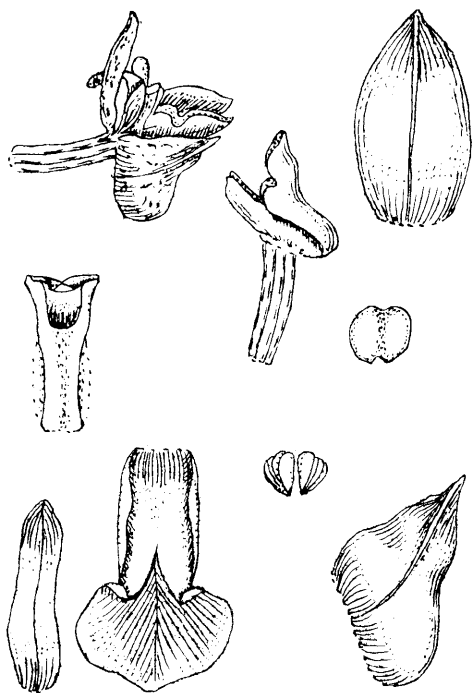
Agrostophyllum fragrans Schltr.



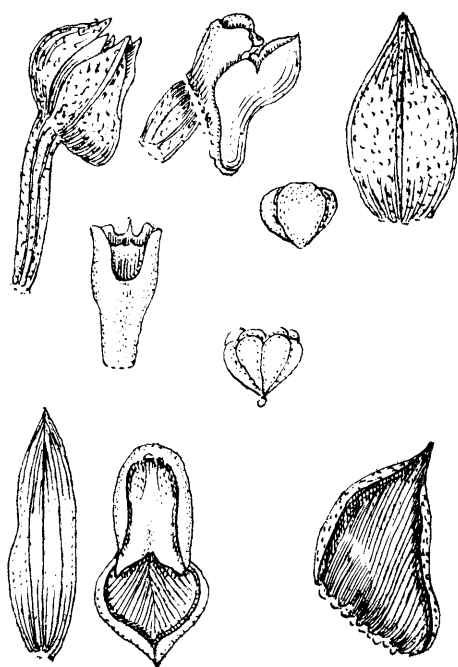
Agrostophyllum verruciferum Schltr.



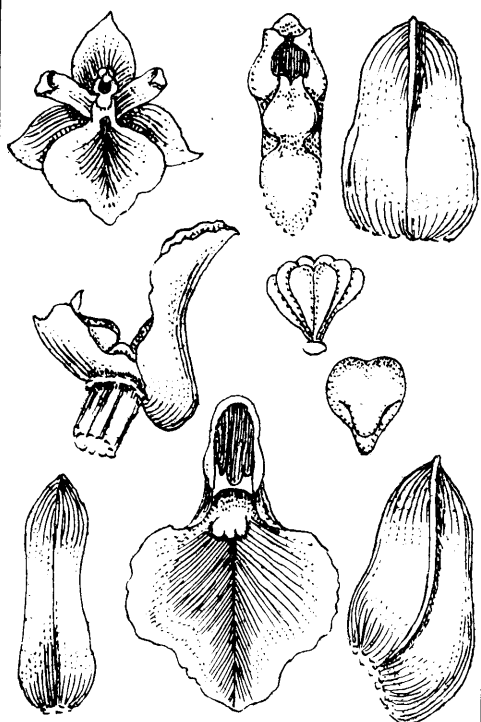
Agrostophyllum appendiculoides Schltr.



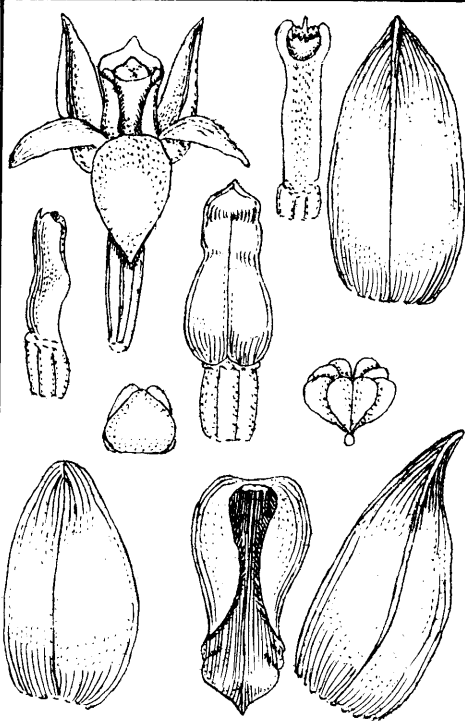
Agrostophyllum costatum J.J. Sm.



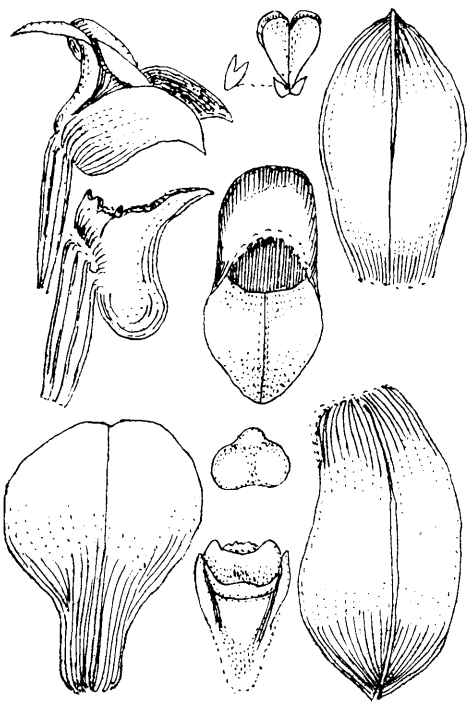
A. costatum var. *concavum* Schltr.



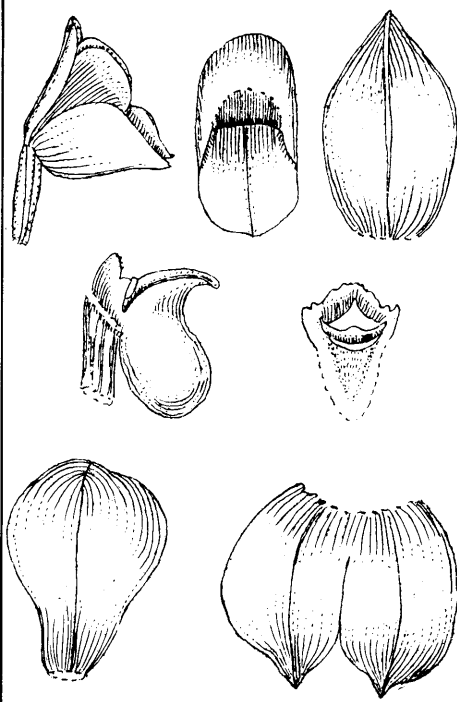
Agrostophyllum superpositum Schltr.



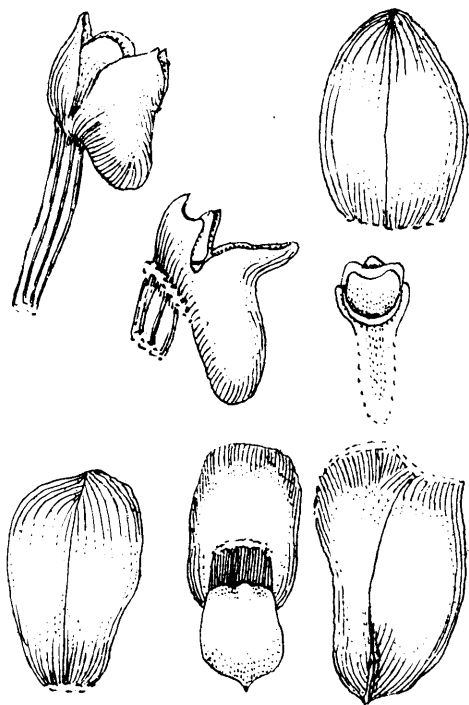
Chitonochilus papuanum Schltr.



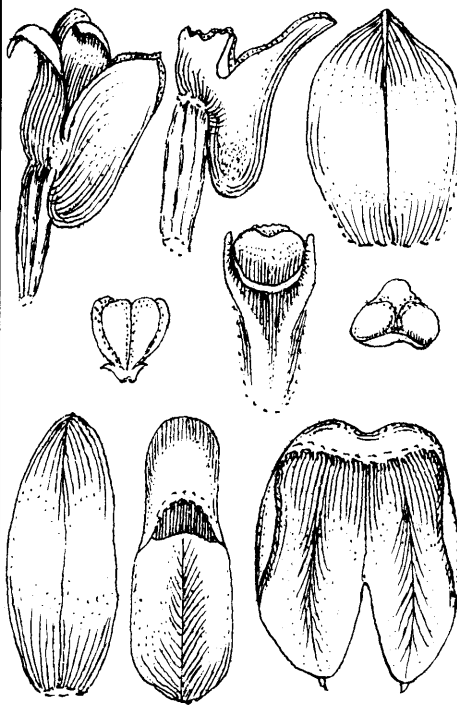
Glomera platypetala Schltr.



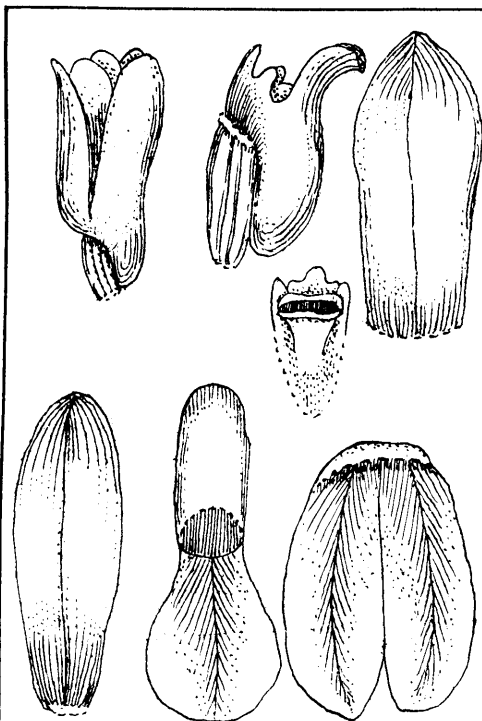
Glomera acicularis Schltr.



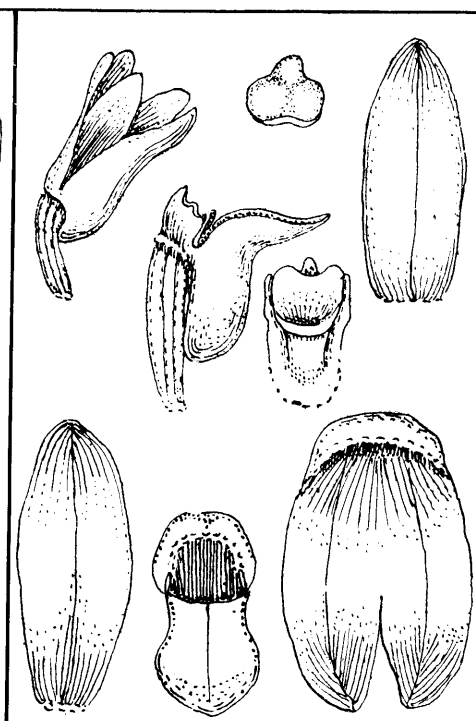
Glomera obtusa Schltr.



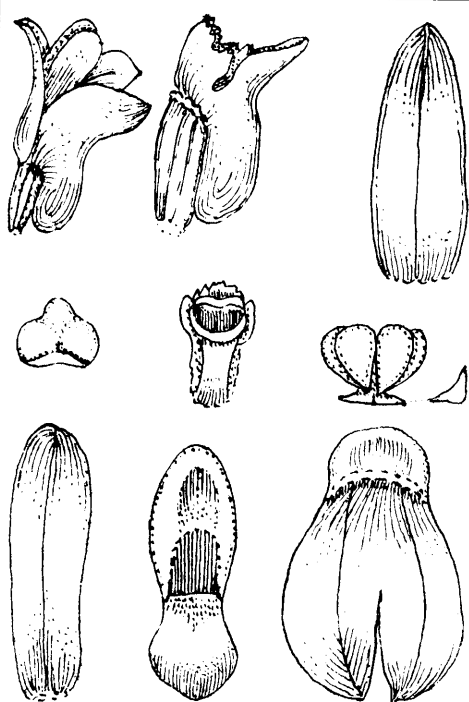
Glomera aurea Schltr.



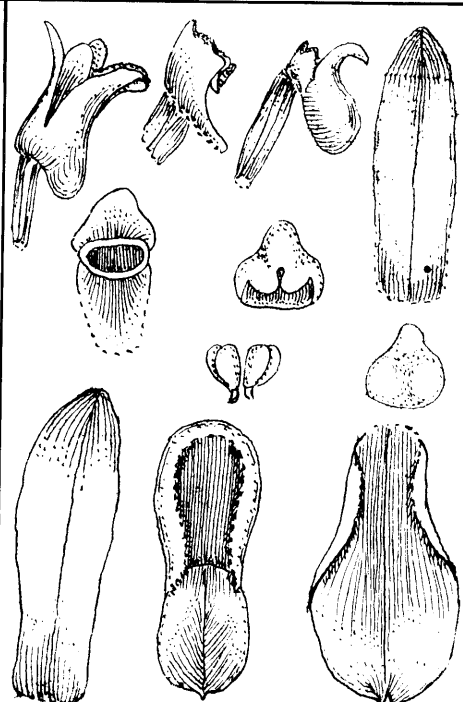
Glomera grandiflora Schltr.



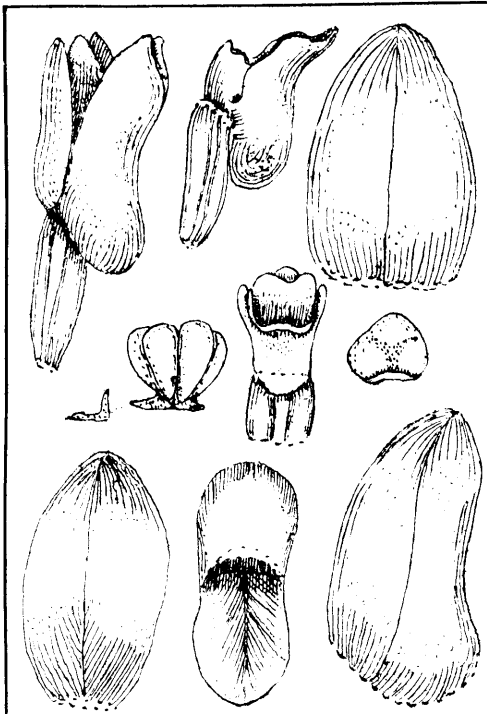
Glomera melanocaulon Schltr.



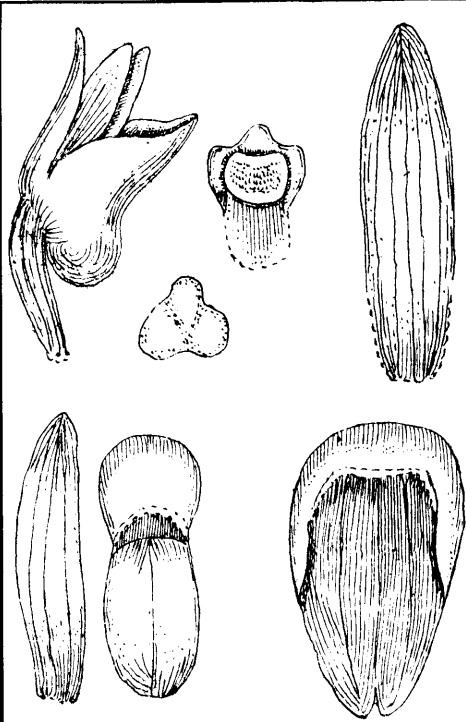
Glomera fruticulosa Schltr.



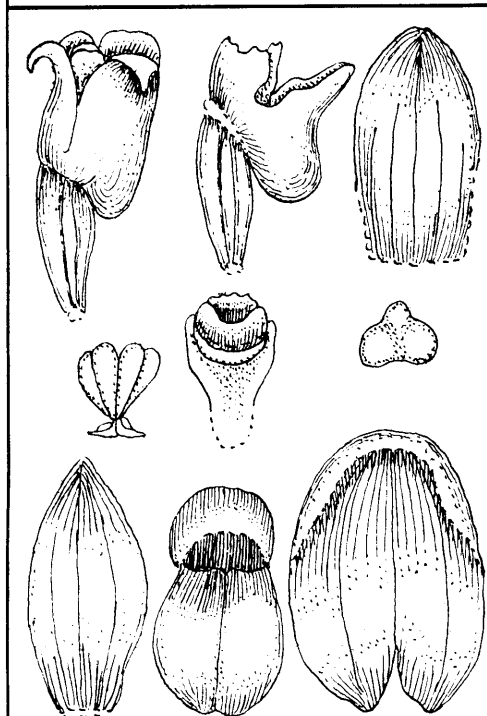
Glomera neo-hibernica Schltr.



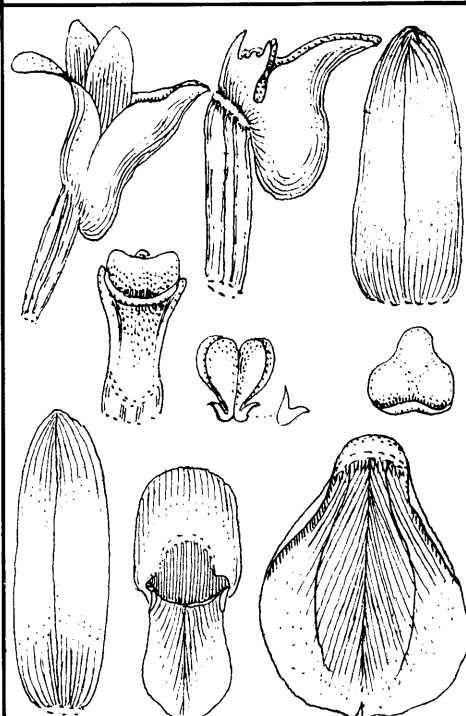
Glomera subpetiolata Schltr.



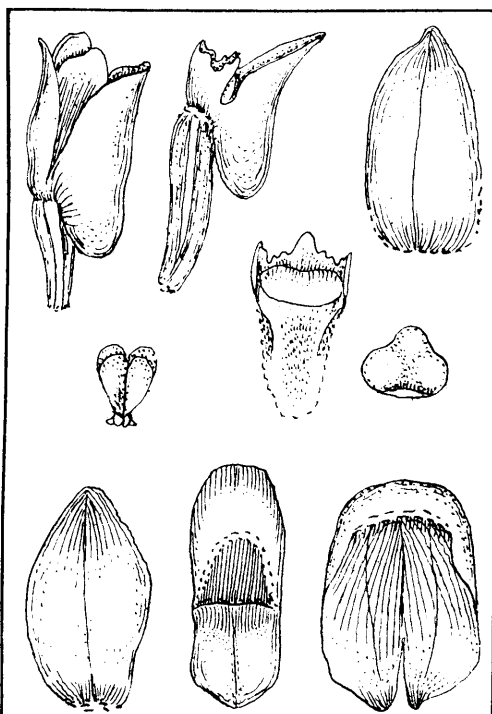
Glomera verrucifera Schltr.



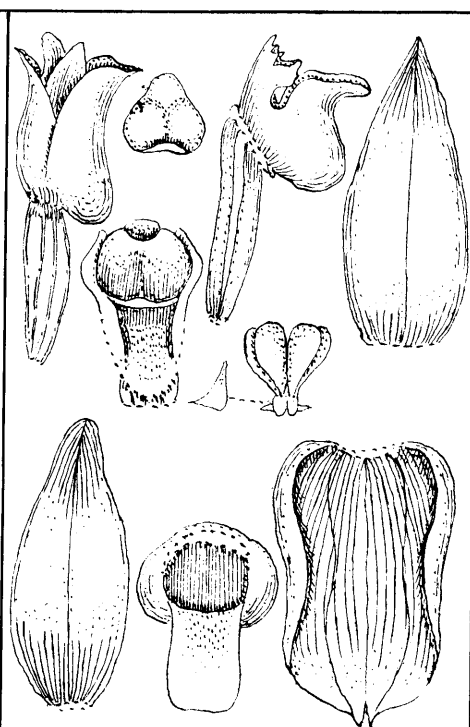
Glomera flammula Schltr.



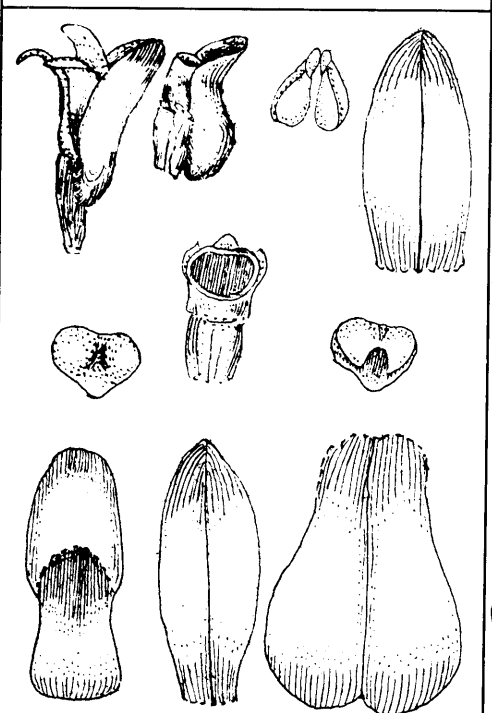
Glomera rugulosa Schltr.



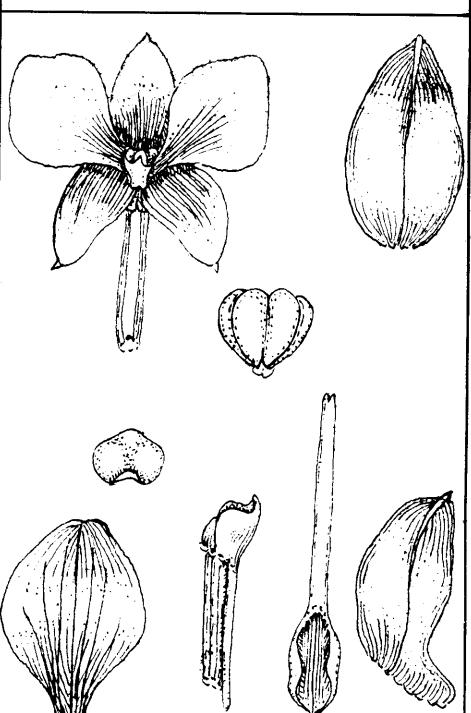
Glomera bambusiformis Schltr.



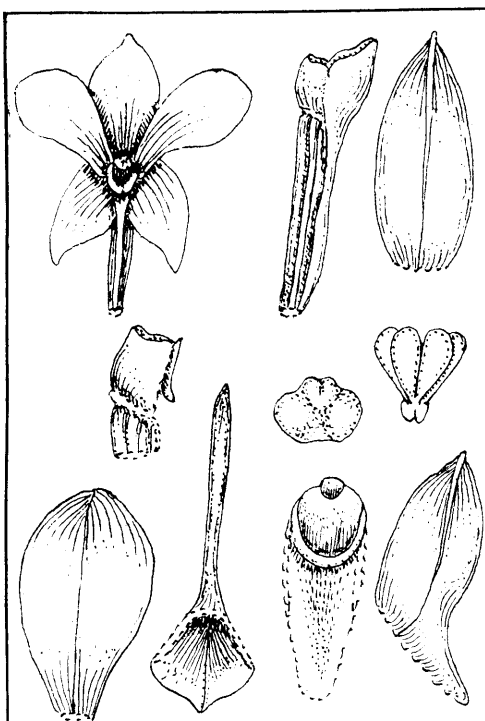
Glomera kaniensis Schltr.



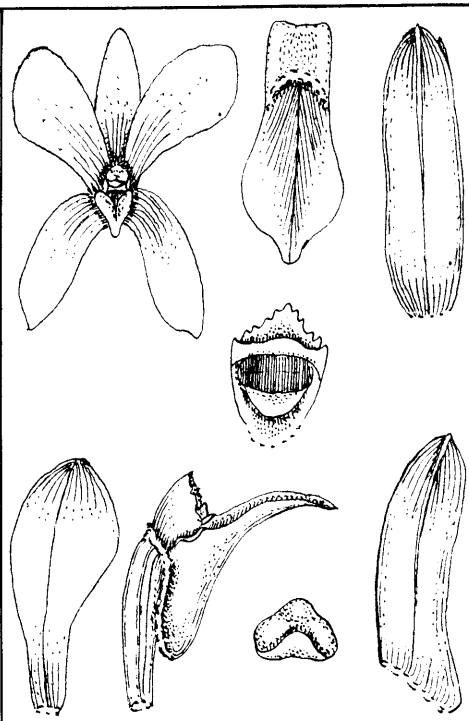
Glomera torricellensis Schltr.



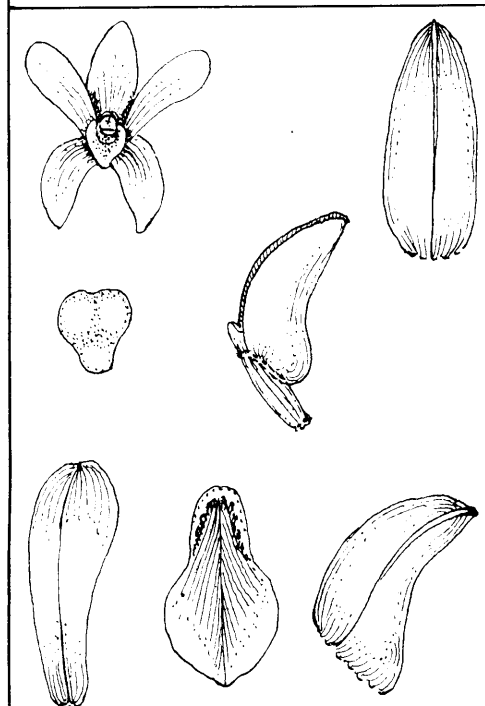
Glossorhyncha adenandroides Schltr.



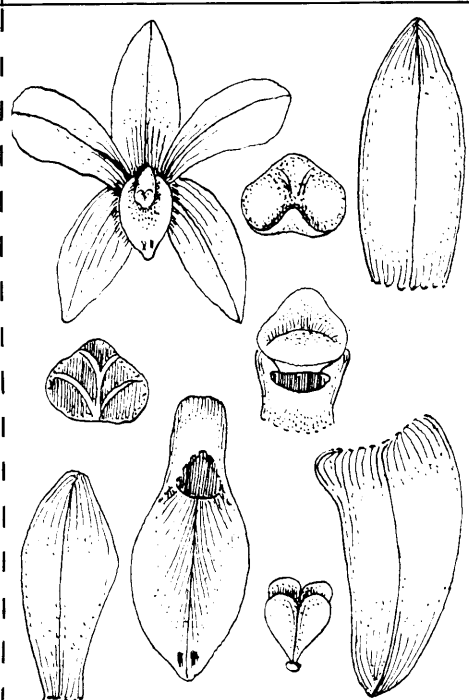
Glossorhyncha stenocentron Schltr.

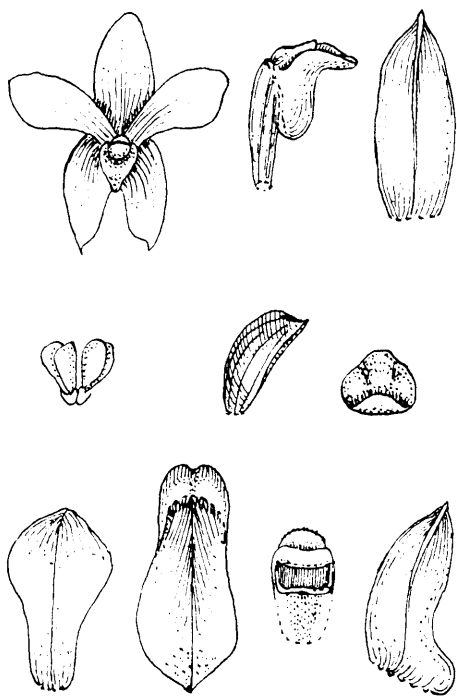


Glossorhyncha pulchra Schltr.

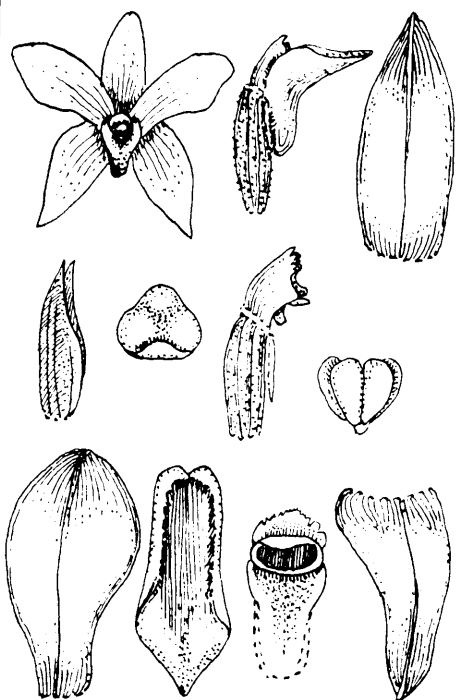


G. hamadryas var. *foliosa* Schltr.

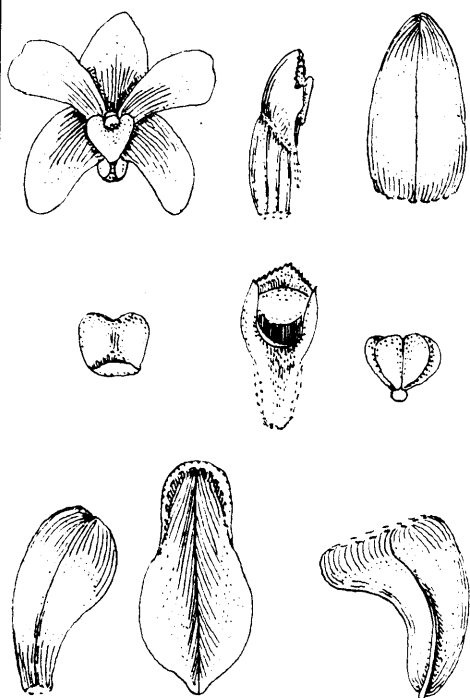




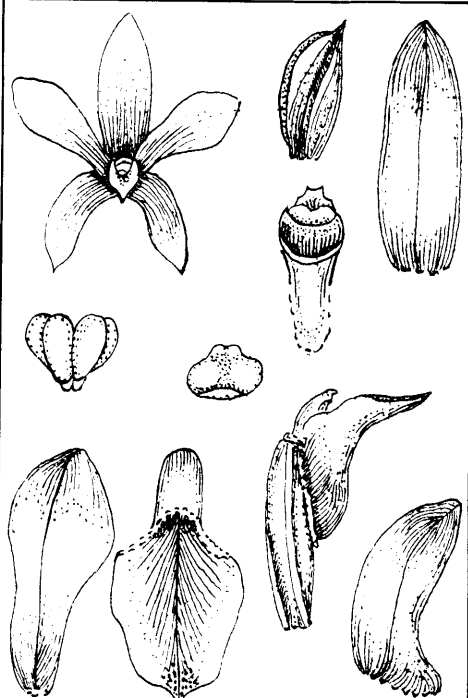
G. hamadryas var. *foliosa* Schltr.



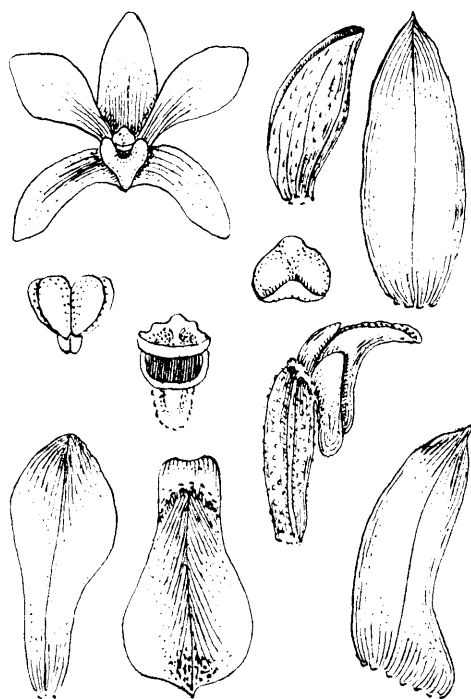
G. hamadryas var. *phaeotricha* Schltr.



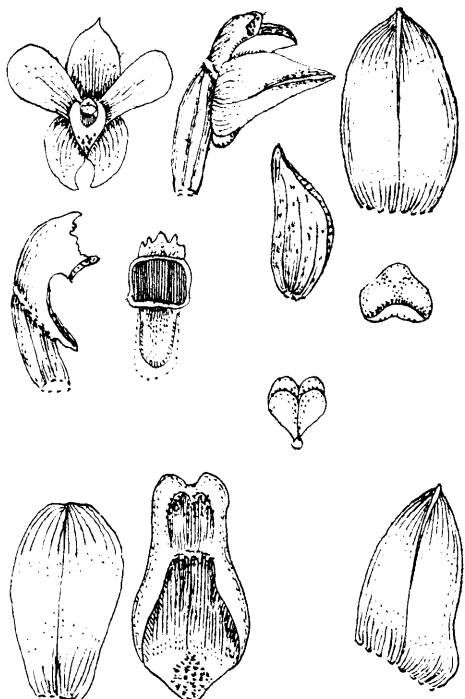
Glossorhyncha subpetiolata Schltr.



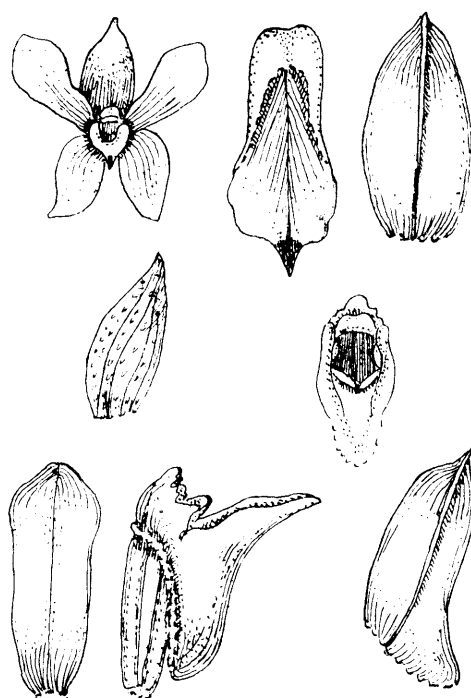
Glossorhyncha dischorensis Schltr.



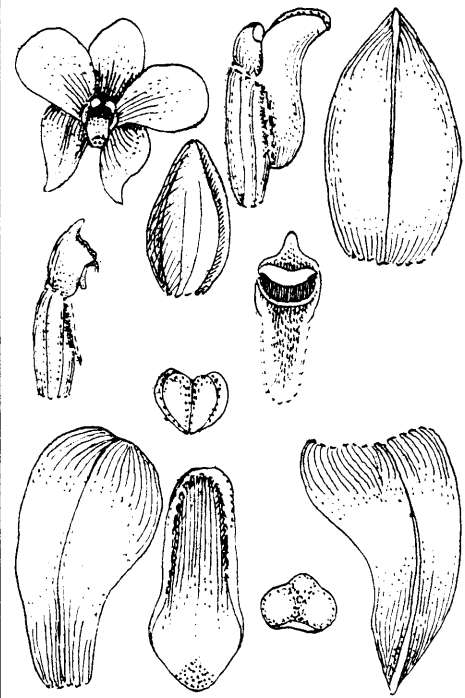
Glossorhyncha adenocarpa Schltr.



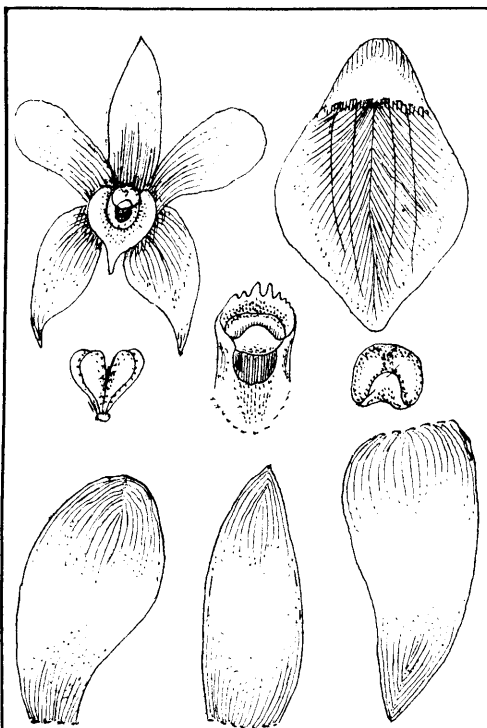
Glossorhyncha acutifolia Schltr.



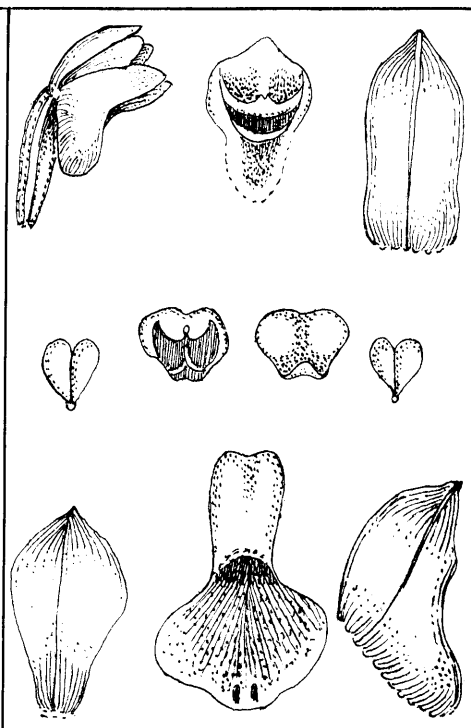
Glossorhyncha polychaete Schltr.



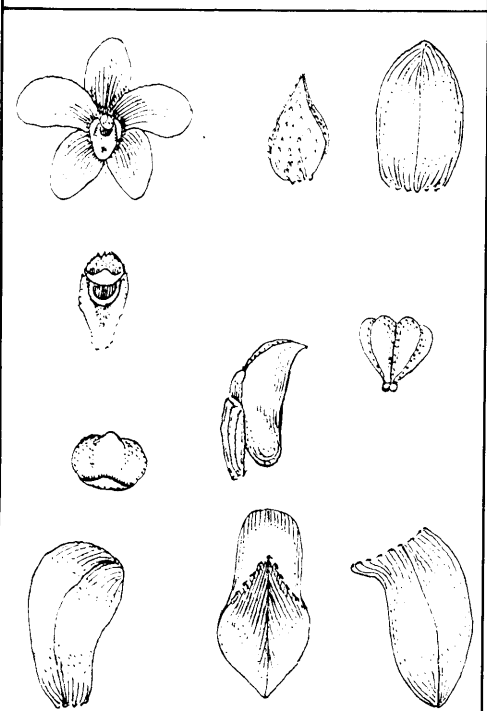
Glossorhyncha verruculosa Schltr.



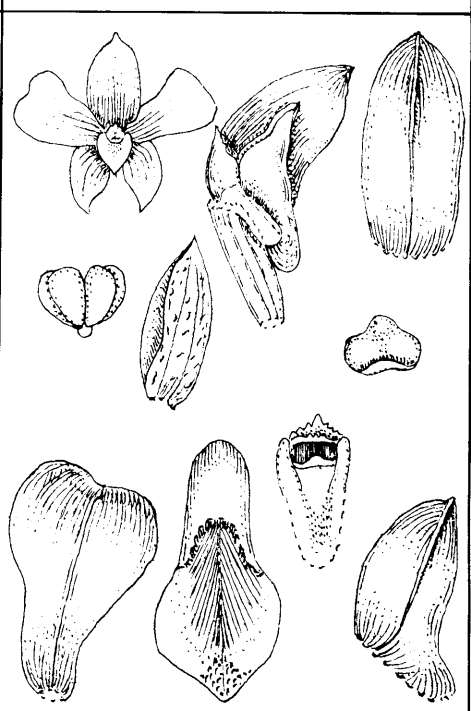
Glossorhyncha pilifera Schltr.



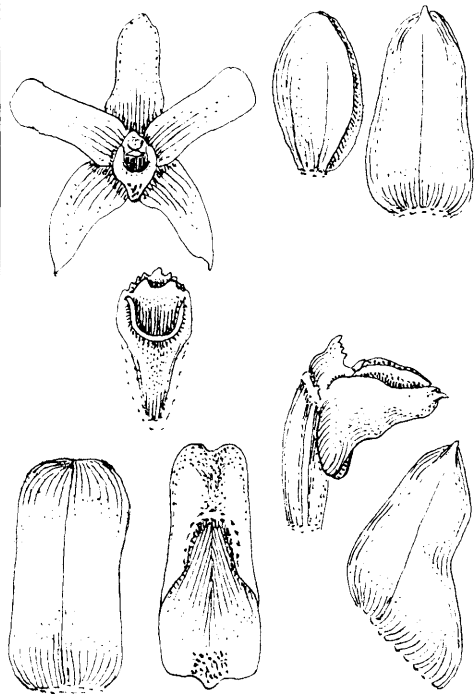
Glossorhyncha squamulosa Schltr.



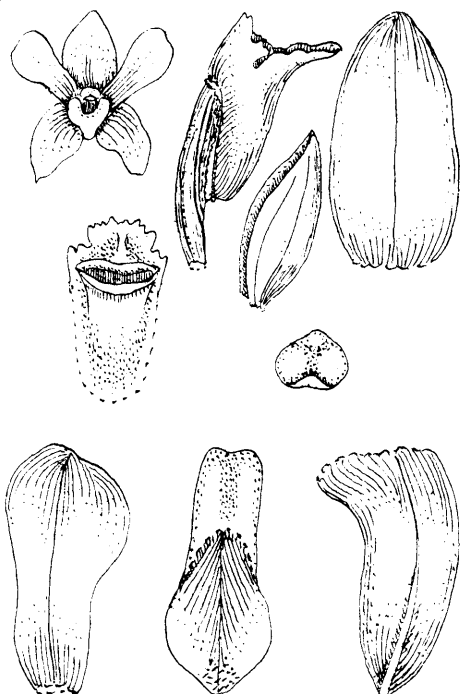
Glossorhyncha kaniensis Schltr.



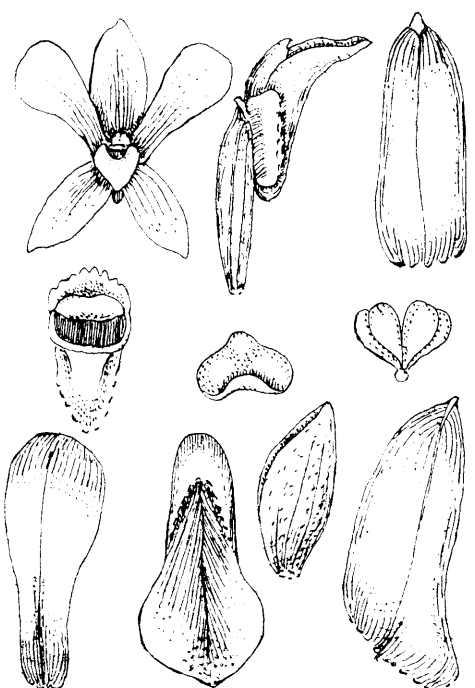
Glossorhyncha latipetala Schltr.



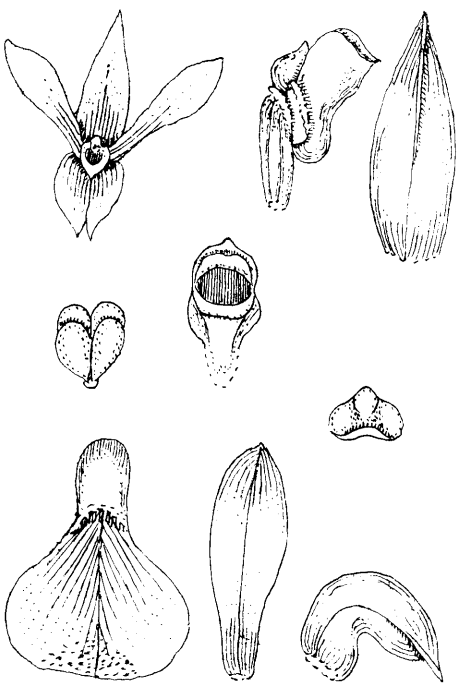
Glossorhyncha brachychaete Schltr.



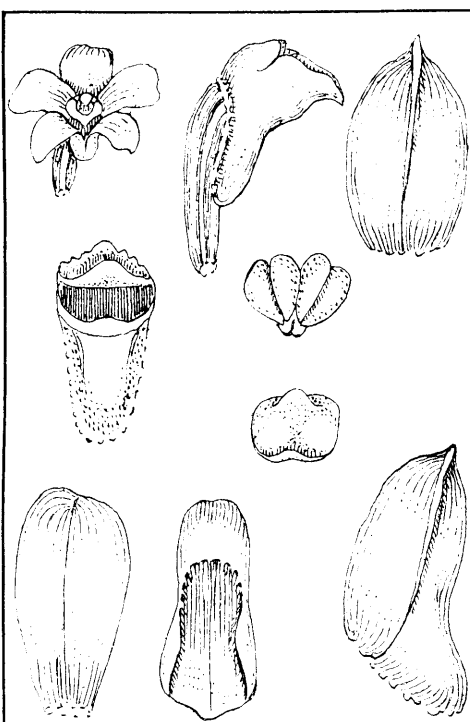
Glossorhyncha flaccida Schltr.



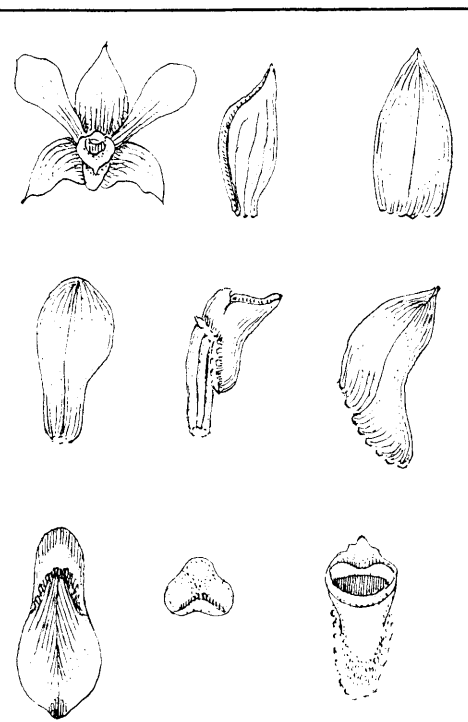
Glossorhyncha longa Schltr.



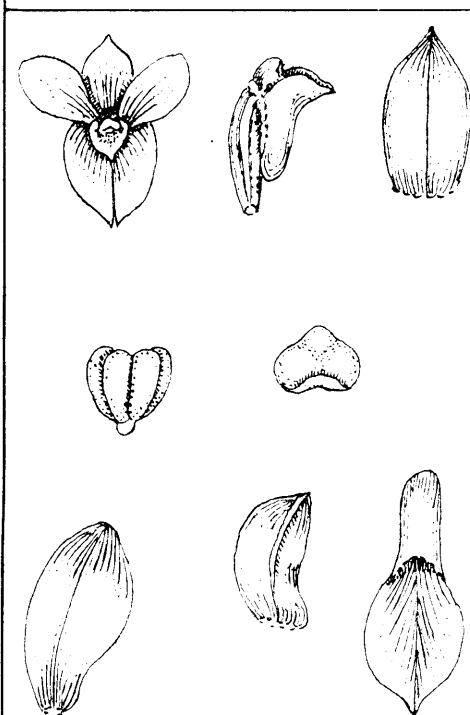
Glossorhyncha diosmoides Schltr.



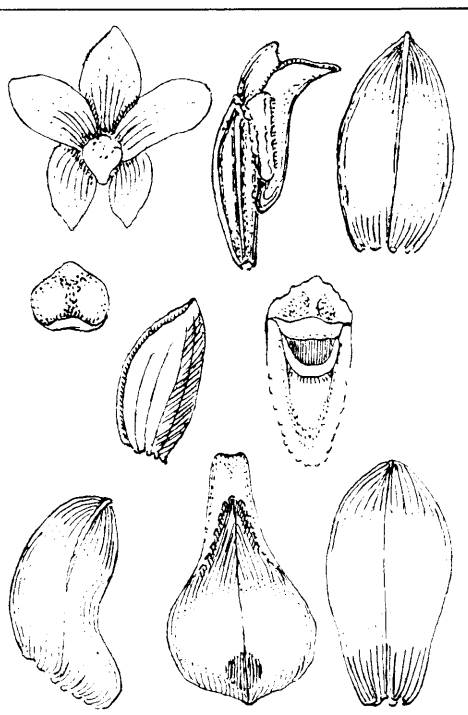
Glossorhyncha acicularis Schltr.



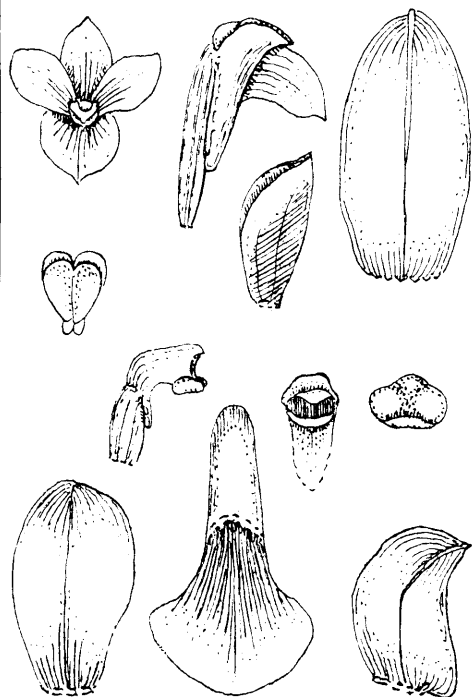
Glossorhyncha subulata Schltr.



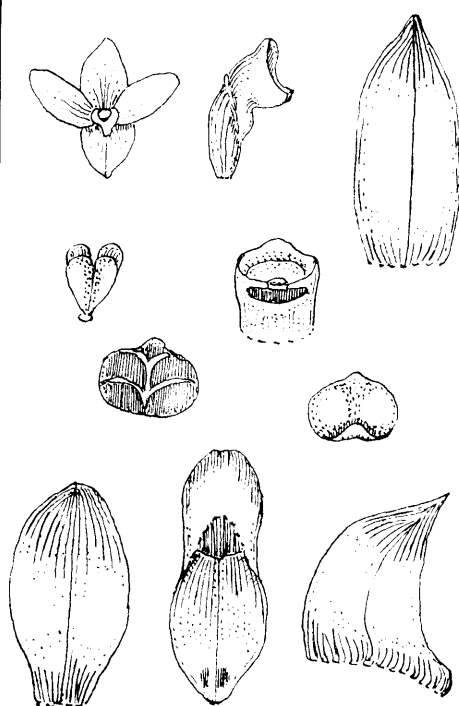
Glossorhyncha torricellensis Schltr.



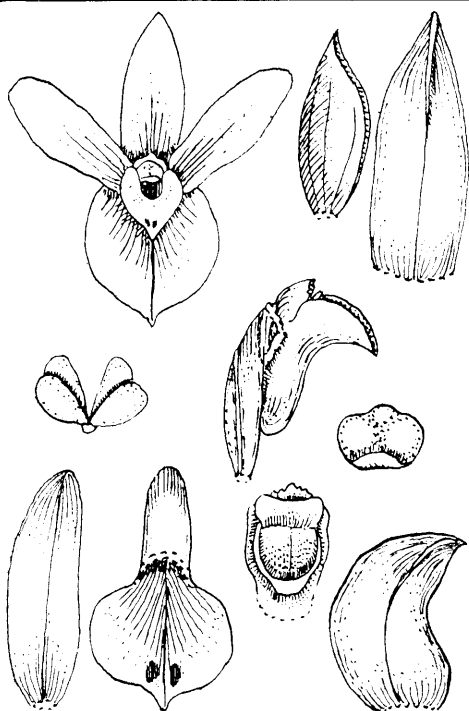
Glossorhyncha obovata Schltr.



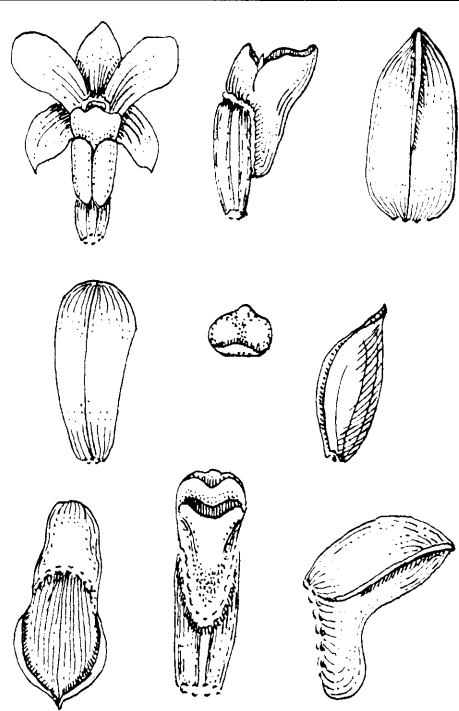
Glossorhyncha papuana (Krzl.) Schltr.



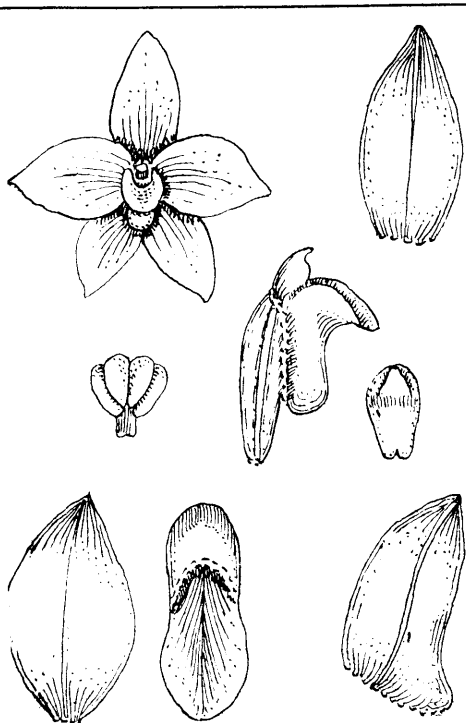
Glossorhyncha elegantula Schltr.



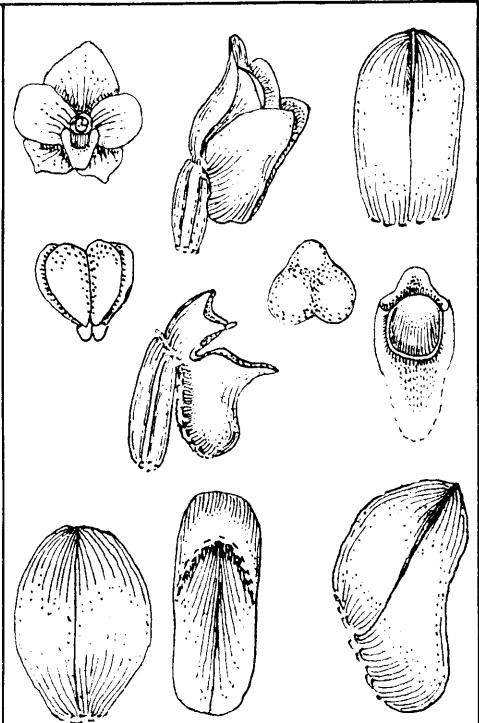
Glossorhyncha imitans Schltr.



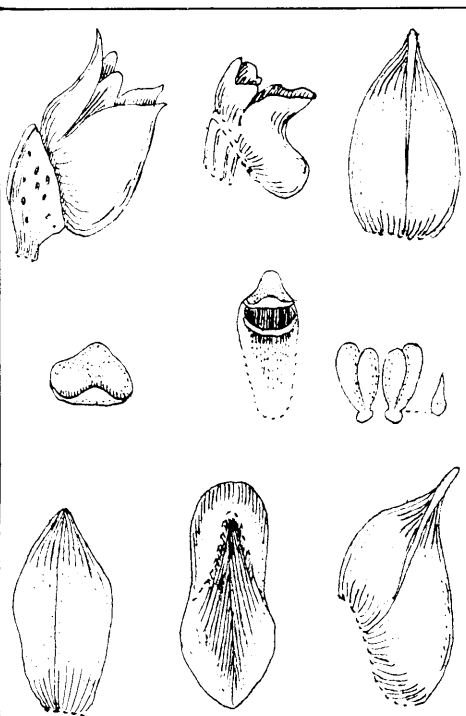
Glossorhyncha nana Schltr.



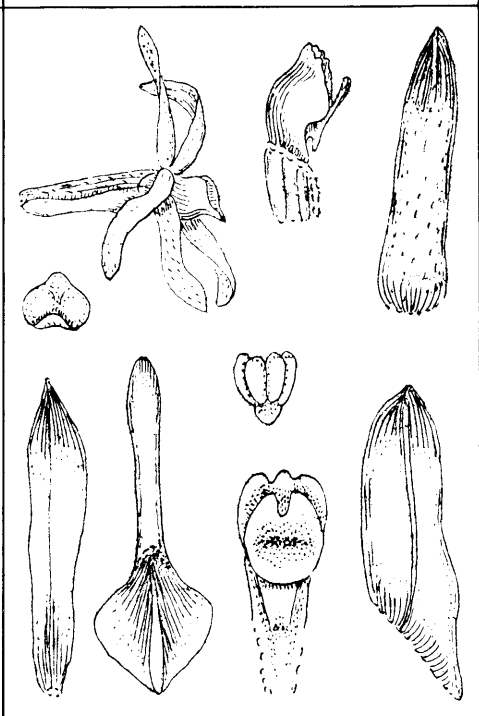
Glossorhyncha leucomela Schltr.



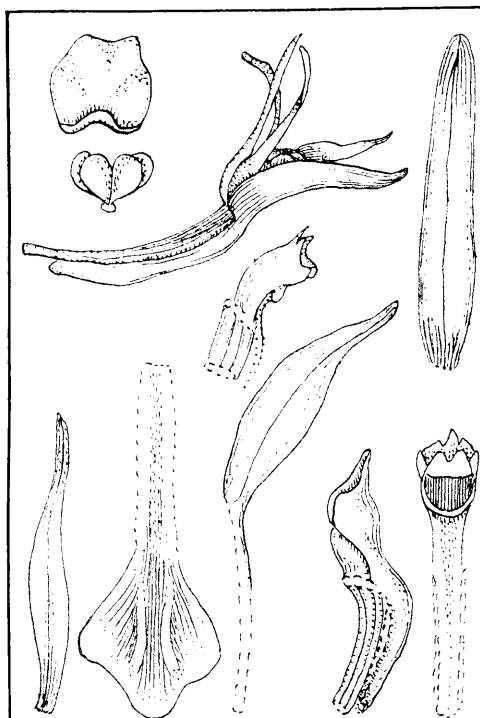
Glossorhyncha pungens Schltr.



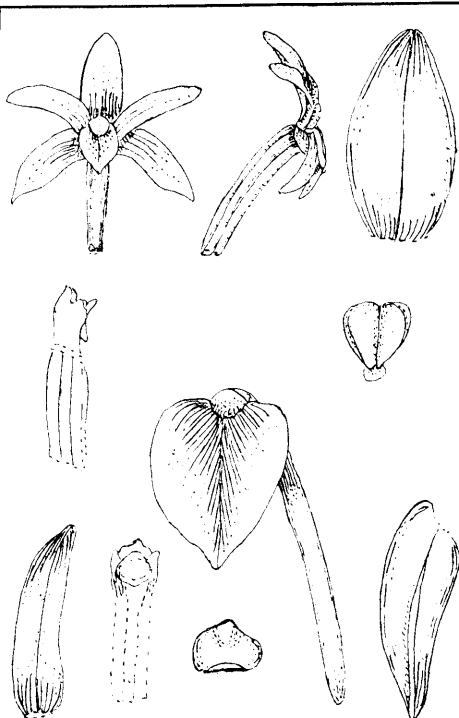
Glossorhyncha glomeroides Schltr.



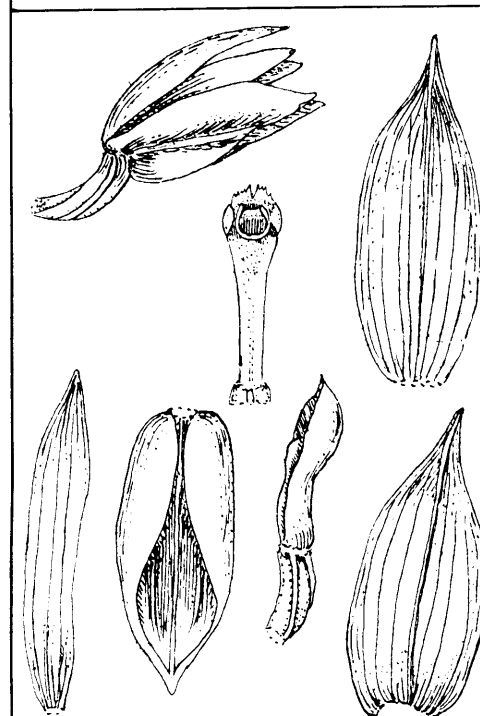
Giulianettia viridis Schltr.



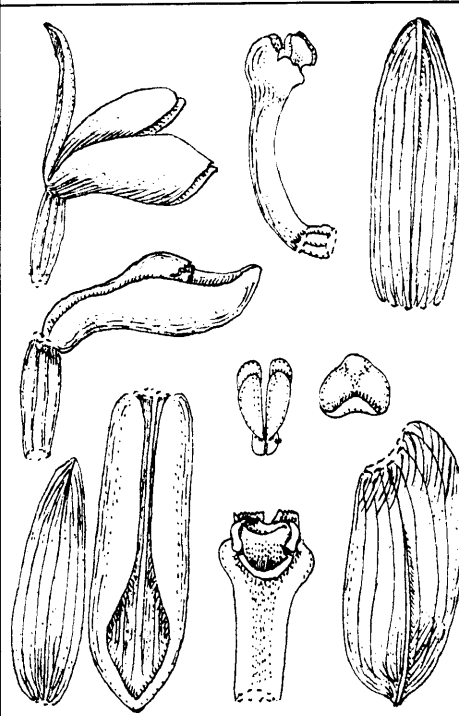
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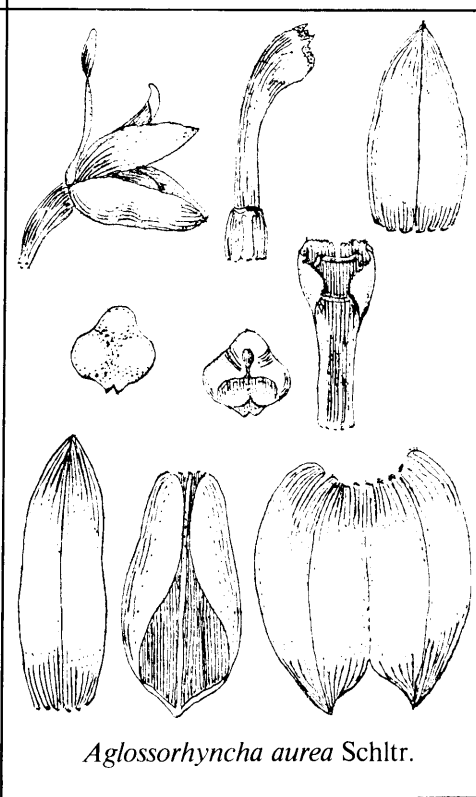
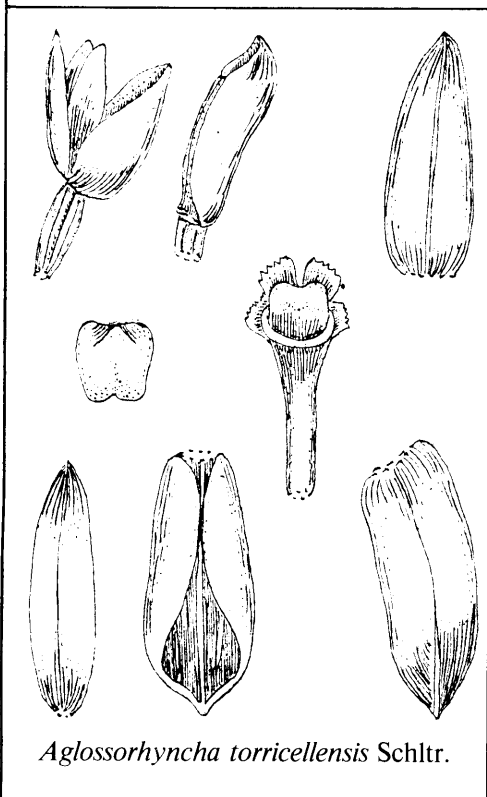
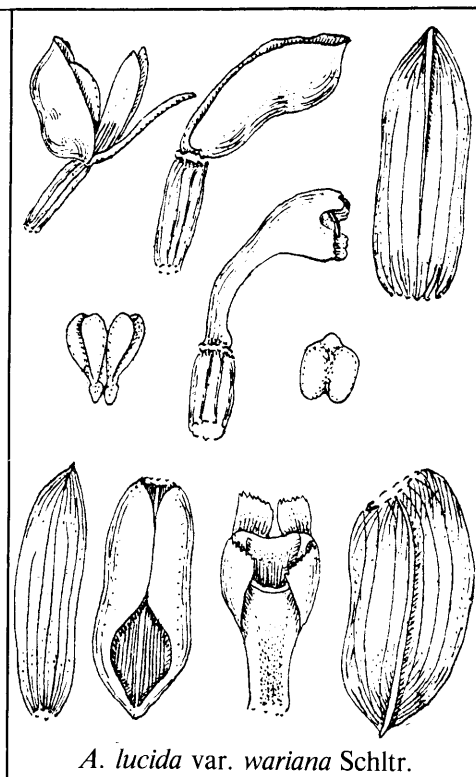
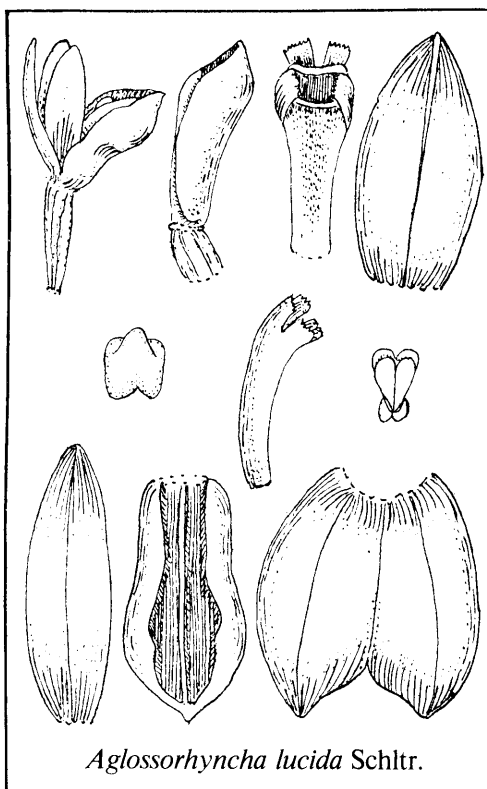
Ischnocentrum myrtillus Schltr.



Aglossorhyncha serrulata Schltr.



Aglossorhyncha viridis Schltr.



Group XVI *Podochilinae*

The last comprehensive work in this group is that published by me in 'Memoires de l'Herbier Boissier' in 1900, entitled 'Monographie der Podochilinae'.

At that time I was able to conduct my observations only on herbarium material and that explains why, after examining the abundant living material now at my disposal, I have arrived in many respects at different conclusions from then. J.J. Smith rightly maintained, and this has been accepted by me elsewhere, that *Thelasis* Bl. and *Oxyanthera* Brogn. must be removed and, together with *Phreatia* Lindl. and related genera, be united into the separate group *Thelasinae*.

Owing to the appearance within the group of another genus, *Lectandra* J.J. Sm., the question has become a little difficult, as to whether the genus *Podochilus* Bl. is to remain within the limits which I then assigned to it by its unification with the genus *Appendicula* Bl. To arrive at a decision, I examined the whole and probably the most abundant material of the group available anywhere and arrived at the conclusion that *Podochilus* Bl. and *Appendicula* Bl. had better be kept separate. There are, actually, certain forms which seem to constitute a transition between the two genera, but in such cases a boundary line may be formed on the basis of the number of pollinia.

These investigations, furthermore, convinced me of establishing two more genera which are distinguished from *Appendicula* Bl. by their habit and floral characteristics.

During my last travels in New Guinea, I paid special attention to the question of maintaining *Lobogyne* Schltr. and have collected a very rich supply of material. It is very difficult to form a judgement on this question, all the more so since some forms occur fairly frequently, others only as isolated specimens. It is, however, peculiar that these individually occurring forms hardly ever grow along with species of which they could be regarded as pelorial formations. Nevertheless, after long observation, I have formed the opinion that *Lobogyne* Schltr. cannot be maintained, but must be regarded as a pelorial form of *Appendicula* Bl.

These pelorial forms seem to be constant for individual species, occurring in two ways, viz. with a complete suppression of the column-foot in the one, and the presence of a completely formed column-foot in the other. A few *Appendicula* species seem to occur only in pelorial form, *A. bracteosa* Rchb. f., which I used as the Type of the genus *Lobogyne* Schltr. Of this species a large quantity of material has passed through my hands in the course of years and I have never yet found typical *Appendicula* flowers, only those of *Lobogyne*. Of the four forms of *Lobogyne* that I have collected material of in New Guinea, I have managed with some degree of certainty to sort out the Types although only after a long search and careful observations.

I have divided *Podochilus* Bl. somewhat differently from what I had done initially, by attaching more importance to the shape of the rostellum and to the presence of two separate viscid masses. The difference here does not suffice for establishing a separate genus, because there is no divergence from *Podochilus* Bl. in habit nor in structure of the flower. The case is different, however, for *Chilopogon* Schltr., where two separate viscid masses are present also but this character seems to be typical for the genus and goes hand-in-hand with characteristics in habit and those of the lip.

On the basis of the conditions described here, I have divided the group into five genera, which are arranged as follows:—

- A. Pollinia 4 *Podochilus* Bl.
- B. Pollinia 6–8
 - 1. Two separate viscid masses *Chilopogon* Schltr.

2. Viscid masses united into one.
 - (a) Pollinia 6
 - + Rostellum upright, more-or-less elongated;
anther pointed, upright *Appendicula* Bl.
 - + + Rostellum very much shortened, anther short,
broad and inclined *Cyphochilus* Schltr.
 - (b) Pollinia 8 *Lectandra* J.J. Sm.

Since the appearance of my monograph, the number of known species has nearly doubled, so that at present about 100 species are recorded in this group, which was formerly almost negligible, and about a third more will be published here.

55. *Podochilus* Bl.

The genus corresponds with the two sections, *Eu-Podochilus* and *Apista*, established in my earlier monograph. The section *Eu-Podochilus* is best left in its present form, and it is limited in its distribution to British India.

From the section *Apista*, I desire to exclude all those species which are distinguished by the possession of two separate viscid masses, and I propose to unite them in another separate section, *Diadena*.

In 1900 I was acquainted with 14 species which came within the limits of this genus as laid down by Blume, since then this number has grown to nearly 25.

Besides *P. densiflorus* Bl. from Dutch New Guinea, and which has not been recorded from German Territory, no other species have been recorded hitherto from the other parts of New Guinea.

§ 1. *Apista*

The species of this section, which is the largest in the genus, are distributed rather widely. *P. microphyllus* Bl. is probably the most western representative, while the most eastern species are those enumerated here, for, up to the present, no true *Podochilus* species have been reported east of New Guinea.

Most of the species listed here are remarkably slender, delicate, creeping plants, only a few of which, such as *P. scalpelliformis* Bl. and *P. imitans* Schltr., occur as small, upright bushes. The most common species is undoubtedly *P. scalpelliformis* Bl. which is distributed not only over the mainland of New Guinea but also occurs in the Bismarck Archipelago and in the Louisiade Islands. Very often it is found in close proximity to the sea coast, but occurs especially in the hill-country and often alongside creeks. It never rises very high into the mountains and I have seen it rarely above 700 m altitude. Another species of the hills is *P. bimaculatus* Schltr. The rest of the species have their habitats in the mountains. The upright species, such as *P. imitans* Schltr. and *P. scalpelliformis* Bl., tend to grow on moss-free branches with very cracked bark, but the creeping forms grow, for preference, on thick mossy pads, usually on branches of trees or on thick tree-trunks; more rarely on the summits of mountains on moss-covered rocks.

1. *P. scalpelliformis* Bl., in Rumphia IV (1848), p. 45.A. 194, p. 4, t. 200C.

Kaiser-Wilhelms-Land: On trees in the forests on the Djemur [River], alt. c. 50 m—R. Schlechter no. 20005, flowering in Sept. 1909; Kaiserin-Augusta River, no. 2 Station—M. Holtrung, flowering in Oct. 1887; on trees and bushes on the Nuru River, alt. c. 150 m—R. Schlechter no. 13811, flowering in Dec. 1901; on trees in the forests of Wobbe and on the Djamu [River], alt. c. 200-250 m—R. Schlechter no. 16311, flowering in July 1907; no. 17529, flowering in April 1908; on trees in the

forests near the Saugueti Base at the foot of the Bismarck Range, alt. c. 200 m—R. Schlechter no. 18466, flowering in Oct. 1908; on trees in the forests near Jaduna, alt. c. 150 m—R. Schlechter no. 19337, flowering in Apr. 1909.

Neu-Mecklenburg: Without location details—Parkinson.

This species blooms throughout the entire year, with the flowers gradually developing on the thick inflorescences and at the same time the new raceme developing from the base of the old one. The flowers are white with the petals bordered red at the apex. The entire flower assumes a yellow colour soon after opening fully.

2. *P. imitans* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 118.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–900 m—R. Schlechter no. 14370, no. 14562, flowering in Apr. 1902; no. 20088, flowering in Sept. 1909.

This species is related closely to *P. scalpelliformis* Bl. and is known to me in German New Guinea from the Torricelli Range only, but it is found also in Dutch New Guinea.

3. *P. Smithianus* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 123.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 14060, flowering in Jan. 1902.

During my last journey I did not find any material of this rare species. In habit it is midway between the erect and creeping forms. Its stems are longer and more rigid than for the latter form and stand mostly erect. The flowers are more like those of *P. Hellwigii* Schltr. and its relatives, but they have two separate caudicles to the pollinia as in *P. scalpelliformis* Bl. and *P. imitans* Schltr.

4. *P. Hellwigii* Schltr., in Mem. Herb. Boiss. (1900), no. 21, p. 22.

P. scalpelliformis Krzl., in Engl. Bot. Jahrb. XVIII (1894), p. 188 (nec Bl.).

P. longipes J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 34.

Kaiser-Wilhelms-Land: On trees in the forests of the Sattelberg [Mount.] near Silello—F. Hellwig, flowering in Apr. 1889.

I have tried in vain to separate *P. longipes* J.J. Sm. from this species. The specimens are indeed a little different in that the racemes seem longer, but this may be explained by the fact that the only inflorescence of the Type of *P. Hellwigii* Schltr. was in an early stage of development, as shown by the presence of a single flower only. The long column-foot is conspicuous, which distinguishes the species easily from the following one.

5. *P. himaculatus* Schltr., sp. nov.

Epiphyticus, decumbens, pusillus, usque ad 20 cm longus, ramosus; rhizomate elongato, cauliformi, tenui; radicibus flexuosis, crassiusculis, teretibus, glabris; caulibus ramisque filiformibus, dense foliatis, teretibus, glabris, vaginis foliorum omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis vel lanceolato-ligulatis, apice obliquis, longius apiculatis, basi cuneatis, glabris, 0.4–0.6 cm longis, medio fere 1.5–2.5 mm latis; racemis ad apices ramorum terminalibus vel subterminalibus, erectis vel patulis, pauci-(2–4)-floris, usque ad 5 mm longis, cum pedunculo brevi; bracteis ovato-lanceolatis, acutis, glabris, mox patulis, ovario subaequilongis; floribus in genere inter minores, patentibus, illis *P. Hellwigii* Schltr. similibus, glabris; sepalis ovatis, apiculatis, vix 0.2 cm longis, lateralibus basi margine anteriore valde ampliatis et connatis, cum pede columnae saccum suborbicularem, obtuse 4-gibbum, 1.5 mm diametientem formantibus; petalis oblique ovato-ellipticis, obtusis, sepalis paulo brevioribus; labello elliptico, obtuso, basi in appendicem brevem, truncatam, subquadrata infra insertionem producto, basin versus paulo angustato, 2.75 mm longo, supra medium vix 0.1 cm lato; columna perbrevis, pede longo, apice incurvo, rostello triangulo, breviter bifido; anthera ovato-cordata, acuminata, latus umbonata, pollinibus oblique clavatis, stipite obtriangulo, cucullato, pollinibus brevioribus, glandula minuta, ovata; ovario cum pedicello brevi, clavato, glabro, c. 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests of Kelel, alt. c. 600 m—R. Schlechter no. 16497, flowering in Sept. 1907; on trees in the forests of the

Finisterre Range, alt. c. 800–1000 m—R. Schlechter no. 18177, flowering in Sept. 1908; no. 19193, flowering in Jan. 1909.

The species is related closely to *P. Hellwigii* Schltr. and I consider it possible to be identical with *P. longipes* J.J. Sm. var. *brevicalcaratus* J.J. Sm. From *P. Hellwigii* Schltr. it is distinguished by the shorter column-foot and spur, a broader labellum, shorter and denser inflorescence and a shorter anther. The flowers are white, with a longish purple spot on each petal. The plant is not uncommon in the central parts of Kaiser-Wilhelms-Land on the mountains between 500–1000 m altitude.

6. *P. warianus* Schltr., sp. nov.

Epiphyticus, decumbens, pusillus, usque ad 15 cm longus, rhizomate filiformi, gracili, cauliformi; radicibus flexuosis, glabris, crassiusculis; caulibus ramisque filiformibus, tenuissimis, plus minusve flexuosis, radicanibus, vaginis foliorum amplectentibus obtectis, glabris, dense foliatis; foliis erecto-patentibus, linearibus vel lineari-lanceolatis, oblique apiculatis, basi cuneatis, glabris, 0.3–0.5 cm longis, 0.75–1.25 mm latis; racemis vulgo terminalibus, interdum lateralibus, brevibus, 2–3-floris, cum pedunculo brevi usque ad 0.5 cm longis; bracteis patulis, ovato-lanceolatis, acutis, ovario subduplo fere brevioribus; floribus in genere inter minores, illis *P. Hellwigii* Schltr. similibus, glabris, petantibus; sepalis late ovatis, minute apiculatis, 0.2 cm longis, lateralibus obliquis, basi margine anteriore lobato-dilatatis et connatis, cum pede columnae saccum turbinatum, apice inflatum, 4-gibbum, 1.5 mm longum formentibus; petalis oblique oblongo-ellipticis, obtusis, sepalis paulo brevioribus; labello obovato-spathulato, basi angustato et in appendicem suborbicularem, retusam, concavam infra insertionem dilatato, 0.3 cm longo, supra medium 0.1 cm lato; columna perbrevis, pede gracili apice incurvo, rostello lanceolato-triungulo, apice breviter exciso; anthera ovato-cordata, antice 3-apiculata, umbonata; pollinibus oblique clavatis, stipite gracili, lineari, apicem versus paulo dilatato concavo, pollinibus longiore, glandula minuta, rotunda; ovario cum pedicello glabro, clavato, c. 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 700 m—R. Schlechter no. 19884 (TYPE), flowering in June 1909; on trees in the mountain forests above Pema on the Waria [River], alt. c. 900 m—R. Schlechter no. 19427, flowering in May 1909; on trees on the peak of [Mount] Gomadjidji (Goromia), alt. c. 450 m—R. Schlechter no. 17473, flowering in Mar. 1908.

This species is strikingly similar to the previous one in habit, but closer examination shows that the leaves are narrower, also that the lip differs considerably in shape, so that there can be hardly any doubt that both species must be kept separate. The colour of the flowers is white with a red spot on each petal.

7. *P. trichocarpus* Schltr., sp. nov.

Epiphyticus, pusillus, depressus, ramosus, usque ad 25 cm longus; rhizomate filiformi, flexuoso, cauliformi; radicibus filiformibus, elongatis, glabris; caulibus ramisque dense foliatis, filiformibus, flexuosis, radicanibus, vaginis foliorum obtectis; foliis subpatentibus, lanceolatis vel lanceolato-ligulatis, apice obliquis, aristato-acuminatis, glabris, 0.4–0.6 cm longis, medio vel infra medium 1.5–1.75 mm latis; racemis ad apices ramorum abbreviatis, ut videtur vulgo unifloris; bracteis ovato-lanceolatis, acutis, ovario brevioribus; floribus in genere mediocribus, illis *P. gracilis* (Bl.) Lindl. similibus; sepalis lanceolatis, acuminatis, glabris, 0.5 cm longis; lateralibus falcato-obliquis, basi margine anteriore dilatatis et connatis, cum pede columnae saccum brevem semiglobosum formentibus; petalis lineari ligulatis, subacutis, subfalcatis, glabris, sepalis paulo brevioribus; labello panduriformi, apiculato, medio valde constricto, glabro, in quinta parte basali peltati affixo, vix 0.4 cm longo, supra basin 2 mm, supra medium 2.25 mm lato; columna brevi, pede mediocri, rostello anguste lanceolato, breviter exciso squama bipartita in facie infra stigma; ovario sessili, setis papilliformis, flexuosis obsesso; capsula late ovali, setoso-papillosa, c. 0.5 cm longa.

Kaiser-Wilhelms-Land: On trees in the mountain forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19727, flowering in June 1909.

Unfortunately, I found only one serviceable flower of this interesting species. Externally, the entire plant is strongly reminiscent of *P. gracilis* (Bl.) Lindl. from Java, but it has an altogether differently shaped labellum. Also *P. schistanthera* Schltr. has an unmistakable resemblance to the above species, but on account of the two separate

viscid discs it must be placed in the section *Diadena* and, besides, it also has a glabrous ovary. The flower was advanced too far, unfortunately, so that the colouring could no longer be distinguished precisely, it appeared to have been reddish.

§ 2. *Diadena*

The two separate viscid masses of the pollinia always distinguish easily the species of this section from all others in the genus. The distribution of the section extends, as far as we know, from the hinterland of India (Perak) through Java, Borneo and the Celebes to New Guinea, where it seems to have reached its maximum development. Up to the present I know of about six species, but more species probably will be found by a closer survey of New Guinea.

Three species have been enumerated from German Territory, of which two prove to be new. These three species, as well as the one occurring in Dutch New Guinea, *P. densiflorus* Bl., are all inter-related closely, though well distinguished by the labellum.

The three species that concern us grow always on trunks of trees or thick comparatively moss-free branches. I have often seen *P. filiformis* Schltr., in mountains in the Waria Valley, clothing the trunks of individual trees on the mountains, like a close mantle from the base to a height of 8 metres. The long, creeping branches of the plant are appressed closely to the substratum and fill every small crack in the bark. These *Podochilus* species do not seem to extend high up into the mountains. I do not recall ever finding them in the mist-forest region. They grow by preference on trees in the hill-country and along creeks or overhanging the latter.

8. *P. polytrichoides* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 122.

Kaiser-Wilhelms-Land: On trees near creeks in the Bismarck Range, alt. c. 600 m—R. Schlechter no. 13935, flowering in Jan. 1902.

The growth of this species is shorter than the two following. It is nearest to *P. muscosus* Schltr., but is well distinguished by the lip. The flowers are white with two red semicircles on the labellum. During my last journey, I did not find this species again.

9. *P. muscosus* Schltr., sp. nov.

Tenuis, decumbens, usque ad 30 cm longus, ramosus; rhizomate cauliformi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramisque filiformibus, flexuosis, dense foliatis, vaginis foliorum obiectis; foliis erecto-patentibus, linearibus, acutis, plus minus tortis, 0.5–0.7 cm longis, medio fere 0.5–0.7 mm latis; racemis ad apices ramorum abbreviatis, 1–3-floris, folia superiora haud superantibus, vulgo duplo brevioribus; bracteis parvulis, ovatis, apiculatis, ovario pedicellato bene brevioribus; floribus in genere inter minores, glabris; sepalis late ovatis, apiculatis, glabris, 2.5 mm longis, lateralibus obliquis, basi margine anteriore valde ampliatis et connatis, cum pede columnae saccum oblongum, obtusum, c. 2.5 mm longum formantibus; petalis oblique oblongis, obtusis, glabris, sepalis paulo sed distincte brevioribus; labello oblongo-cuneato, antice subtruncato-obtusato, leviter retuso cum apiculo parvulo, margine apicem versus subcrenulato-undulato, basi in appendicem brevem, quadratam, truncatam, apice paucicrenulatam producto, toto 0.4 cm longo, antice 0.2 cm lato, appendice 0.1 cm vix latitudine attingente; columna perbrevis, pede gracili, rostello tridentato, dente intermedio minuto; polliniis oblique clavatis, stipitibus gracilibus, basin versus angustatis, polliniis paulo longioribus, glandulis 2 sepratis, parvulis, semioblongis; ovario cum pedicello clavato, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forest environments of Eitape, alt. c. 20 m—R. Schlechter no. 19967 (TYPE), flowering in Aug. 1909; on trees in the forests of the Torricelli Range, alt. c. 400–600 m—R. Schlechter no. 20038, no. 20346, flowering in Sept. 1909.

The species is related closely to the previous one, but the stems and branches are longer and the labellum is considerably different in shape. The pollinia differs also, being shorter than the caudicles, while in *P. polytrichoides* Schltr. the reverse is the case. The flowers are white with a labellum marked with red in front.

10. *P. filiformis* Schltr., sp. nov.

Tenuis, decumbens, usque ad 30 cm longus; rhizomate cauliformi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramisque filiformibus, elongatis, flexuosis, dense foliatis, vaginis foliorum omnino obtectis; foliis linearibus, acutis, tortis, 0.3–0.5 cm longis, medio fere 0.3–0.4 mm latis, glabris; racemis ad apices ramorum abbreviatis, 1–3-floris, foliis superioribus duplo fere brevioribus; bracteis ovatis, acuminatis, ovario brevioribus; floribus in genere inter minores, glabris; sepalis late ovatis, apiculatis, 2.25 mm longis, lateralibus obliquis, basi margine anteriore ampliatis et connatis, saccum brevem, obtusum cum pede columnae formantibus; petalis oblique oblongis, obtusis, sepalis paulo brevioribus; labello oblongo-cuneato, antice exciso cum apiculo minuto interjecto, marginibus medioincurvis dimidio anteriore leviter undulatis, basi in appendicem quadratam, parvulam, truncatam producto, 3.5 mm longo, antice vix 1.75 mm lato, basi 0.75 mm lato; columna brevi, medio distincte dilatata, pede breviusculo, rostello tridentato cum dente intermedio minuto; anthera late ovato-cordata, umbonata, antice breviter biapiculata; polliniis oblique clavatis, stipitibus polliniis aequilongis, cucullato-concavis, basi attenuatis, glandulis oblongis media longitudine; ovario cum pedicello subclavato, 0.2 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Mimi (Waria District), alt. c. 600 m—R. Schlechter no. 17438, flowering in Mar. 1908; on trees in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19374, flowering in May 1909.

This species externally resembles *P. densiflorus* Bl. very much, but it has a much shorter floral mentum, and shorter and broader labellum. The anther and pollinia are also shorter. The flowers are white.

56. *Chilopogon* Schltr.

I have explained already the reasons which led me to establish this new genus. The three species which belong to it are distinguished by a peculiar uniformity in habit and in floral characters. From *Podochilus* Bl. the genus is distinguished by the presence of six pollinia. I would not like to unite it with *Appendicula* Bl. on account of the considerable difference in the shape of the labellum, the two separate viscid masses and the very different anther.

The genus appears to be purely Papuan, for no species have been recorded outside the New Guinea region. The species are related closely to each other in their habit, but well separated by their floral characters. Most of them are typical rain-forest epiphytes, but one species, *C. distichum* (Ridl.) Schltr., is found on trees along watercourses in the hill-country; it evidently requires more warmth than others.

Chilopogon Schltr., gen. nov.

Sepala ovata vel ovato-lanceolata, apiculata vel in acumen cuspidiforme producta, lateralia obliqua, basi margine anteriore dilatata et cum pede columnae mentum plus minus longum formantia. Petala patentia lineari-ligulata, obtusa, obliqua, sepalis paulo breviora. Labellum indivisum vel subtrilobum, basi angustatum cum pede columnae marginibus connatum, lamina lamellis 2 longitudinalibus ornata, ungue barbatum, ima basi callo parvulo auctum. Columna brevi, pede producto, rostello erecto, latius emarginato. Anthera subquadrato-cucullata, antice truncata, loculis apice divergentibus. Pollinia 6, 3-nis stipitibus 2 cucullato-excavatis affixis, glandulis 2 oblongis, separatis. Herbae epiphyticae, caespitosae, pluricaules; caulibus simplicibus, erectis vel erecto-patentibus, bene foliatis; foliis oblongis vel ligulatis, acutis vel apiculatis, apice inaequalibus, vaginis caulem arcte amplexentibus; racemis plus minus dense multifloris, distichis, terminalibus; bracteis amplis, vulgo florem bene superantibus, primum imbricantibus, bifariis. Species 3 adhuc notae, omnes papuanae.

I have discussed earlier the differences by which this genus differs from *Appendicula* Bl. I would like to say only a few words about the structure of the anther, which is considerably different from the acuminate and more-or-less elongated anther of *Appendicula* Bl. and *Podochilus* Bl. In *Chilopogon* the loculi have a distinct inclination to diverge in front and for this reason the anther is more square-capped and expanded in front, often crenate.

The three species clearly have a wider distribution in New Guinea, since *C. distichum* (Ridl.) Schltr. was described originally from the southern part of British Papua. *C. oxysepalum* Schltr. is, it appears, also found in Dutch New Guinea, where according to evidence, *C. bracteatum* Schltr. is present also. Considering the vast amount of material available now I feel compelled to revise the segregation of the various species from the original concept, because, as it turns out, under the former *Podochilus oxysepalus* Schltr., actually two separate species existed.

1. *C. distichum* Schltr. [Ed.—comb. nov.]

Appendicula disticha Ridl., in Journ. Bot. XXIV (1886), p. 354, t. 270.

Podochilus distichus Schltr., in Mem. Herb. Boiss. XXI (1900), p. 57.

Kaiser-Wilhelms-Land: On trees on the Djamu [River], alt. c. 300 m—R. Schlechter no. 16814, flowering in Nov. 1907; on trees in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 16814, flowering in Jan. 1902. [Ed.—the collection numbers are repeated and the former would appear to be valid.]

In contrast to the other two species this is recognised easily by the non-spreading, imbricate bracts and by the denser inflorescence. The mentum is somewhat longer than in *C. oxysepalum* Schltr., but considerably shorter than in *C. bracteatum* Schltr. The flowers are yellowish white with an anther violet-pink in colour.

2. *C. oxysepalum* Schltr. [Ed.—comb. nov.]

Podochilus oxysepalus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 120 (p.p.)

Neu-Pommern: On trees in the forests of the Beining Range above the Karo Falls, alt. c. 500 m—R. Schlechter no. 13696, flowering in Oct. 1901.

I am now convinced that the plant, no. 14350 which I collected in 1902 and placed here, is altogether different from the Type of the species from Neu-Pommern. *C. oxysepalum* Schltr. is recognised by its much shorter mentum, by the labellum which is delicately crenate, broader and shorter, and by the much longer caudicles of the pollinia with a smaller viscid disc. The description which I published in 1905 is made from specimens of no. 13696 and this is, therefore, to be regarded as the Type of the species.

3. *C. bracteatum* Schltr., sp. nov.

Epiphyticum, pluricaule, 10–20 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus erectis vel suberectis, strictis vel substrictis, dense foliatis, teretibus, glabris, vaginis foliorum arcte amplexantibus omnino obtectis; foliis oblongis vel lanceolatis, apice valde inaequaliter biapiculatis, vel bicuspidatis, glabris, 0.8–1.5 cm longis, medio vel infra medium 3.5–5.5 mm latis; racemis plus minus dense multifloris, usque ad 5 cm longis, distichis; bracteis patentibus, amplis, lanceolatis, cuspidatis, margine lacerato-dentatis, glabris, inferioribus flores vulgo subduplo superantibus, superioribus sensim paulo decrescentibus; floribus patentibus, illis *C. distichi* (Ridl.) Schltr. similibus; sepalis ovato-oblongis, longe apiculatis, glabris, 3.5 mm longis, lateralibus basi margine anteriore valde ampliatis, mentum oblongum, obtusum, 3 mm longum formentibus; petalis oblique lineari-ligulatis, obtusis, glabris, sepalis paululo brevioribus; labello e ungue oblongo obtuso in laminam suborbicularem, antice in gibbum oblongum obtusum productam expanso, 0.6 cm longo, lamina 2.75 mm lata, carinis 2 obtusis e medio laminae in unguem decurrentibus, in ungue barbellatis, callo parvulo intus in basi unguis; columna brevi, vulgo erostris, pede gracili, rostello valde emarginato; anthera subquadrato-cucullata, antice emarginata; pollinibus 6, oblique clavatis, ternis stipitibus 2 brevibus affixis, glandulis 2 separatis, anguste ellipticis acutis, amplis, ovario cylindraceo subsessili, glabro, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range alt. c. 1000 m—R. Schlechter no. 14350, flowering in April 1902; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17983 (TYPE), flowering in July 1908.

The plant designated by J.J. Smith as *Appendicula oxysepala* J.J. Sm., and the variety *longicalcarata* J.J. Sm., probably belong here, the latter almost for certain, but the species differs, as explained above, from *C. oxysepalum* Schltr. by its much longer mentum, the labellum, and the quite differently shaped pollinarium. In order to keep the Type of the species as pure as possible, I have established two more varieties which give a different impression externally, but as far as can be judged at present, still belong here.

var. *warianum* Schltr., var. nov.

Differt a forma typica bracteis margine integris, racemis laxioribus, sepalorum apiculis minutis, labelli lamellis crassis, anthera brevior et polliniis brevioribus cum glandulis minoribus.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range in the Waria District, alt. c. 1000 m—R. Schlechter no. 19489, flowering in May 1909.

When I collected this plant I thought I had a separate species, but I am now doubtful whether the distinctions are sufficient. I have regarded it therefore as a variety.

var. *ovale* Schltr., var. nov.

Differt a forma typica foliis brevioribus, ovalibus, obtusatis cum apiculo brevi obliquo, bracteis integris.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14560, flowering in Apr. 1902.

The foliage of this variety looks very different from the Type, but so far it agrees fairly well in its flowers. As in the other forms, the flowers are white with a red anther.

57. *Appendicula* Bl.

The large quantity of living material of the group *Podochilinae*, which I had the opportunity of examining during the last years, has convinced me of the necessity to leave *Appendicula* Bl. alongside *Podochilus* Bl. I have explained already the precise reasons for this. I will now attempt to group the species, since such a division into sections has become an urgent necessity, owing to the present size of the genus.

The latter, in its Blumeian interpretation, would contain two sections, *Appendicula* and *Pseudappendicula* as I have characterised them in my monograph on *Podochilus*. *Pseudappendicula* practically can, thereby, be eliminated after some of the very heterogeneous species have been removed from the genus. Accordingly, I propose to divide the genus in the following manner.

§ 1. *Eu-Appendicula* contains those species which are distinguished chiefly by the usually very short, lateral inflorescences of small flowers. The boundaries between this and the second section are not very sharp, but in this case one may decide to which of the two sections a plant belongs by the bracts, which are very characteristic in *Chaunodesme*.

To this section belong those species which are grouped around *A. reflexa* Bl., *A. cornuta* Bl., *A. angustifolia* Bl., *A. carnosa* Bl., etc.

§ 2. *Chaunodesme* comprises those species which possess a raceme which is chiefly terminal, loosely pendant and gradually elongated with large reflexed bracts. The most characteristic species of this section are *A. pendula* Bl. with its relatives *A. philippinensis* (Schltr.) J.J. Sm., *A. celebica* Schltr. (*Podochilus celebicus* Schltr.), *A. pandurata* Schltr. (*Podochilus panduratus* Schltr.) and others.

§ 3. *Pododesme* is recognised by its long-stalked inflorescences covered for the greatest part of their length by closely surrounding sheaths. It includes such species as

A. undulata Bl., *A. cristata* Bl., *A. elegans* Rchb. f., *A. purpurascens* Bl., *A. infundibuliformis* J.J. Sm. and *A. effusa* Schltr. (*Podochilus effusus* Schltr.).

§ 4. *Oligodesme* contains species which have flowers inserted separately on the tops of the branches. In habit these species are distinguished by their marked branching. Here belong *A. ramosa* Bl., *A. ovalis* (Schltr.) J.J. Sm., *A. imbricata* J.J. Sm. and *A. buxifolia* Bl.

§ 5. *Chromatodesme* is a small section containing a few species in which the short, dense racemes are covered with large, white or rose-red bracts. I place here *A. torta* Bl., *A. calcarata* Ridl., *A. rostellata* J.J. Sm. and *A. crotalina* (Ames) Schltr. (*Podochilus crotalinus* Ames).

So much for the division of the genus. In treating the individual groups, I shall deal more particularly as to which other species belong to them and I will refer also to their habitat. In our Territory three sections only are represented, since *Oligodesme* and *Chromatodesme* do not appear to occur here. The distribution of these sections extends from the hinterland of India and from Sumatra, across Java and Borneo to the Philippines.

§ 1. *Eu-Appendicula*

This section probably has the largest number of species and the widest distribution in the genus. Its representatives occur from India to New Caledonia in most different regions and altitudes. A fair number of species are found also in New Guinea, although here the section *Chaunodesme* contains the main quota.

As regards habit, the species of *Eu-Appendicula* have less sharply defined boundaries than the other [sections]. A whole series of species, viz. *A. reflexa* Bl., *A. carnososa* Bl., *A. pauciflora* Bl., *A. angustifolia* Bl., *A. lucida* Ridl., *A. rubens* Schltr. (*Podochilus rubens* Schltr.) *A. micrantha* Lindl., *A. Vieillardii* Rchb. f. and *A. australis* Schltr. (*Eria australis* Bail.) always have lateral inflorescences whereas others, viz. *A. cornuta* Bl., *A. cyclopetala* Schltr. (*Podochilus cyclopetalus* Schltr.) *A. congenera* Bl., *A. anceps* Bl., *A. Fenixii* (Ames) Schltr. (*Podochilus Fenixii* Ames) and *A. brachiata* Schltr. (*Podochilus brachiatus* Schltr.) have either lateral, adterminal, or only short terminal racemes.

There are also a few species, e.g. *A. rupestris* Ridl. and *A. malindangensis* (Ames) Schltr. (*Podochilus malindangensis* Ames), in which the characteristics of *Eu-Appendicula* are shown to a lesser degree, but nevertheless may be placed here.

In our Territory, I am acquainted with five species of the section, one of which, *A. reflexa* Bl., is a plant widely distributed elsewhere. It was described originally from Java, but now has been collected everywhere from the hinterland of India to New Guinea. Furthermore, from Dutch New Guinea there is a description of *A. callifera* J.J. Sm., a relative of *A. cornuta* Bl.

The species grow under very different conditions. Thus *A. torricelliana* Schltr. and *A. lamprophylla* Schltr. may be regarded as typical mist-forest epiphytes, their roots are embedded always in moss-pads, which hardly ever dry out in those regions. *A. reflexa* Bl., *A. cleistogama* Schltr. and *A. grandifolia* Schltr. are epiphytes of the mist-forests in the hill-country, the first two always growing together in large colonies. *A. grandifolia* Schltr. is observed mostly as isolated specimens on trees overhanging the banks of creeks.

1. *A. torricelliana* Schltr., sp. nov.

Epiphytica, pro genere pusilla, c. 24 cm alta, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, caulibus simplicibus, erectis vel suberectis, dense foliatis, teretibus, glabris, vaginis foliorum arcte amplexantibus omnino obtectis; foliis erecto-patentibus,

ovalibus, apice inaequaliter biapiculatis, glabris, 0.8–1.2 cm longis, medio vel infra medium 0.4–0.5 cm latis; racemis apicalibus, dense plurifloris, abbreviatis, foliis vulgo brevioribus, nunc aequilongis; bracteis patulis, oblongis, obtusiusculis vel apiculatis, ovario pedicellato paulo brevioribus; floribus in genere inter minores, erecto-patentibus, glabris; sepalis ovatis, obtusis, 0.2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis oblique ligulatis, obtusis, sepalis paulo brevioribus, basin versus paululo angustatis; labello quadrato-oblongo, obtusissimo cum apiculo obtuso, medio paululo angustato, 1.75 mm longo, supra basin et supra medium 1 mm lato, exappendiculato; columna perbrevis, subapoda, dente brevi carnoso in facie ante stigma; anthera late ovato-cucullata, obtuse triapiculata, glabra; pollinibus 6 oblique clavatis; ovario cum pedicello clavato, glabro, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20261, flowering in Sept. 1909.

In this plant there is evidently a pelorial formation as is often the case with *Chaunodesme*. In habit the specimen resembles a *Podochilus* species rather than any of the species of *Appendicula* in the Territory. One obtains a fair idea of it by imagining *A. pauciflora* Bl. with short apical, not lateral, inflorescences. The flowers at first are of a pale rose-red, turning yellowish later.

2. *A. cleistogama* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 50 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, plus minus flexuosis, teretibus, glabris, dense foliatis, vaginis foliorum omnino obtectis; foliis patentibus, oblongo-ellipticis, inaequaliter bilobulatis, glabris, 1.3–2 cm longis, medio fere 0.7–1 cm latis; racemis lateralibus, valde abbreviatis, 2–4-floris, quam folia pluries brevioribus; bracteis oblongis, apiculatis, ovario vulgo aequilongis nunc longioribus; floribus in sectione inter minimos, glabris, cleistogamis; sepalis ovato-oblongis, obtusis, 0.2 cm longis, lateralibus obliquis, basi margine anteriore dilatatis et cum pede columnae mentum breve obtusum formantibus; petalis oblique oblongis, obtusis, sepalis distincte minoribus; labello suborbiculari, basi concavo, cum lamella transversa brevi semiquadrata, apice cum apiculo amplo lobuliformi in laminam decurrente, 0.2 cm longo; columna brevi, apicem versus dilatata, pede distincto, clinandrio trilobato, erostri; anthera ovato-cucullata obtusiuscula; pollinibus oblique clavatis, basi rostrato-elongatis; ovario subsessili, clavato, glabro, 0.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Wobbe and the Kaulo Base, alt. c. 300 m—R. Schlechter no. 16479, flowering in Sept. [Ed.—possibly Aug.] 1907.

It is probable, but not certain, that this plant is identical with *A. reflexa* Bl. var. *cleistogama* J.J. Sm. which has been described from Dutch New Guinea, but it is certain that the species published here is not a cleistogamic form of *A. reflexa* Bl., with which it occurs often, but is a separate species. It is always possible to distinguish the two species even from a distance by the much shorter and more regular leaves of *A. cleistogama* Schltr. The lip is also broader and its broad, minute apex is striking. In drying, the species always becomes a reddish brown colour, which is never the case with *A. reflexa* Bl. Amongst the abundant material which I handled, I never found an open flower, whereas with *A. reflexa* Bl. flowering at the same time, never a cleistogamic one. The flowers are white.

3. *A. reflexa* Bl., Bijdr. (1825), p. 301.

var. neo-pommeranica Schltr. [Ed.—stat. et comb. nov.]

Podochilus neo-pommeranicus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 119.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20343, flowering in Sept. 1909; on trees in the forest at Wobbe, alt. c. 200 m—R. Schlechter no. 16325, flowering in July 1907; on trees in the forests at the foot of the Bismarck Range, alt. c. 150–250 m—R. Schlechter no. 18475, flowering in Oct. 1908; no. 18652, flowering in Nov. 1908; on trees in the forests of the

Bismarck Range, alt. c. 200 m—R. Schlechter no. 14063, flowering in Jan. 1902; on trees in the forests near Pema, alt. c. 200 m—R. Schlechter no. 19430, flowering in May 1909; on trees in the forests of the Maboro Range, alt. c. 800 m—R. Schlechter no. 19877, flowering in June 1909.

Neu-Pommern: On trees in the forests on the Karo River in the Beining Range, alt. c. 300 m—R. Schlechter no. 13690, flowering in Oct. 1901; on trees and on rocks in the forests between Cape Lambert and Massawa, alt. c. 50 m—R. Schlechter no. 13715, flowering in Nov. 1901.

I have decided after all to regard this plant as a variety of the widely distributed *A. reflexa* Bl. and hence with a tendency to variation. It is nearest the variety *cycloglossa* Schltr., described by me from the Celebes, but usually it has narrower and longer leaves, broader petals and a strikingly short basal portion of the lip. As in the Type, the flowers are whitish green with almost white petals and labellum.

4. *A. grandifolia* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 100 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosis; caulibus simplicibus, substrictis, teretibus, glabris, dense foliatis, vaginis foliorum arctissime amplexantibus omnino obtectis, basi c. 0.8 cm diametentibus; foliis erecto patentibus, ligulato-oblongis, oblique apiculatis, 7.5–12.5 cm longis, medio fere 1.4–2.8 cm latis, glabris; racemis lateralibus, erectis vel suberectis, dense multifloris, foliis multoties brevioribus; bracteis patulis, ovato-lanceolatis, apiculatis, ovario fere duplo brevioribus; floribus in sectione inter minores, erecto-patentibus, glabris; sepalis triangulo-ovatis, obtusis, 2.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata mentum triangulum obtusum c. 1 mm longum cum pede columnae formantibus; petalis oblique ligulato-oblongis, obtusis, glabris, sepalis paululo brevioribus; labello circuitu oblongo, obtuse apiculato cum gibbo minuto in apice, dimidio inferiore concavo, marginibus columnae pedi adnato, glabro, 2.75 mm longo medio fere 1.75 mm lato, lamella hippocrepiformi supra basin in medium ad margines decurrente, humili; columna brevi, rostello triangulo, exciso, mediocri, lamella humili leviter excisa ante stigma; anthera late triangula acuminata, glabra, basi cordata; pollinibus 6, oblique clavatis, inaequimagnis, stipitibus concavis oblancoatis, brevibus, glandula ovata antice acuta, minuta; ovario gracili, cylindrico, subsessili, 3.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the primary forests of Kelel, near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16234, flowering in July 1908. [Ed.—possibly 1907.]

This species is distinguished, from those related to *A. reflexa* Bl., by the large leaves. In the shape of the flowers it is reminiscent of *A. callifera* J.J. Sm., but the appendage on the lip, found in the species from Dutch New Guinea, is absent. The specimens which I found grew in the same forests in company with *A. reflexa* Bl. and *A. cleistogama* Schltr. By their vigorous growth and large leaves, they were recognisable readily from a distance as a different species. The colour of the flowers is also somewhat different, since the sepals here are yellowish and the other floral parts white.

5. *A. lamprophylla* Schltr., sp. nov.

Epiphytica, valida, erecta vel patula, usque ad 60 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, glabris, strictis vel substrictis, vaginis foliorum arcte amplexantibus omnino obtectis, c. 0.6 cm diametentibus; foliis subpatentibus, oblongis, obtusis, apice breviter excisis cum apiculo interjecto, lucidis, 3.5–5.5 cm longis, medio fere 1.9–2.3 cm latis; racemis lateralibus, patulis, brevibus, densius 10–15-floris, usque ad 2 cm longis, bracteis reflexis, oblongis, apiculatis, ovario duplo vel plus duplo brevioribus; floribus in sectione inter mediocres, glabris; sepalis ovatis, obtusis, 0.3 cm longis, lateralibus valde obliquis, basi margine anteriore lobato-dilatata cum pede columnae mentum conicum subacutum, 2.5 mm longum formantibus; labello circuitu subpandurato, apicem versus dilatato, obtusato cum gibbo minuto apicali, 0.5 cm longo, supra medium 2.75 mm lato, tertia parte basilari concava marginibus pedi columnae adnata, lamella triangulo-bicruri supra basin in margines infra medium decurrente, humili;

columna brevi, rostello triangulo mediocri, utrinque dente parvulo aucto, lamella ante stigma humili, leviter excisa; anthera late reniformi-cordata, acuta, glabra; polliniis 6, oblique clavatis, inaequimagnis, stipite bicruri brevi, glandula minuta, rotundata; ovario sessilibi, gracili, glabro, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20183, flowering in Sept. 1909.

This species is characterised by the smooth, very shiny leaves which are rounded at the apex. The flowers resemble those of *A. callifera* J.J. Sm., but the appendage in the middle of the lamina is absent. The anther is shorter and broader than in the related species. The flowers are greenish with white sepals and petals.

§ 2. *Chaunodesme*

I risked establishing this section to ensure a better division of the genus, although its boundaries are not separated as sharply from those of *Eu-Appendicula* as would seem desirable. I nevertheless found no difficulty in separating the groups, since divergent species were recognised always by the size of the flowers. In a general way I have arranged here those species which are grouped around *A. pendula* Bl. as the Type of the section. To the divergent species belong the first-mentioned, which are distinguished partly by the varying shape of the labellar-ridge and partly by the relatively large bracts.

The area of distribution extends from the hinterland of India across the Sunda Islands, the Moluccas, Philippines, New Guinea to Samoa in the south-seas, where *A. bracteosa* Rehb. f. (*Lobogyne bracteosa* Schltr.) is found as the most eastern sentinel, while the most western outpost is represented by a species of the section *Eu-Appendicula*.

The major species of the section, which thus are outside our Territory, are *A. lancifolia* Hook. f., *A. pendula* Bl., *A. pandurata* Schltr., *A. alba* Bl., *A. xythriophora* Rehb. f., *A. philippinensis* (Schltr.) J.J. Sm., *A. celebica* Schltr., *A. triloba* Schltr. (*Podochilus trilobus* Schltr.) and *A. bracteosa* Rehb. f.

However, in no region is such a development of the section found as in New Guinea. Here forms have developed which stand quite isolated, or which only show relationships to the species in the same region. From the Philippines we may expect novelties, but I think it improbable that forms will be found among them which will not approach, more-or-less, those already known. I have mentioned already the *Lobogyne* question in detail. I consider these forms merely a stage of certain species, some of which no longer occur in their normal forms, and this view may be shown in *A. bracteosa* Rehb. f.

The observations made previously must, however, not yet be considered as concluded. The separation and delimitation of the individual species appears to offer more difficulties in this section than in any other. I have compared often hundreds of specimens of individual species and found, strikingly, that they agreed. It was found usually that every newly visited mountain range always had its own peculiar species. If a species was found which had been collected already on another range, it always agreed perfectly in colour and shape with that species.

I have never found cleistogamic species which remained closed, but some species (also those apart from the *Lobogyne* Type), tend to suppress the formation of the rostellum, which in turn leads to the suppression of the viscid masses. Under such circumstances, self-pollination naturally follows, since the pollinia fall either on the surface of the stigma or are brought otherwise into contact with the overflowing stigmatic fluid.

The habitat conditions of the individual species are very different. Here we find representatives of the section also at all possible altitudes. Even if not in close proximity to the coast, we may meet the first species just a few kilometres inland, generally on trees along watercourses where the hills commence. Under such conditions one frequently finds *A. djamuensis* Schltr. and *A. pseudo-pendula* Schltr. The higher up the mountains we climb, the larger will the number of species become, until in the mist-forest zone, four or five species will be found close together. It is here that the most important, divergent forms are found; some species have become terrestrial and appear to thrive on the root-peat as well as their near relatives do on the moss-covered tree-trunks. Among the terrestrial species may be mentioned *A. dendrobioides* Schltr., *A. anomala* Schltr. and probably also *A. aberrans* Schltr. It is a striking fact that the epiphytic species grow almost always only on the perpendicular tree-trunks and very rarely on thick tree-branches. They seem to prefer a height of 3–5 metres above the ground. Besides the species already enumerated, there are recorded from Dutch New Guinea *A. palustris* J.J. Sm. and *A. penicillata* Bl. and, from British Papua, *A. Chalmersiana* F.v.M., the latter I regard as a species distinct from *A. pendula* Bl. From these two parts of New Guinea, we may expect with certainty many novelties belonging to this section.

6. *A. anomala* Schltr. [Ed.—comb. nov.]

Podochilus anomalus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 116.

Kaiser-Wilhelms-Land: In open clearings in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 14036, flowering in Jan. 1902.

At present I know only one species which seems to have any analogy in the structure of the flowers to this very peculiar plant, viz. *A. aberrans* Schltr., described below. Both species are distinguished by the fleshy, flat appendage of the lip, widened towards the back, and the relatively large bracts with irregular or split margins. These species belong to this section rather than to section *Chromatodesme*.

I did not find this species again during my last visit to the Bismarck Range.

7. *A. aberrans* Schltr., sp. nov.

Epiphytica vel subterrestris in truncis aborum, usque ad 40 cm alta; rhizomate adscendente, elongato vel brevi; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus vel parum ramosis, teretiusculis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, usque ad 3 mm diametentibus; foliis erecto-patentibus, linearibus vel lineari-ligulatis, oblique mucronulatis, glabris, 2.5–4 cm longis, medio fere 2–5 mm latis; racemis terminalibus, patulis, laxius 4–9-floris, usque ad 3.5 cm longis; bracteis rhombo-ovatis, acuminatis, margine minute dentato-laceratis, ovarium plus duplo superantibus; floribus in genere inter majores, glabris; sepalis ovatis, obtusis, 4.25 mm longis, lateralibus valde obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongoideum, obtusissimum, c. 3.5 mm longum formantibus; petalis oblique oblongis, truncato-obtusissimis, basin versus subdilatatis, 3.75 mm longis; labello obovato-spathulato, apice obtuse gibboso-apiculato, 0.6 cm longo, supra medium 0.3 cm lato, appendice basi unguiculata transversa marginem labelli utrinque superante e tertia parte basali basin versus spectante; columna brevi, rostello brevi, erecto, bidentato; anthera umbonata, perlate ovata, antice tridentata, glabra; pollinibus 6 falcato-obliquis, inaequimagnis, glandula parvula rotundata; ovario cylindraceo, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: At the base of tree-trunks in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18794, flowering in Nov. 1908.

This species is aberrant, as in the case of *A. anomala* Schltr., so that I was uncertain whether it was better to separate the two as an individual section. However, I abstained in order to avoid the establishment of too many small sections. *A. aberrans* Schltr. is recognised easily from *A. anomala* Schltr. by its much smaller leaves and the

more elegant, usually overhanging inflorescences. The flowers are white, with a rose-red spot on the apex of the sepals and petals.

8. *A. nivea* Schltr. [Ed.—comb. nov.]

Podochilus niveus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 120.

Kaiser-Wilhelms-Land: On trees in the forests of the ridges of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14462, flowering in Apr. 1902.

The most dainty species of the genus in our Territory. It is distinguished from all others by its very narrow leaves and the very delicate inflorescences. Likewise, the labellum, with its hook-shaped reflexed process, is very characteristic. I did not find the species again.

9. *A. carinifera* Schltr., sp. nov.

Epiphytica, gracilis, usque ad 60 cm alta; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel subsimplicibus, dense foliatis, teretiusculis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis numerosis erecto-patentibus, lineari-ligulatis, apice bidentatis cum mucrone, glabris, 1.5–3 cm longis, medio fere 2–4 mm latis; racemis terminalibus, patulis, subaxe 4–10-floris, usque ad 3.5 cm longis; bracteis ovato-lanceolatis, acutis, ovarium vulgo paulo superantibus; floribus patentibus in sectione mediocribus, glabris; sepalis ovatis, apiculatis, nervo medio carinatis, cum carinis in ovarium decurrentibus, 3.25 mm longis, lateralibus obliquis, basi margine anteriore lobato-ampliatis cum pede columnae mentum oblongoideum, obtusum, c. 2 mm longum formantibus; petalis oblique subfalcato-linearibus, obtusis, basin versus paululo dilatatis, sepalis paulo brevioribus; labello circuitu leviter pandurato-oblongo, apiculato, quarta parte basilari concavo, marginibus columnae pedi adnato, callo carnosio hippocrepiformi, dorso exciso supra basin medium versus in margines decurrente, labello toto 4.25 mm longo, supra basin 2.25 mm lato, supra medium 2 mm lato; columna brevi, pede gracili, (rostello in speciminibus abortu); anthera subreniformi, apiculata, utrinque cum dente laterali, glabra; pollinibus oblique falcato-clavatis, glabris; ovario subsessili, tricarinato, 0.4 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19631, flowering in May 1909.

In this and the two following species, *A. polyphylla* Schltr. and *A. kaniensis* Schltr., again we have three nearly related species which also agree well in habit. Of these, *A. carinifera* Schltr. has narrower leaves than the other two and differs, moreover, in the linear, tongue-shaped petals, thicker lip-callus and the anther. As regards the colour of the flowers, I noted: 'flowers white with violet-red tips and keels, labellum violet-red on the margin, the middle and the apex.'

10. *A. kaniensis* Schltr., sp. nov.

Epiphytica, erecta, gracilis, usque ad 50 cm alta; rhizomate brevi vel stoloniformi, decumbente, vaginis oblecto; radicibus filiformibus elongatis, flexuosis, villosis; caulibus teretiusculis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, simplicibus vel parum ramosis; foliis erecto-patentibus vel suberectis, ligulatis, oblique obtusiusculis, cum mucrone parvulo, 1.2–3.5 cm longis, medio fere 0.3–0.7 cm latis; racemis terminalibus, subaxe 5–10-floris, usque ad 3 cm longis; bracteis mox patentibus, lanceolatis, acuminatis, flores vulgo aequantibus; floribus in genere mediocribus, patentibus, glabris, illis *A. cariniferae* Schltr., similibus; sepalis ovatis, subacutis, glabris, 0.4 cm longis, lateralibus obliquis, acuminatis, basi margine anteriore dilatatis, mentum breve, obtusissimum cum pede columnae formantibus; petalis anguste ligulatis, obtusiusculis, obliquis, sepalis paululo sed distincte brevioribus; labello circuitu oblongo-subpandurato, obtusiusculo, carina hippocrepiformi dorso bifida e basi usque in medium labelli decurrente, labello toto 4.5 mm longo, supra basin et supra medium 2.5 mm lato; columna brevi cum pede facie longitudinaliter foveata, erostellata, anthera reniformi-cucullata, antice alte emarginata bicuspidata; pollinibus oblique clavatis inaequimagnis; ovario subsessili, cylindrico, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17180, flowering in Jan. 1908.

This species may be distinguished from *A. carinifera* Schltr. by the broader leaves, the sepals less sharply keeled on the outside, the much shorter mentum and the broader

labellum. Regarding the differences by which it is separated from *A. polyphylla* Schltr., I shall return to this in the description of the latter. The flowers are yellowish, the petals flushed with red.

11. *A. polyphylla* Schltr., sp. nov.

Epiphytica, erecta, 30–40 cm alta; rhizomate decumbente, breviusculo, vaginis imbricantibus oblecto; radicibus filiformibus, elongatis, flexuosis, villosis; caulibus strictis vel substrictis, simplicibus vel parum ramosis, teretiusculis, multifoliatis, glabris, vaginis arctissime amplectentibus omnino oblectis, 0.2 cm diametientibus; foliis erecto-patentibus vel suberectis, oblongo-ligulatis, minute et inaequaliter bilobulatis, cum mucrone minuto, 1–2.5 cm longis, medio fere 0.3–0.6 cm latis; racemis terminalibus, subdense 5–10-floris, usque ad 2 cm longis; bracteis mox patentibus, ovato-lanceolatis, acutis, ovarium vulgo paulo superantibus; floribus in genere mediocribus, patentibus, glabris, illis *A. cariniferae* Schltr. similibus; sepalis ovatis, apiculatis, 3.5 mm longis, lateralibus basi margine anteriore ampliatis, cum pede columnae mentum semiglobosum obtusissimum formantibus, nervo medio extus leviter carinato-incrassatis; petalis oblique ligulatis, subacutis, sepalis paululo brevioribus; labello circuitu elliptico, obtuso, antice margine irregulari, glabro, 0.4 cm longo, medio fere 2.75 mm lato, lamella hippocrepiformi dorso obscure 4-lobulata e basi usque in tertiam partem basilem decurrente, incrassatione tumidula, obscura, anguste elliptica in medio laminae labelli; columna brevi, apice breviter tridentata, pede breviusculo, rostello triangulo humili; anthera late ovato-cucullata, magniumbonata, apice utrinque apiculo falcato ornata; ovario sessili, glabro, c. 0.3 cm longo, cylindrico.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 19177, flowering in Jan. 1909.

In habit the plant is smaller than the two previous species and it differs considerably in the shape of the labellum. In the structure of the mentum it stands about midway between *A. carinifera* Schltr. and *A. kaniensis* Schltr. The keels on the lateral sepals have much weaker markings than in *A. carinifera* Schltr. The flowers are greenish yellow on the outside; the petals are tinged with red on the outside; the anther is yellow with a purple appendage.

12. *A. biumbonata* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 70 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, substrictis, teretibus, vaginis foliorum omnino oblectis, 0.3–0.4 cm diametientibus, dense foliatis; foliis erecto-patentibus, oblongis, obtusis, apice oblique subbilobulata cum apiculo, 4–6 cm longis, medio fere 1.3–1.7 cm latis; spicis terminalibus patulis, dense multifloris, elongatis, usque ad 7 cm longis; bracteis deflexis, oblongis, obtusis, glabris, ovario paulo brevioribus; floribus in sectione inter mediocres, patentibus, illis *A. pendulae* Bl. similibus, glabris; sepalis ovatis, obtusiusculis, c. 0.5 cm longis, lateralibus obliquis, basi margine anteriore valde ampliatis, cum pede columnae mentum oblongoideum, obtusum, 0.4 cm longum formantibus; petalis obliquis, late elliptico-spathulatis, obtusis, sepalis paululo brevioribus; labello e dimidio inferiore concavo angustiore, dimidio superiore subquadrato-dilatato, obtuse apiculato, in quarta parte anteriore superne umbonibus 2 semiorbicularibus juxtapositis ornato, lamella hippocrepiformi e basi usque in medium ad margines decurrente, tenui, labello toto 0.6 cm longo, infra medium 0.3 cm lato, supra medium 0.4 cm lato; columna brevi, erostellata; anthera subcordato-ovata, antice tridentata, umbone reniformi amplo ornata; polliniis oblique clavatis, inaequimagnis; ovario breviter pedicellato, clavato, glabro, 0.8 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17168, flowering in Jan. 1908.

On superficial inspection, this species hardly is to be distinguished in habit from *A. pendula* Bl. and some other related species, at all events in herbarium specimens. On closer examination, however, it will be seen that the labellum is shaped very differently; the horse-shoe-shaped keels are much broader, the process on the front of the lamina is shaped entirely differently from the pads in *A. pendula* Bl. Also, the broad-elliptical, spathulate, oblique petals, narrowing below, are different. The flowers are greenish yellow, with a purple-red column-foot.

var. *exappendiculata* Schltr., var. nov.

Differt a forma typica labello ovali, exappendiculato, columnae pede brevior.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 16662, flowering in Oct. 1907.

This plant evidently represents a pelorial variety, in which the labellum is transformed, and the column-foot, although developed, is somewhat shortened.

13. *A. djamuensis* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 80 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus simplicibus, substrictis, dense foliatis, teretiusculis, vaginis foliorum arcte amplexantibus omnino obtectis, 4–6 mm diametentibus; foliis erecto-patentibus, ellipticis vel oblongo-ellipticis, oblique obtusis, apice breviter excisis cum apiculo minuto, 3–4.5 cm longis, medio fere 1.5–1.8 cm latis; racemis apicalibus vel versus apicem caulibus lateralibus, patulis, dense multifloris, elongatis, usque ad 10 cm longis; bracteis reflexis, oblongis, obtusiusculis, ovario brevioribus; floribus in genere mediocribus, patentibus, illis *A. pendulae* Bl. similibus, glabris; sepalis ovatis, obtusis, c. 0.5 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliat, cum pede columnae mentum oblongoideum obtusum 0.4 cm longum formantibus; petalis obliquis, late ellipticis, antice obtusissimis, sepalis paulo brevioribus; labello circuitu oblongo, apice emarginato cum apiculo minuto calliformi-incrassato, tertia parte basilari concavo, lamella anguste hippocrepiformi e basi versus medium decurrente mox evanida, labello toto 0.6 cm longo, supra medium 3.5 mm lato; columnae brevi, erostellata, stigmatum humili; anthera ovato-subcordata, acuta, glabra; pollinibus oblique clavatis, subaequimagnis; ovario cum pedicello clavato, glabro, 0.6 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks at the Djamu Gorge, alt. c. 300 m—R. Schlechter no. 16602 [Ed.—possibly 16802], flowering in Nov. 1907.

Externally, this species also is remarkably like some specimens of *A. pendula* Bl. from Java. Here the differences are found also in the flowers, which have a longer mentum, broader petals and differently shaped labellum.

Species related to *A. pendula* Bl. are not distinguished readily in the dried state, thus it is necessary to carry out an accurate analysis of the flowers before making a determination of the species. The flowers are whitish, with petals and labellum red-bordered at the base, and a red anther.

var. *isoglossa* Schltr., var. nov.

Differt a forma typica, petalis spathulatis, labello exappendiculato, spathulato-elliptico, columnae apoda, ante stigma gibbo conico ornata.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 16565, flowering in Sept. 1907.

Probably also a pelorial form, but which represents the *Lobogyne*-stage completely. The column-foot is suppressed completely and on the front of the column the stigma appears as a fleshy conical plug. A rostellum is not developed and the anther, therefore, as in almost all such cases, is bipartite in front.

14. *A. concava* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus simplicibus, substrictis vel leviter flexuosis, teretiusculis, bene foliatis, 2–3.5 mm diametentibus, vaginis foliorum omnino obtectis; foliis erecto-patentibus, oblongis, obtusis, apice oblique et brevissime bilobulatis cum apiculo minuto, 2.5–3.5 cm longis, medio fere 0.6–1.2 cm latis; racemis terminalibus, demum patulis, subdense multifloris, elongatis, usque ad 5 cm longis; bracteis oblongis, apiculatis, ovario brevioribus, reflexis; floribus in genere mediocribus, patentibus, glabris, illis *P. penduli* Bl. similibus; sepalis ovato-triangulis, obtusis, extus minute apiculatis, 0.4 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliat, cum pede columnae mentum oblongoideum obtusissimum, 2.5 mm longum formantibus; petalis perlate ovato-ellipticis, obtusis, sepalis paulo brevioribus; labello circuitu oblongo, obtuso, medio vix constricto, dimidio inferiore valde concavo, lamella longe et anguste hippocrepiformi e basi usque in medium decurrente et evanescente, labello toto vix 0.5 mm longo, 0.3 mm lato; columnae brevi,

erostellata, apice breviter tridentata; anthera late ovato-cucullata, dorso callo satis alto donata, antice minute tridentata, glabra; polliniis oblique clavatis, inaequimagnis; ovario cum pedicello brevi clavato, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17204, flowering in Jan. 1908.

In habit this species is related most closely to *A. pseudo-pendula* Schltr. It is easy to recognise by the labellum, which is strongly concave in the lower half, in contrast to other related species, and by the very broad petals. The flowers are yellow, the petals and labellum red-bordered at the base with the column-foot red.

15. *A. pseudo-pendula* Schltr., [Ed.—comb. nov.]

Podochilus pseudo-pendulus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 122.

Appendicula papuana Krzl., in K. Schum. et Laut., Nachtr. [1905], p. 125.

Epiphytica, erecta vel patula, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, strictis vel subflexuosis, teretiusculis, dense foliatis, glabris, vaginis foliorum omnino obtectis, 2.5–3 mm diametientibus; foliis erecto-patentibus, oblongo-ligulatis, obtusis, inaequaliter et minute bilobulatis cum apiculo minuto, 3–4.5 cm longis, medio fere 0.7–1.2 cm latis; racemis terminalibus lateralibusve, sublaxe multifloris, elongatis, pendulis, usque ad 20 cm longis; bracteis reflexis, ellipticis, acutis, ovario bene brevioribus; floribus in sectione mediocribus, patentibus, glabris, illis *A. pendulae* Bl. similibus; sepalis ovatis, obtusis, 3.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-ampliatis, cum pede columnae mentum oblongoideum obtusum 2.5 mm longum formantibus; petalis subfalcatis, elliptico-spathulatis, apice triangulis, obtusiusculis, sepalis paulo brevioribus; labello e basi oblonga medio dilatato, tertia parte anteriore obscure trilobato, lobo medio quadrato, calloso-apiculato, lateralibus obtusissimis, multo minoribus, lamella hippocrepiformi bene elevata e basi labelli ad margines infra medium decurrente, labello toto 0.5 cm longo, medio fere 0.3 cm lato; columna brevi, rostello triangulo, satis alto, breviter exciso, basi utrinque dente aucto; anthera ovato-cordata, apice minute 3-lobulata; ovario cum pedicello clavato, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20293, flowering in Sept. 1909; on tree-trunks in the mountain forests of Kelel, alt. c. 500 m—R. Schlechter no. 16330, flowering in July 1907; on trees in the forests of the Bismarck Range, alt. c. 700 m—R. Schlechter no. 13937, flowering in Jan. 1902; at Simbang near Finschhafen—Nyman no. 826; on tree-trunks in the mountain forests near Pema, on [Mount] Gomadjidji (Goromia), on the Waria [River], alt. c. 250–350 m—R. Schlechter no. 19402, flowering in May 1909.

All the numbers enumerated belong to species described earlier by myself and by Kränzlin, and I compared them with the Type of the latter in the Berlin Herbarium. I have described the species here again, since neither my own diagnosis, nor that of Kränzlin agrees in certain respects with my more recent observations. For instance, the lip was by no means properly described, since in the anterior third it is distinctly three-lobed.

As also in other species, the inflorescences sometimes appear to be lateral, but the shoots always end with a raceme. It appears to have little in common with *A. bifaria* Lindl., which Kränzlin compared the plant with. It belongs to the 'form-circle' of *A. pendula* Bl.

My notes on the colour of the flowers state: 'flowers white, sepals slightly green on the outside; petals, labellum and column bordered with red.'

var. *cryptostigma* Schltr., var. nov.

Differt a forma typica petalis late et oblique ovalibus, labello late ovali, omnino exappendiculato, columna facie apice alte bilobata, lobis stigma obtegentibus, pede abbreviato.

Kaiser-Wilhelms-Land: On trees alongside creeks in the primary forests of Wobbe,

on the Mudjene [River], alt. c. 300 m—R. Schlechter no. 16254, flowering in July 1907.

This pelorial variety is reminiscent of the variety *exappendiculata* of *Appendicula biumbonata* Schltr., being constructed quite similarly. Our variety differs from the Type in its broad petals, labellum and column. In the latter, the foot is shortened and in front of the stigma there are two erect lobules, which can be recognised only as such by the small cleft or split in the stigma. The lamellae or lobules have here, like the middle-tooth in front of the stigma in the *Lobogyne*-forms, the purpose of preventing, as much as possible, the pollinia from falling downwards. I cannot see why they should be regarded as rudimentary anthers, since they appear to me simply as fleshy tubercles, in which no traces of a vascular bundle is to be found.

16. *A. tenuispica* Schltr. [Ed.—comb. nov.]

Podochilus tenuispicus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 124.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16727, flowering in Oct. 1907; on trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 13974, flowering in Jan. 1902; on tree-trunks in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19171, flowering in Jan. 1909.

A very easily recognised species which is distinguished by the rachis of the raceme being rather markedly spiral. The colour of the flowers is also rather uncommon for a species in our Territory, viz. pale pink with a darker spot on the petals. The species does not seem to be very plentiful, and is confined evidently to the central parts of Kaiser-Wilhelms-Land.

17. *A. lutea* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 40 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus simplicibus, plus minus flexuosis, dense foliatis, teretiusculis, vaginis foliorum arcte amplexentibus omnino obtectis, 1.5–2 mm diametientibus; foliis erecto-patentibus, lanceolato-ellipticis, acutatis, apice ipso bidentatis cum apiculo satis longo, margine (apice tantum) minute serrato-denticulatis, 1.5–2.5 cm longis, infra medium 3.5–6 mm latis; racemis terminalibus, vulgo patulis, subdense 10–15-floris, usque ad 2.5 cm longis; bracteis reflexis, lanceolatis, apiculatis, ovario subduplo brevioribus; floribus in sectione inter minores, patentibus, glabris; sepalis late ovatis, obtusis, 2.5 mm longis, lateralibus valde obliquis, basi margine anteriore valde ampliatis, cum pede columnae mentum oblongoideum obtusissimum, c. 2 mm longum formantibus; petalis oblique ligulatis, obtusis, sepalis distincte brevioribus; labello circuitu oblongo, antice rotundato, obtuse apiculato, 3.5 mm longo, c. 2 mm lato, basi lamella bicurvi, dorso calcariformi-complicata, cruribus sensim divergentibus in medium laminae decurrentibus et evanescentibus ornato, basi concavo; columna brevi, erostellata; anthera reniformi, antice biapiculata, umbone reniformi callifero ornata; ovario cum pedicello clavato glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18577, flowering in Nov. 1908.

On superficial inspection one could be inclined to mistake this plant for *A. tenuispica* Schltr., but this is contradicted in the first place by the yellow flowers. Furthermore, the raceme is denser with a straight, rigid rachis, and it differs completely in the labellum. The yellow of the flowers may be called almost golden yellow. The labellum has two brownish spots.

18. *A. fallax* Schltr., sp. nov.

Epiphytica, erecta, 25–30 cm alta, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, strictis vel substrictis, dense foliatis, teretiusculis, glabris, vaginis foliorum arcte amplexentibus omnino obtectis, 2–2.5 mm diametientibus; foliis erecto-patentibus, lanceolatis, acutatis, apicem versus margine minute serrulato-denticulatis, apice ipso breviter triaristatis, 2–3.5 mm longis, medio vel infra medium 0.5–0.8 cm latis; racemis terminalibus, patulis, subaxe 10–15-floris, usque ad 3 cm longis; bracteis reflexis, lanceolatis, acutis, ovario vulgo

subaequilongis; floribus patentibus, in sectione inter minores, glabris; sepalo intermedio oblongo-ovato, obtuso, 0.4 cm longo, lateralibus subacutis, intermedio aequilongis, antice basin versus valde ampliatis, cum columnae pede mentum oblongoideum obtusissimum 0.3 cm longum formantibus; petalis oblique sublineari-ligulatis, obtusis, sepalis paulo brevioribus; labello circuitu oblongo, antice paulo dilatato, obtusato cum apiculo calliformi, dimidio inferiore concavo, e basi appendice quadrato-hippocrepiformi, dorso truncato, sensim ad margines in medium labelli decurrente et evanescente, labello toto 5.5 mm longo, supra medium 0.3 cm lato; columna brevi, rostello erecto, triangulo, breviter exciso, stigmatibus antice exciso; anthera ovato-cordata, obtusiuscule acuminata, dorso gibbo parvulo donata; pollinibus oblique clavatis, inaequilongis, stipite cucullato, antice sensim attenuato, pollinibus paulo brevioribus, glandula parvula elliptica; ovario cum pedicello brevi subclavato-cylindraceo, glabro, 0.3–0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19074, flowering in Jan. 1909.

A plant with few well-marked characteristics, standing about midway between *A. flava* Schltr. and *A. flaccida* Schltr. It differs from both in the shape of the labellum, but approaches more closely *A. flaccida* Schltr. which has broader petals, a more conical mentum and smaller flowers. *A. oblonga* Schltr., described below, belongs likewise to this relationship. *A. fallax* Schltr. has white flowers with red spots on the lip, similar to those in *A. flaccida* Schltr.

19. *A. flaccida* Schltr. [Ed.—comb. nov.]

Podochilus flaccidus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 117.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–900 m—R. Schlechter no. 14342 (TYPE), flowering in Apr. 1902; no. 20311, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1200 m—R. Schlechter no. 16737, flowering in Oct. 1907; on trees in the forests of the Finisterre Range, alt. c. 900–1000 m—R. Schlechter no. 17996, flowering in July 1908; no. 19180, flowering in Jan. 1909.

An extremely characteristic species which always is recognised easily by the shape of the lip and the colour; pale yellow with red spots on the labellum.

var. *lobogyne* Schltr. [Ed.—nom. et stat. nov.]

Lobogyne papuana Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 126.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Torricelli Range, alt. c. 700–1000 m—R. Schlechter no. 14490, flowering in Apr. 1902; no. 20113, flowering in Sept. 1909.

I have described fully this plant previously. J.J. Smith has, without doubt, stated correctly that it is a pelorial variety of *A. flaccida* Schltr.

The no. 14710, listed from Neu-Mecklenburg at the time, must be the pelorial form of a species, the Type of which is unknown. For *A. neo-hibernica* it is, in my opinion, too large.

20. *A. neo-hibernica* Schltr., sp. nov.

Epiphytica, gracilis, erecta vel patula, 15–25 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, strictis vel substrictis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis, c. 2 mm diametentibus; foliis erecto-patentibus, lanceolatis vel elliptico-lanceolatis, acutatis, apice minute excisis cum apiculo setiformi, 1.5–2 cm longis, medio vel infra medium 2.5–4 mm latis; racemis terminalibus, subaxe multifloris, elongatis, usque ad 8 cm longis; bracteis reflexis, lanceolatis, acutis, glabris, ovario fere duplo brevioribus; floribus in sectione inter minimos, patentibus, glabris; sepalis ovatis, obtusiusculis, 0.2 cm longis, lateralibus valde obliquis, basi margine anteriore lobato-ampliatis cum pede columnae mentum conicum obtusum rectum 2.5 mm longum formantibus; petalis oblique oblongo-ligulatis, obtusis, basin versus margine anteriore paulo ampliatis, sepalis paulo brevioribus; labello e basi angusta late cuneato, antice subito rotundato et in apicem brevem obtusum lobuliformem exeunte, appendice

basali hippocrepiformi, basin labelli omnino obtegente, labello toto 0.3 cm longo, supra medium 2.75 mm lato; columna brevi, pede gracili perlongo, rostello erecto ligulato-triangulo alto; ovario graciliter pedicellato, glabro, 0.4 cm longo.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14706, flowering in July 1902.

I had placed the above number previously under the description of *Podochilus flaccidus* Schltr., and based entirely on specimens from the Torricelli Range. I realize now, that the plant from Neu-Mecklenburg is quite a well-separated species, which has not only much smaller flowers, but also differs in its remarkably long mentum and, above all in the labellum which is very narrow at the base, and broadly wedge-shaped towards the front. I unfortunately made no notes at the time regarding the colour, since I then regarded the plant as *Podochilus flaccidus* Schltr.

21. *A. oblonga* Schltr., sp. nov.

Epiphytica, erecta, c. 20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus simplicibus, strictis vel substrictis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obectis; foliis erecto-patentibus, oblongo-ligulatis, obtusiusculis, apice inaequaliter et minute bilobulatis cum apiculo minuto setiformi, 2–3.3 cm longis, medio fere 0.6–0.9 cm latis; racemis terminalibus vel versus apicem caulibus lateralibus, patulis, 6–7 cm longis, subaxe multifloris; bracteis reflexis, lanceolatis, acuminatis, ovario subduplo brevioribus; floribus patentibus, in sectione vix inter mediocres, glabris; sepalis ovatis, 3.5 mm longis, intermedio obtusiusculo, lateralibus subacutis, valde obliquis, basi margine anteriore lobato-ampliatas, mentum oblongoideum obtusum 0.3 cm longum formantibus; petalis oblique oblongis, obtusis, sepalis paululo brevioribus; labello circuitu oblongo, antice obtuse apiculato, basi concavulo, lamella hippocrepiformi e basi in medium decurrente et evanescente, cruribus subparallelis, labello toto 0.5 cm longo, 2.5 mm medio lato; columna brevi erostellata; anthera reniformi, antice excisa, umbone reniformi ornata; ovario pedicellato clavato, glabro, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18560, flowering in Oct. 1908.

This species looks exceedingly like *A. flaccida* Schltr., but has a quite differently shaped labellum. The colour of the flowers is also different, being yellow-green with red-bordered petals and large red streaks in the middle and on the margins of the lip.

22. *A. humilis* Schltr., sp. nov.

Epiphytica, erecta, humilis, 15–25 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, strictis vel substrictis, bene foliatis, teretiusculis, vaginis foliorum omnino obectis, 2–3 mm diametentibus; foliis subpatentibus vel erecto-patentibus, lanceolato-ligulatis, apice bidentatis cum apiculo setiformi interjecto, 3–5 cm longis, medio vel infra medium 0.5–1.2 cm latis; racemis terminalibus, patulis, subdense 10–20-floris, usque ad 3 cm longis; bracteis mox reflexis, oblongis, obtusis, ovario pedicellato multo brevioribus, floribus in sectione mediocribus, patentibus, glabris; sepalis oblongis, minute apiculatis, 0.5 cm longis, lateralibus valde obliquis, basi margine anteriore lobato-ampliatas, mentum oblongoideum obtusum dorso obliquum 0.4 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusis, basi paulo decurrentibus, supra medium paululo dilatatis, sepalis paulo brevioribus; labello circuitu oblongo-subpandurato supra medium dilatato, obtusissimo, 0.8 cm longo, supra medium 0.4 cm lato, lamella hippocrepiformi supra basin, cruribus lyrato-curvatis ad margines supra medium decurrentibus, gibbo minuto superne in apice laminae; columna brevi, rostello mediocri, bidentato; anthera ovato-cordata, acuminata, umbonata; polliniis oblique clavatis, inaequimagnis, stipite gracili, bicurvi, polliniis aequilongo, glandula minuta, rotundata; ovario cylindraceo, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20089, flowering in Sept. 1909.

This species is distinguished from its relatives by its compact growth and rather long leaves. In the latter character it approaches *A. dendrobioides* Schltr. The flowers are white-yellow, the petals and labellum white, the latter with red markings in the middle.

23. *A. dendrobioides* Schltr. [Ed.—comb. nov.]

Podochilus dendrobioides Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 117.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600–700 m—R. Schlechter no. 14325, flowering in Apr. 1902; no. 20029, flowering in Sept. 1909.

This species is related very closely to *A. palustris* J.J. Sm., but it appears to differ in the deeper emargination in the apex of the leaf-sheaths. My best specimen, sent to me by the author, is more robust, but otherwise it is strikingly like my species. It is evident, as often happens in New Guinea, that this is one of a series of very closely related species; *A. calcicola* is another one. In habit the species is very reminiscent of some *Dendrobium* species.

24. *A. calcicola* Schltr., sp. nov.

Terrestris vel subepiphytica, erecta, 45–70 cm alta, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus erectis, strictis vel substrictis, simplicibus, bene foliatis, teretibus, glabris, vaginis foliorum arcte amplexentibus omnino obtectis, supra basin 0.3–0.4 cm diametentibus; foliis erecto-patentibus, lanceolatis, acutatis, apice breviter bilobulatis cum apiculo minuto interjecto, 5–9 cm longis, infra medium 1–2.3 cm latis, vaginis apice margine profunde emarginatis; racemis terminalibus vel rarius lateralibus, patulis, subduplo multifloris, elongatis, usque ad 7 cm longis; bracteis reflexis, oblongis, obtusis, ovario subduplo brevioribus; floribus in sectione mediocribus, illis *A. dendrobioidis* Schltr. similibus, patentibus, glabris; sepalis ovatis, obtusis, vix 3.5 mm longis, lateralibus obliquis, basi margine anteriore bene dilatatis, cum pede columnae mentum oblongoideum obtusum, 2.75 mm longum formantibus; petalis oblique sublineari-ligulatis, obtusis, basi paulo decurrentibus, sepalis paulo brevioribus; labello circuitu oblongo-cuneato, antice subtruncato-obtusato cum apiculo parvulo, medio margine utrinque plica parvula prosiliente ornato, 0.5 cm longo, infra apicem 3.25 mm lato, lamella bicruri, basi anguste hippocrepiformi, e basi cruribus leviter divergentibus supra medium paulo dilatatis usque infra apicem laminae decurrentibus; columna brevi, pede apice concavo, rostello parvulo, bidentato; anthera reniformi-cucullata obtusiuscule et breviter apiculata; polliniis oblique clavatis, subaequimagnis, stipitibus oblique oblanceolatis, polliniis subaequilongis; glandula parvula, rotundata; ovario cum pedicello gracili, cylindraceo, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On limestone rocks and at the foot of trees on the ridges of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17977, flowering in July 1908.

This species, growing abundantly on coral limestone, has a strong attachment to it. It shows great similarity to *A. dendrobioides* Schltr. and *A. palustris* J.J. Sm., but has a shorter mentum, narrower petals and a more cuneate labellum, broad in front, a shorter rostellum and a differently shaped pollinarium. The leaf-sheaths are more similar to those of *A. palustris* J.J. Sm. The flowers are yellow-green, with red-bordered petals, a labellum red in its lower half and pale yellow in its upper half.

25. *A. Steffensiana* (Schltr.) J.J. Sm., in Nova Guinea VIII (1908) [1909], p. 119, t. XL, no. 134.

Podochilus Steffensianus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 124.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14423, flowering in Apr. 1902; no. 20161, flowering in Sept. 1909; on trees in the forests of the mountain country of Asai, alt. c. 700 m—R. Schlechter no. 17712, flowering in May 1908.

J.J. Smith considers it possible that this plant might prove identical with *A. penicillata* Bl. This certainly is not the case since *A. penicillata* Bl. is a much smaller plant with differently shaped, blunt leaves, and an entirely different labellum. There is not the slightest doubt that this species belongs to the same relationship, but the deep fold at the base of the lip-callus is absent, and the hairiness is entirely different. Moreover, in habit this species is very similar to *A. floribunda* Schltr. which I had described previously as *Podochilus floribundus* Schltr.

§ 3. *Pododesme*

In a general way, the species of this section are related closely to those of the previous section in respect to the structure of the flowers, but always differ in their inflorescences, which show a tendency to branch and which are provided at the base with a long stalk bearing bracts only.

In this section I place the following species: *A. undulata* Bl., *A. elegans* Rchb. f., *A. effusa* Schltr., *A. purpurascens* Bl., *A. infundibuliformis* J.J. Sm. and *A. cristata* Bl., all found in the Malacca Peninsula and the Sunda Islands. From our region, I have to add *A. polystachya* Schltr. and a second somewhat doubtful species, *A. isoglossa* Schltr., as the only representatives of the section in German New Guinea. Furthermore, from Dutch New Guinea *A. applicata* J.J. Sm. has been described; if its published illustration is quite correct, it may be different from my *A. polystachya*.

The flowers in this section are generally of a dark cherry-red colour, although more rarely yellow or greenish flowers occur. In contrast to the species of the section *Chaunodesme*, the mentum here is not so pronounced, except in the case of *A. undulata* Bl. A distinct mentum is always present, although not in a sac-like or spur-like shape. *A. undulata* Bl. also differs in habit from the other species and has been arranged here only temporarily as a doubtful, anomalous species.

26. *A. polystachya* Schltr. [Ed.—comb. nov.]

Podochilus polystachyus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 121.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji in the Waria Valley, alt. c. 450 m—R. Schlechter no. 19911, flowering in June 1909; on trees in the forests of [Mount] Dscheregi (in the Waria District), alt. c. 400 m—R. Schlechter no. 17413, flowering in March 1908.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 400 m—R. Schlechter no. 14664, flowering in July 1902.

The specimens from the Waria District agree so well with the Type from Neu-Mecklenburg that I did not hesitate to consider them identical, only in the colour do I find some differences; whereas the specimens from Neu-Mecklenburg have green flowers with a white labellum and violet column, the flowers of the specimens from the Waria Valley are flushed with red on the outside, and with a cherry-red lip.

27. *A. isoglossa* Schltr., sp. nov.

Epiphytica, erecta vel patula, usque ad 70 cm longa; rhizomate valde abbrevito; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, substrictis, teretiusculis, dense foliatis, vaginis foliorum omnino obtectis, c. 3 mm diametentibus; foliis erecto-patentibus, oblongo-ligulatis, obtusis, apice minute excisis cum apiculo minuto, 4.5–5.5 cm longis, medio fere 1–1.6 cm latis; paniculis terminalibus pedunculatis, basi vaginis pluribus obsessis, usque ad 18 cm longis, ramis subaxe 10–15-floris, erecto-patentibus; bracteis patentibus, ellipticis, acutis, ovario fere aequilongis; floribus erecto-patentibus, illis *A. polystachyae* Schltr. paulo minoribus, glabris; sepalis ovatis, obtusiusculis vel acutiusculis, vix 0.3 cm longis, lateralibus obliquis, basi margine anteriore paulo ampliatis, cum pede columnae mentum breve obtusum formantibus; petalis oblique ovatis, obtusiuscule acutatis, glabris, sepalis paulo minoribus; labello circuitu ovato, obtusiusculo, basi concavo, intus basi callo parvulo antice bilobo ornato, sepalis subaequilongis, infra medium 1.75 mm lato; columna brevi, latere utrinque in dentem conicum producta, rostello brevi triangulo, lamella transversa carnosa, bilobata ante stigma; anthera late ovato-cordata, antice breviter excisa, latiumbonata, glabra; polliniis inaequimagnis oblique clavatis; ovario cylindrico, glabro, sessili, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17500, flowering in March 1908.

Here I was faced with a peculiar dilemma. Should I regard these definite pelorial plants simply as a variety of *A. polystachya* Schltr., or as pelorial forms of a particular species? I have decided finally on the latter course, because in the first place I do not

know of *A. polystachya* Schltr. in the area where I found this plant, and secondly I found certain differences in the structure of the leaves, the bracts, the colour of the flowers and the breadth of the petals, which made it advisable to keep the plant separate at present. The colour of the entire flower is cherry-red.

58. *Cyphochilus* Schltr.

All the genera of *Podochilinae* dealt with so far were distinguished by the possession of a more-or-less strongly elongated, erect rostellum and an erect anther. The genus *Cyphochilus* Schltr. following on here is in marked contrast to those with a deeply concave rostellum on which rests a blunt, fairly broad, anther. The whole structure of the column is strikingly reminiscent of the genus *Eria* Lindl., however, only six pollinia and a very distinct viscid gland are present. The pollinarium separates the genus also from *Appendicula* Bl., since the pollinia are situated directly on the viscid disc after the manner of the *Glomerinae*. On the basis of these characteristics, I would, almost, have been tempted to place the genus with the latter group if the labellum had not reminded me of a closer relationship with *Appendicula* Bl. The structure of the lip undoubtedly bears a very close resemblance to *Appendicula* Bl., but in all species differs in the link between the column-foot and the labellum, the attachment being by means of a narrow claw, as in *Podochilus* Bl. All species have in common this peculiarity, viz. that the lip is widened in front and ends in two, more-or-less large lobes. The appendages of the lip consist of a callus with a free posterior margin bicrural towards the front, on which, anteriorly, there is a tubercle. The two crura are separated by a more-or-less broad furrow which is covered always on the inside with fine hair.

Had I only been able to procure one species of this form, I might, perhaps, have hesitated in establishing a new genus, but since I know no less than seven species, with this extremely characteristic structure of column and lip, as well as the same characteristic habit, I could have no doubt that we are dealing here with one of those typical Papuan genera which, with our growing knowledge of this interesting flora, has filled us so often with surprise.

Cyphochilus Schltr., gen. nov.

Sepala ovata vel oblonga, subpatentia, lateralibus obliqua, basi margine anteriore vulgo paulo ampliata, cum pede brevi columnae mentum obtusum breve formantia. Petala erecto-patentia, sepalis subaequilonga sed multo angustiora, vulgo oblique lineari-ligulata. Labellum pedi columnae ungue tenui affixum, e basi cuneata in laminam plus minus late bilobatam dilatatum, ad basin laminae genuflexo-porrectum, callo bicruri dorso cucullato-concavo intus minute puberulo ornatum cruribus depressis apicem versus dilatatis in laminam decurrentibus antice rotundatis, callo vel apiculo intermedio anteposito. Columna brevis, cum pede pro tribu perbrevis, semiteres, glabra, apice biauriculata, rostello depresso altius emarginato. Anthera late cordata antice obtusa, brevis, dorso vulgo gibbo donata. Pollinia 6, oblique pyriformia, brevia, ternis coalitis glandulae satis amplae sine stipite affixis. Stigma reniforme vel semiglobosum, apertum, antice haud lamella protectum. Ovarium rectum cylindricum sessile, perigonio vulgo haud longius.

Suffrutices terrestres, rigidiusculi, pluricaules, pedales et ultra, e basi simplici superne ramosis, ramis plus minus arcuato-divergentibus, dense foliatis; foliis bifariis, ellipticis vel lanceolatis, articulatis, vaginis arcte caulem amplexentibus; floribus in racemis paucifloris apicalibus, pro tribu satis magnis, bracteis nunc parvulis nunc majoribus. Species 7 adhuc notae insulae Papuae indigenae.

I have given my detailed reasons already for establishing this new genus which, as such, differs considerably from *Appendicula* Bl. through identical distinguishing features in all species.

Apart from the six species mentioned here, I am familiar with only one other from Dutch New Guinea, *C. bilobus* (J.J. Sm.) Schltr. (*Appendicula biloba* J.J. Sm.).

As it appears, the separate species are distributed rather locally. Every mountain range has its own species. Generally, the *Cyphochilus* species are inhabitants of

humus-rich places on open, wind-exposed ridges of the rain-forest where they grow mixed with other true shrubs, especially *Rubiaceae*, *Annonaceae* and *Myrsinaceae*, and are difficult to recognise instantly as orchids. Nevertheless, I found a species, *C. collinus* Schltr., in the Waria Valley on hills 400 m high, which is far below the mist-forest formation, in similar exposed locations growing in root-peat in company with other orchids, the closer relatives of which do not normally descend to that level. *C. parvifolius* Schltr. I found as a small shrub among the springs in the deep shadows of the hill-forests, always on stones or rocks and *C. rivularis* Schltr. only on the banks of mountain creeks, on steep, almost vertical walls which would be inundated during floods.

From this description of the habitat of *Cyphochilus* species it should be apparent why they have the stiff, often almost wire-like stems and branches, which surely have some increased breaking resistance.

1. *C. parvifolius* Schltr., sp. nov.

Terrestris, erectus, pluricaulis, ramosus, 30–45 cm altus; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus ramisque gracilibus, curvatis, rigidulis, dense foliatis, vaginis arcte amplexantibus omnino obtectis; foliis erecto-patentibus, elliptico-ligulatis, apice minute bidentatis, cum apiculo minuto intermedio, 1.2–2 cm longis, medio fere 2.5–5 mm latis, glabris; racemis apicalibus abbreviatis, vulgo ut videtur unifloris, basi vaginulis paucis bracteiformibus obsessis; bractea ovato-lanceolata, acuminata, ovario brevior; floribus in genere inter minores, porrectis; sepalis oblongis, apiculatis, glabris, 0.6 cm longis, lateralibus obliquis, subapiculatis, basi margine anteriore paulo ampliatis cum pede columnae mentum obtusum breve formantibus; petalis oblique linearibus, acuminatis, infra apicem paululo dilatatis, glabris, sepalis subaequilongis; labello e basi cuneato-unguiculata dimidio superiore in laminam late reniformem bilobulatam margine leviter subcrenulato-undulatam subito dilatato, 0.7 cm longo, lamina supra basin 0.7 cm lata, appendice supra basin cucullato in lamellas 2 intus basi puberulas apicem versus dilatatas rotundatas usque in basin laminae productas exeunte, gibbo puberulo obscuro utrinque in tertia parte basali unguis intus juxtaposito, callo oblongo mediano in apice laminae; columna semitereti, glabra, auriculis amplis obtusatis; anthera late ovato-cordata, obtusa, glabra, dorso gibbo obtuso donata; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On rocks and stones in deep places and springs in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19531, flowering in May 1909.

I found large numbers of this species growing together, but only one normal flower. The rest were all damaged by gall-wasps and therefore not available for examination. The species is distinguished very well from all others by its small leaves. In the shape of the lip it comes nearest to *C. montanus* Schltr. The flowers are greenish white with a white labellum.

2. *C. rivularis* Schltr., sp. nov.

Terrestris, erectus, fruticulosus, rigidiusculus, ramosus, 50–70 cm altus, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, puberulis; caulibus ramisque erectis vel erecto-patentibus, rigidulis, dense foliatis, teretiusculis, vaginis foliorum omnino obtectis; foliis erecto-patentibus linearibus vel lineari-lanceolatis, acutatis, apice bidentatis cum apiculo minuto intermedio, 2.3–3.5 cm longis, infra medium 0.2–0.4 cm latis; racemis apicalibus abbreviatis, paucifloris, foliis fere duplo brevioribus; bracteis lanceolatis, acutiusculis, ovario fere aequilongis; floribus in genere inter mediocres, erecto-patentibus; sepalis oblongis, apiculatis, glabris, c. 0.5 cm longis, lateralibus obliquis, basi margine anteriore paululo ampliatis, cum pede columnae mentum dilatatis dimidio inferiori minute puberulis antice rotundatis usque in medium laminae apicalis decurrentibus, callo conico parvulo in medio laminae anteposito; columna brevi, apicem versus paulo dilatata, glabra, auriculis brevibus; anthera reniformi-cordata, subacuta, glabra; pollinibus oblique pyriformi-clavatis, glandula late elliptica satis ampla; ovario cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On steep loamy embankments on the banks of Govidjoa Creek in the Dischore Range [Waria District] alt. c. 1200 m—R. Schlechter no. 19737, flowering in June 1909.

In its floral structure this species stands close to *C. parvifolius* Schltr., but differs externally in its long, narrow leaves. On closer inspection, the flowers show important deviations. The petals are broad and blunt, the labellum is similar in shape, but the callus is longer in front and the side-pieces are provided with a conical appendage in the middle; moreover the depression between the two lobes is much deeper in front. The auricles of the column are shorter, and the foot narrower. The colour of the flowers is yellow-green.

3. *C. latifolius* Schltr., sp. nov.

Terrestris, erectus, pluricaulis, ramosus, rigidulus, c. 50 cm altus; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus ramisque erectis vel erecto-patentibus, rigidis, dense foliatis, teretiusculis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, ellipticis vel lanceolato-ellipticis, apice inaequaliter bidentatis, cum apiculo vel mucrone parvulo, 5–8 cm longis, medio vel infra medium 1.5–2 cm latis, glabris; racemis apicalibus vel versus apices ramorum lateralibus, brevibus, foliis brevioribus, paucifloris; bracteis vaginisque lanceolatis, obtusiusculis, ovario vix aequilongis vel brevioribus; floribus in genere mediocribus, erecto-patentibus; sepalis oblongis, obtusiusculis, glabris, 5.5 mm longis, lateralibus obliquis, basin versus margine anteriore paulo ampliatis, cum pede columnae mentum obtusum, breve formantibus; petalis oblique spatulato-ligulatis, obtusis, apice oblique truncatis, glabris, sepalis paulo brevioribus; labello e basi oblongo-unguiculata dimidio superiore in laminam late reniformem, antice excisam, bilobatam, margine subcrenulatam expanso, 0.7 cm longo, lamina infra medium 7.5 mm lato, callo cucullato supra basin bicruri, cruribus bene latis, medio paulo attenuatis antice rotundatis, basi dense puberulis usque infra medium laminae decurrentibus, gibbo parvulo oblongo obtuso in medio laminae anteposito; columna brevi, apicem versus dilatata, brachiis brevibus, pede brevi; anthera subreniformi-cordata, obtusiuscula, glabra; ovario cylindrico, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On steep, loamy banks on the Govidjoa Creek in the Dischore Range [Waria District] alt. c. 1000 m—R. Schlechter no. 19766, flowering in June 1909.

This species grows under similar conditions to *C. rivularis* Schltr., but may be recognised easily externally by its large, broad leaves. In habit it reminds one more of *C. montanus* Schltr., but has broader leaves than the latter, more spatulate petals and, in its details, well distinguished by the labellum. Unfortunately, I did not at the time obtain much material of the species, since I believed initially that the plant was identical with *C. collinus* Schltr., but it has an entirely different-shaped labellum. The flowers are yellowish with a white lip.

4. *C. montanus* Schltr. [Ed.—comb. nov.]

Podochilus montanus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 119.

Kaiser-Wilhelms-Land: In open clearings in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 14023, flowering in Jan. 1902.

When I described this species in 1905 I had only defective, damaged floral material. In the meantime amongst my duplicates I have discovered a flower which gives a much better picture of the floral structure. Since it became apparent that the initial description was in error on certain points I am now giving a further description.

Flores in genere mediocribus, erecto-patentibus; sepalis oblongis apiculatis, glabris, c. 0.5 cm longis, lateralibus obliquis, basi margine anteriore ampliatis, mentum obtusum, breve formantibus; petalis oblique ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi oblongo-unguiculata dimidio superiore subito in laminam latissime reniformem, leviter bilobatam, antice leviter emarginatam cum apiculo obtuso, margine subundulatam dilatato, callo supra basin cucullato in crura 2 semiovata dimidio inferiori puberula antice obtusa, usque ad basin laminae producto, gibbo conico intermedio in basi laminae anteposito, labello toto 0.5 cm longo, lamina supra basin 6.5 mm lata; columna brevi, auriculis brevibus, glabra, pede brevi; anthera subreniformi, obtusiuscula; ovario cylindrico, glabro, 0.5 cm longo.

The colour of the flowers is pale yellow. Unfortunately, I did not find this interesting species again during my last journey.

5. *C. anemophilus* Schltr., sp. nov.

Terrestris, erectus, ramosus, pluricaulis, usque ad 100 cm altus, rigidiusculus; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus ramisque erectis vel erecto-patentibus, dense foliatis, rigidulis, vaginis foliorum omnino obtectis; foliis lanceolatis, acutatis, apice minute bilobulatis cum apiculo setiformi, 4.5–8 cm longis, infra medium 0.6–1.6 cm latis; racemis terminalibus, foliis fere aequilongis, vaginis bracteisque lanceolatis, acutis, glabris, ovario aequilongis vel paulo longioribus; floribus in genere inter majores, erecto-patentibus; sepalis oblongis, 6.5 mm longis, intermedio apiculato, lateralibus submucronulatis, obliquis, basi margine anteriore paulo ampliatis, cum pede columnae mentum obtusum breve formantibus; petalis lineari-ligulatis, apice subtruncato-obtusatis, obliquis, sepalis subaequilongis; labello circuito late cuneato, antice obtuse bilobato cum apiculo obtuso interjecto, 0.8 cm longo, infra apicem 0.7 cm lato, callo cucullato, conico supra basin in crura 2 intus basi puberula semi-oblonga obtusa usque ad tertiam partem apicalem labelli producta, gibbo conico obtuso parvulo anteposito; columna brevi, auriculis brevibus, pede perbrevis; anthera late ovata, obtusiuscula, glabra; pollinibus oblique pyriformibus, subaequimagnis, glandula subquadrata, ampla; ovario cylindraco glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: Between grass and small shrubs on the ridges of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16641 (TYPE), flowering in Oct. 1907; on exposed locations on the ridges of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19163, flowering in Jan. 1909.

Together with *C. collinus* Schltr., this species is distinguished from the others by its labellum which widens gradually towards the front so that the marked separation between claw and lamina seen in others is not possible. Closely related to *C. anemophilus* Schltr. is also *C. bilobus* (J.J. Sm.) Schltr., a species from Dutch New Guinea already referred to above, but which seems to differ in the labellum and in the broader petals. I will return to the differences from *C. collinus* Schltr. below. The flowers of *C. anemophilus* Schltr. are yellow-green, with a white labellum, red in the centre.

6. *C. collinus* Schltr., sp. nov.

Terrestris, erectus, fruticosus, rigidulus, pluricaulis, 45–70 cm altus, ramosus; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus ramisque erectis vel erecto-patentibus, bene foliatis, teretibus, rigidulis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, lanceolatis, acutatis, apice minute bilobulatis cum apiculo minuto, 5–7.5 cm longis, infra medium 0.8–1.4 cm latis; racemis paucifloris vulgo foliis brevioribus, terminalibus; vaginis bracteisque lanceolatis, acutis, ovario fere aequilongis; floribus in genere inter minores, erecto-patentibus, albidis; sepalis ovato-oblongis, acutis vel subacuminatis, glabris, 0.5 cm longis, lateralibus obliquis, basi margine anteriore paulo ampliatis, cum pede columnae mentum obtusum, breve formantibus; petalis oblique linearibus, acutis vel apiculatis, sepalis subaequilongis; labello cuneato, antice bilobato-emarginato cum apiculo parvulo interjecto, 5.5 mm longo, 3.5 mm lato, callo bicruri intus puberulo supra basin, cruribus antice vix dilatatis rotundatis, usque ad tertiam partem apicalem decurrentibus, gibbo conico antice interposito; columna brevi, auriculis amplis, pede brevi; anthera reniformi-cordata, obtusa, glabra, cum umbone cordato; pollinibus oblique pyriformibus inaequimagnis, glandula ampla quadrata; ovario cylindrico, glabro, c. 5 cm longo.

Kaiser-Wilhelms-Land: In root-peat in exposed locations and steep slopes of [Mount] Gomadjidji in the Waria Valley, alt. c. 450 m—R. Schlechter no. 19370, flowering in May 1909.

Here we have another species related to *C. anemophilus* Schltr. from which it is, nevertheless, distinguished by its smaller flowers, by the pointed narrow petals, the much narrower labellum and by the pollinia. Externally, the species bears a great similarity to *C. anemophilus* Schltr. and *C. montanus* Schltr. from the Bismarck Range. The colour of the flowers is somewhat uniformly whitish.

59. *Lectandra* J.J. Sm.

This genus has a peculiar history. Its Type was first described and illustrated by J.D. Hooker in 'Icones Plantarum' t. 2097 in January 1892 as *Agrostophyllum pauciflorum*. Ridley, who himself collected the plant repeatedly in the Malayan States, and who also observed it for a time under culture in the Botanic Gardens at Singapore, decided that it could not possibly remain in the genus *Agrostophyllum* and so he described it again, more precisely as *Eria minutiflora* Ridl. (in 'Journ. Linn. Soc. Bot.' XXXII (1894), p. 299). Later on he realized correctly that it would be better to regard it as a separate genus, *Poaephyllum*, which he accordingly established in his 'Materials for a Flora of the Malayan Peninsula', p. 108, in the year 1908, where he arranged it beside *Agrostophyllum*. However, in the meantime J.J. Smith had found the plant in Java and had published it as *Lectandra parviflora* J.J. Sm. gen. nov., sp. nov., overlooking its identity with *Agrostophyllum pauciflorum* Hook. f. whereby *Lectandra* has priority over *Poaephyllum*. The plant, therefore, must be known as *Lectandra pauciflora* (Hook. f.) Schltr. The position of the genus was established correctly in the *Podochilinae* by J.J. Smith.

When, in 1905, I dealt with the orchids of my first New Guinea collection, I described a plant which I called, provisionally, *Eria podochiloides* Schltr., because I knew that it was related closely to *Eria minutiflora* Ridl. I then published a comment (in K. Schum. et Laut., Nachtr., [1905], p. 182) in which I emphatically stated: 'In habit this species resembles *Eria minutiflora* Ridl. chiefly. Meanwhile I place it in this genus, although I am convinced it will not remain there permanently. Further observation on living material is required before the question is finally decided.' Although the name *Lectandra* J.J. Sm., as well as *Poaephyllum* Ridl., was given for *E. minutiflora* Ridl., Kränzlin felt himself constrained to rename my species which I had compared with it (*E. minutiflora* Ridl.) and called it *Trichotosia podochiloides* Krzl. That this species belongs to *Lectandra* will be clear to every one who compares my fairly detailed description.

In this *Lectandra podochiloides* Schltr. we had the first representative of the genus from New Guinea. During my last journey, I collected a second species, *L. tenuipes* Schltr., of which I also have seen material from British Papua, collected in the vicinity of Milne Bay.

The two *Lectandra* species endemic to New Guinea are related closely to each other and in habit very much like *Lectandra pauciflora* (Hook. f.) Schltr., but are distinguished by the labellum, which has at its base a finely haired callus with a definitely free posterior margin.

In the structure of the column, the genus shows a certain degree of conformity with *Cyphochilus* Schltr., but in *Lectandra* J.J. Sm. there are always eight pollinia and in *Cyphochilus* only six, as indicated above. One of the two species in question, *L. tenuipes* Schltr., is known to me only from the eastern part of the Territory, where it is found partly on trees, or on rocks in the hill-country between 250–600 m altitude. *L. podochiloides* Schltr., however, is an epiphyte of the mist-forest zone, where I always collected it only on the trunks of trees along the mountain creeks. So far I have found it only on the Torricelli Range.

1. *L. podochiloides* Schltr. [Ed.—comb. nov.]

Eria podochiloides Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 182.

Trichotosia podochiloides Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1911), p. 136.

Kaiser-Wilhelms-Land: On trees alongside streams in the Torricelli Range, alt. c.

800–900 m—R. Schlechter no. 14367, flowering in Apr. 1902; no. 20108, flowering in Sept. 1909.

The specimens collected in both 1902 and 1909 showed the eight pollinia always tightly compressed to four with an imperfect viscid disc, whereas in the species *L. tenuipes* Schltr., the eight pollinia are freer, together with a distinct viscid disc, similar to that in *Cyphochilus* Schltr. I think that I am right in assuming that the latter form of the pollinarium is the normal one for the genus.

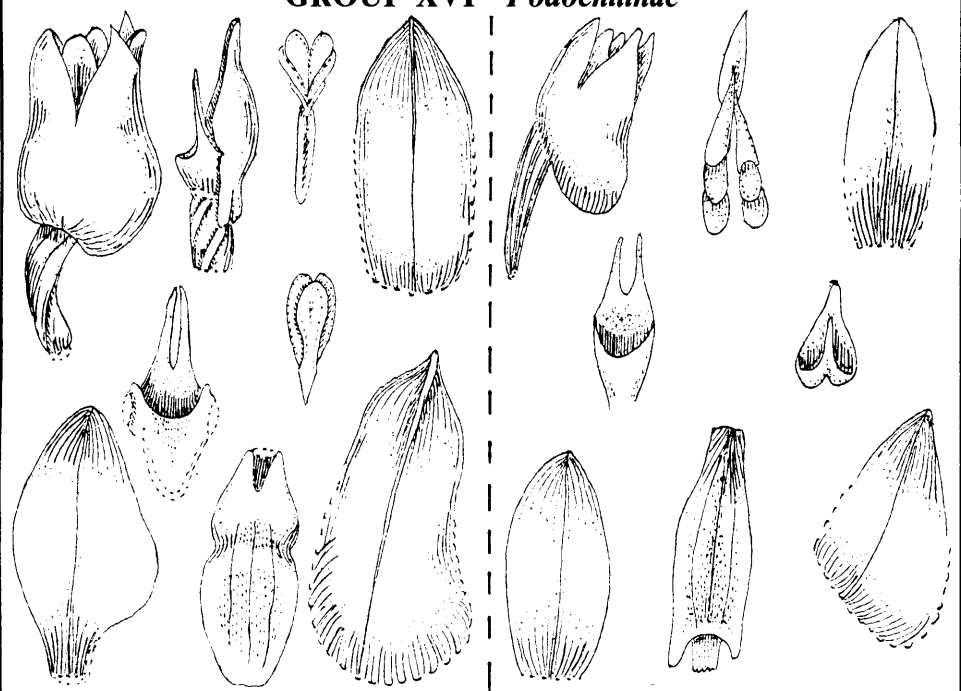
2. *L. tenuipes* Schltr., sp. nov.

Epiphytica, patula, usque ad 60 cm longa, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus simplicibus, strictis vel plus minus flexuosis, paulo compressis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis erecto-patentibus, linearibus, acutatis, apice inaequaliter bidentatis cum mucrone parvulo interjecto, 2.5–4 cm longis, medio fere 2.5–3.5 mm latis; racemis tenuissimis sensim elongatis, flexuosis, patentibus, usque ad 9 cm longis, pedunculo et rhachi filiformibus; bracteis minutis, squamiformibus, ovatis, ovario multoties brevioribus; floribus illis *L. podochiloidis* Schltr. similibus, succedaneis, c. 0.3–0.4 cm distantibus; sepalis oblongis, acutis, 0.4 cm longis, glabris, lateralibus obliquis, basi margine anteriore paulo ampliatis, cum pede columnae mentum obtusum, breve formantibus; petalis oblique lineari-ligulatis, obtusis, glabris, sepalis paululo brevioribus; labello circuitus oblongo-ligulato, obtusiusculo, dimidio inferiore concavo, dimidio superiore margine utrinque 2-plicato, subtrilobulato, 0.4 cm longo, supra basin 0.2 cm lato, apicem versus paululo angustiore, callo oblongo retrorso in tertia parte basilari minute puberulo, callo minuto elliptico superne infra apicem; columna semitereti, apice paulo dilatata, facie minute puberula; anthera subquadrato-cucullata, antice truncata; polliniis 8, oblique clavatis, inaequimagnis, glandulae satis magnae quadratae affixis; ovario subsessili, gracili, glabro, 3.5 mm longo.

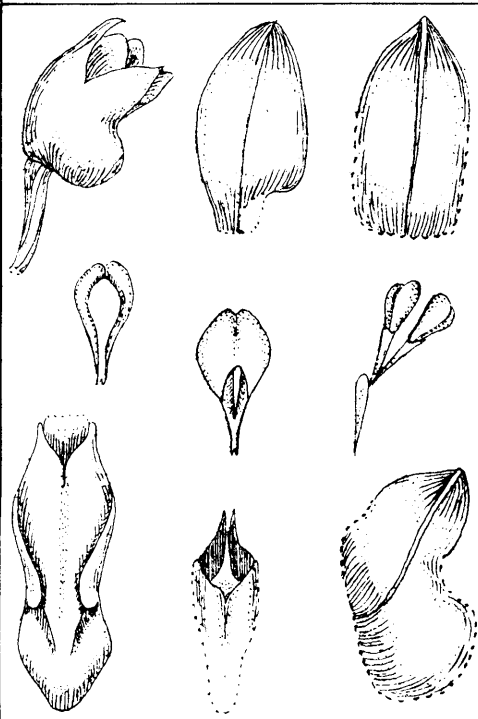
Kaiser-Wilhelms-Land: On trees and rocks on [Mount] Gomadjidji (Goromia), in the Waria District, alt. c. 350–450 m—R. Schlechter no. 17392, flowering in Mar. 1908; no. 19383, flowering in May 1909.

Apart from the locations mentioned here, I have seen the plant also in the Mt. Dscheregi region at about 600 m altitude. As I have mentioned already above, this species is reported also from the Milne Bay region of British Papua. It belongs to those orchids found flowering throughout the year, because as in *L. podochiloides* Schltr., the whole inflorescence always gradually develops further at the apex and continues to produce one new flower at a time until it has attained a length up to about 9 cm, requiring for this, according to my estimate, certainly more than a year, perhaps several years. Compared to *L. podochiloides* Schltr. this species possesses a longer inflorescence and the labellum is completely different. The flowers are white with pink spots on the labellum.

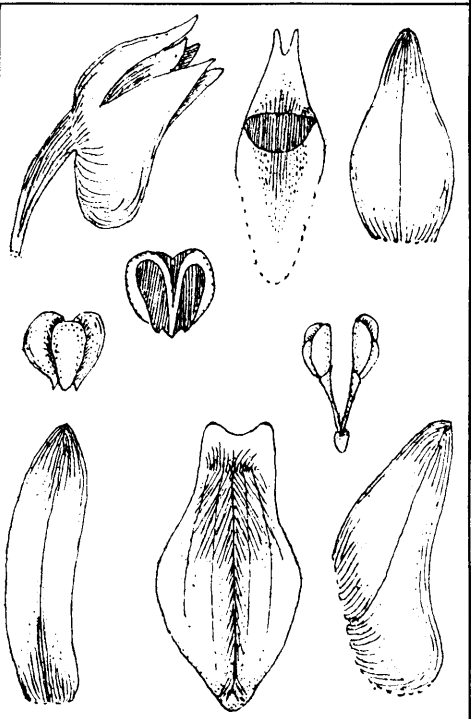
GROUP XVI *Podochilinae*



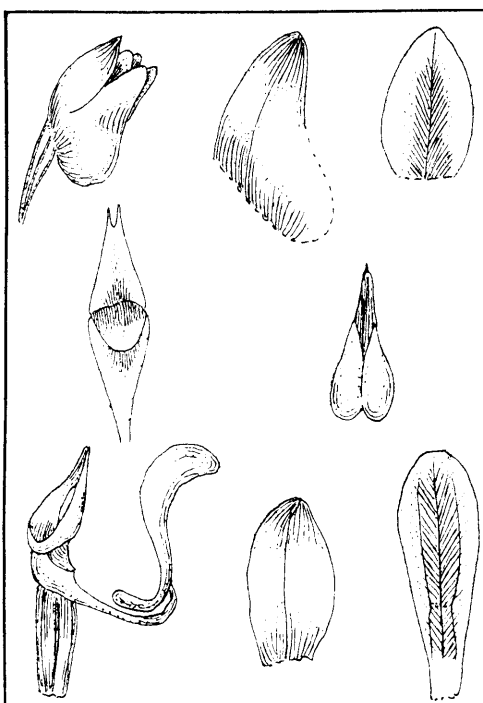
Podochilus scalpelliformis Bl.



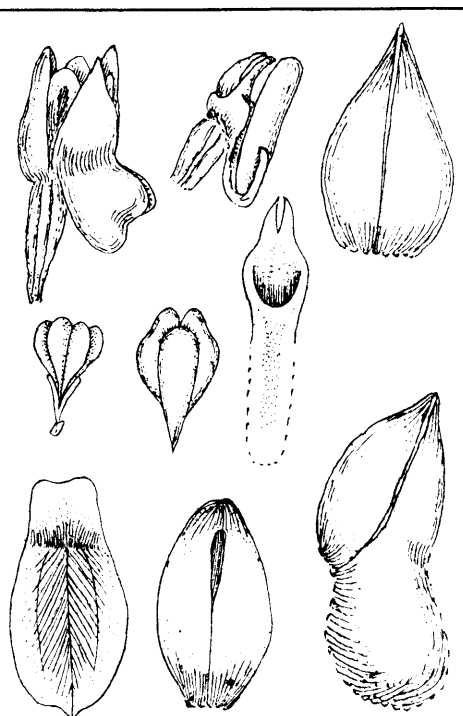
Podochilus imitans Schltr.



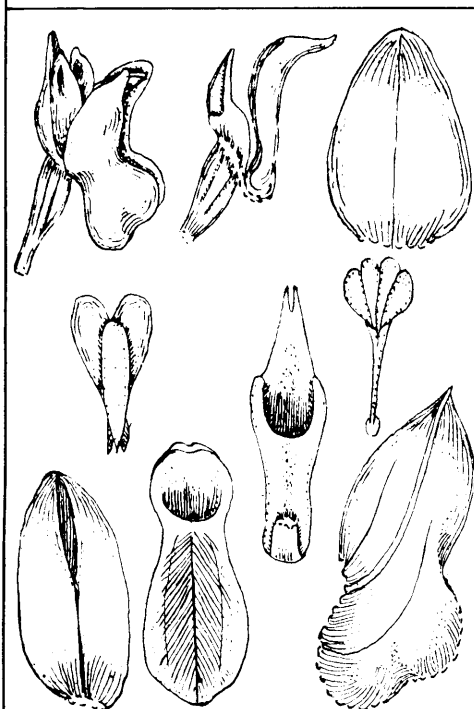
Podochilus smithianus Schltr.



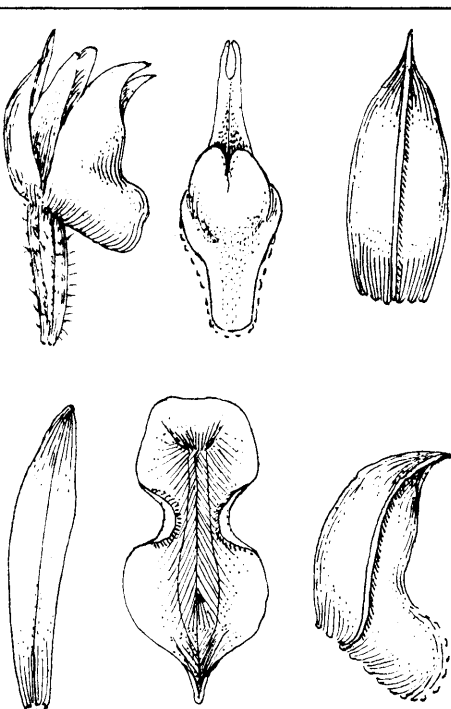
Podochilus Hellwigii Schltr.



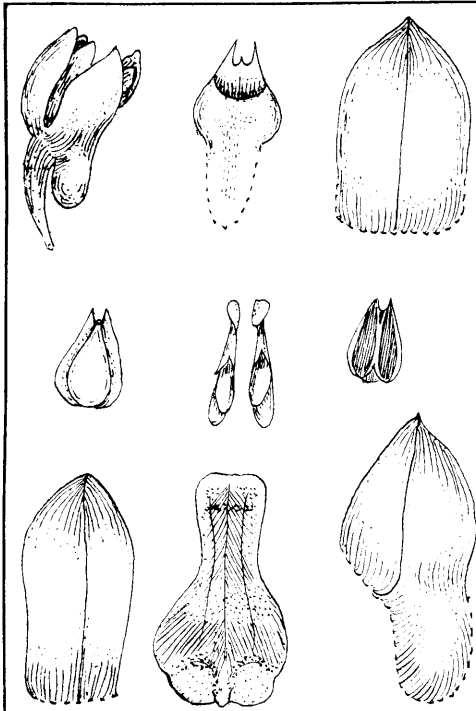
Podochilus bimaculatus Schltr.



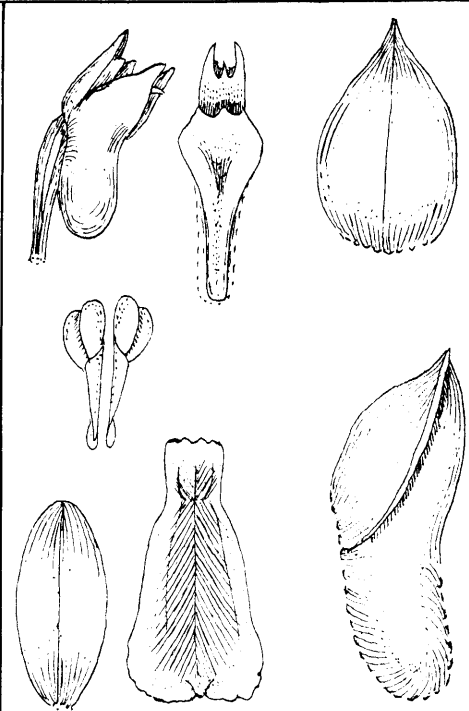
Podochilus wariatus Schltr.



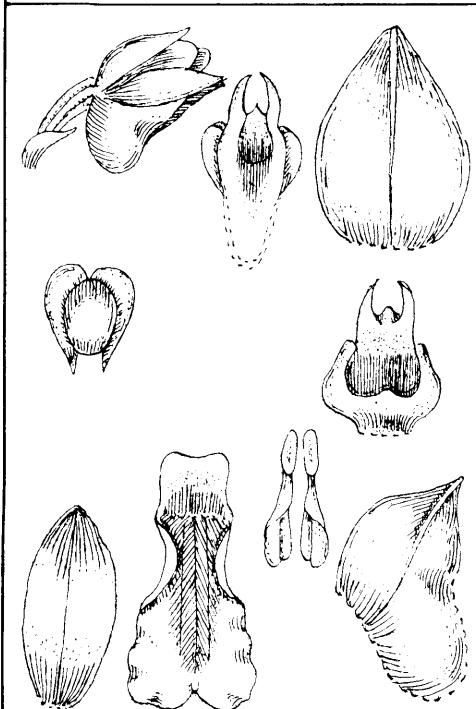
Podochilus trichocarpus Schltr.



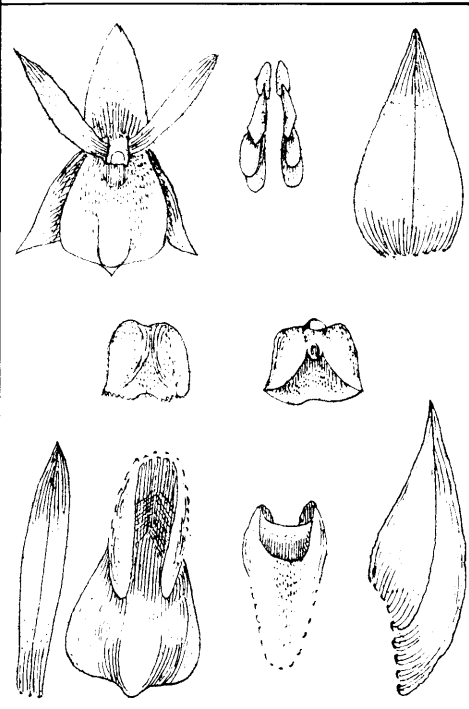
Podochilus polytrichoides Schltr.



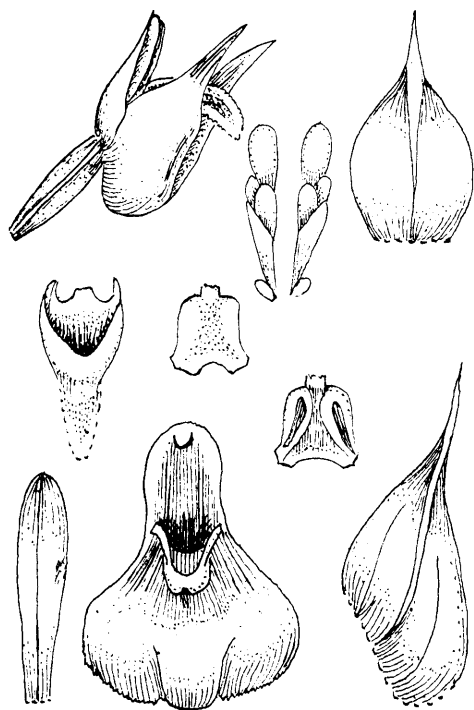
Podochilus muscosus Schltr.



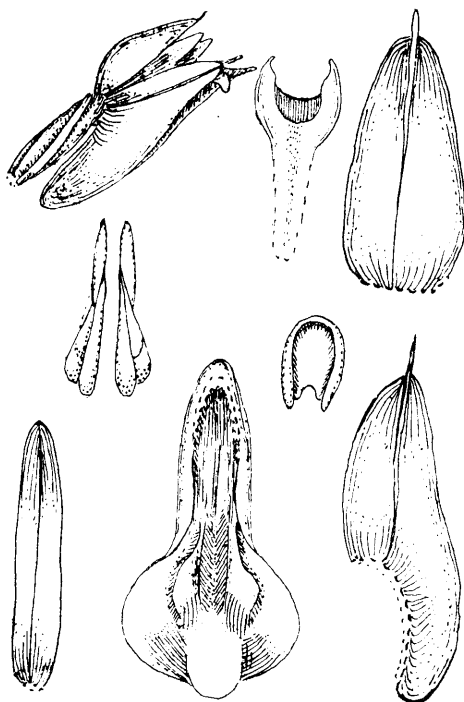
Podochilus filiformis Schltr.



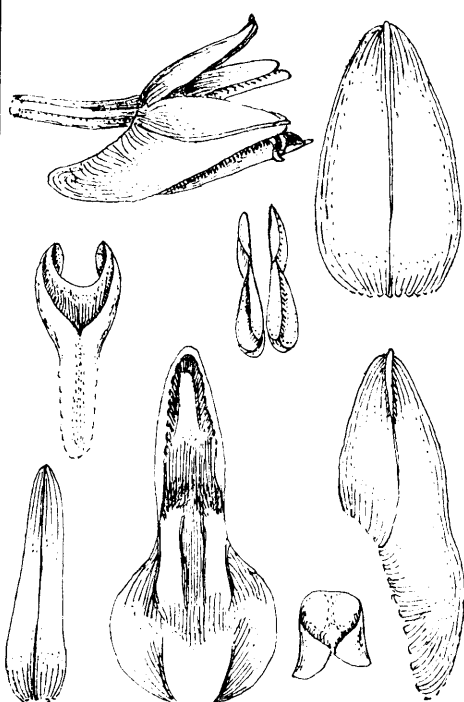
Chilopogon distichum Schltr.



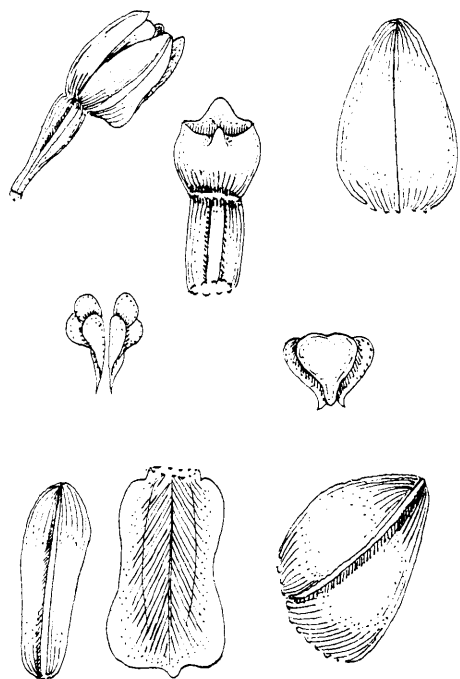
Chilopogon oxysepalum Schltr.



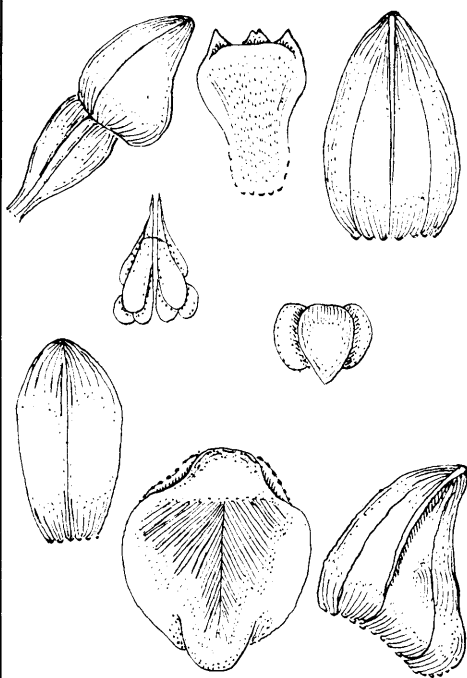
Chilopogon bracteatum Schltr.



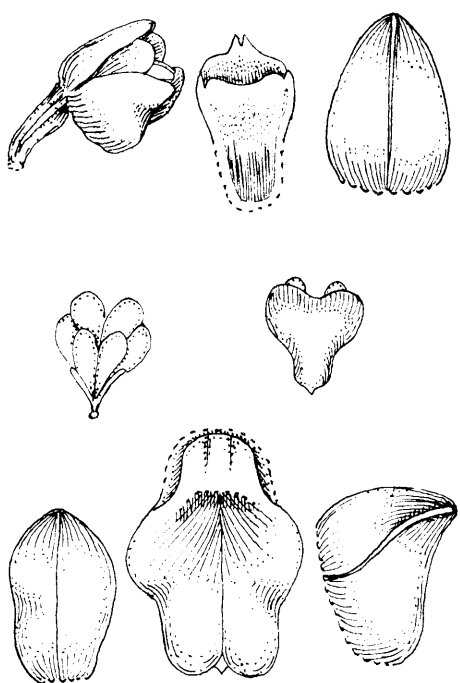
C. bracteatum var. *warianum* Schltr.



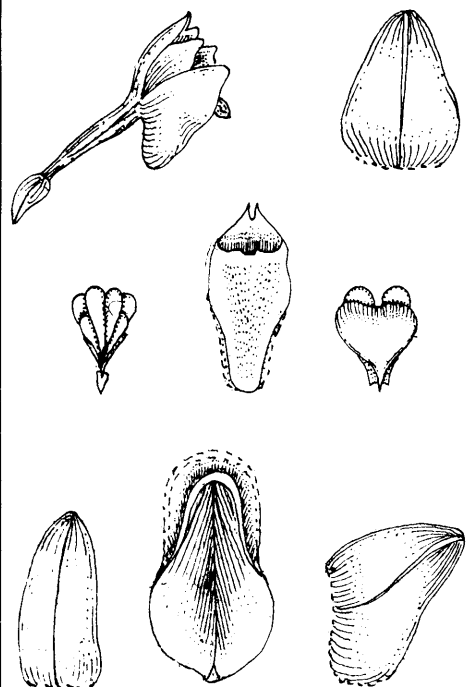
Appendicula torricelliana Schltr.



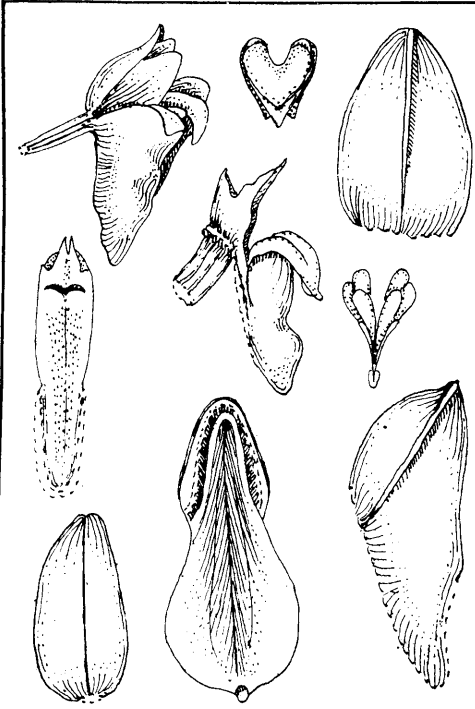
Appendicula cleistogama Schltr.



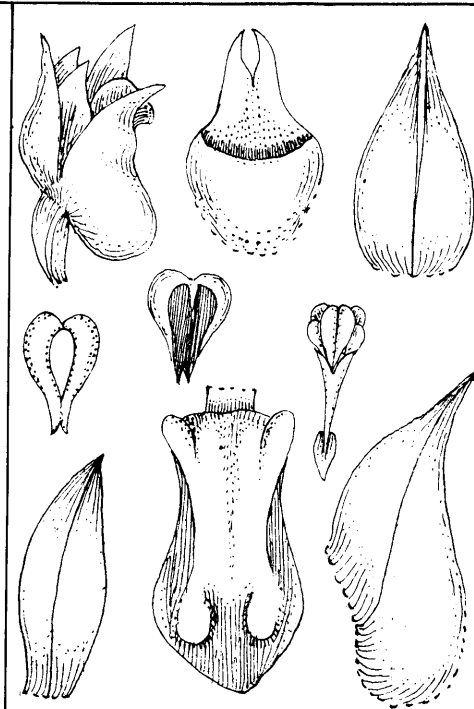
A. reflexa var. *neo-pommeranica* Schltr.



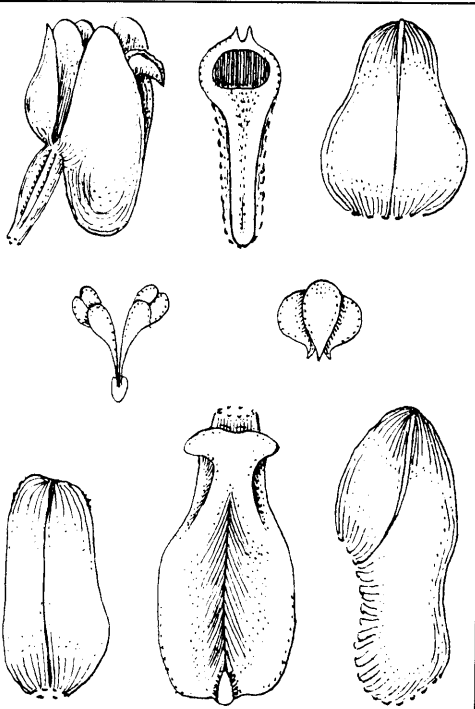
Appendicula grandifolia Schltr.



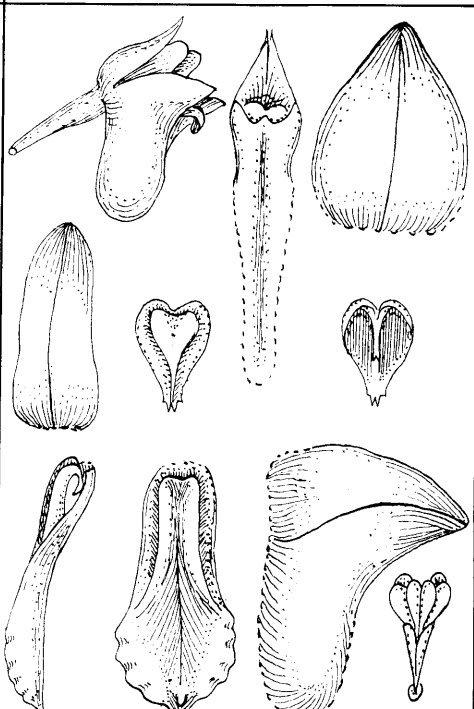
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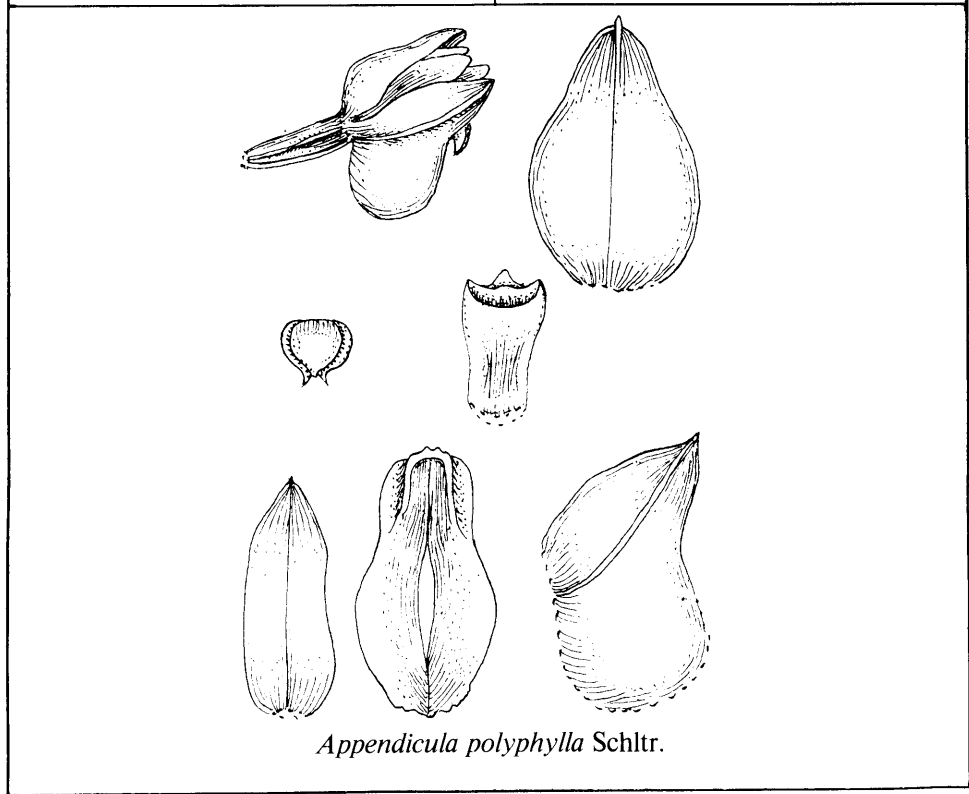
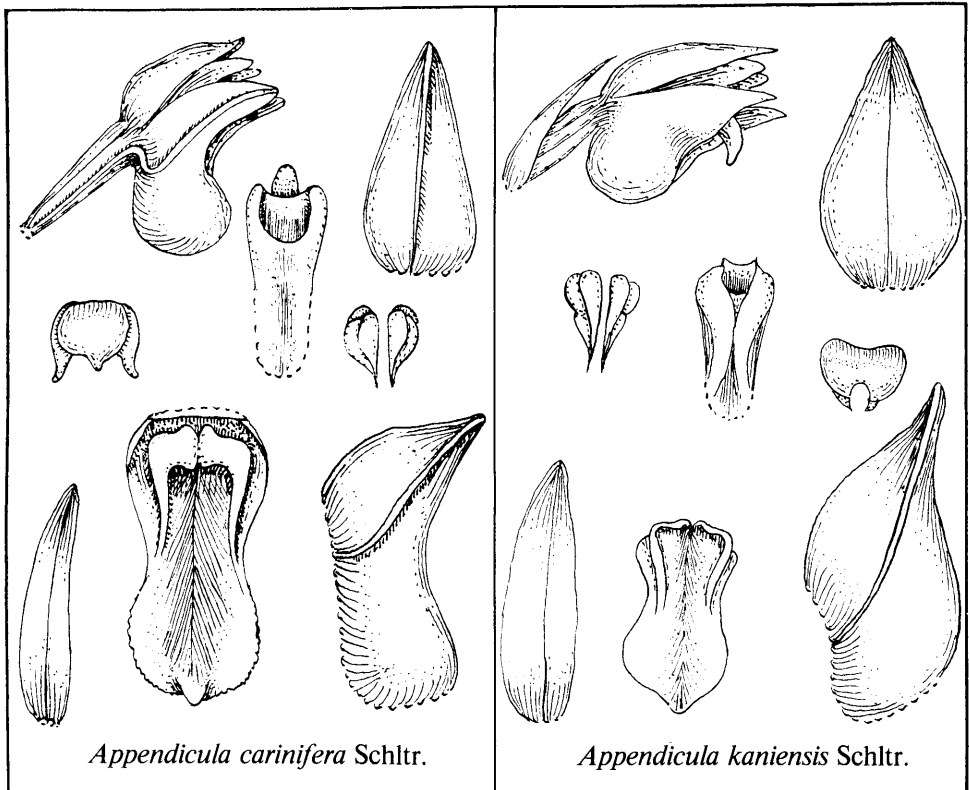
Appendicula anomala Schltr.

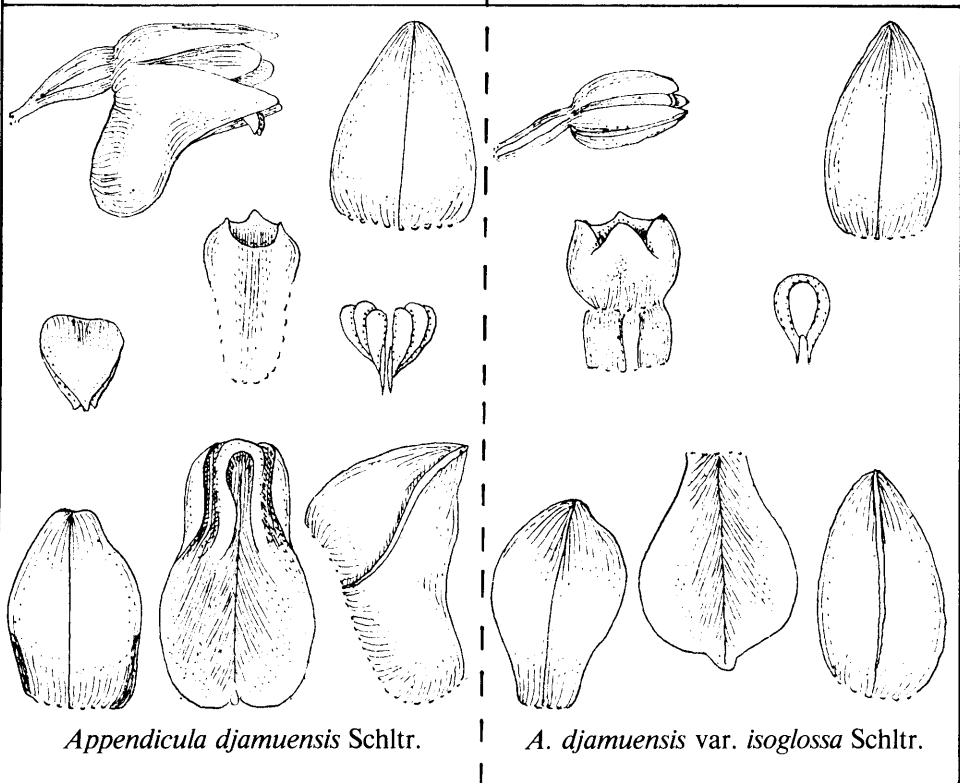
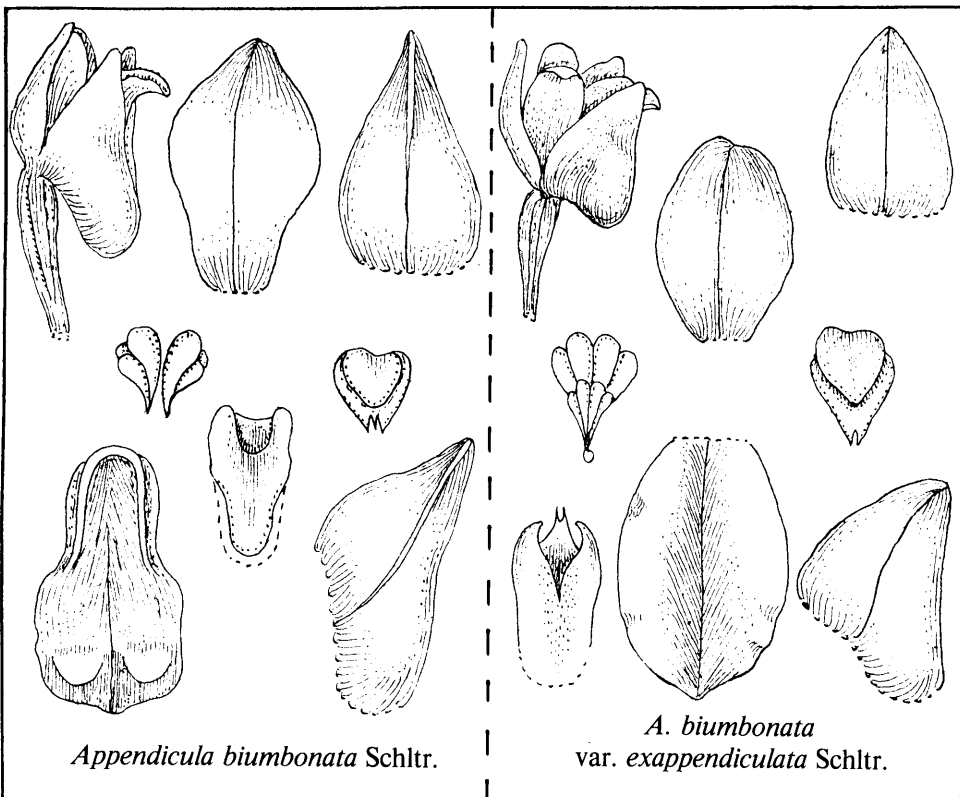


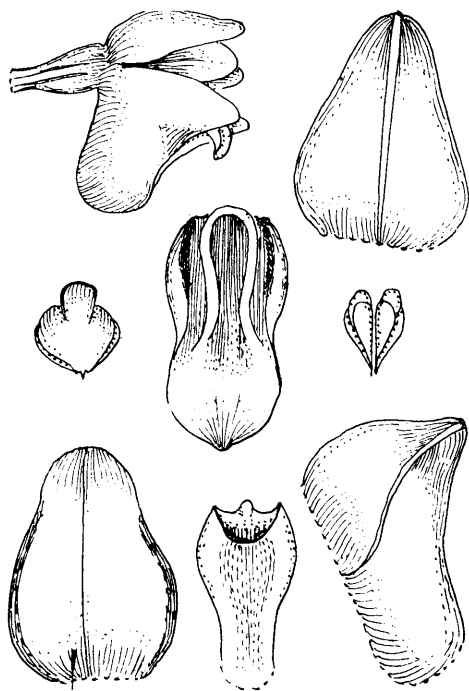
Appendicula aberrans Schltr.



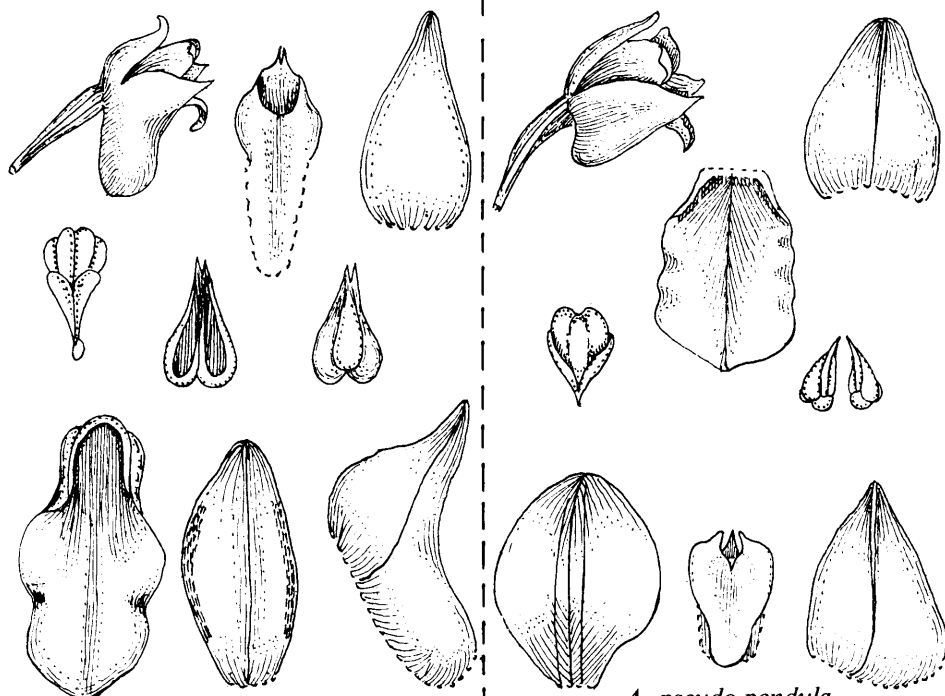
Appendicula nivea Schltr.





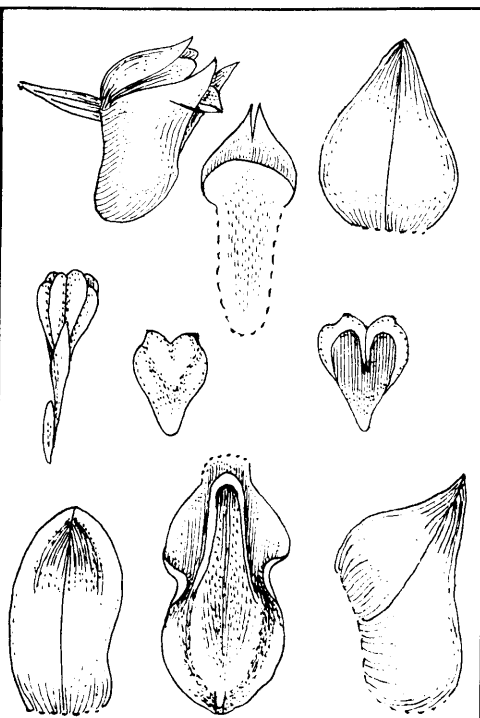


Appendicula concava Schltr.

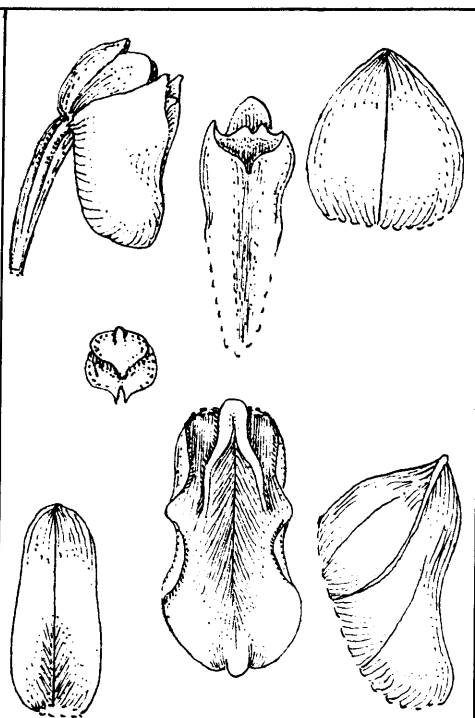


Appendicula pseudo-pendula Schltr.

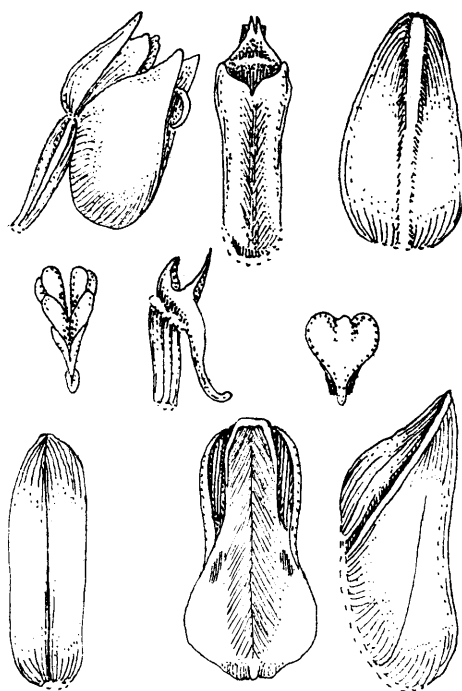
A. pseudo-pendula
var. cryptostigma Schltr.



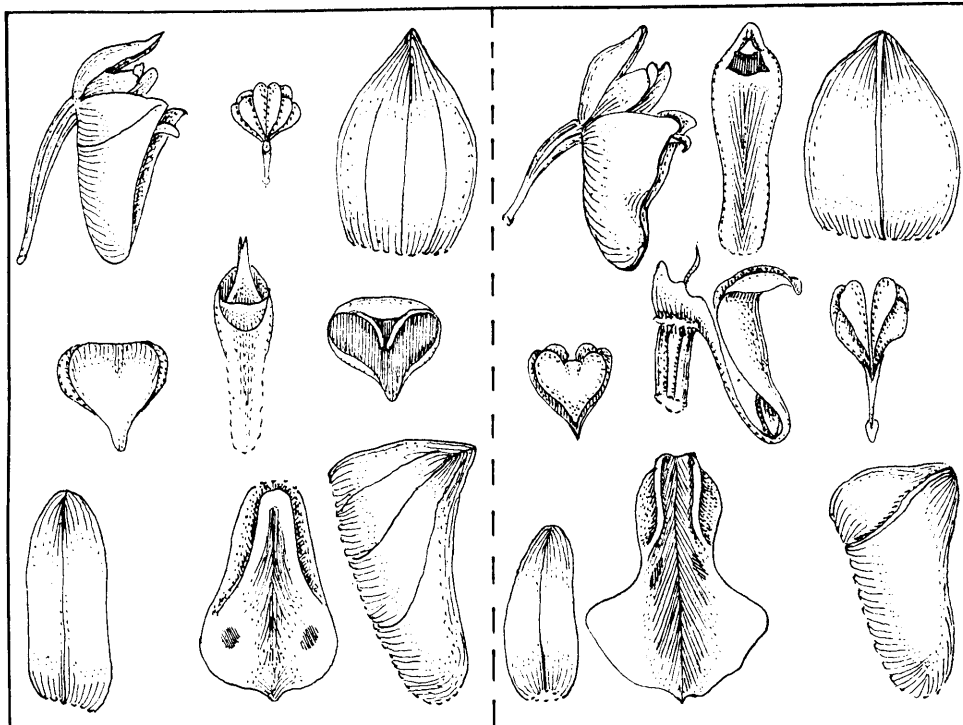
Appendicula tenuispica Schltr.



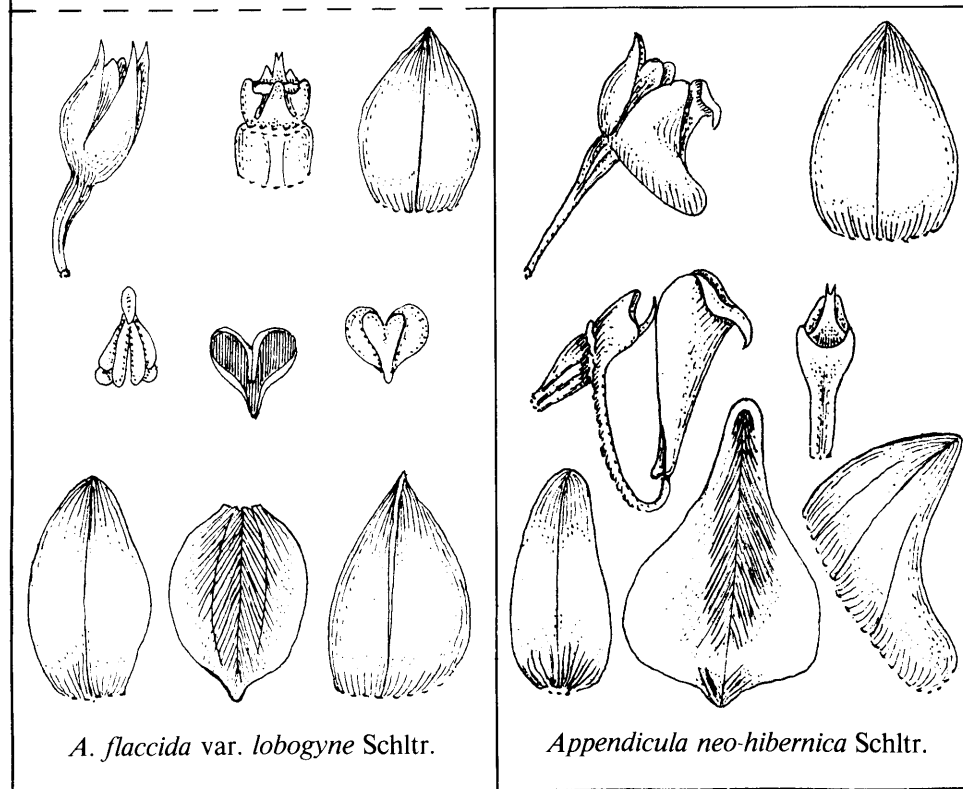
Appendicula lutea Schltr.



Appendicula fallax Schltr.

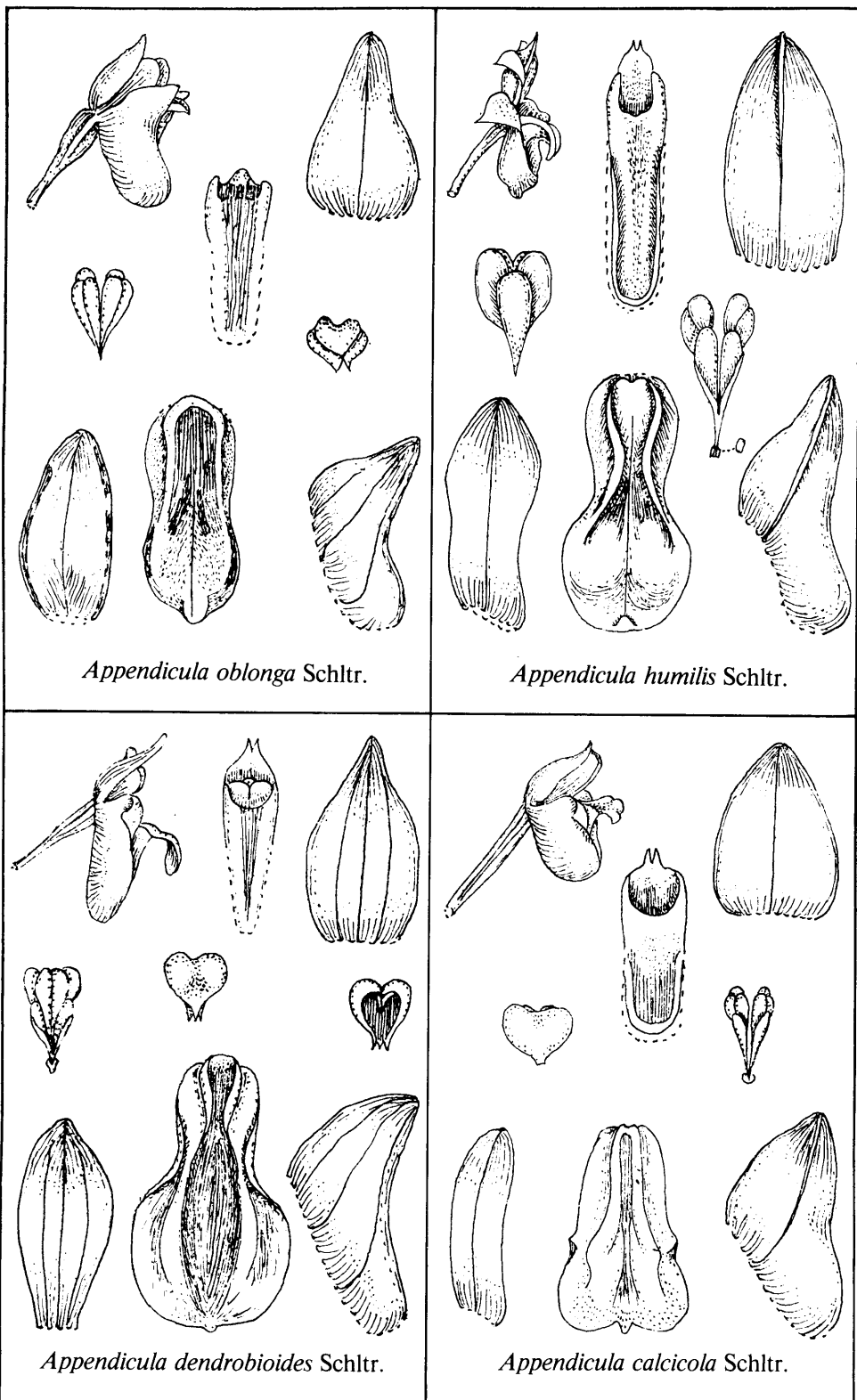


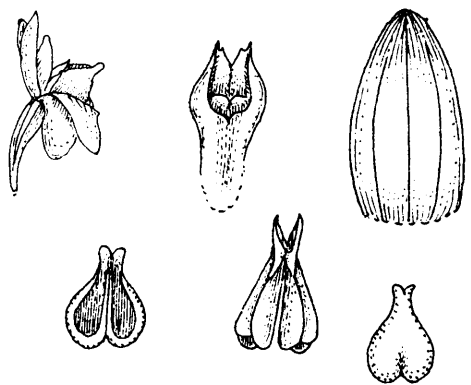
Appendicula flaccida Schltr.



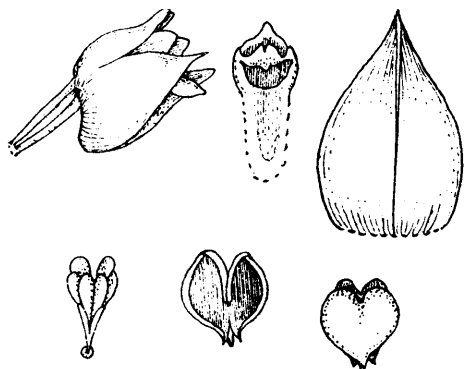
A. flaccida var. *lobogyne* Schltr.

Appendicula neo-hibernica Schltr.

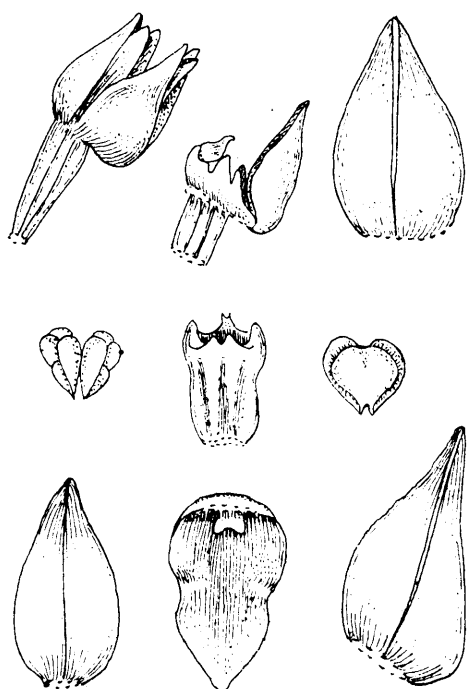




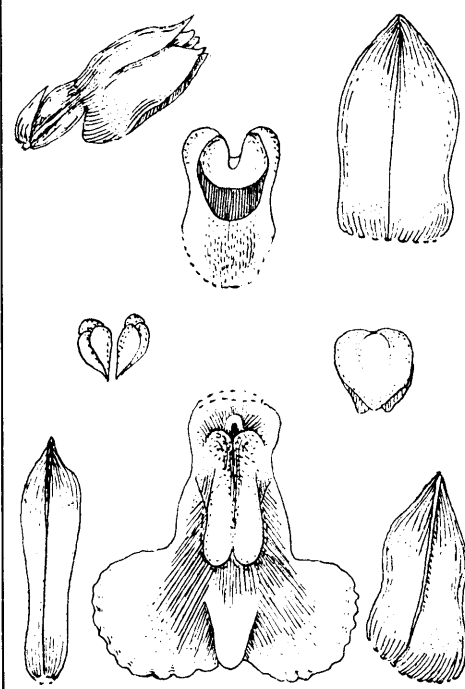
Appendicula Steffensiana
(Schltr.) J.J. Sm.



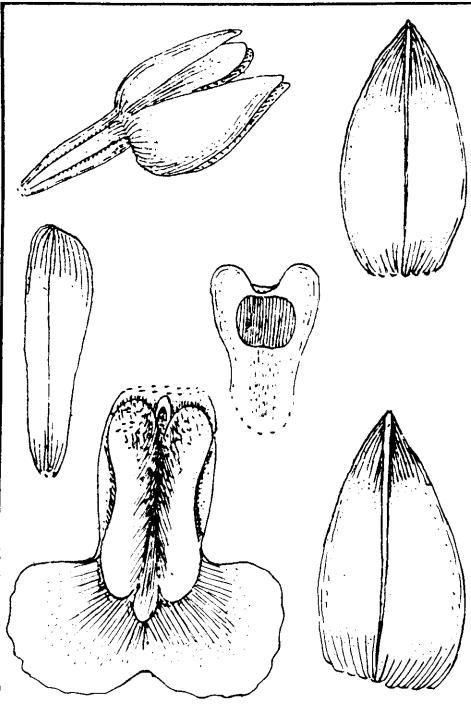
Appendicula polystachya Schltr.



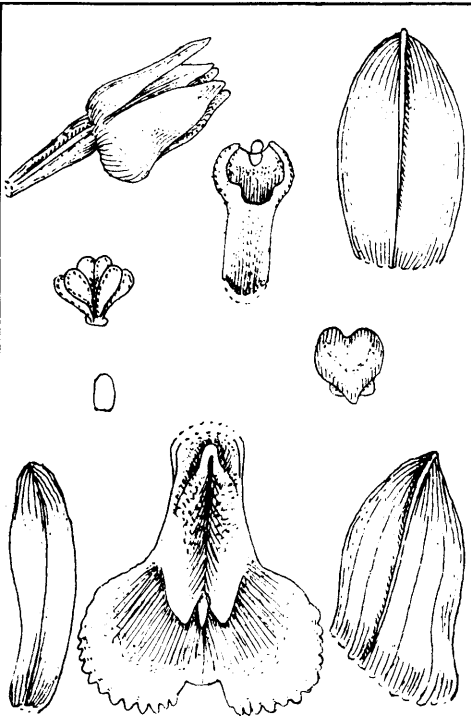
Appendicula isoglossa Schltr.



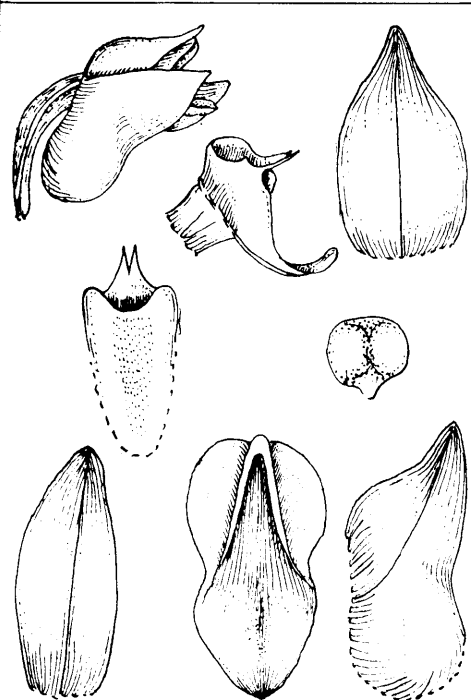
Cyphochilus parvifolius Schltr.



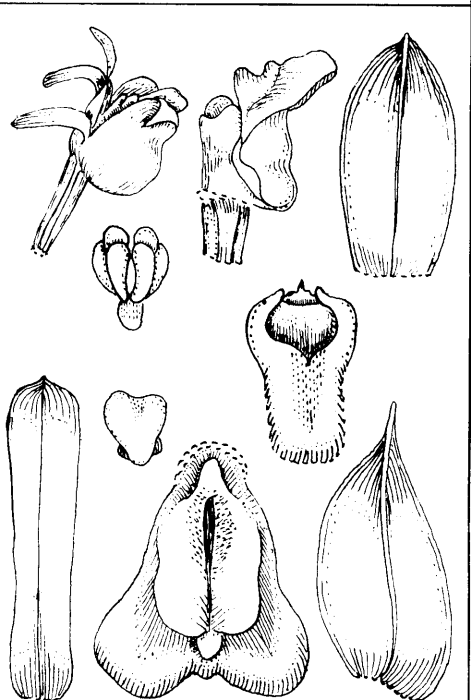
Cyphochilus rivularis Schltr.



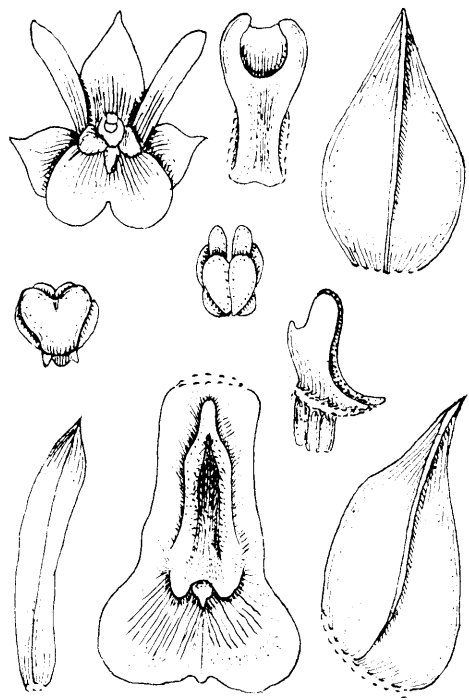
Cyphochilus latifolius Schltr.



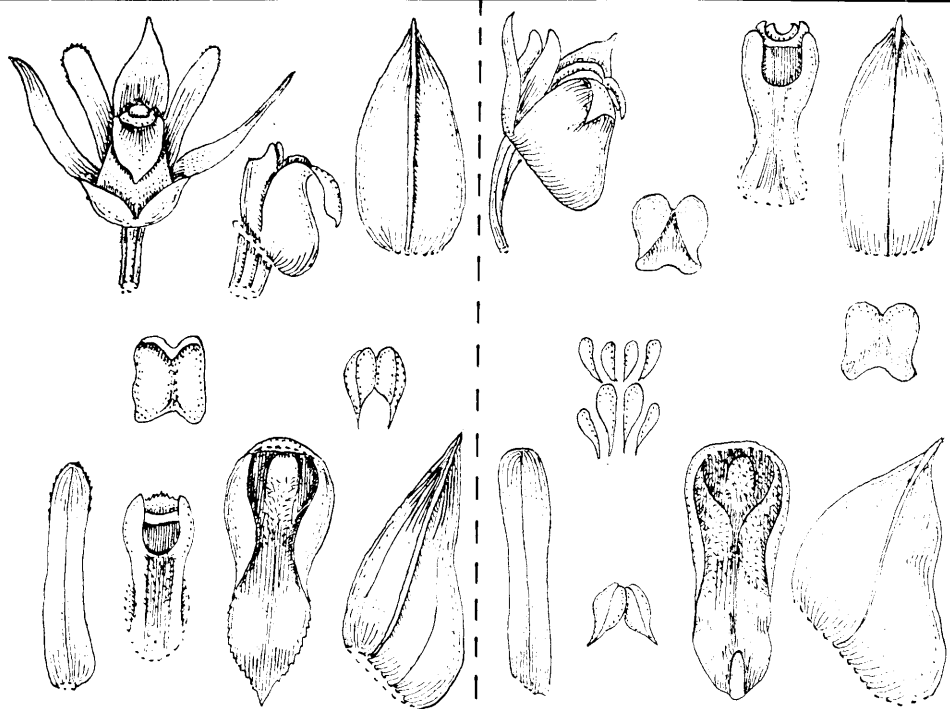
Cyphochilus montanus Schltr.



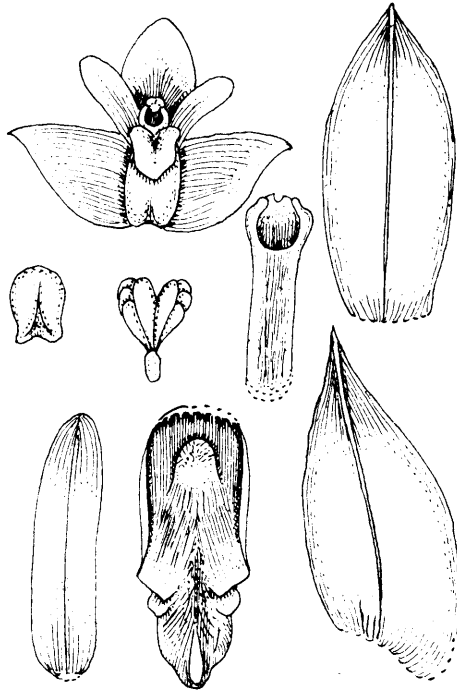
Cyphochilus anemophilus Schltr.



Cyphochilus collinus Schltr.



Lectandra podochiloides Schltr.



Lectandra tenuipes Schltr.

Group XVII *Polystachyinae*

Pfitzer established this group, generally, with those genera of Bentham's groups *Eulophieae* and *Cymbidieae* which are distinguished by a terminal inflorescence, and he included with them *Tipularia* Nutt., *Acrolophia* Pfitz., *Galeandra* Lindl., *Oreorchis* Lindl., *Polystachya* Hook., *Ansellia* Lindl. and *Bromheadia* Lindl. Of these, I have already mentioned (p. 181) *Tipularia* Nutt. and *Oreorchis* Lindl. and expressed my opinion that is better to consider them together with *Corallorhiza* R. Br. and some related genera, as forming a separate group *Corallorhizinae*.

Accordingly, there still remain in the group five genera, viz. *Acrolophia* Pfitz., *Galeandra* Lindl., *Polystachya* Hook., *Ansellia* Lindl. and *Bromheadia* Lindl. R.A. Rolfe has published recently another genus *Neobenthamia* which, if it is not regarded as an aberrant species of *Polystachya* Hook., undoubtedly belongs here. Of these five, or possibly six, genera *Galeandra* Lindl. is purely American, *Acrolophia* Pfitz. and *Ansellia* Lindl. are typically African, *Polystachya* Hook., the genus richest in species, is principally African with a few American and about five Asiatic-Malayan species. *Bromheadia* Lindl. is a Malayan genus, which singularly seems to be missing from Java. In treating the genus *Claderia* Hook. f., I have drawn attention already to this peculiar fact and have also pointed out that I have found species of these two genera growing together in New Guinea, as well as several other orchids closely related to species from the Malacca Peninsula. The occurrence of the genus *Bromheadia* Lindl. is, therefore, surely all the more interesting, firstly because it is found in this association and secondly because the area of distribution is extended considerably towards the east.

60. *Bromheadia* Lindl.

Up to the present, the distribution of *Bromheadia* Lindl. has been restricted to a relatively small area, the Peninsula of Malacca, Sumatra and Borneo. I observed a species of the genus in the Celebes on the mountains near Toli-Toli, but this, unfortunately, was not in flower. By proving its occurrence in New Guinea, from which it has been reported lately by Dutch collectors, the limit of distribution is extended suddenly far to the east.

Until recently only two species of the genus were known, viz. *B. Finlaysoniana* (Lindl.) Rchb. f. and *B. aporoides* Rchb. f. Recently, however, H.N. Ridley personally undertook the exploration of the orchidaceous flora of the Malay Peninsula and, in fairly rapid succession, recorded six more new species. Accordingly, up to the present, the genus consists of eight species divided into two sections; viz.

§1. *Eu-Bromheadia* contains species with flat leaves and more-or-less elongated inflorescences, together with a short broad column. These are all terrestrial with the exception of *B. alticola* Ridl. Here also belong *B. Finlaysoniana* (Lindl.) Rchb. f., *B. silvestris* Ridl., *B. rupestris* Ridl. and *B. alticola* Ridl.

§2. *Aporodes* contains species with equitant leaves and short, clustered inflorescences on which the flowers appear one-by-one at definite intervals and live only for a short time. The column is very slender and I think it possible that these two sections may be regarded in the future as genera. My flower material, as far as *Aporodes* is concerned, is not very good, so that, unfortunately, I am not able to decide the question. In this section, which contains only epiphytes, should be placed *B. aporoides* Rchb. f., *B. pungens* Ridl., *B. brevifolia* Ridl. and *B. scirpoidea* Ridl.

Of the two species described here, *B. pulchra* Schltr. belongs to the section *Eu-Bromheadia* and *B. falcifolia* Schltr. to the section *Aporodes*.

§ 1. *Eu-Bromheadia*

The only species known to me from German New Guinea is *B. pulchra* Schltr., a magnificent plant which may well rival the most beautiful forms of *B. Finlaysoniana* (Lindl.) Rchb. f. It is a tall plant and, like *B. Finlaysoniana* (Lindl.) Rchb. f., is found only at lower altitude on the drier slopes with very porous soil, not too far from the sea. It appears to be especially fond of the edges of the forest, where the lower part of the stem is shaded by ferns and small shrubs, while the upper part rises above these and strives towards the sun.

1. *B. pulchra* Schltr., sp. nov.

Terrestris, elata, simplex, gracilis, 150–200 cm alta; rhizomate valde abbreviato; radicibus crassiusculis, teretibus, flexuosis, glabris; caulibus simplicibus substrictis, bene foliatis, apice subnudis, paululo compressis, vaginis foliorum arcissime, amplexantibus omnino obtectis, foliis erecto-patentibus, lorato-ligulatis, apice inaequaliter et obtuse bilobulatis cum apiculo minuto interjecto, 15–20 cm longis, medio fere 2.5–3 cm latis; racemo terminali, longius pedunculato, erecto, pedunculo vaginis longe amplexantibus oblecto, racemo ipso usque ad 10 cm longo, vulgo simplici, nunc 1-ramoso, rhachi flexuosa, carnosa; bracteis deltoideo-ovatis, acutis, ovario multo brevioribus; floribus succedaneis usque ad 15, in genere inter magnos, erecto-patentibus; sepalis ligulato-oblongis, obtusiusculis, glabris, intermedio 3.5 cm longo, lateralibus obliquis, nervo intermedio carinato-incrassatis, 3.25 cm longis; petalis oblique ovalibus, obtusiusculis, sepalis lateralibus aequilongis, 1.4 cm medio latis; labello circuitu elliptico, supra medium trilobo, 2.75 cm longo, medio fere 1.5 cm lato, lobis lateralibus oblique oblongis, obtusis, brevibus, intermedio oblongo, obtusissimo cum apiculo, lateralibus multo majore, minute ruguloso, lamina medio intus in tertia parte basali squama triangula donato, fovea longitudinali anteposita mox evanescente; columna semitereti, subalata, basin versus dilatato-marginata, glabra, 1.5 cm alta; anthera triangulo-cucullata, antice alte biloba cum apiculo minuto interjecto; pollinibus 2 oblique ovalibus, longitudinaliter foveatis, stipite subquadrato-ligulato, basin versus paulo dilatato, glandula transversa, angusta; ovario cylindraceo, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: In humus at the edge of forests near Adolphafen, alt. c. 10 m—R. Schlechter no. 19212, flowering in Apr. 1909; on more open slopes of the mountain forests near Jaduna, alt. c. 50 m—R. Schlechter no. 19288, flowering in Apr. 1908 [Ed.—probably 1909].

This species is well distinguished from *B. Finlaysoniana* (Lindl.) Rchb. f. both in the colour of the flowers and in the labellum. J.J. Smith illustrated a plant from Dutch New Guinea as *B. palustris* Lindl. var. *papuana* J.J. Sm. (in 'Nova Guinea' VIII (1908) [1909], p. 26, t. IX, 26.) which perhaps is identical with the plant described here, but in the illustration does not agree entirely.

The species described here is entirely different from *B. Finlaysoniana* (Lindl.) Rchb. f. (*B. palustris* Lindl.). For *B. pulchra* Schltr. the sepals of the flowers are a violet-pink colour, the petals white and the labellum is mainly golden yellow.

§ 2. *Aporodes*

Only four species of this section, enumerated above, have been described so far. Here I hazard the description of a fifth species, for although unfortunately I have found no flowers, the plant certainly is related to *B. scirpoidea* Ridl. and, as the first representative of the section from New Guinea, it appeared too interesting and also too important plant-geographically to be overlooked.

The species grows in the east of Kaiser-Wilhelms-Land in the hilly forests of the Waria District as an epiphyte on tall trees. It appears to be rather rare, since I have found it only once. The specimens which I collected grew on the thick branches of a myrtaceous tree, with dry, cracked bark and destitute of moss.

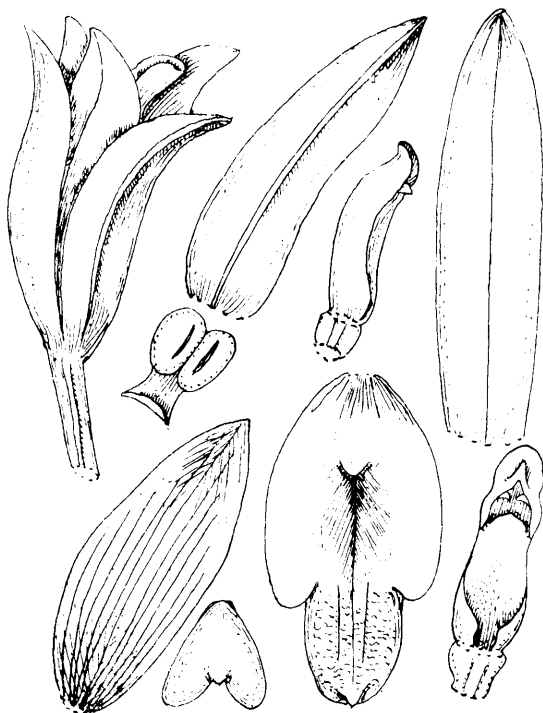
2. *B. falcifolia* Schltr., sp. nov.

Epiphytica, erecta, rigida, 15–25 cm alta; rhizomate valde abbreviato, lignescente; radicibus teretibus,

flexuosis, glabris; caulibus, simplicibus, rigidis, substrictis vel paulo flexuosis, paulo compressis, laxe 4–5-foliatis, vaginis foliorum arctissime amplexantibus omnino obtectis; foliis equitantibus, anguste lineari-falcatis, acutis, textura rigide coriaceis, glabris, 7–18 cm longis, 2.5–3.5 mm latis; inflorescentiis terminalibus valde abbreviatis, subcapitiformibus; bracteis squamiformibus, minutis; floribus nondum notis.

Kaiser-Wilhelms-Land: On the trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19919 in June 1909.

The species is related to *B. scirpoidea* Ridl. and closely resembles it in habit. I have described it without seeing any flowers, but there is no possible doubt that it belongs to this section. Hopefully, this description may induce botanists staying in New Guinea to look out for this interesting plant, so that a description of the flowers can be added.

GROUP XVII *Polystachyinae**Bromheadia pulchra* Schltr.

Group XVIII *Phajinae*

The genera which Pfitzer has united under this group were arranged by Bentham, in his division of the *Orchidaceae* for the 'Genera Plantarum', into the most diverse subtribes. Thus we find, according to Bentham, *Pachystoma* Bl. and *Spathoglottis* Bl. with *Eriaceae*; *Phajus* Lour. and *Acanthephippium* Bl. with *Bletieae*; *Calanthe* R. Br. with *Coelogyneae* and *Plocoglottis* Bl. with *Cyrtopodieae*. Nobody who has had the opportunity to study the genera in the living state will have any doubt that they are all related and form a fairly natural group. Therefore, preference must be given to Pfitzer's division, because once again he grouped together (as he so often did) those genera which, without a doubt, belonged together, whereas under the old system they were scattered as individuals. Of course, Pfitzer has included some genera in the *Phajinae* which, in my opinion, were better omitted.

J.J. Smith has written already about *Tainia* Bl., which he has placed in *Collabiinae*. Instead of this, however, *Ascotainia* Ridl. belongs here; at the time it probably was the only '*Tainia*' known to Pfitzer. Regarding the position of *Chysis* Lindl., I am not certain, but this genus does not appear to belong naturally to this group. *Aplectrum* Nutt. certainly is related to *Corallorhiza* R. Br. and has been mentioned already (p. 118).

The genera which then still remain in the group are, *Phajus* Lour., *Calanthe* R. Br. (including *Preptanthe* Rehb. f. and *Limatodes* Lindl.), *Calanthidium* Pfitz. (which I have not been able to examine, but which from the illustration of *Calanthe* R. Br. is probably different generically), *Spathoglottis* Bl., *Ipsa* Lindl., *Ancistrochilus* Rolfe, *Pachystoma* Bl., *Plocoglottis* Bl., *Bletia* R. Br., *Anthogonium* Lindl. and *Acanthephippium* Bl. Of these ten genera, there is only one, *Bletia* R. Br., which is purely American; of *Calanthe* R. Br. only a single aberrant species occurs in America; all the remaining eight genera belong to the Old World, *Ancistrochilus* Rolfe being African, the rest Indo-Malayan, with radiants in the neighbouring countries. India, with the Malay Peninsula, probably contains a larger number of species than any other region, since about 70 species are known to belong there, while the total number of group-species is now estimated at about 240, of which approximately 150 belong to *Calanthe* R. Br.

Next to the above-mentioned region, New Guinea certainly must be regarded as the second richest, for already I have been able to enumerate 50 species, and doubtless many more will be added.

In our Territory we have representatives of *Phajus* Lour., *Calanthe* R. Br., *Spathoglottis* Bl., *Pachystoma* Bl., *Plocoglottis* Bl. and *Acanthephippium* Bl., i.e. six of the above-mentioned genera. As a seventh genus, there may be added another plant which, in habit, might be a *Calanthe* from the section *Preptanthe*, but in the structure of the flower and especially in the column, differs too greatly from the latter, as well as from *Phajus*, to place it in either of these two genera.

61. *Acanthephippium* [Bl.]

Amongst the genera of *Phajinae* there is hardly one which claims so much interest by its peculiar flower-structure as *Acanthephippium*. Whenever I have had living material of the genus to hand, I have been reminded always by the peculiar perianth, and above all by the position of the lip, of the South American genus *Anguloa* R. et Pav. although naturally, they have nothing in common, but only possess certain analogies. The genus stands alone in the group by the singular shape of its perianth as well as by the striking development of its column-foot, on the point of which is to be found, saddle-wise, the labellum.

At present the known species are in perfect agreement as to structure and show no approach to other described genera. In habit they are true *Phajinae* and show a particular approach to *Phajus* Lour.

At present nine species are known, and these have a distribution reaching from Ceylon, across India and the Sunda Islands to the Celebes and Philippines, then extending south-east to British Papua. The most western species is *A. bicolor* Lindl. from Ceylon and India. The following are recorded from New Guinea: *A. splendidum* J.J. Sm. from the Dutch part and *A. javanicum* Bl. from the British, but, as has been remarked on already by J.J. Smith, it may be assumed confidently that the determination of the latter plant is not quite correct. I cannot say whether the other species mentioned by J.J. Smith is in reality his *A. splendidum*, since I have never seen the specimens, but it is certain that the species described below is very much like *A. splendidum* J.J. Sm., yet represents a hitherto unrecorded species. Since it is distributed very widely in our Territory, I feel justified in assuming that it occurs beyond our borders in the British and Dutch parts and suspect that the two species mentioned there may be identical with it.

The only known species from our Territory is a typical inhabitant of the forest. It is to be found, indeed not infrequently, in the very humid places in the mountain-forests, but it is surprising how often it occurs in the secondary-forest. It grows there, by preference, in the dense shade of tall *Zingiberaceae*, such as *Alpinia*, *Costus* and *Tapeinochilus* species, or in thick undergrowth. I have found the plant often in the hill-country at about 150 m altitude, but it occasionally reaches to the lower levels of the mist-forest formation in the mountains, as established by specimens from the Ibo Range.

1. *A. papuanum* Schltr., sp. nov.

Terrestris, valida, usque ad 80 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis carnosus, oblongoideo-cylindraceis vel crasse cylindraceis, apicem versus paulo angustatis, rarius anguste lageniformibus, usque ad 25 cm altis, infra medium 3–5 cm diametientibus, apice vulgo bifoliatis, basi et supra vaginis paucis amplectentibus primum obtectis; foliis erecto-patentibus, ellipticis, acuminatis, basi cuneatis, sensim in petiolum, usque ad 20 cm longum attenuatis, lamina usque ad 45 cm longa, medio fere usque ad 15 cm lata, glabra; racemis lateralibus supra basin pseudo-bulborum nondum omnino evolutorum, erectis, laxe 3–6-floris, pedunculo bene evoluta, usque ad 16 cm longo, glabro; bracteis late ovatis, acuminatis, glabris, amplis, ovario vulgo brevioribus; floribus erectis in genere inter majores, glabris, illis *A. splendidi* J.J. Sm. similibus; sepalis oblongis, obtusis, dimidio inferiore marginibus in tubum oblique urceolarem arcte coalitis, c. 3.5 cm longis, lateralibus basi margine anteriore ampliatis cum pede columnae mentum inflatum, late obovoideum a facie paulo compressum, obtusissimum, c. 1.4 cm longum formantibus; petalis e basi unguiculata oblique ovatis, obtusiusculis, glabris, c. 3.3 cm longis; labello curvato, trilobo, explanato 1.6 cm longo, inter margines loborum lateralium 1.6 cm lato, lobis lateralibus erectis oblongo-quadratis, obtusissimis, marginibus exterioribus incurvulis, c. 0.5 cm longis et latis, intermedio oblongo, dimidio inferiore vix dilatato, obtusissimo, retuso cum apiculo obtuso interjecto, marginibus subcrenulato, 0.8 cm longo, supra medium 0.5 cm lato, carinis 5 obtusis e basi labelli usque supra medium decurrentibus, carina intermedia e basi usque in apicem labelli producta, medio subito interrupta vel constricta, carinis lateralibus interioribus e basi usque supra medium dimidio anteriore in lineam gibborum plurium obtusorum dissolutis, mox evanidis, lamellis exterioribus in margines basis lobii intermedii evanescentibus, medio leviter paucigibbosis; columna semitereti, glabra, 1.4 cm alta, infra apicem paulo dilatata; facie haud foveata, pede curvato, expanso 2.8 cm longo, clinandrio paulo contracto, dorso trilobulato, lobulo intermedio longiore; anthera galeato-cucullata, acute apiculata, glabra; polliniis inaequilongis, oblique clavatis, superioribus falcatis, inferiores plus duplo superantibus; ovario torto, cylindraceo, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Gati Mountain, alt. c. 650 m—R. Schlechter no. 16864 (TYPE), flowering in Nov. 1907; in humus in the secondary-forests near Boroai, alt. c. 500 m—R. Schlechter no. 17071, flowering in Dec. 1907; in humus in the forests of the Ibo Range, alt. c. 900 m—R. Schlechter no.

19031, flowering in Dec. 1908; in humus in the forests at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 200 m—R. Schlechter no. 18524, flowering in Oct. 1908; in humus in the secondary-forests in the Bismarck Range, near Hokrocho Village, alt. c. 100 m—R. Schlechter no. 19143, flowering in Nov. 1908 [Ed.—possibly in Jan. 1909]; in humus in the secondary-forests near Jaduna (Waria District), alt. c. 150 m—R. Schlechter no. 19272, flowering in Apr. 1909.

I have described the flowers of this species in considerable detail so that the differences from *A. splendidum* J.J. Sm. may be established accurately. These differences lie in the keels of the labellum and the shape of the front lobe as well as in the long lateral lobes; likewise in the column, which like *A. splendidum* J.J. Sm. at the base, i.e. the upper-half of the base of the column-foot, has a deep narrow excavation, such as occurs in *Dendrobium* and probably indicates nectaries. These are completely absent in *A. papuanum* Schltr. Also the column-foot is different and the pollinia narrower and bent more. I have noted the colour of the flowers as follows; yellowish, red-striped, petals white, labellum white with red lines and yellow middle-lobe, column white, foot yellow with red stripes and spots.

62. *Phajus* Lour.

Phajus Lour. belongs to those exotic orchidaceous genera which were known already in Europe at the beginning of the last century, and which were introduced into European green-houses long ago. In 1831 Lindley was able to describe nine species in this genus in his 'Genera and Species of Orchidaceous Plants', but this number has become multiplied continuously since then, so that about 50 have been described up to the present. These are distributed over a region extending from West Africa, across Madagascar, India, China, Malay Archipelago, New Guinea, northern Australia, New Caledonia as far as the Samoan Islands. In West Africa, *P. Mannii* Rchb. f. and *P. occidentalis* Schltr. must be regarded as the most western species, and *P. Graeffei* Rchb. f., of the Samoas, as the most eastern representative. The genus is divided into four sections, viz. *Eu-Phajus*, *Pesomeria*, *Limatodes* and *Gastrorchis*. Only the first two claim consideration for our Territory and these now will be characterised briefly.

§ 1. *Eu-Phajus*. Stems thickened into a short, many-jointed pseudobulb. Flowers on a peduncle arising from the base of the pseudobulb, large and most beautifully coloured. Lip with a short spur, closely attached to the base of the column.

§ 2. *Pesomeria*. Stems elongated. Peduncles originating at the sides of the stems, flowers usually rather large. Labellum with only a protruberance or short conical sac at the base, very shortly attached to the base of the column.

Only one representative of each of these two sections is known with certainty to occur in our Territory but I believe I am able to recognise a second species of *Eu-Phajus*, a plant which I found without flowers in the Ibo Range, which may be regarded as a close relative of *P. celebicus* Schltr.

§ 1. *Eu-Phajus*

I have chosen the above name for this section instead of the adjectival name '*Genuini*' proposed by Pfitzer, in order to introduce uniformity in the naming of the sections, since I am of the opinion that substantives should be used for section names.

To the section *Eu-Phajus* belongs the smaller part of the more recently known species and above all it includes the frequently cultivated *P. Tankervilleae* (Bl.) O. Ktze. and those species more closely related to it, some of which have been united incorrectly with it. These beautiful plants used to be cultivated more frequently in Europe, and it is all the more regrettable that they are now so seldom seen, because their culture is extremely simple and their magnificent flowers are long-lasting. To this group also

belongs *P. callosus* (Bl.) Lindl. and the better known *P. flavus* Lindl., formerly known under the name *P. maculatus* Lindl., together with its relatives.

The species which I have to describe here is related to *P. callosus* (Bl.) Lindl. It is no less beautiful than the latter and really deserves to be introduced also into European collections.

I found the species usually between stones in semi-open places in the forests of the mountain ridges, at about 800–1300 m altitude. The plant is particularly frequent on the sharp ridges of the Finisterre Range, where, with its foliage and beautiful leaves reminiscent of *P. callosus* (Bl.) Lindl., it adds considerable beauty to the mist-forest zones.

1. *P. montanus* Schltr., sp. nov.

Terrestris, erectus, 60–80 cm altus; rhizomate valde abbreviato; radicibus flexuosis, teretibus, breviter villosulis; pseudobulbis ovalibus, teretiusculis, usque ad 4 cm altis, usque ad 1.8 cm diametentibus; foliis erecto-patentibus, 4–6, petiolatis, lamina elliptica, acuminata, plurinervi, usque ad 70 cm longa, medio fere usque ad 12 cm lata, basi cuneata, sensim in petiolum basi dilatata vaginantem usque ad 40 cm longum angustata; scapo erecto, stricto vel substricto, cum racemo usque ad 80 cm longo, tereti, glabro, vaginis paucis, dissitis, alte amplexantibus, acuminatis, obsessis; racemo laxius 6–15-floro, erecto, usque ad 30 cm longo; bracteis mox caducis, ellipticis, acutis, florem nondum omnino evolutum obteguntibus; floribus patentibus, demum patulis, in genere inter majores; sepalis lanceolato-ellipticis, acuminatis, glabris, c. 4 cm longis, medio fere 1–1.2 cm latis, lateralibus obliquis; petalis oblique ligulato-lanceolatis, acutis, glabris, sepalis subaequilongis, sed distincte angustioribus, medio fere c. 0.8 cm latis; labello e basi concava, puberula late cuneato, tertia parte anteriore trilobo, c. 4 cm longo, explanato inter apices loborum lateralium 3 cm lato, lobis lateralibus erectis, oblique triangulis, obtusis, lobo intermedio subquadrato-orbiculari, apiculato, 1.2 cm longo, carinis 2 brevibus parallelis in medio labelli, carinula tertia intermedia per medium lobi intermedii decurrente; columna semitereti, infra apicem paulo dilatata, glabra, c. 2.2 cm longa; anthera late ovato-cucullata, glabra; pollinibus oblique clavatis; ovario cum pedicello glabro, clavato, c. 3 cm longo.

Kaiser-Wilhelms-Land: In the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20084, flowering in Sept. 1909; between open clumps of bushes on the mountains on the upper Djamu [River], alt. c. 800 m—R. Schlechter no. 17348, flowering in Feb. 1908; in humus between stones in the bush-forest on the ridges of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18256, flowering in Sept. 1908; no. 19135, flowering in Jan. 1909; in humus in the forests of the Dischore Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19596, flowering in May 1909.

As already stated, this species is related to *P. callosus* (Bl.) Lindl. From this, on close comparison, it is distinguished at once by the labellum which possesses a differently shaped middle lobe, moreover, in *P. montanus* Schltr. the petals are narrower and the spur shorter. The colouring of the really beautiful flowers is as follows: sepals and petals yellowish on the outside, brown on the inside, labellum white, red in front and the column rose-red. It sincerely is hoped that the plant will be introduced soon into European greenhouses.

§ 2. *Pesomeria*

In his description of the orchids of Java, J.J. Smith has united all the *Phajus* species which possess long stems into the section *Limatodes*. I definitely cannot agree with this because *Limatodes* Bl. originally included only *P. pauciflorus* Bl. which, in my opinion, in conjunction with *P. corymbioides* Schltr. and *P. stenocentron* Schltr., form a well-defined section in themselves. *P. amboinensis* Bl. and *P. indigoferus* Hassk. are better referred to the section *Pesomeria*, in case the Madagascan forms such as *P. tetragonus* Rchb. f. are not acknowledged as a separate group, which in my opinion, is very unlikely. Since I described *P. papuanus* I have formed the opinion that this species is better regarded as a variety of the widely distributed *P. amboinensis* Bl. and I have treated it accordingly. In our Territory this species grows only in the low-lying forests

at about 600 m altitude and always in very moist, shady places. I found it most frequently near the coast or in the primary forests in close proximity to the coastal vegetation.

2. *P. amboinensis* Bl., Mus. Lugd.-Bat. II, p. 180.

var. *papuanus* Schltr. [Ed.—stat. et comb. nov.]

P. papuanus Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 139.

Kaiser-Wilhelms-Land: In humus of the forests at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14595, flowering in Apr. 1902; in humus in the forests near Djawer in the Minjem Valley, alt. c. 150 m—R. Schlechter no. 17269, flowering in Feb. 1908.

The specimens collected last differed from the initial ones in that the middle lobe of the labellum distinctly exceeded the lateral lobes, whereas in the Type of *P. papuanus* Schltr. it was hardly as long. The flowers of the latter were, furthermore, pure white, but in the specimens from Djawer, in contrast, they were white with a pale yellow lip.

63. *Calanthe* R. Br.

In the advance of our knowledge of the flora of the Malaysian island regions, of the south-seas and of China, the number of species in the genus *Calanthe* R. Br. has so increased in recent years that it is now by no means an easy task to make a review and a determination of the individual species, even though the genus may be divided into several well-defined sections. Recently, some other forms have become known which do not fit into either one or the other sections, so that we find it necessary, to avoid destroying the sharp delimitation of the latter, to admit several small sections. Proceeding on these lines the following sub-division appears to be suitable.

1. SUB-GENUS *Eu-Calanthe*

Plants stemless or with cylindrical, elongated stems, but never with fleshy pseudobulbs. Leaves not deciduous and not jointed. The pedicels glabrous or covered with very short, closely appressed hairs.

§ 1. *Caulodes*: Plants with the habit of *Apostasia* species, with elongated, leaved-stems and lateral inflorescences with fairly large, persistent bracts and small flowers with a simple, tongue-shaped labellum.

§ 2. *Rhodochilus*: Stemless plants with very short, dense inflorescences and large persistent bracts. Perianth only slightly spreading, lip undivided, tongue-shaped with a distinct spur.

§ 3. *Ghisbreghtia*: Stemless plants with elongated, loose inflorescences and small persistent bracts. Flowers covered inside and out with hairs. Perianth moderately open, lip undivided with prominent middle vein. Spur short, but distinct.

§ 4. *Calothyrsus*: Stemless plants with elongated, mostly loose inflorescences. Bracts persistent, moderately large or small. Perianth spreading widely. Lip nearly always divided, three or four-lobed, more rarely two-lobed; with warts or lamellae at the base of the lamina. Spur long or short, but always distinct.

§ 5. *Styloglossum*: Stemless plants. Racemes with deciduous bracts. Flowers white or yellow. Perianth spreading a little or not at all. Labellum usually fairly small, undivided or with small side lobes, more seldom two-lobed. Spur shortly saccate or elongated.

§ 6. *Aceratochilus*: Stemless plants with elongated, loose inflorescences and persistent bracts. Perianth widely spreading. Lip obscurely lobed with a crenulate margin and keels at the base of the lamina; absolutely without a spur.

2. SUB-GENUS *Preptanthe*

Plants with thick, fleshy pseudobulbs from which all the thin, jointed leaves fall off annually. The pedicels are covered with fine hair, likewise usually the flowers.

§ 1. *Eu-Preptanthe*: This is the only section in the sub-genus. The sub-genus might, with equal propriety, be regarded as a separate genus; it is indeed a question whether this would not be more advantageous considering the dimensions which *Calanthe* has now attained.

Of the above sections the following are the only ones which require special consideration so far as our Protectorate is concerned, viz. *Caulodes*, *Rhodochilus*, *Calothyrsus*, *Styloglossum* and *Aceratochilus* indicating that the majority of sections is represented. *Ghisbreghtia* is American and, together with *C. mexicana* Rchb. f., is, up to the present, the only species of the genus known in the New World.

§ 1. *Caulodes*

This new section has been characterised already. Its species are distinguished from all others in the genus by their elongated stems, imparting to the plant the appearance of certain species of *Apostasia*. When I discovered the first specimen of *C. apostasioides* Schltr. in November 1908, this habit in the genus was still unknown, but meanwhile there has been described from Dutch New Guinea a species, *C. caulescens* J.J. Sm., which must be very closely related to *C. apostasioides*. Both are natives of the high mountains and occur along with small shrubs on the ridges in exposed situations. The soil in which I collected *C. apostasioides* Schltr. consisted of damp root-peat on which patches of *Sphagnum* grew. During the rainy season the temperature at those high elevations very often drops to freezing point in the mornings.

1. *C. apostasioides* Schltr., sp. nov.

Terrestris, erecta, 25–50 cm alta; rhizomate decumbente, cauliformi, radicante; radicibus flexuosis, elongatis, teretibus, breviter tomentosulis; caule simplici, tereti, glabro, dense foliato, vaginis foliorum omnino obecto, stricto vel substricto; foliis erecto-patentibus, lanceolatis vel elliptico-lanceolatis, acuminatis, basi sensim in petiolum basi dilatata vaginantem angustatis, lamina 10–14 cm longa, medio fere 1.8–2.2 cm lata, petiolo 3–4 cm longo; racemo laterali, erecto, subaxe 4–10-floro, foliis brevioribus, pedunculo tereti, glabro, petiolo fere aequilongo; bracteis erectis vel suberectis, ellipticis, acuminatis, floribus aequilongis vel paulo brevioribus; floribus erectis, in genere inter minores, glabris; sepalis ovalibus, apiculatis, 0.8 cm longis, lateralibus, obliquis; petalis e basi unguiculato-angustata late ellipticis, obtusis, obliquis, sepalis fere aequilongis; labello curvato, lamina parvula, late oblongo-ligulata, obtusa, c. 4 mm longa, ostio gibbo obtuso bene alto ornata, calcare deflexo cylindraceo, obtusissimo, ostium versus angustato, c. 7 mm longo; columna marginibus labello omnino adnata, apicem versus paulo dilatata, rostello brevi, emarginato; anthera late ovato-cucullata, antice subtruncatula, glabra; pollinibus oblique clavatis, glandulae amplae rotundatae affixis; ovario breviter pedicellato, cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: In peat and humus on ridges of the Bismarck Range above Hokocho, alt. c. 2300 m—R. Schlechter no. 18731, flowering in Nov. 1908.

This species must be related closely to *C. caulescens* J.J. Sm., but differs in its larger pointed leaves, in its taller growth, in the labellum which is provided with a tall callus at its base and the spur narrowed at the base. The flowers are white with a shiny red lip lamina. They remind one of certain species of *Glomera*.

§ 2. *Rhodochilus*

In this section we find also one of the anomalous forms of the genus. The habit of the species reminds one more of *Styloglossum*, but it does not have the large deciduous bracts and short pedicel [of the latter section]. They are more like *Curculigo* than any other species. Besides *C. rhodochila* Schltr., which I described in 1905, there has been

described from Dutch New Guinea another species, *C. breviscapa* J.J. Sm., which, according to the author, is related closely to my species. Consequently, the section consists at present of two species. I have found *C. rhodochila* Schltr. always as an epiphyte on tree-trunks, especially on the trunks and stilt-like roots of *Pandanus* in a very wet part of the mist-forest in the Bismarck Range.

2. *C. rhodochila* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 143.

Kaiser-Wilhelms-Land: On tree-trunks, particularly *Pandanus*, in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 14021, flowering in Jan. 1902.

During my last visit to the Bismarck Range I found no further material of this very characteristic species. I have stated already the colour of the flowers as white with a cinnabar-red labellum.

§ 3. *Calothyrsus*

This is by far the largest section of the genus. It includes the majority of species occurring in India, China and Japan, as well as the African species. Its distribution corresponds to that of the whole genus, with the exception of the section *Ghisbreghtia* with its solitary Central American species.

From India alone, Hooker f. enumerated 23 species of the section; from China and Japan possibly the same number are known. In our own Territory, I am acquainted at present with 12 species which are to be found partly in the forests of the plains and partly in the mountains high up in the mist-forest formation. All grow in the humus of the forest, mostly in deep shade; less frequently, like *C. spathoglottoides* Schltr., on exposed cliffs.

In the following enumeration I have mentioned first those species with a comparatively simple, two-lobed labellum; then those which are related to the 'form-circle' of *C. veratrifolia* R. Br.; and lastly those species with a three-lobed labellum and small lateral-lobes, because these seem to come closer to *Styloglossum* than the others.

3. *C. coiloglossa* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 141.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14554, flowering in Apr. 1902.

It is a peculiarity, considering the large number of endemics in New Guinea, that in this species, in *C. bicalcarata* J.J. Sm. and *C. kaniensis* Schltr., we have three species under consideration, which are related closely to one another, but there are, nevertheless, good specific distinctions. *C. brevicealcarata* J.J. Sm. is, according to the description and illustration, distinguished from the two others by the spur being extended backwards, not, as in *C. coiloglossa* Schltr. and *C. kaniensis* Schltr., curved forwards. As to the difference between the last two species, I will enter into details below.

4. *C. kaniensis* Schltr., sp. nov.

Terrestris, erecta, 65–80 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, sparsim puberulis vel glabris; foliis erecto-patentibus, c. 10, lineari-lanceolatis, acuminatis, e medio sensim in petiolum basi dilatata vaginantem dilatatis, glabris, usque ad 75 cm longis, medio fere usque ad 1.9 cm latis; scapo erecto, stricto, cum racemo usque ad 80 cm alto, tereti, vaginulis paucis, dissitis, arcte amplexantibus obsesso, praesertim apicem versus minutissime puberulo; racemo subdense 15–25-floro, quaquaverso, c. 15 cm longo; bracteis patentibus, lanceolatis, acuminatis, ovario multoties brevioribus; floribus patentibus, illis *C. coiloglossae* Schltr. similibus, sed minoribus; sepalis ovato-ellipticis, apiculatis, glabris, vix 1.5 cm longis, lateralibus obliquis; petalis oblique ligulatis, obtusiusculis, dimidio superiore paulo dilatatis, glabris, sepalis fere aequilongis; labello late reniformi, antice emarginato cum apiculo minuto interjecto, 1.5 cm longo, medio fere latitudine 2 cm subattingente, glabro, sacco triangulo compresso in dimidio inferiori labelli ostio verrucis minutis

circumdato, basi callo trilobulato ornato, calcare uncinato-incurvo, e basi cylindrico sensim valde inflato, apice leviter bilobulato, expanso labello vix aequilongo; columna brevi, glabra, antice valde dilatata, 3.5 mm longa; ovario cylindraceo-clavato, minutissime puberulo, pedicello incluso c. 1.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the crests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17026, flowering in Dec. 1907.

From the closely related *C. coiloglossa* Schltr. this species is distinguished by its smaller flowers, narrower petals, shorter spurred labellum, with a markedly uncinat spur and by the different warty covering at the base. Externally, the species may be recognised also by the numerous narrow leaves. The flowers are white, later becoming yellowish, with a labellum yellow in the centre.

5. *C. Engleriana* Krzl., in K. Schum. et Laut., Nachtr. [1905], p. 142.

C. veratrifolia var. Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 145.

Kaiser-Wilhelms-Land: In humus in the mountain forests of Albo in the Minjem Valley, alt. c. 200 m—R. Schlechter no. 16207, flowering in June 1907; Ramu region—Lauterbach no. 3185; in humus in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13913, flowering in Jan. 1902; in humus of the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18440, flowering in Oct. 1908.

It is probably better to keep this species separated from *C. veratrifolia* R. Br. (amongst which there is, evidently, a whole series of species), although it approaches the latter more closely than many varieties now included therein. The plant is characterised by its large, long-stemmed flowers and the long, slightly bent spur. It is probably the most beautiful species of the near relatives of *C. veratrifolia* R. Br., and should be introduced into cultivation by German gardeners. The same species has been found also in Dutch New Guinea.

6. *C. veratrifolia* R. Br., Bot. Reg., sub. t. 573.

var. *cleistogama* Schltr., sp. nov. [Ed.—var. nov.]

Differt a forma typica floribus clausis, cleistogamis, extus dense puberulis, petalis magis ellipticis apiculatis, columna dorso puberula, calcare dense puberulo, leviter incurvulo, filiformi.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 19054, flowering in Dec. 1908 [Ed.—possibly Jan. 1909].

I have placed this plant here provisionally as a variety, although I am doubtful whether all these forms, after closer examination of abundant material of *C. veratrifolia* R. Br., will remain ultimately in that species. The flowers of this plant are white with yellow warts at the base of the lamina of the lip.

7. *C. orthocentron* Schltr., sp. nov.

Terrestris, erecta, usque ad 70 cm alta; rhizomate valde abbreviato; radicibus elongatis, flexuosis, villosulis; foliis c. 6 erecto-patentibus, ellipticis, acuminatis, basi cuneatis, in petiolum basi dilatata vaginantem transeuntibus, lamina 20–30 cm longa, medio fere 6–8 cm lata; scapo erecto, tereti, praesertim apicem versus minute puberulo, vaginulis paucis dissitis, arctissime amplectentibus obresso, cum racemo usque ad 70 cm alto; racemo erecto, subdense multifloro, usque ad 15 cm longo; bracteis patentibus, lanceolatis, acutis, ovario pedicellato paulo brevioribus; floribus erecto patentibus vel patentibus, illis *C. veratrifoliae* R. Br. similibus, sed minoribus; sepalis patentibus, ellipticis, acuminatis, extus sparsim et minutissime puberulis, 1.1 cm longis, lateralibus obliquis; petalis patentibus, oblique lanceolato-ellipticis, acuminatis, basin versus subunguiculato-angustatis, sepalis aequilongis; labelli lamina tripartita, partitionibus lateralibus ligulato-falcatis, apicem versus paululo dilatatis, oblique truncatis, 7.5 mm longis; partitione intermedia e isthmo lineari-cuneato usque ad tertiam partem basilarem bipartita, 1.1 cm longa, partitionibus divergentibus, ligulato-falcatis, apicem versus paululo dilatatis, oblique truncatis cum apiculo minuto interjecto, callo trilobulato ad basin laminae verrucis parvulis pluribus dense aggregatis antepositis; calcare subfiliformi cylindrico, obtusiusculo, rectissimo, 1.3 cm longo, minutissime et sparsim puberulo; columna e basi angusta

dilatata, auriculis permagnis obliquis, clinandrii lobo dorsali brevi, obtusissimo; polliniis oblique clavatis, inaequimagnis, glandula obovata, antice acuta, per medium carinata; ovario graciliter pedicellato, cylindraceo, minute puberulo, pedicello incluso c. 3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests near Toliba, alt. c. 300 m—R. Schlechter no. 18968 (TYPE), flowering in Dec. 1908; in humus in the forests near Pema, alt. c. 300 m—R. Schlechter no. 19428, flowering in May 1909; in humus in the mountain forests near Jaduna, alt. c. 250 m—R. Schlechter no. 19325, flowering in Apr. 1909.

This plant is, undoubtedly, related closely to *C. veratrifolia* R. Br., but nevertheless I decided to regard it as a separate species on account of its peculiar straight, short spur and its strikingly large lateral lobes, and auricles of the column which are more extended than I have observed previously in any other species. The colour of the flowers is the same as *C. veratrifolia* R. Br., viz. white with a yellow callus and warts on the labellum.

8. *C. torricellensis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 144.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14498, flowering in Apr. 1902.

It is remarkable that, of the four species of the section *Calothyrsus* which I collected on my first expedition, I found only one on my second journey, viz. *C. Engleriana* Krzl., a widely distributed species. This seems to be proof that the species are distributed mostly locally and the time of flowering restricted to certain months of the year. This is the case in *C. torricellensis* Schltr. This species is related closely to *C. Wernerii* Schltr., but well distinguished by its smaller flowers and its short spur.

9. *C. Wernerii* Schltr., in Fedde, Repertor. X (1912), inedit.

Kaiser-Wilhelms-Land: In the forests on the Gelu River (Finisterre Range)—Dr. E. Werner no. 51, flowering in July 1907.

I have seen this species often in the Finisterre Range at an altitude of 800–1100 m where it is a fairly conspicuous plant, even in its non-flowering state, in consequence of its dense, yellow-spotted leaves, but I was never fortunate enough to see it in flower. It appears to occur most frequently on the edge of the bamboo zone which must be traversed in the ascent of these mountains at an altitude of about 1000 m.

The species is related closely to *C. torricellensis* Schltr. It has a much longer and more slender spur, and larger flowers. Its description will be published shortly in Fedde's Repertorium. According to the statement of the collector, the flowers are yellowish.

10. *C. Finisterrae* Schltr., sp. nov.

Gracilis, erecta, c. 50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis c. 3–5, erecto-patentibus, ellipticis, acuminatis, basi in petiolum sensim angustatis, lamina usque ad 25 cm longa, medio fere usque ad 6 cm lata, petiolo usque ad 10 cm longo; scapo gracili, teretiusculo, e basi glabrata apicem versus minutissime puberulo, vaginulis paucis, amplexantibus, acuminatis distantibus obsesso; racemo laxo 3–5-floro, usque ad 8 cm longo; bracteis erecto-patentibus, ovatis vel lanceolatis, acuminatis, ovario pedicellato 3–4-plo brevioribus; floribus in sectione vix inter mediocres, subsecundis, erecto-patentibus, mox patulis; sepalis subspathulato-ellipticis, apiculatis, c. 1.1 cm longis, medio fere 4.5 mm latis, glabris, lateralibus obliquis; petalis patenti-decurvulis, oblique subspathulato-ellipticis, obtusis, glabris, sepalis subaequimagnis; labelli lamina alte 3-partita, segmentis lateralibus subporrectis, oblique ligulatis, obtusiusculis, c. 5 mm longis, intermedio oblongo, tertia parte apicali obtusiuscule bilobulato, cum apiculo minuto interjecto, 0.7 cm longo, verrucis c. 6 ad ostium calcaris, glabris, verruculis pluribus antepositis usque ad basin lobi intermedii, calcare incurvulo, cylindrico, apice vix ampliato minute bilobulato extus glabro, intus ostio minutissime puberulo, c. 1.4 cm longo; columna glabra, apicem versus paulo ampliata, c. 0.6 cm longa, auriculis oblique triangulis obtusis, porrectis; anthera rotundato-galeata, antice obscure bidentata, glabra; ovario glabrato, cum pedicello c. 1.6 cm longo, subclavato.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18195, flowering in Sept. 1908.

From all the species of the Section *Calothyrsus* in the Territory, this one is distinguished by the few-flowered inflorescences. Together with the following two species it is related to *C. flava* Hassk. and *C. graciliscapa* Schltr., particularly to the latter. The flowers are green-yellow.

11. *C. camptoceras* Schltr., sp. nov.

Terrestris, erecta, usque ad 100 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis erecto-patentibus, ovalibus, acuminatis, basi cuneatis, in petiolum brevem angustatis, usque ad 30 cm longis, medio fere usque ad 9 cm latis, subtus minute puberulis; scapo gracillimo, tereti, minute puberulo, vaginulis paucis, distantibus, arcte amplexantibus, acuminatis, obsesso; racemo subdense multifloro, usque ad 30 cm longo, c. 2 cm diametiente; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario pedicellato duplo fere brevioribus; floribus erecto-patentibus demum patulis, in genere inter minores; sepalis elliptico-oblongis, obtusiuscule apiculatis, glabris, intermedio 0.6 cm longo, lateralibus obliquis c. 0.7 cm longis; petalis decurvis, subfalcatis, lineariligulatis, obtusis, apicem versus paululo dilatatis, glabris, 6.5 mm longis; labello petalis aequilongo, alte 3-fido, lobis lateralibus subdivaricatis, oblique subfalcato-oblongis, obtusis, 0.4 cm longis, intermedio oblongo, usque supra medium bifido, lobulis obtusis, 0.4 cm longo, callis 4 ad ostium calcaris in basi laminae, 3 subaequimagnis antepositis, calcare cylindraceo-clavato, genuflexo-porrecto, apice retusiusculo, c. 1 cm longo, extus glabro, intus fauce dense puberulo; columna apicem versus dilatata, lateralibus basi puberula, marginibus omnino labello adnata, 4.5 mm longa, auriculis oblique triangularibus obtusis; anthera late, ovata, antice bidentata, umbone late ovato ornata, glabra; pollinibus oblique clavatis, inaequimagnis, glandula minuta rotundata; ovario cum pedicello clavato, minute puberulo, c. 1 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18239, flowering in Sept. 1908.

One of the small-flowered species of almost insignificant colouring. In the floral structure it is related likewise to *C. flava* Hassk. From *C. Finisterrae* Schltr., described above, it is distinguished easily by the many-flowered inflorescences and the smaller flowers. The leaves are a dark metallic-green, the flowers greenish with a white-green labellum.

12. *C. micrantha* Schltr., sp. nov.

Terrestris, gracilis, erecta, 35–55 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis erecto-patentibus, ovalibus, acuminatis, basi cuneatis, in petiolum basi dilatata vaginantem angustatis, lamina 10–25 cm longa, medio fere 4–8 cm lata, utrinque glabra; scapis gracilibus, teretibus, vaginulis paucis, dissitis, amplexantibus, acuminatis, minute puberulis; racemo subdense multifloro, usque ad 15 cm longo, c. 2 cm diametiente; bracteis ovato-lanceolatis, acuminatis, puberulis, ovario pedicellato paulo brevioribus; floribus in sectione inter minimos, erecto-patentibus, demum patulis; sepalis reflexis, ovalibus, obtusis, 0.4 cm longis, glabris, lateralibus obliquis; petalis reflexis, ligulato-linearibus, obtusis, apicem versus paulo dilatatis, glabris, sepalis fere aequilongis; labello petalis aequilongo, alte trifido, lobis lateralibus divergentibus, ligulato-oblongis obtusis, 2.5 mm longis, intermedio oblongo, usque ad medium obtusiuscule bilobulato, 2.75 mm longo, callis 3 ad ostium calcaris in basi laminae, verrucis 4 parvulis antepositis, calcare recto, horizontali, cylindrico, apice paululo ampliato, subbilobulato, glabro, 1.1 cm longo; columna apicem versus ampliata, glabra, auriculis rotundato-triangularibus; anthera late ovato-cucullata, glabra, antice minute excisa, dorso umbonata; pollinibus oblique clavatis, subaequimagnis; glandula rotundata, mediocri; ovario cum pedicello subclavato, glabrato, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18823, flowering in Nov. 1908.

This species undoubtedly is related closely to the previous one, but its leaves are much smaller and there are significant differences in the labellum in the shape of the segments and the spur, which necessitates keeping both species separate. The flowers are whitish green, the labellum nearly white.

13. *C. spathoglottoides* Schltr., sp. nov.

Terrestris, erecta, 20–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis 3–4 erecto-patentibus, ovalibus, acuminatis, basi cuneatis, in petiolum basi dilatata amplectentem angustatis, utrinque molliter et brevissime puberulis, lamina usque ad 15 cm longa, medio fere usque ad 5.5 cm lata, petiolo 3–6 cm longo; scapo erecto, tereti, vaginulis paucis, dissitis, acuminatis, obsesso, minute puberulo; racemo laxius 4–7-floro, usque ad 8 cm longo; bracteis lanceolatis, acuminatis, minute puberulis, ovario pedicellato fere 3-plo brevioribus; floribus erecto-patentibus, in genere mediocribus, illis *C. celebicae* Rolfe similibus, sed paulo minoribus; sepalis oblongis, 1.5 cm longis, glabris, intermedio obtusiusculo, lateralibus obliquis, acute apiculatis; petalis oblique ellipticis, obtusiusculis, glabris, 1.35 cm longis; labello petalis aequilongo, e basi unguiculata trilobo, lobis lateralibus basalibus parvulis, oblique oblongis, obtusis, divergentibus, 1.5 mm longis, intermedio e basi angusta cuneato, antice breviter et obtuse bilobulato cum apiculo interjecto, 0.9 cm longo, infra apicem 0.7 lato, callo duplici in basi laminae, lineis 3 verruculosus antepositis, calcare antorsim curvato, cylindrico, apicem versus paulo ampliato, obtuso, sparsim et minute puberulo, 1.2 cm longo; columna brevi, apicem versus dilatata, 3.5 mm longa glabra, auriculis brevibus, rotundatis; anthera late ovato-cordata, apiculata, glabra, umbone triangulo-reniformi ornata; ovario cum pedicello clavato, dense et minutissime puberulo, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19062, flowering in Jan. 1909.

This species is proof again of the close relationship between the floral regions of North Celebes and New Guinea, since it is a close relative of *C. celebica* Rolfe. It differs in its more compact growth, smaller flowers and the somewhat differently shaped labellum. The latter reminds one somewhat of *Spathoglottis* Bl. by its narrow shape, widened towards the front, which induced me to call the species *spathoglottoides*. *C. Englishii* Rolfe from British Papua may, perhaps, belong also to this relationship, but it has much smaller leaves and a shorter, thicker cylindrical spur. The flowers are violet-red with a golden yellow lip-callus and a white column.

14. *C. parvilabris* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 143.

Kaiser-Wilhelms-Land: In humus in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 13954, flowering in Jan. 1912 [Ed.—probably 1902].

Unfortunately, I did not find this interesting species again. This is all the more regrettable since my single specimen was very much decayed when the collection was damaged greatly by sea-water on loading into the ship. I am not quite certain whether the species belongs to the section *Calothyrsus*, since the inflorescence was so damaged but I seem to remember that it had persistent bracts. The flowers are a pure white.

§ 4. *Styloglossum*

This name was applied initially in 1827 by Breda as the generic name of an orchid which proved later on to be *C. curculigoides* Lindl. Therefore, the name has now been retained as a section name for the species which are grouped around *C. curculigoides* Lindl.

Compared to *Calothyrsus*, this section is recognised by its deciduous bracts. The species, furthermore, are recognised by their habit in possessing a close, usually cylindrical inflorescence, nearly always overgrown by the leaves. The flowers are apparently always either white or golden yellow with various intermediate shades.

The section is distributed from the Himalayas, through the Malay-Papuan region to the Samoan Islands. In China and Japan, where *Calanthe* species are otherwise abundant, representatives of this section are missing. No species are known in Australia either, but in New Caledonia the section is represented by *C. Langei* F.v.M. and *C. Balansae* Finet. In our Territory I know the eight species enumerated here. Besides these, *C. tunensis* J.J. Sm. has been reported from Dutch New Guinea. In general *Styloglossum* species grow in the humus of the mist-forest formations,

although there are some exceptions. *C. leucosceptrum* Schltr. occurs as solitary specimens, for example, in the Waria District on hills at 300 m, in association with other mountain plants, which there extend lower down into the valley than in other parts of the Protectorate.

C. chrysantha Schltr. is known to me only as an epiphyte on tree-trunks, while the closely related *C. chrysoleuca* Schltr. grows like the rest in forest-humus. *C. inflata* Schltr. is found in humus-rich places on limestone rocks in the mist-forest formation.

15. *C. chrysoleuca* Schltr., sp. nov.

Terrestris, erecta, c. 30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis erectis, c. 4, anguste lanceolatis, acuminatis, basi cuneatis, sensim in petiolum basi dilatata vaginantem angustatis, lamina usque ad 25 cm longa, medio fere c. 2 cm lata, petiolo 5–7 cm longo; scapo erecto, pro genere breviusculo, cum racemo c. 13 cm longo, tereti, glabro, vaginis paucis amplis, laxe amplexantibus, acuminatis obsesso; racemo subdense 15–20-floro, cylindraceo, c. 4 cm longo; bracteis caducis, ellipticis, acuminatis, glabris, flores superantibus; floribus in sectione inter minores, mox patulis, illis *C. chrysanthae* Schltr. similibus sed paulo minoribus; sepalis oblongis, acuminatis, glabris, intermedio 0.8 cm longo, lateralibus obliquis 9.5 mm longis; petalis oblique ovalibus, apiculatis, glabris, 0.7 cm longis; labello circuitu panduriformi-trilobato, lobis lateralibus basalibus, obtuse triangulis, abbreviatis, intermedio e basi subunguiculato-angustata late obovato, antice obtusissimo cum apiculo minuto, labelli lamina tota 0.5 cm longa, inter apices loborum lateralium et infra apicem lobi intermedii 0.3 cm lata, glabra, callo duplici humili oblongo, obtuso, retrorso supra basin labelli inter lobos laterales, calcare cylindraceo apice paululo dilatato, truncato-obtusissimo, glabro, 0.4 cm longo; columna glabra, apicem versus dilatata, 3.5 mm longa, auriculis triangulis, apiculatis, brevibus; anthera reniformi-cucullata, apiculata; ovario cum pedicello clavato, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18093, flowering in Aug. 1908.

This species is a close relative of *C. chrysantha* Schltr., but has smaller flowers of a different shade, with more-pointed sepals, a shorter and thicker spur, not narrowed towards the base and a labellum much constricted in the centre. The flowers are golden yellow, with paler petals and a white front-lobe to the lip.

16. *C. chrysantha* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 141.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14494, flowering in Apr. 1902; no. 20150, flowering in Sept. 1909.

As I have mentioned previously, this species is related closely to *C. tunensis* J.J. Sm., but I consider that it differs specifically in its longer, clavate spur and the higher pad on the lamina of the lip. The flowers are golden yellow.

17. *C. neo-hibernica* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 142.

Neu-Mecklenburg: In humus in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14707, flowering in July 1902.

In this and the next four species, we have a series of closely related forms, which differ from one another in size, in the shape of the lip, length and shape of the spur and in the column. Of these *C. neo-hibernica* has the shortest spur. The flowers are a pure white.

18. *C. longifolia* Schltr., sp. nov.

Terrestris, erecta, usque ad 80 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis 4–6, erectis, perlongis, linear-ligulatis, acuminatis, lamina sensim in petiolum angustata, usque ad 55 cm longa, medio fere usque ad 3.5 cm lata, petiolo c. 30 cm longo, basi dilatata vaginante; scapo tereti, glabro, vaginis paucis amplis, dissitis, acuminatis, amplexantibus obsesso, cum racemo c. 40 cm longo; racemo dense multifloro, cylindraceo, usque ad 5 cm longo; bracteis angustis, acuminatis, flores aequantibus, mox caducis, floribus in sectione mediocribus, patentibus; sepalis oblongis, apiculatis, glabris, 1.1 cm longis, lateralibus obliquis; petalis oblique ellipticis, apiculatis, 0.9 cm longis, medio fere 0.5 cm latis, glabris; labelli lamina triloba, ad ostium

calcaris carinis 2, brevibus donata, glabra, 0.6 cm longa, inter apices loborum lateralium 0.4 cm lata, lobis lateralibus parvulis, oblique oblongis, obtusis, subporrectis, intermedio oblongo-cuneato, obtusissimum, lateralibus multoties majore, calcare subfiliformi-cylindraco, apice subclavato-ampliato, glabro, 1.7 cm longo; columna apicem versus paulo dilatata, glabra, 0.3 cm longa, antice oblique truncata, auriculis obsoletis, clinandrio dorso trilobato, lobis lateralibus unidentatis; anthera ovato-cucullata, subacuta, subcordata, umbone magno ovato donata, glabra; ovario cum pedicello clavato, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20334, flowering in Sept. 1909.

In habit this species is not unlike that of *C. neo-hibernica* Schltr., but the leaves are broader and are distinguished by the exceptional length relative to the breadth. Moreover, the spur is much longer and the shape of the lip, with blunt longish, lateral lobes is altogether different. The flowers are white with pale yellow lateral lobes to the lip.

19. *C. stenophylla* Schltr., sp. nov.

Terrestris, erecta, usque ad 50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis erecto-patentibus vel suberectis, 7–9, linearibus, acuminatis, supra basin paulo attenuatis, usque ad 60 cm longis, medio fere 1.5–2 cm latis; scapo erecto, tereti, glabro, vaginis paucis dissitis, amplexantibus, acuminatis, glabris, cum racemo usque ad 30 cm longo; racemo subaxe pluri-multifloro, c. 5 cm longo; bracteis caducis; floribus patentibus, in sectione mediocribus, graciliter pedicellatis; sepalis elliptico-oblongis, apiculatis, glabris, vix 1.1 cm longis, lateralibus obliquis, intermedio paulo angustioribus; petalis late ellipticis, obtusis, obliquis, c. 1 cm longis, medio fere 6.5 mm latis; labelli lamina trilobata, glabra, laevi, 0.6 cm longa, inter apices loborum lateralium 0.5 cm lata, lobis lateralibus basilaribus, oblique ovato-falcatis, obtusiusculis, parvulis, intermedio cuneato, antice truncato cum apiculo minuto, lateralibus multoties, majore, calcare recto, filiformi-cylindraco, obtusiusculo, glabro, c. 2 cm longo; columna glabra, apicem versus paulo ampliata, 0.6 cm longa, antice oblique truncata, auriculis obsoletis, clinandrio trilobulato, lobulis lateralibus apiculatis; anthera ovato-cucullata, obtusa, glabra, umbone ovato ornata; polliniis inaequimagnis, oblique clavatis; ovario cum pedicello gracili clavato, c. 1.7 cm longo, glabro.

Kaiser-Wilhelms-Land: In humus in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18061, flowering in July 1908.

This species agrees fairly well in the flower with *C. longifolia* Schltr., but the two narrow crests in front of the entrance to the spur are missing. The lateral lobes of the lip are erect, and the spur is not thickened at the apex as in the latter. In habit the two species look somewhat different, since in *C. stenophylla* Schltr. the leaves are appreciably narrower and a distinction between the lamina and petiole is hardly possible. The colour of the flowers is alike in both species, viz. pale yellow lateral lobes to the labellum in an otherwise snow-white flower.

20. *C. leucosceptrum* Schltr., sp. nov.

Terrestris, erecta, usque ad 80 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis villosulis; foliis erecto-patentibus vel suberectis, lineari-lanceolatis, acuminatis, glabris, infra medium paululo attenuatis, usque ad 80 cm longis, medio fere usque ad 3 cm latis; scapo stricto, tereti, glabro, vaginis paucis amplis, dissitis, acuminatis, amplexantibus obsoeto, racemo incluso usque ad 55 cm longo, racemo cylindrico, dense multifloro, usque ad 15 cm longo; bracteis mox caducis; floribus graciliter pedicellatis, patentibus, mox patulis, in sectione inter mediocres; sepalis ellipticis, apiculatis, glabris, c. 1 cm longis, lateralibus obliquis, basi margine anteriore paulo ampliatis; petalis obliquis, late ellipticis, obtusis, glabris, sepalis paulo brevioribus; labelli lamina triloba, c. 0.8 cm longa, inter apices loborum lateralium 5.5 mm lata, glabra, laevi, lobis lateralibus subporrectis, oblique falcato-ovatis, subacutis, parvulis, lobo intermedio oblongo-quadrato, antice truncato cum apiculo minuto, lateralibus multo majore, calcare leviter arcuato, infra apicem vix dilatato, subfiliformi-cylindraco, glabro, c. 2 cm longo; columna apicem versus paulo ampliata, antice oblique truncata, auriculis valde obsoletis, clinandrio producto, obtuse tridentato; anthera ovato-cucullata, subacuta, glabra, umbone ovato crasso ornata; polliniis oblique clavatis, subaequimagnis, glandula parvula rotundata; ovario graciliter pedicellato, clavato, glabro, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the hill forests at Jaduna on the Waria

[River], alt. c. 300 m—R. Schlechter no. 19319, flowering in Apr. 1909.

The chief characteristic in the flower of this species is the column very obliquely truncate in front, a shape which I know in no other *Calanthe* species. Externally, the plant resembles *C. longifolia* Schltr., but is distinguished easily from it by the long-stemmed flowers with their long spurs. The flowers are snow-white.

21. *C. cruciata* Schltr., sp. nov.

Terrestris, erecta, usque ad 90 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; foliis c. 7, erecto-patentibus vel suberectis, anguste lanceolatis, acuminatis, basin versus sensim petiolato-angustatis, glabris, usque ad 90 cm longis, medio fere usque ad 5 cm latis; scapo erecto, substricto, tereti, glabro, vaginis paucis, acuminatis, amplexantibus obsesso, inflorescentia inclusa c. 55 cm alto; racemo dense multifloro, ovali, c. 10 cm longo; bracteis mox caducis; floribus patentibus, illis *C. leucosceptrum* Schltr., similibus, sed paulo majoribus, gracillime pedicellatis; sepalis ovalibus, apiculatis, glabris, 1.2 cm longis, lateralibus obliquis; petalis oblique ovalibus, apiculatis, sepalis paululo brevioribus et latioribus; labelli lamina cruciata-trilobato, c. 0.7 cm longa, inter apices loborum lateralium 0.7 cm lata, lobis lateralibus patentibus, basalibus, oblique oblongis, obtusis, lobo intermedio duplo majore, oblongo, apiculato, glabro, calcare subfiliformi-cylindraceo, obtuso, apice vix ampliatus, surdato, c. 2 cm longo, ostio paulo dilatato; columna apicem versus paulo ampliata, glabra, auriculis lateralibus subobsoletis, medio apiculatis, clinandrio semiorbiculari, concavo; anthera ovato-cucullata, obtuse apiculata, glabra, callo reniformi apiculato dorso ornata; pollinibus oblique clavatis, subaequimagnis, glandula ampla ovali.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17120, flowering in Jan. 1908.

Undoubtedly, the species is related closely to *C. leucosceptrum* Schltr., but is distinguished by the rather larger flowers and the larger, cruciate, erect lateral lobes of the lip. Moreover, the anther is longer with a low reniform callus and the viscid disc of the pollinia is considerably larger. The flowers are pure white.

22. *C. inflata* Schltr., sp. nov.

Terrestris, erecta, usque ad 50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; foliis suberectis vel erecto-patentibus, lanceolatis vel lanceolato-ellipticis, acuminatis, basi cuneatis, in petiolum basi dilatata vaginantem sensim angustatis, lamina usque ad 40 cm longa, medio fere usque ad 6 cm lato, petiolo usque ad 6 cm longo; scapo substricto, erecto, tereti, glabro, vaginis paucis, amplis, acuminatis, alte amplexantibus obsesso, cum racemo usque ad 45 cm longo; racemo subdense multifloro usque ad 14 cm longo; bracteis ovalibus, acuminatis, caducis, flores primum superantibus; floribus patentibus, mox patulis, in sectione vix inter majores, illis *C. saccatae* J.J. Sm. similibus; sepalis ovalibus, acuminatis, glabris, intermedio c. 1.1 cm longo, lateralibus obliquis, c. 1.2 cm longis; petalis late elliptico-spathulatis, apiculatis, glabris, obliquis, sepalis paulo brevioribus; labelli lamina oblongo-cuneata, usque supra medium bilobata, 0.7 cm longa, inter apices loborum lateralium 0.5 cm lata, glabra, basi callo erecto corniformi ornato, lobis oblique oblongis, obtusis, calcare brevissimo, sacciformi-inflato, oblique semigloboso, paulo antrorsum spectante; columna apicem versus paulo dilatata, glabra, 0.5 cm longa, auriculis abbreviatis, clinandrio minute lobulato; anthera reniformi-cucullata, obtusa, umbone magno reniformi ornata, glabra; pollinis oblique clavatis, inaequilongis, 4-nis glandulae magnae semiorbiculari affixis; ovario cum pedicello clavato, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: In humus on limestone rocks in the forests on steep slopes of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19071, flowering in Jan. 1909.

This species, together with *C. saccata* J.J. Sm., is very characteristic compared with all others in the section, in the peculiar formation of the sac at the base of the lip. This species is distinguished easily from *C. saccata* J.J. Sm. by its deep, two-lobed labellum. The flowers are white with an orange-red, horny tubercle at the base of the lip-lamina.

§ 5. *Aceratochilus*

Here I have united into one section two fairly divergent forms, of which my *C. aceras*

Schltr. belongs to New Guinea, and the other, *C. undulata* J.J. Sm., to Borneo. These two species are distinguished from those of the other sections of the sub-genus *Eu-Calanthe* by the total suppression of a spur or sac-formation. In their habit and flowers, they resemble the section *Calothyrsus*, but, with *Styloglossum*, have in common the peculiarity of losing their bracts before flowering.

C. aceras Schltr. is indigenous to our Territory, and is a huge plant with large leaves, and inflorescences taller than a man. It is found in the more open places in rich humus soil, and on steep mountain ridges, at about 1200–1600 m altitude in the mist-forest formation.

23. *C. aceras* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 140.

Kaiser-Wilhelms-Land: In humus on steep ridges of the Finisterre Range, alt. c. 1250 m—R. Schlechter no. 19079, flowering in Jan. 1909; in more open places in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 14049, flowering in Jan. 1902.

A very characteristic species to which the much smaller *C. undulata* J.J. Sm., from Borneo, seems to be related. The specimens from the Finisterre Range have a slightly narrower lip-lamina than the Type from the Bismarck Range. The sepals and petals are yellowish or brown-yellow, the labellum and column are white.

64. *Aulostylis* Schltr.

In *Calanthe* R. Br. and *Phajus* Lour., certain forms occur which have been placed sometimes with *Phajus* and sometimes with *Calanthe*. Of these, *Calanthe gracilis* Lindl. and *Phajus calanthoides* Ames may be mentioned as undoubtedly close relatives. It may be concluded from this that *Calanthe* R. Br. and *Phajus* Lour. are two genera, difficult to distinguish, but this is by no means the case if we take into consideration the characteristics on which *Calanthe* R. Br. was founded originally, viz. a labellum connate almost to the top with the margins of the column. *Calanthe gracilis* Lindl. is, therefore, not really a *Calanthe*, but belongs to *Phajus*, if *Limatodes* Lindl. is not to be retained, to which certain objections could be raised.

A similarly differing form is found in *Aulostylis* Schltr. As regards habit, no objections could be raised in regarding the plant as *Calanthe* or the [sub-genus] *Preptanthe* respectively, but the flower structure does not allow this admission, because the absolutely spurless labellum is quite free from the column; the latter also representing a peculiar structure. Thus, its margins are widened and connate in front, so that the upper part of the column forms a tube, in which the stigma and rostellum are enclosed completely.

When I saw the first specimens of the plant, I thought I was dealing with an abnormal pelorial form of *Calanthe* R. Br. but later on I saw large numbers at different locations, so that I became convinced of the stability of this character. In addition, the anther and rostellum were developed quite normally and I therefore decided, contrary to my original intention, to form a new genus. In this I was supported by Ridley (to whom I showed my sketches in Singapore) who also was of the opinion that such forms should be separated. After all, it is much better to separate them until it can be proved that they are abnormal transformations, than to destroy the sharp generic boundaries by including them.

Aulostylis Schltr., gen. nov.

Sepala patentia, oblongo-elliptica, acuminata, extus tenuiter longipilosa. Petala patentia, oblique obovata, apiculata, glabra, sepalis paulo breviora. Labellum circuitu ovale, apiculatum, obscure trilobatum, medio longitudinaliter leviter incrassatum, superne glabrum, subtus basin versus sparsim pilosum, marginibus omnino liberum, ecalcaratum. Columna glabra, labello duplo brevior, marginibus dilatatis incurvis, antice connatis tubum triquetrum apice apertum formans, rostellum antice bifidum

et stigma reniforme includens. Anthera reniformis, apice excisa, glabra. Pollinia 8, oblique clavata, basi cohaerentia. Ovarium pedicellatum, clavatum, longipilosum.

Planta epiphytica habitu omnino *Preptanthe* Ldl. imitans; rhizomate valde abbreviato; radicibus flexuosis, minutissime puberulis; pseudobulbis ovoideis, paucifoliatis; foliis erecto-patentibus, annuis, caducis; scapo basali, erecto, piloso, vaginis obesso, folia superante; racemo laxo plurifloro subnutante; bracteis foliaceis, erecto-patentibus, persistentibus; floribus magnis ochroleucis.

Species singula adhuc nota, Papuae insulae incola.

Whether it is a case of an abnormal transformation or an adaptation of a former *Preptanthe* Lindl. which has now become a rule, must be left to the future. I prefer to treat it for the time being as the latter so that it can be regarded as a pelorial transformation when justified. This is preferable to having, suddenly, to describe a *Calanthe*, where the characters of the classification would have to be altered considerably.

The sole species, *A. papuana* Schltr., grows in the upper region of the hill-country in the central part of Kaiser-Wilhelms-Land, as an epiphyte on tall trees; however, always below the mist-forest formation, where apparently the pseudobulbs can have a dormant period prior to shooting afresh. In some areas the plant is not rare. Its flowers open wide, as in *Preptanthe* species, but always only in the manner described here. I have examined young buds and the arrangement of the individual parts always conforms to that found in all other flowers examined.

1. *A. papuana* Schltr., sp. nov.

Epiphytica, erecta, usque ad 50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, minute puberulis; pseudobulbis ovoideis, obscure angulatis, vaginis 1-2 foliiferis primum obtectis, apice foliis 2-3 mox caducis coronatis, 5-7 cm altis, infra medium 2-3 cm diametentibus; foliis articulatis, erecto-patentibus vel suberectis, lanceolato-ellipticis vel ellipticis, acuminatis, plicatis, utrinque glabris, basi in petiolum brevem angustatis, usque ad 40 cm longis, medio fere usque ad 8 cm latis; vaginis usque ad 3 cm altis persistentibus; scapo gracili, tereti, longipiloso, apicem versus subvillosus, vaginis paucis amplexentibus acuminatis obesso, cum racemo usque ad 50 cm longo; racemo laxo 7-15-floro, usque ad 20 cm longo; bracteis foliaceis, lanceolatis, acuminatis, extus pilosis, intus glabris, ovarium fere aequantibus; floribus erecto-patentibus, speciosis, ochroleucis; sepalis elliptico-oblongis, acuminatis, extus longipilosis, c. 2.5 cm longis, lateralibus obliquis; petalis oblique obovato-ellipticis, apiculatis, glabris, 2.3 cm longis, supra medium 1.2 cm latis; labello late elliptico, apiculato, supra medium obscure trilobato, c. 2 cm longo, supra medium 1.1 cm lato, lobis lateralibus obtusatis, intermedio subsemiquadrato, regione incrassata intermedia e basi labelli usque infra apicem decurrente, nervo medio sulcato, labello toto superne glabro, subtus basin versus sparsim piloso; columna generis, glabra, obtuse triquetra, c. 1.2 cm longa; anthera generis, glabra; ovario cum pedicello clavato, villosus, c. 3 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17665, flowering in May 1908; on trees in the forests of the Finisterre Range, above Meireka, alt. c. 700 m—R. Schlechter no. 17957, flowering in July 1908.

In habit, this plant may well be compared with *Preptanthe vestita* Rchb. f., but its floral structure is quite different. I tried my utmost to see whether a normal *Preptanthe* form of this species might be found, but I could discover no trace of it.

The flowers spread out quite normally and are by no means inferior in size to those of *Preptanthe vestita* Rchb. f., but they are distinguished by their peculiar formation. The colour is yellowish white.

65. *Spathoglottis* Bl.

There are very few genera of the *Orchidaceae* in which the individual species have been confused so much as in *Spathoglottis* Bl. This is attributed to their usually being very closely related, and therefore not easily distinguished. On the other hand it appears that until now, we have, not always, recognised their more important

characters, and that they have been described inadequately. During my last journeys I took great pains to discover to which of the characters most importance should be attached in determining the species of this genus, and I came to the conclusion that the shape and degree of hairiness of the labellum form the best distinctions, even between very closely related species. I have not been able to detect any variation in these characters in any individual species, although I have examined a large number of flowers for this purpose. On the other hand, the degree of hairiness on the outside of the perianth segments is variable and is, therefore, often useless for determination of the species.

The genus at present contains about 30 species, of which about one third have been described from New Guinea. To these I now have to add a number of others. Accordingly, it is definite that *Spathoglottis* Bl. has its centre of dispersion in New Guinea, and from this centre the species diminish in number in every direction. India may be regarded as their most western range, whilst in the north they have penetrated to China. Northern Australia and New Caledonia constitute their limits in the south, and *S. pacifica* Rchb. f. has extended easterly as far as the Viti [Fiji] and Samoan Islands.

The species which occur in our Territory are distributed evenly over that area, but diminish markedly in number as we begin to ascend the mountains. Thus, only *S. parviflora* Krzl. and *S. altigena* Schltr. can be regarded as typical mountain plants. The other species are found in the hill-country especially along river courses and on hill-sides. Only two species are confined strictly to the sunny along-zone, viz. *S. portus-Finschii* Krzl. and *S. Kenegiae* Schltr. I have never been able to discover any species in close proximity to the coast.

Besides those enumerated here from German New Guinea, two more species are recorded from British Papua, viz. *S. stenophylla* Ridl. and *S. papuana* Bail. From Dutch New Guinea, Kränzlin and J.J. Smith have recorded *S. plicata* Bl., but these determinations require confirmation. Further from there an endemic species, *S. obovata* J.J. Sm., should be mentioned, though this perhaps could be united with *S. stenophylla* Ridl. The division of the genus, as far as one can see, is only possible on vegetative characters. In this manner only a small group of species can be separated, being distinguished from the main group by the flower-stalks appearing before the leaves, the latter being shed after a period of growth. Whether this characteristic is sufficiently constant to establish a section remains doubtful. The only really divergent species that I know in the genus is the rare *S. Handingiana* Par. et Rchb. f. from Siam and Burma.

1. *S. portus-Finschii* Krzl., in K. Schum. et Hollr., Fl. Kaiser-Wilhelms-Land (1889), p. 32.
- S. Hollrungii* Krzl., in K. Schum. et Hollr., Fl. Kaiser-Wilhelms-Land (1889), p. 33.
- S. plicata* Krzl., in K. Schum. et Hollr., Fl. Kaiser-Wilhelms-Land (1889), p. 33, p.p. (nec Bl.).
- S. pubescens* Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds. (1901), p. 244 (nec Lindl.).
- S. Lauterbachiana* Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds. (1901), p. 244.

Kaiser-Wilhelms-Land: On rock faces on the Nuru River, alt. c. 160 m—C. Lauterbach, no. 2251, flowering in July 1896 [Ed.—no location cited] alt. c. 100 m—R. Schlechter no. 14302, flowering in Feb. 1902; on steep grassy hills near Jawer, on the Minjem [River], alt. c. 100 m—R. Schlechter no. 16216, flowering

in June 1907; on grassy hills at the foot of the Bismarck Range, alt. c. 200 m—R. Schlechter no. 18647, flowering in Nov. 1908; at Massa, near the Boja [River], not far from Finschhafen—Hollrung no. 230, flowering in July 1886; near Kelana in grass—Hellwig no. 50, flowering in July 1888.

The specimens and synonyms enumerated here belong, undoubtedly, to a single species being the only one in the Territory in which the flower stalks appear on a leafless plant. The tubers are remarkably thick and round, reminding one of the tubers of *Preptanthe*. Some specimens, which are still cited as synonyms by Kränzlin, have not been seen by me, and therefore I could not discuss them.

In the Berlin Herbarium there are three sheets of Hollrung no. 230, which doubtless have all been collected on one day at the same location and which certainly all belong to the same species. These three sheets have all been determined differently by Kränzlin, viz. *S. portus-Finschii* Krzl., sp. nov., *S. Hollrungii* Krzl., sp. nov. and *S. plicata* Bl. The same thing happened to Lauterbach's two sheets of no. 2251, of which the Berlin Herbarium received a duplicate sheet on which the number was omitted. Of these, one is marked *S. pubescens* Lindl. and the other *S. Lauterbachiana* Krzl., sp. nov. Without question, both are identical with *S. portus-Finschii* Krzl. The flowers are violet-pink, with brownish lateral lobes and a yellow centre on the lip.

2. *S. Kenejiae* Schltr., sp. nov.

Terrestris, erecta, 65–75 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis parvulis, conicis; foliis erectis vel suberectis, 2–4, sub anthesi (in specimine singulo) usque ad 70 cm longis, elliptico-lanceolatis, longe acuminatis, glabris, medio fere usque ad 4 cm latis, basi in petiolum longiusculum sulcatum sensim angustatis; scapo stricto vel substricto 65–75 cm alto, tereti, e basi glabrata apicem versus sensim tomentosulo, vaginulis paucis dissitis, obtusis obsesso; racemo dense multifloro, breviusculo; bracteis patentibus, late ovalibus, obtusis, tomentosulis, ovario 3–4-plo brevioribus; floribus erecto-patentibus vel suberectis, in genere mediocribus; sepalis oblongo-ellipticis, obtusis, extus minutissime tomentosulis, intus glabris, 1.7 cm longis, lateralibus paulo obliquis; petalis oblique ellipticis, obtusis, glabris, sepalis aequilongis sed sublongioribus; labello e basi trilobo, 1.3 cm longo, explanato inter apices loborum lateralium 1.3 cm longo, lobis lateralibus falcato-ligulatis, obtusis, glabris, 0.8 cm longis, lobo intermedio e ungue lineari, basi utrinque lobulo minuto, obtuse triangulo, sparsim pilosulo aucto, antice in lobum reniformem breviter excisum, 0.3 cm longum 0.7 cm infra basin latum, basi obscure tricarinatum expanso, callis 2 separatis, obtusis, triangulo-globosis, superne sparsim pilosis, pro genere amplius in ima basi lobi intermedii ante lobos laterales; columna gracili semitereti, apicem versus paulo dilatata, glabra, 1.1 cm longa; anthera subreniformi-cucullata, obtusa, obscure umbonata, glabra; pollinibus generis; ovario cylindrico, tomentosulo, c. 2.2 cm longo.

Kaiser-Wilhelms-Land: On damp grassy depressions in the plains on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18290, flowering in Sept. 1908.

In its flowers this species externally resembles *S. portus-Finschii* Krzl., but they are smaller and the latter differs in habit by possessing large tubers and bearing leaves at flowering time. This, and the two following species, *S. altigena* Schltr. and *S. rivularis* Schltr., are distinguished from those which follow next in that the lateral lobes of the lip, when spread out, are falcate, being bent forward; whereas in *S. grandiflora* Schltr., *S. papuana* Bail. and their relatives, they stand out at right angles from the middle lobe. The flowers are pale rose-red, with pale brownish lateral lobes of the lip which has a yellow centre, and a rose-red middle lobe.

3. *S. altigena* Schltr., sp. nov.

Terrestris, erecta, gracilis, 60–80 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis puberulis; pseudobulbis parvulis, vix conspicuis; foliis erectis vel erecto-patentibus, 2–4, anguste lanceolato-ligulatis, acuminatis, plicatis, longipetiolatis, 50–70 cm longis, medio fere usque ad 3.5 cm latis; scapis substrictis vel paulo flexuosis, glabris, vaginulis paucis, dissitis, amplexentibus, apiculatis obsessis, 60–80 cm altis; racemo erecto, laxius 10–15-floro; bracteis elliptico-lanceolatis, acuminatis, ovario gracillime pedicellato subduplo brevioribus, glabris; floribus

erecto-patentibus, in genere mediocribus; sepalis elliptico-oblongis, glabris, extus obtuse apiculatis, 1.5 cm longis, lateralibus obliquis; petalis oblique ovalibus, obtusis, glabris, sepalis aequilongis sed latioribus; labello e basi trilobo, 1 cm longo, infra apices loborum lateralium 1.5 cm lato, lobis lateralibus falcato-ligulatis, obtusis, glabris, 0.9 cm longis, intermedio e basi unguiculato-angustata obovato-spathulato, antice truncato-obtusissimo cum apiculo minuto, 0.7 cm longo, infra apicem 4.5 mm lato, basi callis 2 separatis subglobosis, glabratis, basi antice puberulis ornato, caeterum glabro; columna gracili, leviter arcuata, glabra, apicem versus paulo dilatata; anthera ovato-cucullata, obtuse apiculata, dorso gibbo parvulo conico ornata, glabra; ovario cylindraceo, gracillime pedicellato, glabro, cum pedicello c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On clay slopes in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19717, flowering in June 1909.

This is one of the few species of *Spathoglottis* which can be regarded as endemic to the mist-forest formation. It is characterised especially by the short middle lobe of the lip. The flowers are violet-red, the centre of the labellum yellow with two distinct yellow excrescences at the base of the middle lobe.

4. *S. rivularis* Schltr., sp. nov.

Terrestris, erecta, pusilla, 25–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; bulbo minuto; foliis 2–4, erecto-patentibus, anguste linearibus, longe acuminatis, basi in petiolum sensim paulo angustatis, glabris, usque ad 35 cm longis, medio fere 4–6.5 mm latis; scapis gracillimis, pauci-(2–4)-floris, foliis aequilongis vel paulo brevioribus, teretiusculis, glabris, vaginis paucis, dissitis, alte et arcte amplexantibus, apiculatis obsessis; bracteis erecto-patentibus, ovalibus, breviter acuminatis, pedicellum amplexantibus, ovario pedicellato fere duplo brevioribus; floribus in genere mediocribus, erecto-patentibus; sepalis ovalibus, obtusis, glabris, 1.5 cm longis, lateralibus obliquis; petalis sepalis similibus et fere aequimagnis, paululo tantum latioribus; labello e basi trilobato, c. 1.1 cm longo, inter apices loborum lateralium 1.5 cm lato, lobis lateralibus falcatis, oblongo-ligulatis, obtusis, margine anteriore apicem versus nunc subdenticulatis, glabris, c. 1 cm longis, lobo medio e basi lineari-unguiculata basi utrinque margine breviter angulata, dimidio superiore obovato-spathulato, obtuso cum apiculo minuto, ima basi callo bilobato ornato, 0.8 cm longo, infra apicem 0.5 cm lato; columna gracili, leviter arcuata, glabra, 1.3 cm longa; anthera rotundato-galeata, antice obtuse apiculata, dorso obtuse umbonata; ovario cylindraceo, glabro, cum pedicello c. 2 cm longo.

Kaiser-Wilhelms-Land: In trickling water between clefts in the rocks on the Waria [River], near Gobi, alt. c. 300 m—R. Schlechter no. 19555, flowering in May 1909.

Closely related to *S. altigena* Schltr., but easily recognised by its habit, with its very narrow leaves and short, few-flowered inflorescences. It is very similar in its floral structure, but it has a more distinct and longer clawed middle lobe, a longer column and an ovary with a much shorter pedicel. The flowers are pale pink; the lip violet-red with a golden yellow claw and callus on the middle lobe.

5. *S. papuana* Bail., in Queensl. Agric. Journ. III (1898), p. 159.

var. *puberula* Schltr., var. nov.

Differt a forma typica sepalis extus et ovario minutissime puberulis.

Kaiser-Wilhelms-Land: On damp slopes on the banks of the Garup [River], alt. c. 100 m—R. Schlechter no. 20019, flowering in Sept. 1909; on the edge of streams on the slopes of the Torricelli Range, alt. c. 400 m—R. Schlechter no. 20130, flowering in Sept. 1909; on rocky, hilly slopes on the lower Nuru [River], alt. c. 100 m—R. Schlechter no. 14299, flowering in Feb. [Ed.—possibly Mar.] 1902.

I regard the three [specimen] numbers above as forms of *S. papuana* Bail., a variety in which the flowers are hairy on the outside. Unfortunately, I possess only a single defective flower of Bailey's Type, which he kindly sent me. This shows only the lower part of the lip, which completely agrees with my plant and for the remainder the very accurate description by the author fits perfectly. The species is related closely to *S. grandifolia* Schltr., but it has only short roundish corners at the base of the mid-lobe and, at the end of the claw of the latter a small callus curved backwards, which also has

been described by Bailey. The large double callus at the base of the claw is divided a little deeper than in *S. grandifolia* Schltr. The flowers are violet-pink with a yellow brown-spotted centre and callus to the lip. The foliage, as mentioned by Bailey, already is fairly variable, more so than in any other species.

6. *S. grandifolia* Schltr., sp. nov.

Spathoglottis plicata Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzg. Süds. (1901), p. 244, p.p. (nec Bl.).

Terrestris, valida, usque ad 180 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis omnino inter vaginas absconditis, parvulis, ovoideis, vix 3 cm diametientibus; foliis 2–4 erecto-patentibus, ellipticis, acuminatis, glabris, basi cuneatis in petiolum angustatis, usque ad 150 cm longis, medio fere usque ad 25 cm latis; scapis substrictis vel arcuatis, teretibus, glabris, vaginis paucis dissitis, obtusiuscule acuminatis, arcte amplexantibus obsessis, usque ad 180 cm altis; racemo sensim elongato, dense multifloro, rhachi vulgo minute puberulo; bracteis mox patulis, ovalibus, acuminatis, glabris, ovario pedicellato plus duplo brevioribus; floribus in genere inter majores, erecto-patentibus; sepalis elliptico-oblongis, obtusiusculis, extus minute puberulis, intus glabris, c. 2 cm longis; petalis oblique ovalibus obtusiuscule apiculatis, glabris, sepalis aequilongis, sed paulo latioribus; labello e basi trilobato, c. 1.5 cm longo, explanato inter apices loborum lateralium c. 1.2 cm lato; lobis lateralibus divaricatis, angulum rectum formantibus, oblique ligulatis, apice oblique truncatis, c. 0.6 cm longis, lobo intermedio c. 1.2 cm longo, infra apicem, 0.6 cm lato, e ungue lineari, antice late obovato-obcordato, supra basin margine utrinque in lobulum falcato-triangularum subacutum expanso, callo retrorso amplo medio leviter sulcato, obovoideo-triangulari, in medio unguis squamula transversa, carnosa retrorsa aucto, glabro; columna gracili, glabra, apicem versus paulo dilatata, c. 1.3 cm longa; anthera ovato-cucullata, obtusa, dorso umbone humili, disciformi, subquadrato ornata; ovario cum pedicello gracili, minute puberulo, c. 3.3 cm longo.

Kaiser-Wilhelms-Land: On steep open slopes alongside the creeks near the Kaulo Base, alt. c. 250 m—R. Schlechter no. 16339, flowering in July 1907; on steep shady rock-faces on the banks of the Maijen [River], alt. c. 100 m—R. Schlechter no. 18050, flowering in July 1908; on moist slopes alongside the creeks at the foot of the Finisterre Range, alt. c. 400 m—R. Schlechter no. 19133, flowering in Jan. 1909.

Besides *S. pulchra* Schltr., this is probably the most stately of the species in the Territory and is found fairly frequently in the central parts of Kaiser-Wilhelms-Land on steep cliffs in the immediate vicinity of creeks. Apparently, it has been mistaken always for *S. plicata* Bl. from which, however, it is very different. Its closest relative is *S. papuana* Bail., but in the latter species the falcate lobes at the base of the middle lobe are absent. Furthermore, the lip is quite glabrous and has a transverse scale turned backwards in the middle of the claw of the middle lobe. The flowers are a violet-pink with darker lateral lobes to the lip, and a yellow glabrous callus.

7. *S. wariana* Schltr., sp. nov.

Terrestris, erecta, elata, usque supra 100 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis parvulis, vaginis absconditis, c. 2 cm diametientibus; foliis 2–3 erecto-patentibus, elliptico-lanceolatis, longius acuminatis, basi sensim in petiolum longum attenuatis, usque ad 90 cm longis, medio fere usque ad 6.5 cm latis, glabris; scapis gracilibus substrictis, elatis, usque supra 100 cm altis, rhachi excepta glabris, vaginis paucis dissitis, alte amplexantibus, obtuse acuminatis obsessis; racemo dense 10–25-floro, brevi, sensim paulo elongato; bracteis patulis, ovalibus, breviter acuminatis, ovarii pedicellati dimidium superantibus; floribus erecto-patentibus, in genere inter majores; sepalis oblongo-ellipticis, obtusis, extus minute puberulis, c. 1.7 longis, lateralibus obliquis; petalis oblique late-ellipticis, obtusis, glabris, sepalis aequilongis, sed latioribus; labello e basi trilobo, 1.3 cm longo, inter apices loborum lateralium 1.5 cm lato, lobis lateralibus divaricatis, angulum rectum formantibus, oblique ligulatis, apice paululo dilatatis, oblique truncatis, c. 0.7 cm longis, intermedio e ungue lineari supra basin margine obtuse angulato cum angulis puberulis, antice late obovato-obcordato, c. 1 cm longo, infra apicem 5.5 cm lato, squama transversa obtusa, antrorsum incurva in medio unguis, callo triangulari usque ad medium bipartito, glabro, supra basin unguis; columna gracili, glabra, apicem versus paulo dilatata, c. 1.3 cm longa; anthera ovato-cucullata, subacuta, glabra, dorso umbone depresso, disciformi, parvulo, suborbiculari ornata; ovario cum pedicello subclavato, minute puberulo, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On dry grassy hills between undergrowth in the vicinity of the Waube Creek in the Waria District, alt. c. 200–400 m—R. Schlechter no. 17452, flowering in Mar. 1908.

This species is related so closely to the previous one, that I have been in doubt for a long time whether it would not be better to regard it as a variety; but since all the flowers examined by me showed the same characteristics, I finally decided to describe it. It is smaller in growth and shorter-stemmed, and the flowers are a little smaller. The labellum is proportionately broader with a bipartite, glabrous callus, and in the middle of the claw there is a small transverse scale always pointing forwards. The lateral lobes of the labellum are here, as in *S. papuana* Bail., reduced to two roundish, angular projections, very hairy at the top. I have examined many specimens and always have found these characteristics.

The whole group of species surrounding *S. plicata* Bl. is very difficult to determine, since the individuals are related closely and have to be compared very accurately. The flowers are red and the callus of the labellum yellow.

8. *S. bulbosa* Schltr., sp. nov.

Terrestris, erecta, valida, usque ad 100 cm alta; rhizomate valde abbreviato; radicibus crassiusculis, flexuosis, tomentosulo-villosis; pseudo-bulbis magnis, usque ad 8 cm altis, 6 cm diametentibus, 2–4-foliatis, vaginis obtectis; foliis ellipticis, acuminatis, basi sensim in petiolum angustatis, usque ad 100 cm longis, medio fere usque ad 12 cm latis, utrinque glabris; scapo erecto, stricto vel substricto, glaberrimo, vaginis paucis brevibus, obtusis, amplexantibus obsesso, usque ad 100 cm longo; racemo brevi, dense multifloro; bracteis deflexis, ovalibus, breviter acuminatis, glabris, ovario pedicellato vulgo triplo brevioribus; floribus erecto-patentibus patentibusve, in genere inter majores; sepalis ovalibus, obtusis, utrinque glabris, c. 2 cm longis, lateralibus obliquis; petalis oblique suborbiculari-ovalibus, obtusis, sepalis aequilongis; labello e basi trilobo, 1.5 cm longo, inter apices loborum lateralium 1.7 cm lato, lobis lateralibus retrorsum divaricatis, oblique ligulatis, apice truncatis, basin versus margine anteriore dilatatis, 8.5 mm longis, intermedio e basi angusta sensim dilatato, antice obovato-obcordato cum apiculo obtuso, glaberrimo, sine squama transversa, 0.9 cm longo infra apicem 0.5 cm lato, callo obcordato-obovato retrorso medio sulcato apice plurisetoso infra basin lobi intermedii inter lobos laterales; columna gracili, glabra, apicem versus dilatata, arcuata, c. 1.7 cm longa; anthera subcordato-ovata, obtusa, glabra; ovario cum pedicello glaberrimo, cylindraceo, c. 4 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19354, flowering in May 1909.

On superficial examination this very distinct species could be mistaken for *S. grandifolia* Schltr. However, it may always be recognised easily by the large basal pseudobulbs and the very characteristic shape of the lip, which has no transverse scale on the claw of the middle lobe as in the last three species (in which the scale is present); the callus is between the side lobes, thus on the front of the middle lobe. The column is bent more than that of its relatives. The flowers are dark violet-pink, with a yellow callus on the lip; the lateral lobes are brownish red and the front lobe dark red.

9. *S. pulchra* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 147.

Neu-Pommern: On moist, sunny slopes on the upper Karo River, in the Beining Range, alt. c. 400 m—R. Schlechter no. 13700, flowering in Oct. 1901.

This to me is easily the most beautiful species of the genus. It is very well characterised by the narrow shape of the middle lobe of the lip and in this respect reminds me of the otherwise very different species, *S. aurea* Lindl. This robust, large-flowered plant deserves to be introduced into our greenhouses. It is restricted apparently to the island of Neu-Pommern.

10. *S. parviflora* Krzl., in Engl. Bot. Jahrb. XVI (1892), p. 18.

Kaiser-Wilhelms-Land: On slopes and on limestone rocks in the Finisterre Range,

alt. c. 1100–1600 m—Hellwig no. 328, flowering in Oct. 1888; [Ed.—no locations cited] R. Schlechter no. 18006, flowering in July 1908; no. 19159, flowering in Jan. 1909.

I have now collected abundant material of this interesting species and am convinced that it is entirely different from all other species in our Territory. From the original description I would never have been able to recognise it, had I not seen the Type in the Berlin Herbarium. Its closest relative is *S. stenophylla* Ridl. from British Papua, but that differs in its larger flowers and in the lip.

These two species, and *S. albida* Krzl., are the only ones in New Guinea in which the base of the middle lobe is not narrowed into a distinct claw, but may be described simply as obovate.

11. *S. albida* Krzl., in Notizbl. Kgl. Bot. Gart. Berlin II (1898), p. 107.

Neu-Pommern: In grassland near Ralum, on volcanic ground—Dahl no. 650, flowering in Mar. 1897; on grassy open clearings near Herbertshöhe, alt. c. 50 m—R. Schlechter no. 13778, flowering in Nov. 1901; in grassland on Mount Nord-Tochter [North Daughter], alt. c. 300 m—Dahl [Ed.—no date cited].

This species is very characteristic in its small flowers, in its consistent very faint colouring, and in the shape of the labellum. As I have observed previously, it always appears to occur singly, especially after grass fires, since in the dense alang-formation it is not suffocated before its development.

66. *Plocoglottis* Bl.

This genus, which was founded by Blume in 1825, is a typical Malay-Papuan one of which, up to the present, 18 species have been described. Some of these may be identical with each other, so that the total number may be reduced to 15. These are distributed in the following way:—

About eight species from the Sunda Islands including Malacca, two from the Philippines, and the rest from the Moluccan-Papuan region. Beyond question these numbers will be increased considerably in the near future because the progressive exploration of the last two-mentioned regions has shown already what a quantity of novelties, especially orchidaceous ones, we may expect from there.

This genus is distinguished sharply from its co-genera in the group *Phajinae* and is a near relative of *Porphyroglottis* Ridl., according to that author. Particularly characteristic is the structure of its column and labellum, the latter of which is attached at the base by a hinge-like band and shortly after opening of the flower is pressed firmly against the column, remaining in that position unless released by a certain pressure from above. The raising of the lip is, as I have discovered, caused by releasing the tension, the zone for which lies at the base of the labellum. Nowhere else on the lamina is an irritable spot to be located. The relief of the tension appears to be brought about chiefly by increased moisture, or by rain. Thus it can be explained why a sudden release usually happens at night or in the early hours of the morning, when the tropical dew falls.

It is noticeable on superficial observation of the species that they form two groups, easily recognised by their habit. I will define these more clearly as sections.

§ 1. *Eu-Plocoglottis* contains those species which bear one foliage-leaf on a short, mostly cylindrical pseudobulb. It occasionally happens that a particularly robust bulb bears two leaves standing side by side, the inner one being generally much smaller than the outer one.

§ 2. *Phyllocaulos*. In contrast to the other section, this one includes only those species

with long, stalk-like pseudobulbs on which appear five or more leaves, the sheaths of which overlap each other to such an extent that they produce a long, stem-like structure, attaining in some species a height of one metre or more.

In both sections the inflorescences arise laterally at the lower part of the pseudobulb. *Eu-Plocoglottis* contains the larger number of species, but in both sections the geographical distribution is the same, as I shall refer to later in the individual sections. All the species of the genus prefer the shady primary-forest and occur at different altitudes according to the individual species, but always in those locations where a good layer of humus is present. Some are especially fond of loamy sub-soil and it would appear that all prefer a considerable degree of moisture in the soil, e.g. as for *P. foetida* Ridl., which selects areas close to water.

§ 1. *Eu-Plocoglottis*

I have arranged here those species which group themselves around *P. javanica* Bl. and *P. Lowii* Rchb. f. The section comprises no less than 15 previously described species some of which may yet be deleted (I am thinking of those which have been described as relatives of the little known *P. Lowii* Rchb. f.).

Of these 12 [Ed.—15] species, four are recorded from Java, Sumatra and the Malay Peninsula, three from the island of Borneo, two from the Philippines, one from the Celebes and not less than five from New Guinea.

These five species from the Papuan region are, *P. neo-hibernica* Schltr. and *P. pubiflora* Schltr. from German New Guinea and *P. confertiflora* J.J. Sm., *P. lancifolia* J.J. Sm. and *P. striata* J.J. Sm. from Dutch New Guinea. As I still have to describe two more novelties, the number of species from the Papuan region totals seven, of which three come from Dutch New Guinea and four from German New Guinea. I have, already, said something about the habitat in which these species grow, it remains to be added that all four may be designated mountain plants. Two of them, *P. neo-hibernica* Schltr. and *P. pubiflora* Schltr., seem to be limited to the mist-forest zone, the other two are found below this zone and descend to about 250 m altitude.

It is surprising that *P. pubiflora* Schltr. and *P. atroviridis* Schltr. are related closely to *P. Lowii* Rchb. f. and its relatives from Borneo.

1. *P. atroviridis* Schltr., sp. nov.

Terrestris, erecta, usque ad 65 cm alta; rhizomate abbreviato; radicibus crassiusculis, teretibus, flexuosis, villosulis; pseudobulbis 1.5–2 cm distantibus, cylindraceis, apicem versus paulo attenuatis, unifoliatis, 5–7 cm longis, supra basin 0.5–0.7 cm diametientibus; folio erecto, elliptico, acuminato, basi cuneato, breviter petiolato, glabrato, 20–30 cm longo, medio 3–5 cm lato; scapo supra basin pseudobulborum laterali, erecto, stricto, gracili, puberulo, cum inflorescentia usque ad 65 cm alto, vaginulis paucis, dissitis, arcte amplectentibus obsesso, teretiusculo; racemo laxo 15–20-floro, usque ad 30 cm longo; bracteis erecto-patentibus, lanceolatis, acuminatis, ovario fere 3-plo brevioribus, suberectis, in genere vix inter mediocres; sepalis intermedio ligulatis-oblongis, subacutis, utrinque puberulis, c. 1.8 cm longo, lateralibus deflexis, obovato-oblongis, falcatis, obtusiuscule apiculatis, speculo glabro intus excepto utrinque puberulis, c. 1.1 cm longis; petalis erecto-patentibus subfalcatis, lineari-lanceolatis, subacutis, utrinque glabris, c. 1.6 cm longis; labello e basi breviter cuneata quadrato, antice cuspidato, marginibus lateralibus pectinato-fimbriatis, basi squamis 2 appressis donato, medio obscure biumbonato, antice juxta cuspidem auriculis 2 inframarginalibus triangulis acutis aucto, per medium longitudinaliter sulcato, glaberrimo, 0.5 cm longo, supra basin 0.8 cm lato, infra apicem 0.6 cm lato, angulis acutis; columna semitereti, glabra, leviter curvata, 0.8 cm longa, juxta rostellum margine brevissime subdentato-angulata; anthera subquadrata, antice obtusa, umbone reniformi-triangulo obtuso crasso ornata, glabra; pollinibus inaequimagnis, stipitibus paribus distantibus longioribus glandulae late reniformae affixis; ovario cylindraceo, puberulo, 1.7 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 19270, flowering in Apr. 1909.

This species is related closely to *P. pubiflora* Schltr., but easily and well distinguished by its larger flowers, the very long dorsal sepal, the shape of the labellum, the less slender column and the very different anther and pollinia. By the dissimilar sepals it strongly reminds one of *P. Lowii* Rchb. f. from Borneo. The flowers are whitish with red-flushed sepals and a brownish red-spotted labellum. The leaves are a deep, dark green with a metallic lustre on the upper side.

2. *P. pubiflora* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 146.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14561, flowering in Apr. 1902.

I have drawn attention already to the relationship of this species to *P. Lowii* Rchb. f. The plant externally resembles *P. atroviridis* Schltr. very closely, but the flowers differ so that it appears necessary to separate the species. In the two species, the anther and pollinia, as well as the column, differ considerably. The flowers of *P. pubiflora* Schltr. are dark violet-red.

3. *P. neo-hibernica* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 145.

Neu-Mecklenburg: In humus in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14677, flowering in July 1902.

A species, well characterised by the short compact habit and by the flowers, which appears to indicate endemism to the Bismarck Archipelago. I have not yet found this species in Kaiser-Wilhelms-Land. The pseudobulbs are often two-leaved, but in this respect do not approach the Type of the section *Phyllocaulos*. The flowers are pale yellow closely striped with red and with a pale yellow lip.

4. *P. sakiensis* Schltr., sp. nov.

Terrestris, erecta, usque ad 60 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis approximatis, cylindraceis, unifoliatis, apicem versus paulo attenuatis, usque ad 10 cm longis, supra basin 0.7–0.9 cm diametentibus; folio erecto, elliptico, acuminato, basi cuneato, in petiolum 7–15 cm longum sensim angustato, utrinque glabro, lamina usque ad 35 cm longa, medio fere 6–10 cm lata; scapo supra basin pseudobulborum laterali, erecto, substricto, teretiusculo, e basi glabrata apicem versus sensim paulo puberulo, vaginis paucis dissitis, amplexantibus obsessis, racemo incluso usque ad 45 cm alto; racemo subaxe 8–15-floro, erecto, usque ad 17 cm longo; bracteis lanceolatis, acuminatis, erecto-patentibus, nunc ovario subaequilongis, nunc paulo brevioribus; floribus erecto-patentibus in genere inter majores; sepalis oblongis, acuminatis, extus minute puberulis, intus glabris, 1.6 cm longis lateralibus obliquis; petalis ligulato-linearibus, acutis, falcatis, utrinque glabris, sepalis subaequilongis; labello cuneato-quadrato, antice subito truncato cum cuspidate, medio obtuse bicarinato, basi margine utrinque auriculo triangulo incurvo, depresso donato, 1 cm longo, supra basin 4.5 mm lato, infra apicem 8.5 mm lato, calcare oblongoideo, lateraliter paulo compresso, parvulo, c. 0.2 cm longo; columna leviter curvata, glabra, 7.5 mm longa, clinandrio contracta; anthera subquadrato-cucullata, dorso cordata, antice truncata; ovario cylindraceo, minutissime puberulo, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests on the Saki River, alt. c. 300 m—R. Schlechter no. 18285, flowering in Sept. 1908.

A very characteristic species which might be placed best alongside *P. lancifolia* J.J. Sm. It may be recognised easily by the shape of the lip. In its flowers it closely resembles some species of the section *Phyllocaulos*, all the more so since their colour is very similar. In habit it is a typical *Eu-Plocoglottis*. The flowers are yellow with red spots, white lip and a reddish column.

§ 2. *Phyllocaulos*

During my last stay in New Guinea, I was quite surprised when I found that the section *Phyllocaulos* was not represented, as I had surmised, by the single species *P. moluccana* Bl., but by a whole series of species closely related to one another, though

easily recognised in the living state by their habit and by their leaves but nevertheless very much alike in the structure of their flowers. I also found that the plants which I originally believed to be *P. moluccana* Bl. belonged to two different species, both of which must be separated from *P. moluccana* Bl.

By thoroughly studying the group I came to the conclusion that not less than six species occur in our Territory.

Until recently only four species of this section were known, viz. *P. foetida* Ridl. from the Malay Peninsula; *P. dilatata* Bl. from Java and Borneo; *P. moluccana* Bl. from the Moluccas (resp. Amboina) and New Guinea; and the very aberrant peculiar *P. hirta* Bl. from Borneo, a species which is very different from the others in its flower structure and which is the giant of the genus. We see, therefore, that, in spite of the small number of species, the same primitive countries (with the exception of the Philippines and Celebes) are represented, as in the case of *Eu-Plocoglottis*.

After my last investigations, I very much doubt the occurrence of *P. moluccana* Bl. in New Guinea. J.J. Smith also reports this plant from Dutch New Guinea, but I surmise that the species occurring there will prove to be specifically different. Of the species occurring in our Territory, all of which I have to describe here as new, there are three inhabitants of the mountain and hill-forests below the mist-forest zone. They are found only in the primary and never in the secondary forests, growing mostly in scattered colonies, so that it is nearly always possible to collect several specimens without much difficulty.

The three species of the mist-forest regions, *P. kaniensis* Schltr., *P. glaucescens* Schltr. and *P. torricellensis* Schltr. grow in similar conditions, but under a greater degree of atmospheric humidity.

Of *P. kaniensis* Schltr., I have collected this species only twice, a single specimen on each occasion and of these only the one was in flower.

5. *P. kaniensis* Schltr., sp. nov.

Terrestris, erecta, valida, usque ad 100 cm alta; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caule teretiusculo stricto, basi vaginis mox decadentibus obsesso, apice 10–12-foliato, c. 0.7 cm diametiente; foliis apicem versus valde approximatis, ellipticis, acuminatis, basi cuneatis, usque ad 30 cm longis, medio fere usque ad 6 cm latis, nervis primariis 5 prominulis, utrinque glabris; scapo stricto vel substricto, tereti, e basi subglabrata apicem versus minutissime et dense puberulo, cum racemo usque ad 50 cm longo, vaginulis paucis dissitis mox decadentibus obsesso; racemo subdense plurifloro, c. 10 cm longo; bracteis lanceolatis, acuminatis, dense puberulis, ovario fere duplo brevioribus; floribus erecto-patentibus vel suberectis, illis *P. moluccanae* Bl. similibus; sepalis patentibus, lanceolato-oblongis, acutis, extus brevissime puberulis, intus glabris, c. 1.9 cm longis, lateralibus paulo obliquis; petalis oblique sublanceolato-linearibus, subacuminatis, basi extus subinconspicue puberulis, caeterum glabris, sepalis subaequilongis; labello subquadrato, apicem versus paulo dilatato, antice truncato, medio apiculato, basi margine utrinque squama ampla, oblique triangulari, intramarginali ornato, medio toris 2 basin versus paulo divergentibus donato, 7.5 mm longo, basi 4.5 mm lato, apice 0.6 cm lato, sacculo perbrevis semioblongo, glabro; columna oblongoidea, dorso minutissime puberula, clinandrio contracta, 0.8 cm longa; anthera ovato-cucullata, glabra, antice obtuse apiculata, umbone ovato antice contracto ornata; polliniis nutantibus, stipitibus gracillimis, longioribus, glandula orbiculari, polliniis fere triplo minore; ovario cum pedicello subclavato, brevissime et dense puberulo, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17636 [Ed.—possibly 17236], flowering in Jan. 1908.

Even externally it can be seen that this species has considerably broader leaves than *P. moluccana* Bl., but also in the flowers we find various differences, especially so in the narrower shape of the lip with a much shorter apex, furthermore in the broader column. The colour of the flowers is quite different; the sepals are brown on the outside, yellow-brown inside; the petals yellow with a few brown spots at the base; the lip white with two small red spots.

6. *P. papuana* Schltr., sp. nov.

Terrestris, erecta, valida, usque ad 130 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus erectis, strictis, teretiusculis, basi vaginis mox caducis distantibus obsessis, dimidio superiore dense 10–14-foliatis, supra basin c. 1 cm diametientibus; foliis erecto-patentibus, lanceolatis, longe acuminatis, basi cuneatis, subpetiolatis, usque ad 35 cm longis, infra medium vel medio usque ad 5 cm latis, glabris, subtus nervis primariis 5 prominulis; scapis erectis, substrictis vel subflexuosis, racemo incluso usque ad 75 cm longis, e basi subglabra apicem versus brevissime subtomentosulo-puberulis, vaginis paucis dissitis, mox decadentibus obsessis; racemo dense multifloro, sensim elongato, usque ad 25 cm longo; bracteis patentibus vel demum recurvis, deltoideo-lanceolatis, acuminatis, brevissime puberulis, ovario vulgo duplo fere brevioribus; floribus erecto-patentibus, illis *P. moluccanae* Bl. similibus; sepalis patentibus lanceolato-oblongis, 1.5 cm longis extus brevissime puberulis, intus glabris intermedio subacuto, lateralibus obliquis, acuminatis; petalis erecto-patentibus, subfalcatis, sublanceolato-linearibus, acuminatis, extus dimidio inferiore sparsim puberulis; labello quadrato, cum angulis obtusis, antice truncatissimo cum apiculo mediano lobuliformi, basi lobis intramarginalibus triangulis 2 donato, medio longitudinaliter foveato et lamellis 2 obtusis, subparallelis longitudinalibus, medio dilatatis ornato, 0.7 cm longo, 0.6 cm lato, sacco minuto perbrevis subconico; columna crassiuscula glabra, 0.6 cm alta, oblongoidea, clinandrio contracta, facie basi V-formiter incrassata; anthera oblongoidea antice truncata et minute serrulata, umbone ovato, antice subrostrato-contracto et evanido ornata, glabra; pollinibus nutantibus, stipitibus gracillimis, longioribus, glandula minuta, pollinibus multoties minore; ovario cum pedicello subclavato, brevissime subtomentosulo-puberulo, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the primary forests of Wobbe [Village] in the Minjem Valley, alt. c. 200 m—R. Schlechter no. 16425, flowering in Aug. 1907; in humus in the primary forests on the Kaulo [River], alt. c. 400 m—R. Schlechter no. 17006, flowering in Dec. 1907.

To this species may also belong a plant, no. 18968, which I collected near Toliba in the Saki Valley.

The species may be distinguished easily from *P. kaniensis* Schltr. and *P. moluccana* Bl., by its broad square labellum. It also has much longer pointed leaves than either of the other two species. The flowers are yellow, spotted with red on the inside, the lip white with two round red spots below the middle; the column yellowish with red transverse bands in front.

7. *P. pseudo-moluccana* Schltr., sp. nov.

Plocoglottis moluccana Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 145 (nec Bl.) p.p.

Terrestris, erecta, usque ad 80 cm alta; rhizomate abbreviato; radicibus, filiformibus, elongatis, flexuosis, tomentosulis; caulibus erectis, strictis, teretibus, basi vaginis paucis mox decadentibus obsessis, supra c. 9-foliatis, c. 0.5 cm diametientibus; foliis erecto-patentibus, lanceolatis, acuminatis, basi subpetiolato-cuneatis, utrinque glabris, usque ad 30 cm longis, infra medium usque ad 3.5 cm latis, nervis primariis 3 prominulis, nunc 2 obscuris additis; scapis strictis vel substrictis, teretiusculis, vaginis paucis mox decadentibus, distantibus obiectis, e basi subglabra apicem versus brevissime subtomentoso-puberulis, usque ad 65 cm altis; racemo subdense multifloro, usque ad 12 cm longo; bracteis patentibus lanceolatis, acuminatis, brevissime puberulis, ovario subduplo brevioribus; floribus erecto-patentibus, illis *P. moluccanae* Bl. similibus; sepalis patentibus lanceolato-oblongis, acuminatis, extus minute puberulis, c. 1.5 cm longis, lateralibus obliquis; petalis oblique lanceolato-ligulatis, acuminatis, glabris, sepalis fere aequilongis; labello cuneato, antice trilobo, lobis lateralibus anguliformibus, divergentibus, intermedio lanceolato, obtusiusculo, cuspidiformi, laterales bene superante, sinibus obtusis, labello toto 0.7 cm longo, inter apices loborum lateralium 0.5 cm lato, gibbis 2 oblongis infra medium ornato, basi lobulis 2 parvulis intramarginalibus donato; columna crassiuscula, brevi, glabra, clinandrio contracta, 0.5 cm alta; anthera cucullato-ovata, antice rotundata, margine serrulata, extus sparsim pilosula, longitudinaliter carinata; pollinibus oblongoideis, stipitibus tenuibus, longioribus, glandula oblonga, ampla, pollinibus paulo minore; ovario cum pedicello subclavato, brevissime subtomentosulo, c. 2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13872, flowering in Jan. 1902; in humus in the forests at the

foot of the Bismarck Range, near the Saugueti Base, alt. c. 150 m—R. Schlechter no. 18522, flowering in Oct. 1908.

This species differs from *P. moluccana* Bl., hence its description is given as new.

It is more slender in habit than the latter and the other two species of this relationship described above. The long, lobe-shaped apex of the lip and the anther are very characteristic. The flowers are yellow with red dots on the inside, the lip white, the column whitish with two red spots on the back.

8. *P. glaucescens* Schltr., sp. nov.

Terrestris, erecta, gracilis, usque ad 60 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, tomentosulis; caulibus gracilibus, dimidio inferiore vaginis mox decadentibus dissitis obsessis, dimidio superiore 6–8-foliatis, 0.3–0.4 cm diametientibus; foliis glaucescenti-cinereis erecto-patentibus, lanceolatis, acuminatis, basi cuneatis, usque ad 25 cm longis, infra medium usque ad 2.4 cm latis, nervis primariis 3 prominulis; scapis gracilibus, strictis vel substrictis, teretibus, usque ad 40 cm altis; vaginis paucis, dissitis, mox decadentibus obsessis, e basi subglabra apicem versus brevissime subtomentosulis; racemo laxo 6–12-floro, usque ad 12 cm longo; bracteis patentibus, lanceolatis, acuminatis, ovarii dimidium superantibus; floribus erecto-patentibus, illis *P. moluccanae* Bl. similibus; sepalis lanceolato-oblongis, extus minute puberulis, 1.5 cm longis, intermedio erecto acutiusculo, lateralibus reflexis, obliquis, acuminatis; petalis oblique lanceolato-ligulatis, acuminatis, extus glabris, intus sparsim pilosis, sepalis aequilongis, labello quadrato, antice trilobulato, lobulis brevibus triangularibus, acutis, lateralibus divergentibus, anguliformibus, intermedio paulo majore recurvo sinibus obtusissimis, labello toto 0.8 cm longo, antice 0.6 cm lato, incrassationibus 2 obscuris falcatis medianis ornato, basi lobulis 2 intramarginalibus triangulis donato, sacculo minuto obtuso, oblongoideo; columna crassiuscula, glabra, facie oblonga, basi attenuata, clinandrio contracta, 0.6 cm alta; anthera cucullata ovato-triangulari, obtusa apice minute serrulata, dorso carinato-umbonata, glabra; pollinibus nutantibus, stipitibus tenuissimis, longioribus, glandula rotundata, parvula; ovario cum pedicello clavato, brevissime subtomentosulo, 1.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17355, flowering in Feb. 1908.

The chief characteristic, which distinguishes this species immediately in the living state, is the bluish silver-grey colour of the leaves. In other respects it is related very closely to *P. pseudo-moluccana* Schltr., except for the recurved lateral sepals, a differently shaped labellum and additional differences in the column, anther and pollinia. The flowers are pale yellow, the sepals, petals and column spotted red on the inside, the lip white.

var. *cleistogama* Schltr., var. nov.

Differt a forma typica habitu humiliore, floribus cleistogamis.

Kaiser-Wilhelms-Land: In humus in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17678, flowering in June [Ed.—possibly May] 1908.

A cleistogamous variety of the above.

9. *P. torricellensis* Schltr., sp. nov.

Plocoglottis moluccana Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 145 (nec Bl.) p.p.

Terrestris, erecta, gracilis, usque ad 70 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; caulibus gracilibus, basi vaginis mox decadentibus dissitis obsessis, supra laxo 12–13-foliatis, teretibus, c. 0.3 cm diametientibus; foliis erecto-patentibus, lanceolatis, longe acuminatis, basi petiolato-angustatis, glabris, usque ad 20 cm longis, infra medium usque ad 1.7 cm latis, nervis primariis 3 prominulis; scapis gracillimis, teretibus, vaginulis paucis dissitis, mox decadentibus obsessis, e basi subglabra, brevissime subtomentosulis, usque ad 65 cm longis; racemo laxo 8–15-floro, usque ad 11 cm longo; bracteis patentibus, lanceolatis, acuminatis, minute puberulis, ovario fere duplo brevioribus; floribus erecto-patentibus, illis *P. moluccanae* Bl. similibus; sepalis lanceolatis, acuminatis, extus brevissime puberulis, 1.5 cm longis, subrecurvo-patentibus, lateralibus obliquis; petalis ligulato-lanceolatis, acuminatis, utrinque sparsim puberulis, sepalis subaequilongis; labello quadrato, angulis obtusis, antice trilobato, lobis lateralibus semiorbicularibus brevibus, margine irregularibus, intermedio cuspidiformi, laterales bene superante, lobis 2 supra basin

intramarginalibus, obliquis, amplis, acuminatis. labello toto glabro, 0.7 cm longo, basi et antice 0.5 cm lato, basi medio foveato, carinis 2 medio ampliatis, supra medium antice conjunctis, longitudinalibus ornato, sacculo minuto obtuso; columna crassiuscula, brevi, glabra, facie oblonga, clinandrio contracta, 0.6 cm longa; anthera oblonga, antice obtusata subdenticulata, medio superne carinato-umbonata; ovario cum pedicello clavato, subtomentosulo, 1.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 600–800 m—R. Schlechter no. 14563, flowering in Apr. 1902.

This species is related closely to the previous one but has green leaves and a differently shaped lip with two crests along the centre, uniting in front. At the time I did not make any accurate notes about the colour of the flowers, but it is certainly similar to that in the last species.

10. *P. maculata* Schltr., sp. nov.

Terrestris, erecta, gracilis, 30–50 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, villosulis; caulibus gracilibus, teretibus, glabris, basi vaginis paucis amplexantibus, dissitis, mox decadentibus primum oblecto, supra 5–9-foliato; foliis erecto-patentibus, lanceolatis, longius acuminatis, glabris, basi petiolato-cuneatis, nervis primariis 3 prominulis, usque ad 15 cm longis, medio usque ad 2.5 cm latis; scapis gracillimis, 30–40 cm altis; vaginulis paucis dissitis mox decadentibus obsessis, teretibus, e basi subglabra apicem versus brevissime subtomentosulis; racemo laxo 5–10-floro, usque ad 8 cm longo; bracteis erecto-patentibus, lanceolatis, acuminatis, puberulis, ovarii dimidium superantibus; floribus erecto-patentibus, illis *P. moluccanae* Bl. similibus; sepalis oblongo-ligulatis, acutis, extus minute puberulis, 1.1 cm longis, lateralibus obliquis; petalis subfalcatis, lineari-ligulatis, breviter acuminatis, glabris, sepalis subaequilongis; labello quadrato cum angulis obtusis, antice truncatissimo cum acumine, 0.7 cm longo, basi apiceque 0.6 cm lato, medio paulo incrassato, basi lobulis intramarginalibus, obliquis acutis donato, sacculo minutissimo; columna brevi, crassiuscula, labello fere duplo brevior, dorso sparsim puberula, basi facie V-formiter incrassata; anthera ovato-cucullata, glabra, antice obtusa; medio longitudinaliter latius carinato-umbonata; pollinibus nutantibus, stipitibus tenuissimis, glandula rotundata, pollinibus duplo minore, ovario cum pedicello clavato, brevissime subtomentosulo, 1.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the mountain forests near Jaduna, alt. c. 300 m—R. Schlechter no. 19316, flowering in Apr. 1909.

This is the smallest species in the section *Phyllocaulos*. It may be recognised by its flowers which have shorter, broader sepals, more linear petals, a square labellum and a very short hairy column. In the living plant the pale green, closely yellow-spotted leaves are characteristic. The flowers are yellow, thickly spotted on the inside with red. The lip is white with two short red stripes below the middle. The column is yellowish with a broad red transverse stripe.

67. *Pachystoma* Bl.

Up to the present, the species of this genus are very little known, and very likely have been described indifferently. In addition, most authors had but little material, so that they were unable to form an opinion as to what extent the species varied in the shape of the labellum and the number of crests upon it. Indeed, I did not fare much better, since for my description of *P. gracile* Schltr. I found only two little plants with few flowers, whilst the material which I was now able to collect in New Guinea was likewise too scanty to decide the question. Only once did I find, at one location, about seven specimens of a species which proved fairly constant in respect to the shape of the labellum, mentum and crests. At another location, despite keen searching, I found only a single small plant which had little to distinguish it from the first one mentioned. For this reason I am compelled here to treat the question in the same way as previous authors have done, viz, to regard the crests on the lip and the shape of the latter as specific characters, as is also done in connection with the related genera.

The nearest relative, alongside of which the genus has to stand in the System of

the *Orchidaceae*, is *Ipsea* Lindl. from which *Ancistrochilus* Rolfe is, generally, well separated, although standing in close relationship as regards its flower structure. The latter has turned completely to epiphytism.

Spathoglottis Bl. is connected with *Ipsea* Lindl. through forms such as *S. ixioides* Lindl. and *S. Fortunei* Lindl. Through *Pachystoma* Bl. a type of transition is formed to the *Eulophiinae* which it strikingly resembles, except in its pollinarium.

Up to the present, six species of the genus are known, these being distributed over an area beginning in India, extending in a north-east direction to China, and eastwards past the Sunda Islands and New Guinea, then south-east over northern Australia to New Caledonia.

So far as I know, all species occur only in open grasslands, mostly among the alang (*Imperata*) whose leaves, as far as known, they resemble deceptively. In these alang-fields the plants are often subjected to the hottest sun and to grass-fires and their rhizomes gradually shrivel appreciably during the dry season. When the alang vegetation has become too dense they remain resting in this condition invisible for many years until by external agencies, above all by grass-fires (which recur every year in many regions), the ground is cleared and they make use of this interval to develop their flower-spikes. Quite similar conditions prevail in the case of *Ipsea speciosa* Lindl. in India and Ceylon.

1. *P. papuanum* Schltr., sp. nov.

Terrestre, erectum, sub anthesi aphyllum, usque ad 65 cm altum; scapo tereti, vaginis lanceolatis, acuminatis, arcte amplexantibus omnino oblecto, glabro; racemo subdense multifloro, secundo, usque ad 20 cm longo, rhachi puberulo; bracteis erectis vel suberectis, lanceolatis, acuminatis, mox desiccantibus, inferioribus flores superantibus, superioribus sensim paulo brevioribus; floribus patulis, extus puberulis; sepalis oblongis, obtusiusculis, extus minutissime puberulis, 1.2 cm longis, lateralibus paulo obliquis, apiculatis; petalis oblique lineari-ligulatis, subacutis, infra apicem vix dilatatis, dimidio inferiore sparsim et tenuissime puberulis, sepalis subaequilongis; labello e basi concava angustiore, cuneato, supra medium trilobo, 1.2 cm longo, explanato inter apices loborum lateralium 0.8 cm lato, disco dimidio inferiore sparsim puberulo, lobis lateralibus oblique oblongis, obtusis, 3.5 mm longis, lobo intermedio subquadrato-cuneato, antice truncato, exciso, margine crenulato, lateralibus basi pauciciliatis, 4.5 mm longo, infra apicem 4 mm lato, carinis 2 e basi labelli parallelis, puberulis, dimidio superiore bipartitis et in lineas 4 verrucularum verruculis sparsis margine additis usque infra apicem lobi intermediarii decurrentibus, linea intermedia verrucularum in lobo medio interjecta, verruculis omnibus apice setula minuta ornatis; columna gracili, semitereti, pilosula, 0.7 cm longa, apice trilobato-dilatata, lobis lateralibus oblique rhombeis, intermedio obtuso minore, pede brevi; anthera reniformi-cucullata, obtusa, sparsim pilosula; pollinibus oblique clavatis; ovario cum pedicello clavato, brevissime puberulo, 0.7 cm longo.

Kaiser-Wilhelms-Land: On grassy hills in the vicinity of the Malia River, at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18472, flowering in Oct. 1908.

I consider it probable that the plant which was described and illustrated by J.J. Smith as *P. pubescens* Bl., in 'Nova Guinea' VIII (1908) [1909], p. 21, t. VII, f. 20, belongs here. The species appears to be completely different from the Java plant. The flowers are rose-red, the centre of the lip and the warts on it are greenish yellow.

2. *P. affine* Schltr., sp. nov.

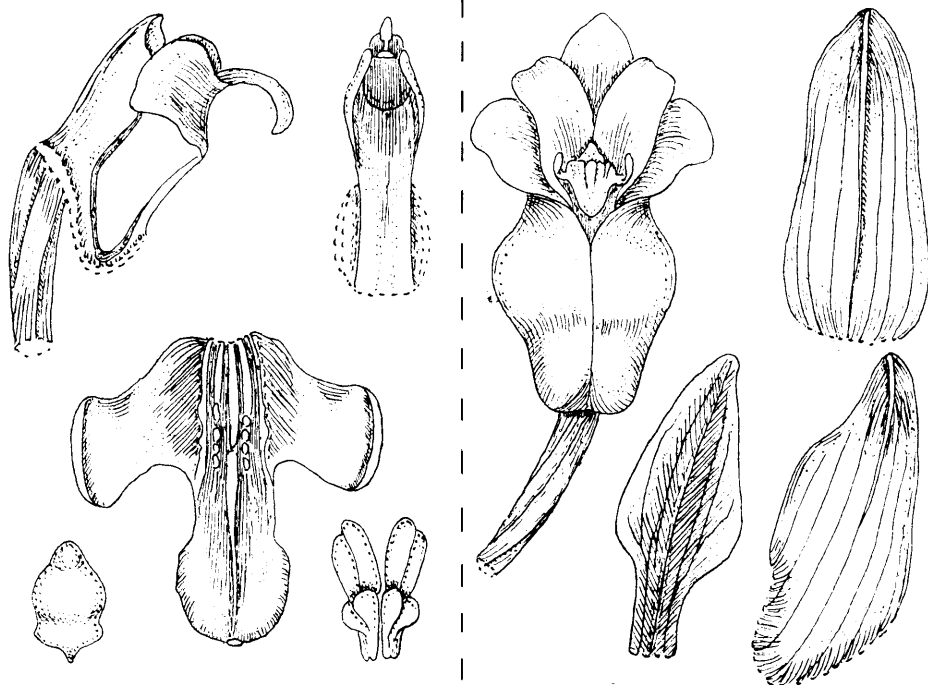
Terrestris, erecta, sub anthesi aphylla, c. 70 cm alta; scapo tereti, glabrato, subflexuoso; vaginis longis, lanceolatis, acuminatis, amplexantibus oblecto; racemo subaxe 15–20-floro, c. 13 cm longo, subsecundo; bracteis lanceolato-linearibus, acuminatis, erectis, inferioribus flores superantibus, superioribus sensim paulo brevioribus; floribus subpatulis, illis *P. Holtzei* F.v.M. similibus et fere aequimagnis; sepalis ligulato-oblongis, extus brevissime puberulis, 1.2 cm longis, intermedio obtusiusculo, lateralibus breviter acuminatis, obliquis; petalis linearibus, acutis, dimidio superiore paulo dilatatis, sepalis subaequilongis; labello e basi concava, angustiore late cuneato, tertia parte superiore trilobato, dimidio inferiore intus sparsim puberulo, 1 cm longo, inter apices loborum

lateralium 0.7 cm lato, lobis lateralibus oblique rhombeis, obtusis, 2.5 mm longis, intermedio cuneato-oblongo, antice rotundato, 4.5 mm longo, lineis 2 elevatis basi nudis antice dense verruculosus e basi labelli ad margines lobi intermedii usque infra apicem decurrentibus, carinula brevior intermedia verruculosa e basi lobi intermedii usque supra medium addita, carinula laterali everruculosa libera utrinque juxta carnulam intermediam in medio lobi intermedii interposita, verruculis carinulae intermediae et marginalibus omnibus setula coronatis; columna gracili, puberula, substricta, 0.6 cm longa, apice dilatata, lobis lateralibus intermedio majoribus, oblique quadratis, pede perbrevis; anthera reniformi-cucullata, subglabra; ovario cum pedicello brevissime puberulo, 0.6 cm longo.

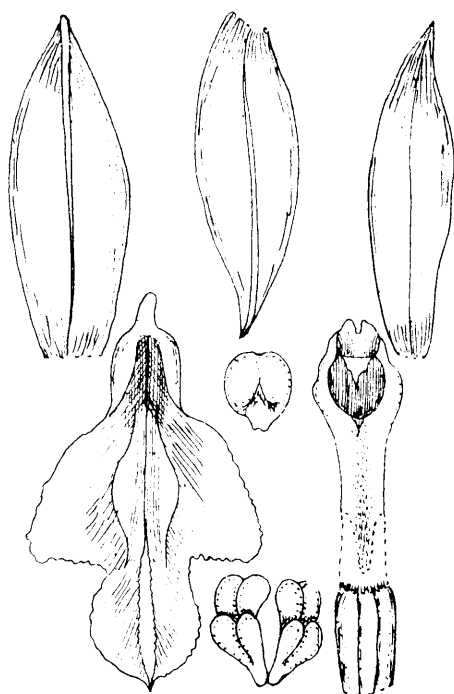
Kaiser-Wilhelms-Land: On an alang-hill at Jawer, on the Minjem [River], alt. c. 150 m—R. Schlechter no. 16573, flowering in Sept. 1907.

P. gracile Schltr. from New Caledonia may be regarded as the nearest relative of this species, but in *P. gracile* Schltr., the middle ridge of the lip extends throughout the entire length. It is conspicuous that the two short crests on the middle lobe (lying between the short median crest and the marginal ones) are free from warts, and do not reach or extend as far as the middle of the lobe. The colour of the flower I have stated as rose-red with a violet column.

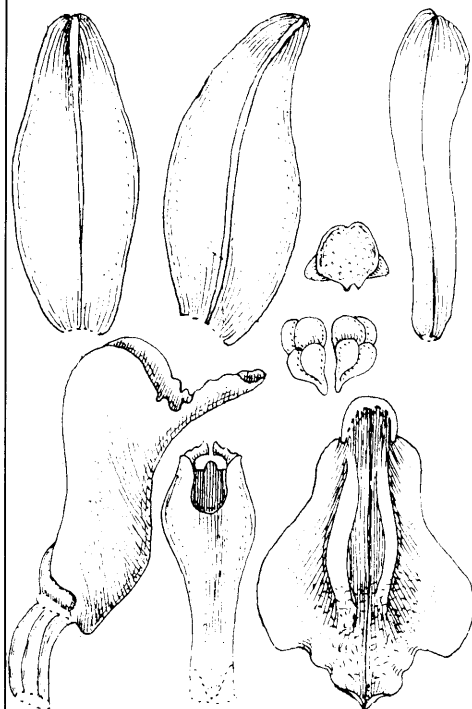
GROUP XVIII *Phajinae*



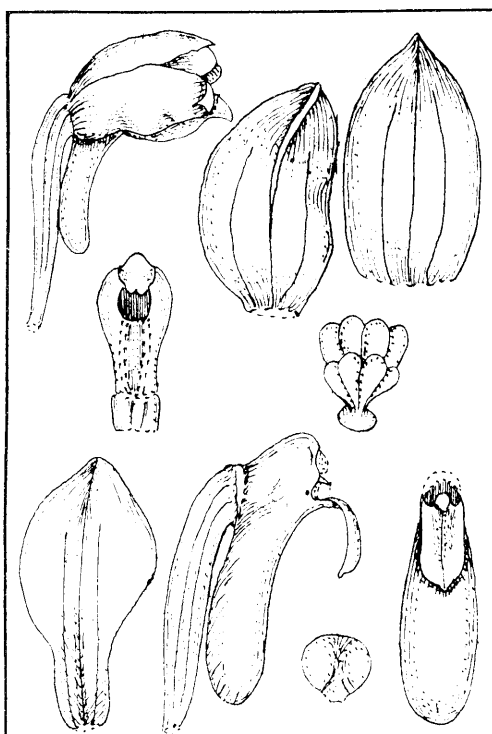
Acanthephippium papuanum Schltr.



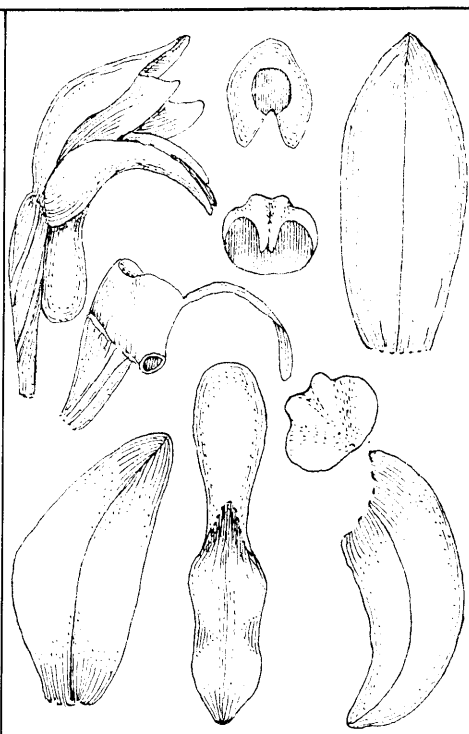
Phajus montanus Schltr.



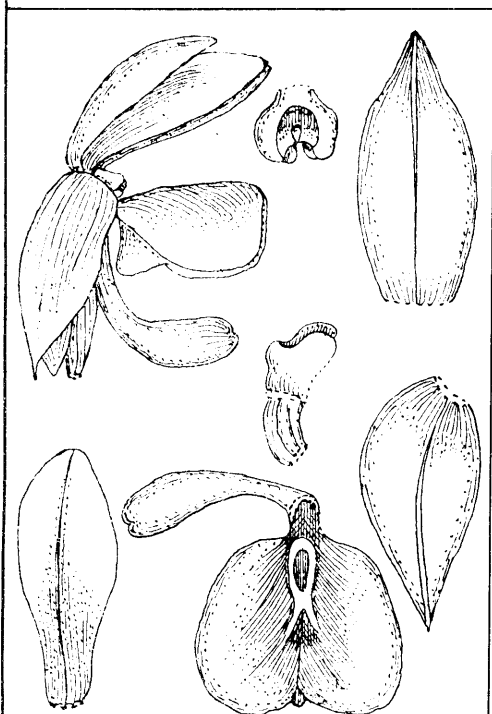
P. amboinensis Bl. var. *papuanus* Schltr.



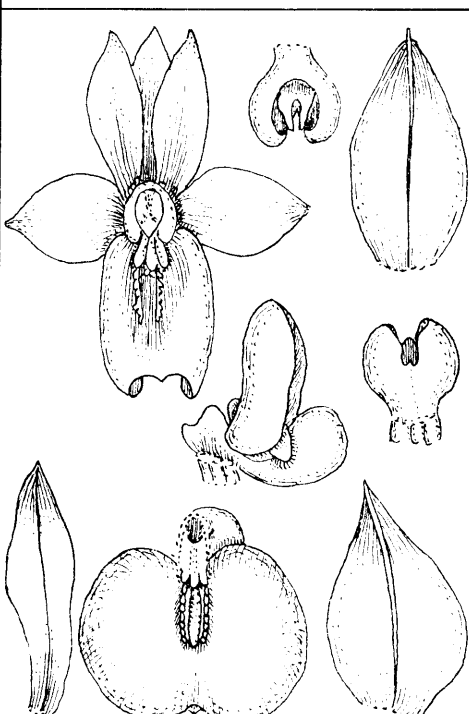
Calanthe apostasioides Schltr.



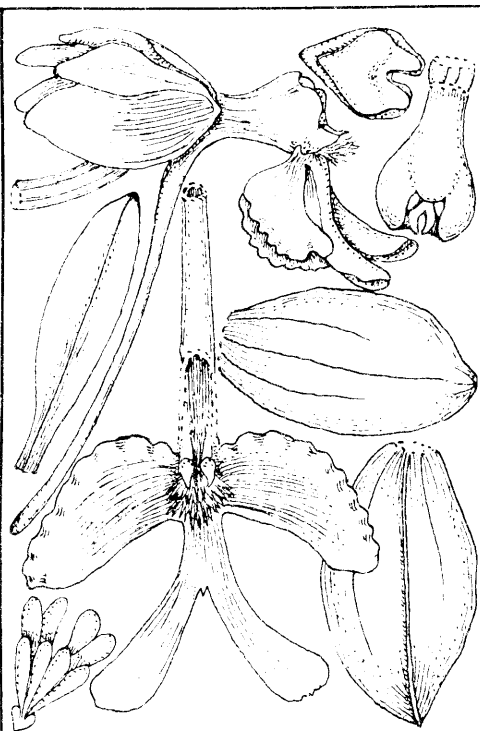
Calanthe rhodochila Schltr.



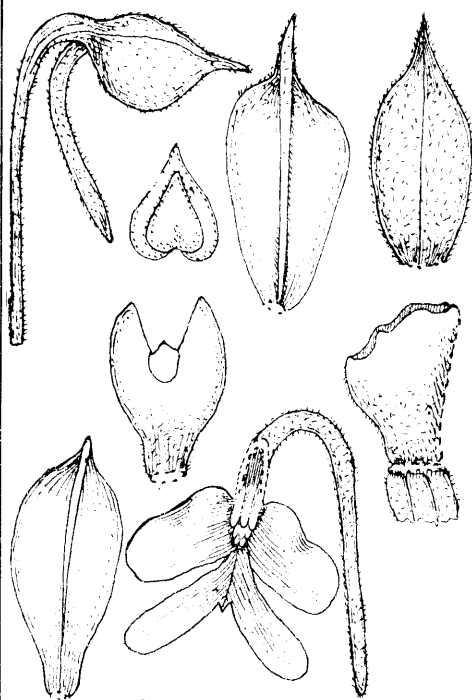
Calanthe coiloglossa Schltr.



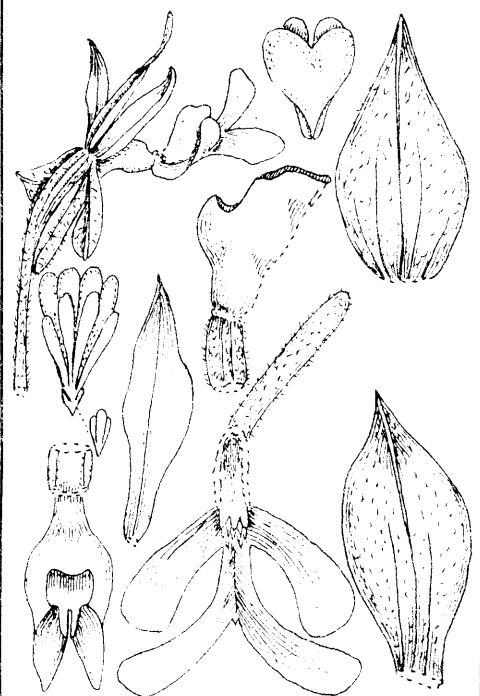
Calanthe kaniensis Schltr.



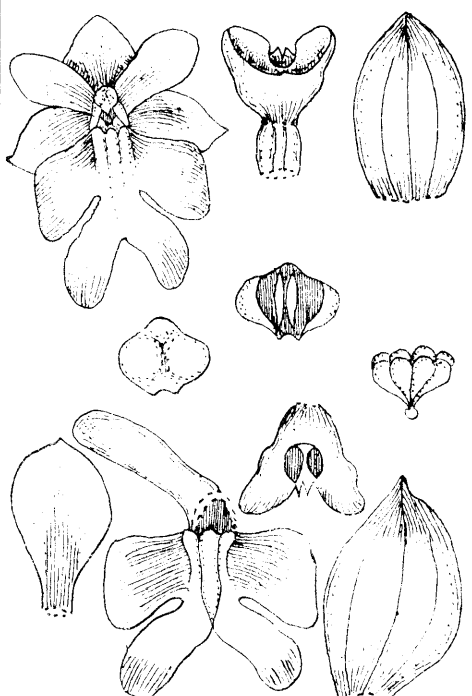
Calanthe Engleriana Krzl.



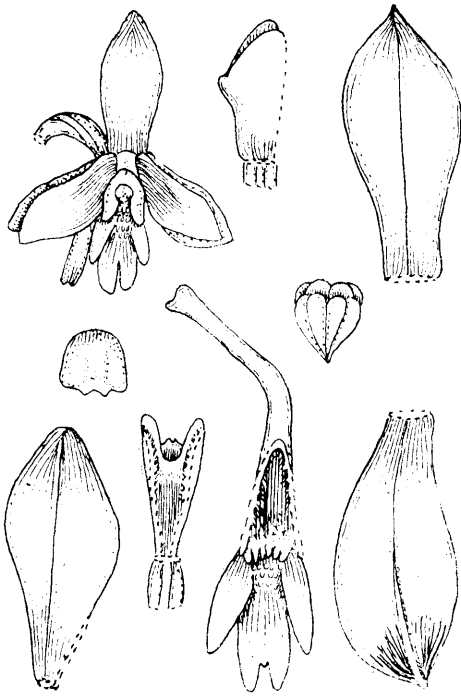
Calanthe veratrifolia
var. *cleistogama* Schltr.



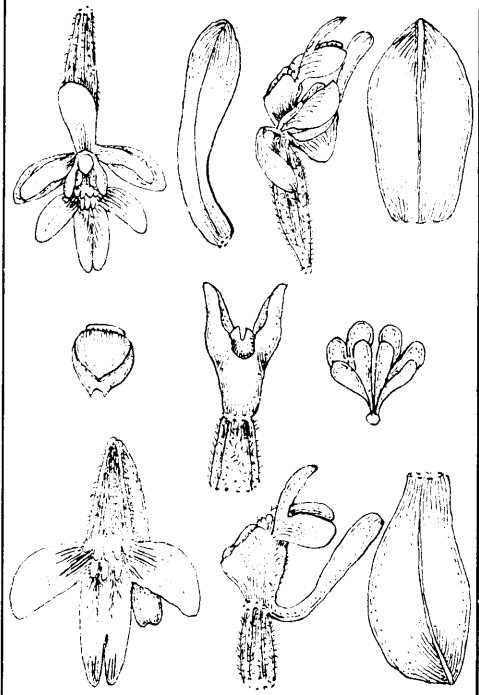
Calanthe orthocentron Schltr.



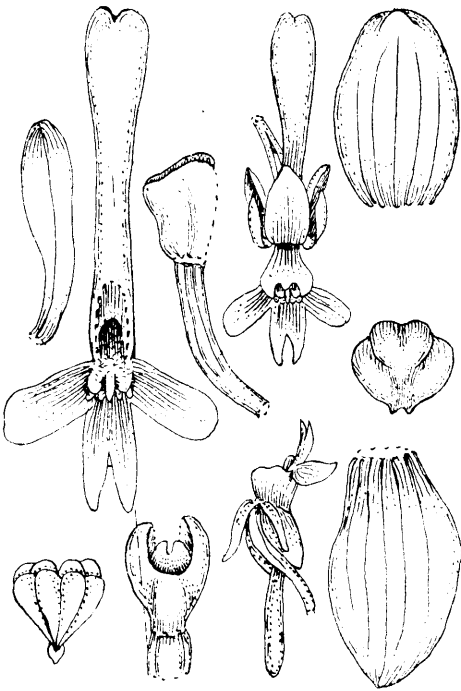
Calanthe torricellensis Schltr.



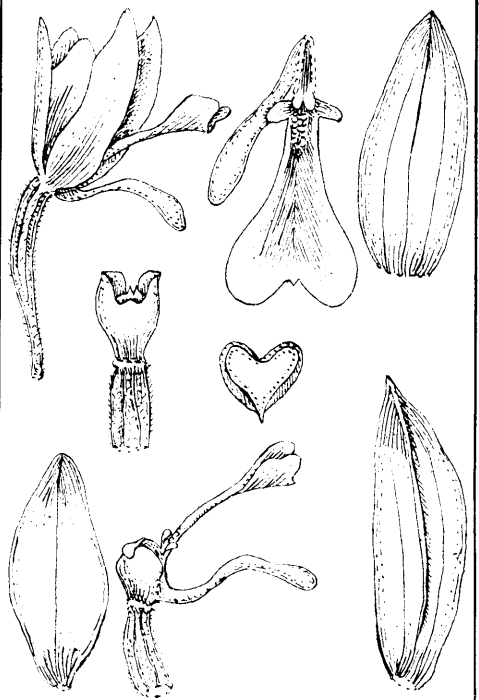
Calanthe Finisterrae Schltr.



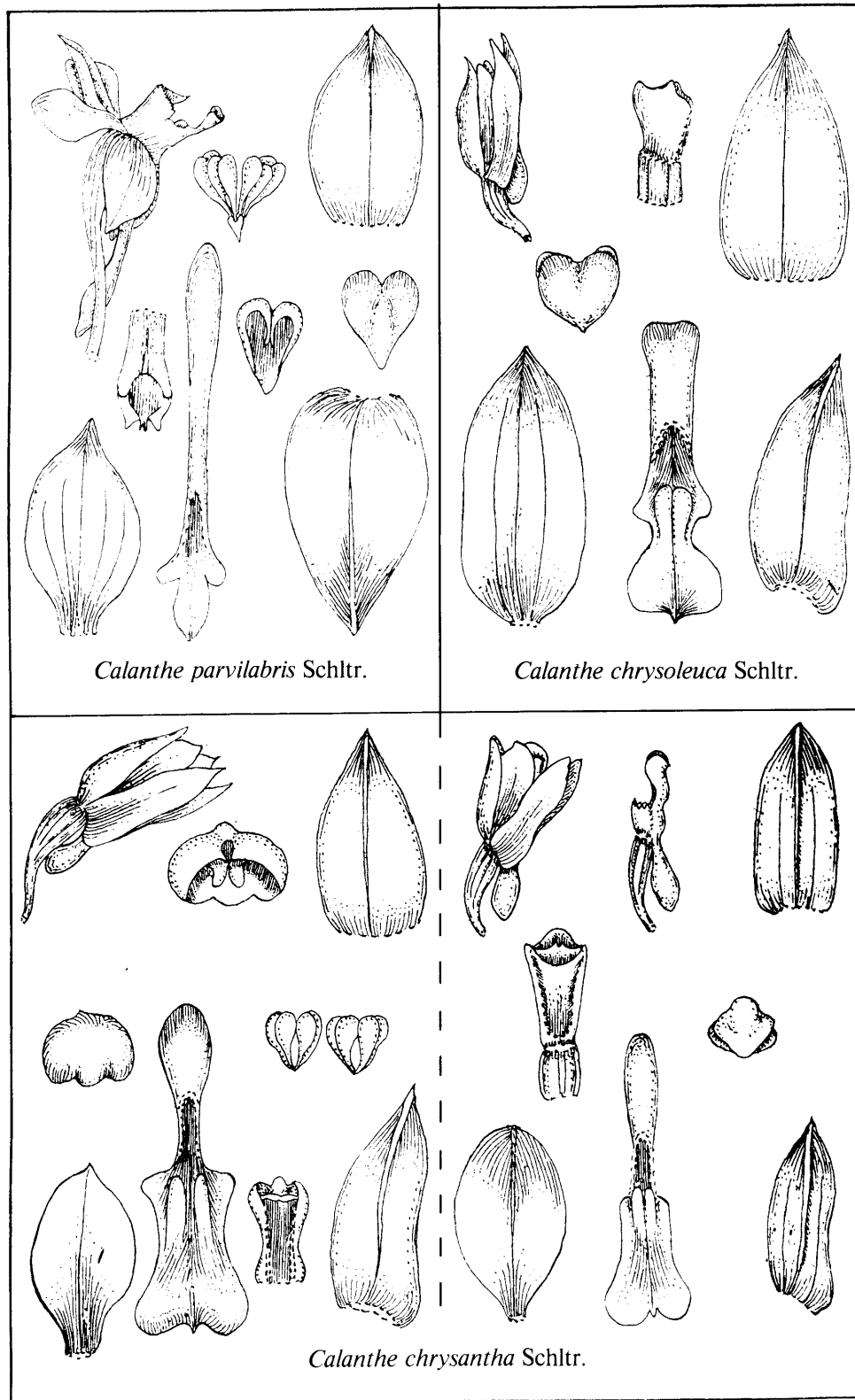
Calanthe camptoceras Schltr.

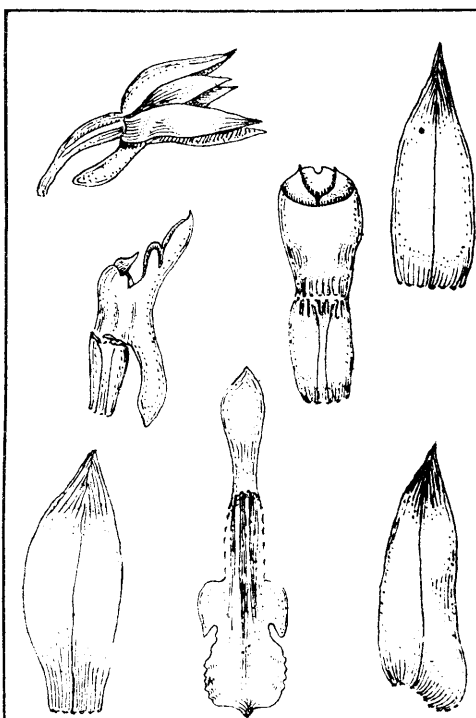


Calanthe micrantha Schltr.

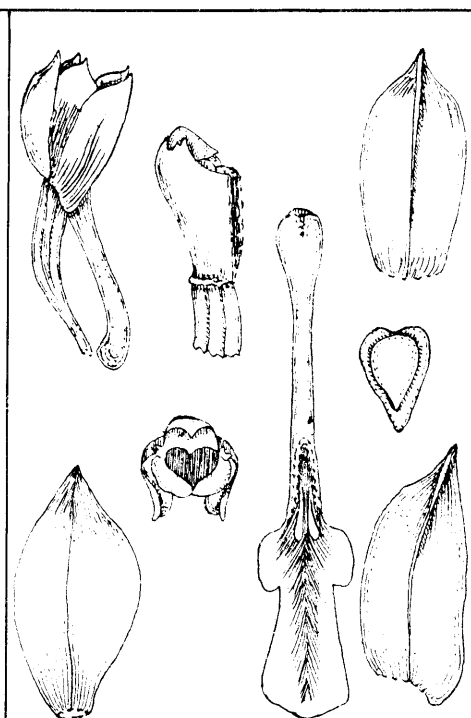


Calanthe spathoglottoides Schltr.

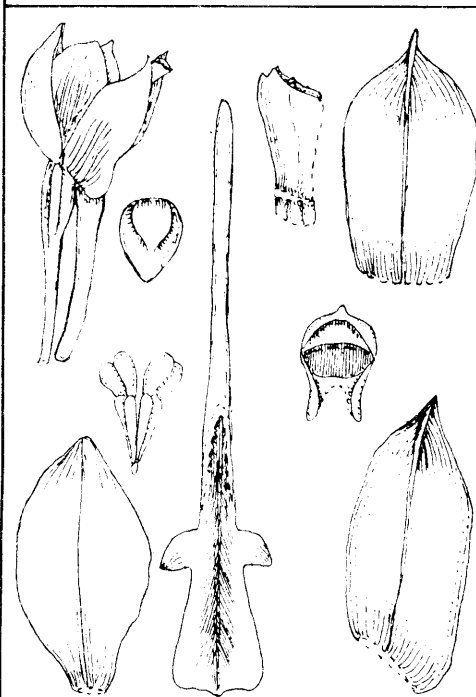




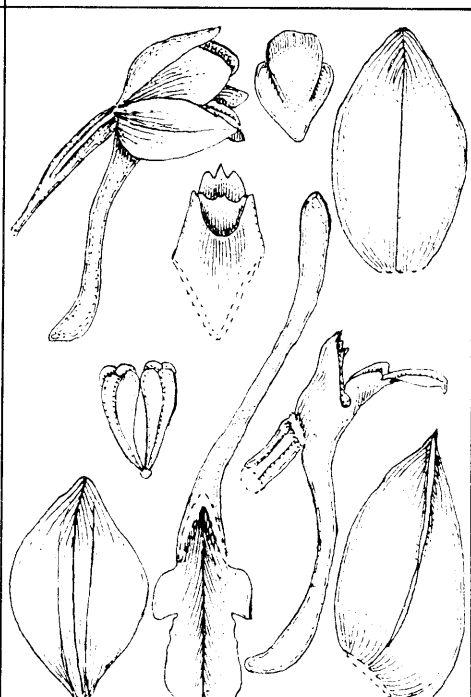
Calanthe neo-hibernica Schltr.



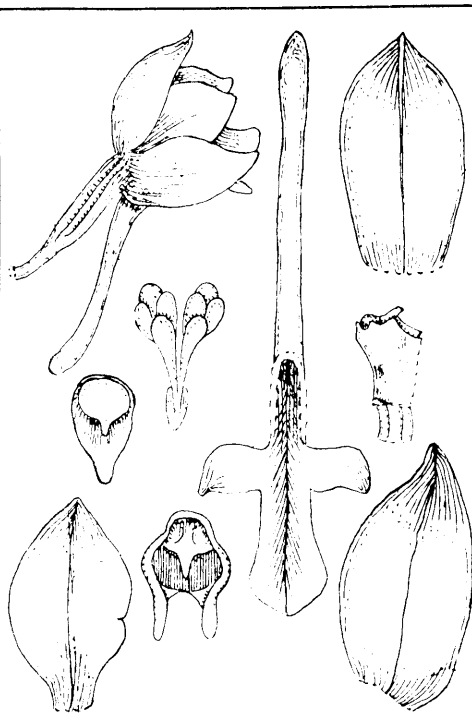
Calanthe longifolia Schltr.



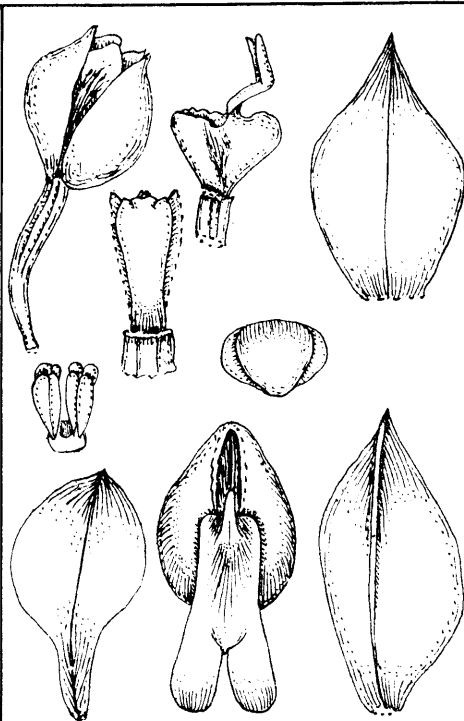
Calanthe stenophylla Schltr.



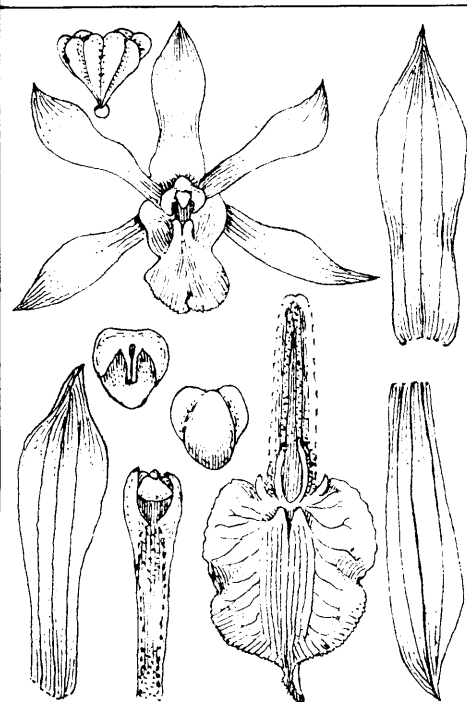
Calanthe leucosceptrum Schltr.



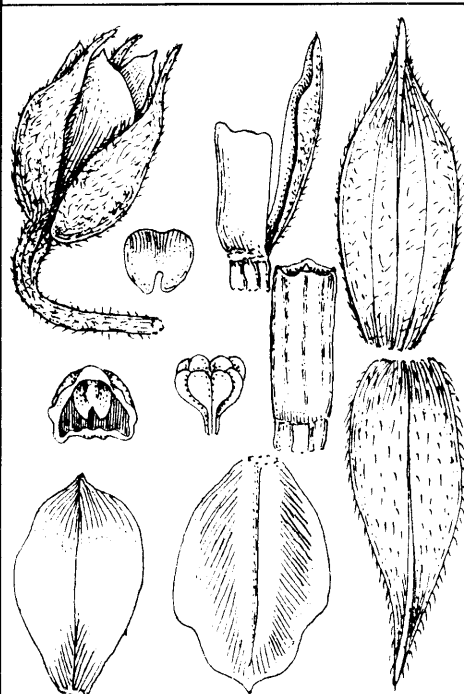
Calanthe cruciata Schltr.



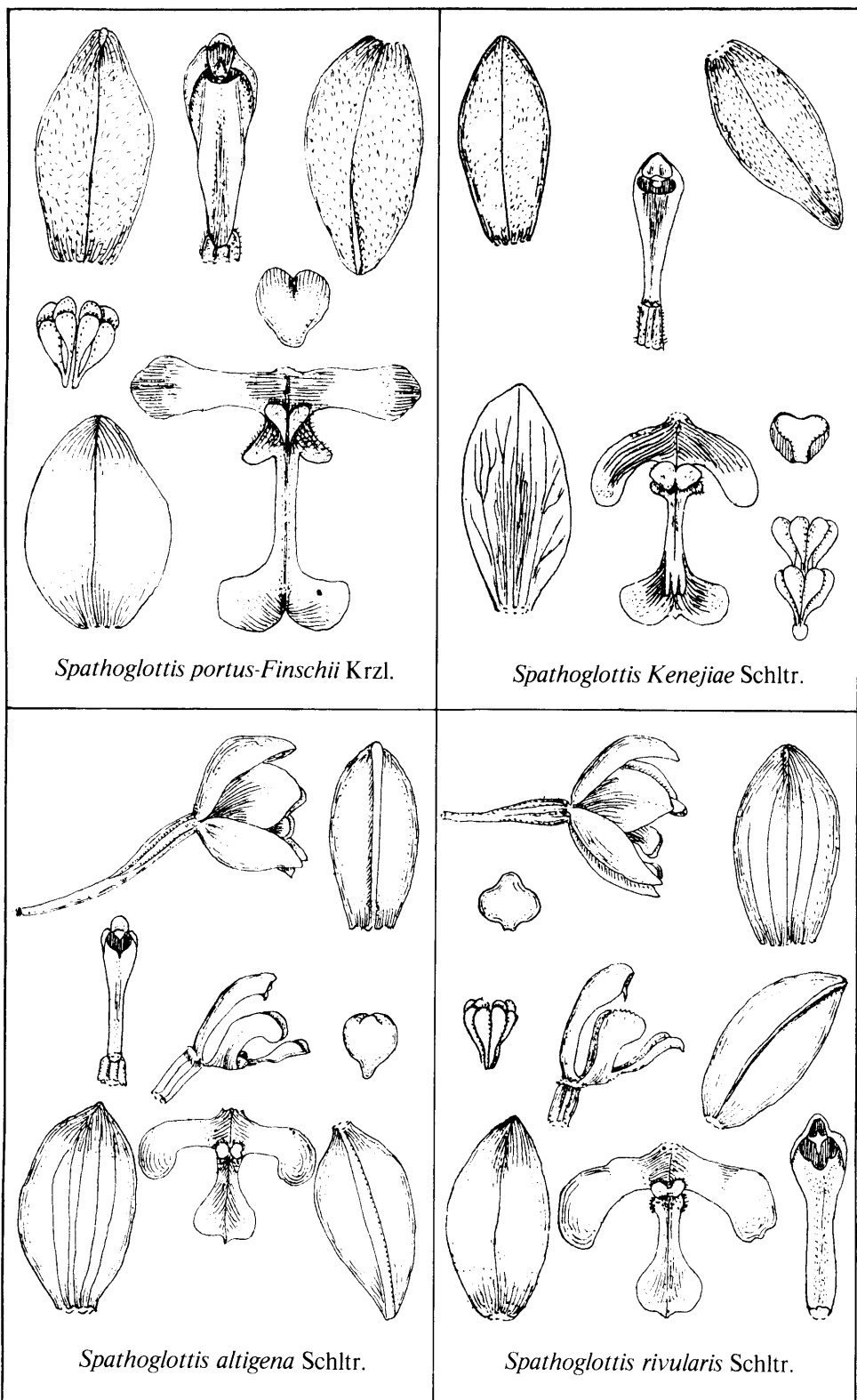
Calanthe inflata Schltr.

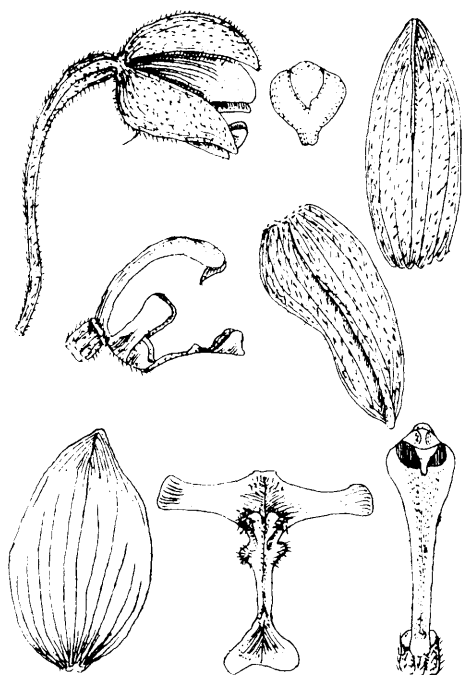


Calanthe aceras Schltr.

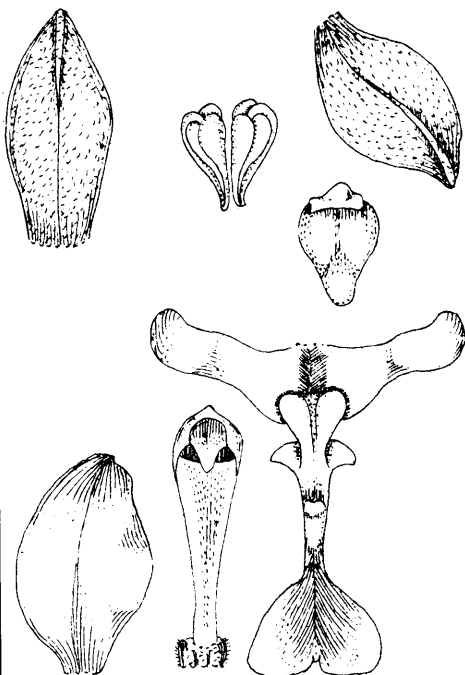


Aulostylis papuana Schltr.

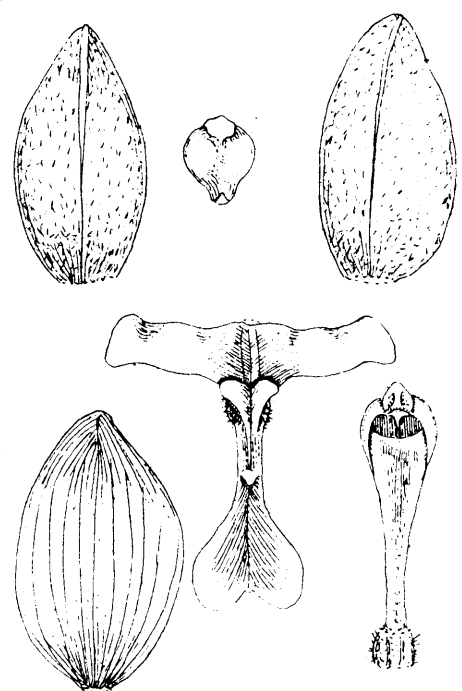




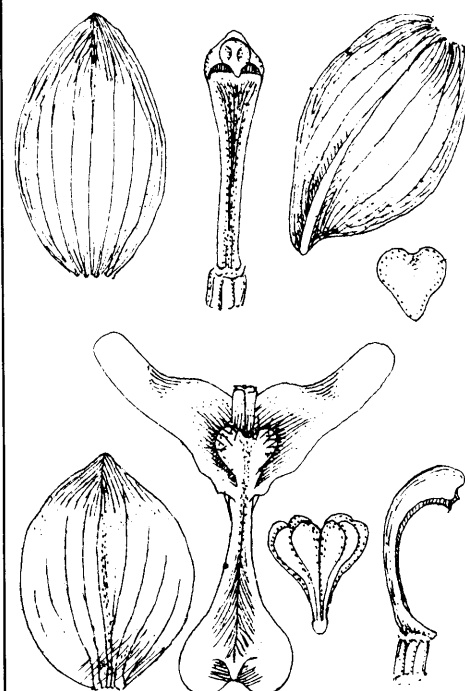
S. papuana Bail. var. *puberula* Schltr.



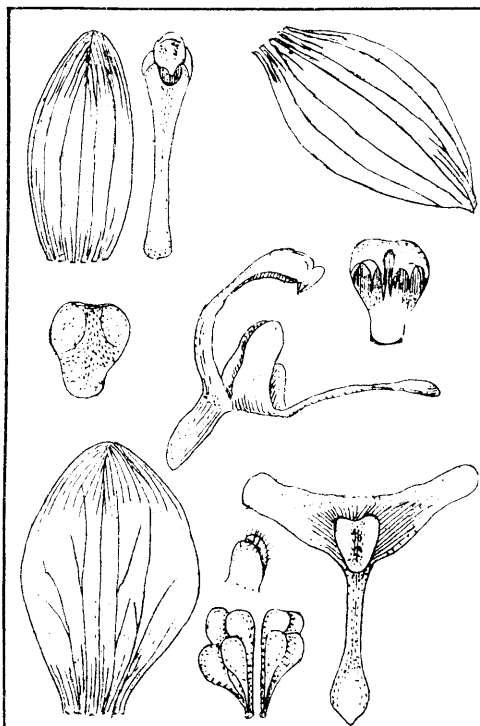
Spathoglottis grandifolia Schltr.



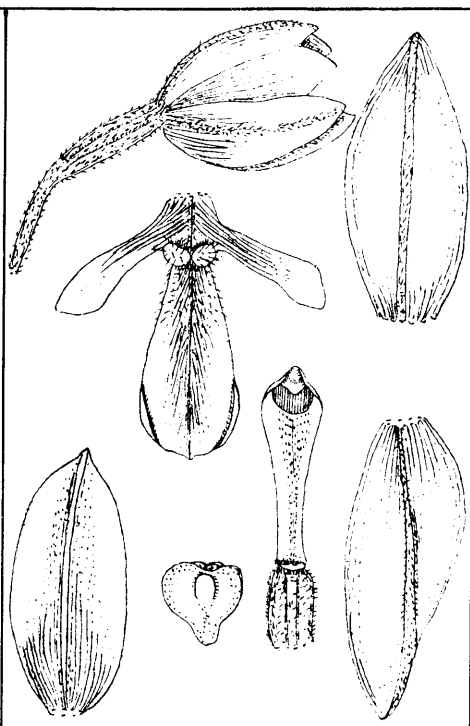
Spathoglottis wariana Schltr.



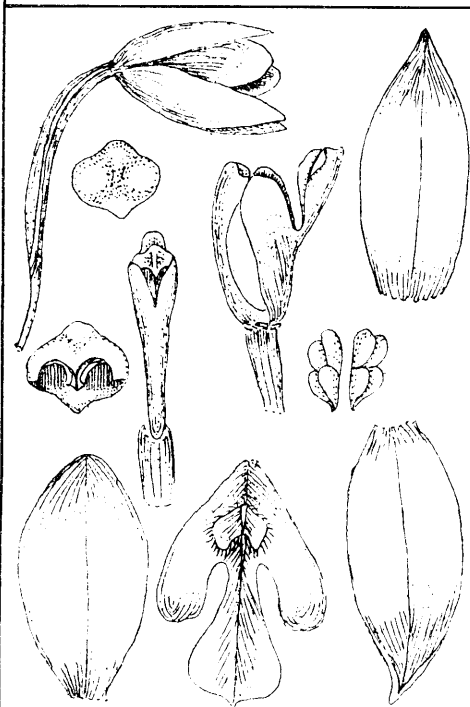
Spathoglottis bulbosa Schltr.



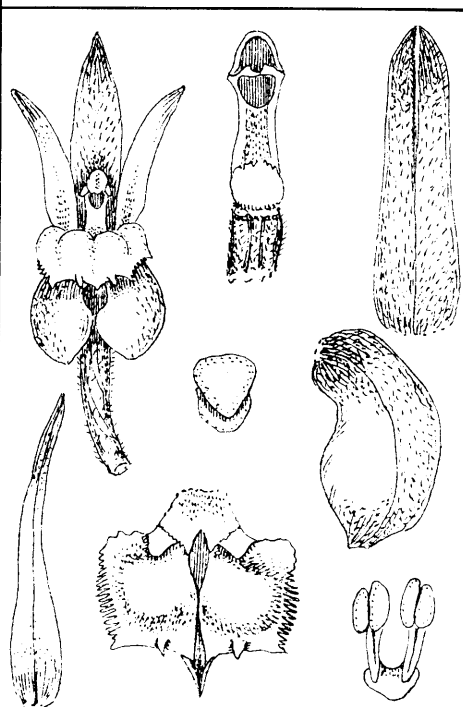
Spathoglottis pulchra Schltr.



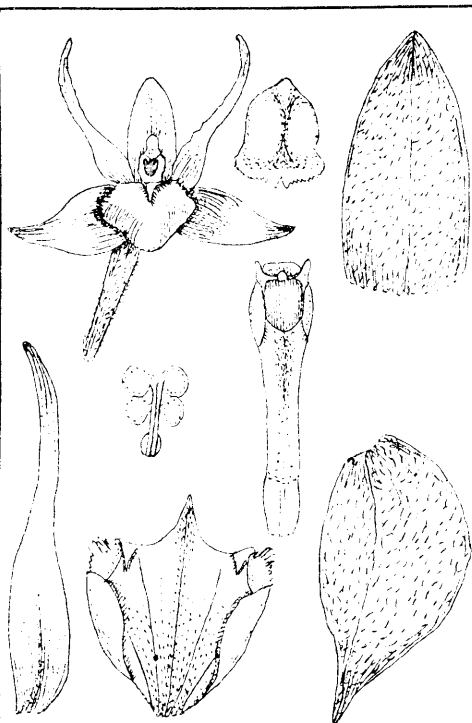
Spathoglottis parviflora Krzl.



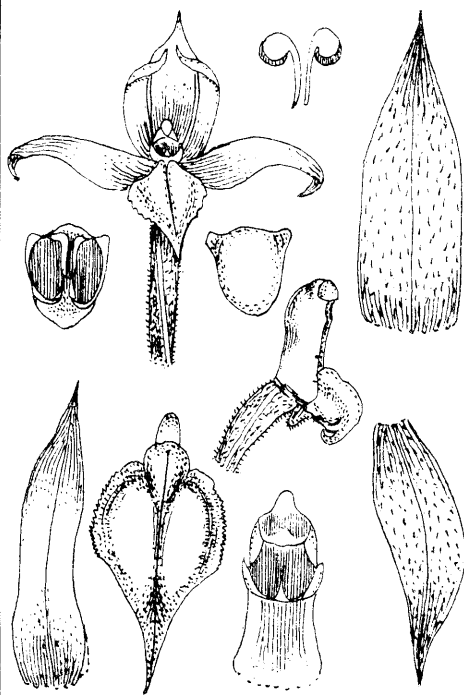
Spathoglottis albida Krzl.



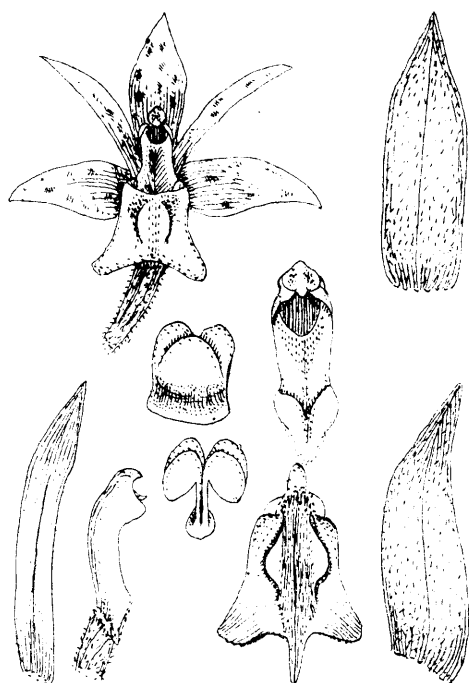
Plocoglottis atroviridis Schltr.



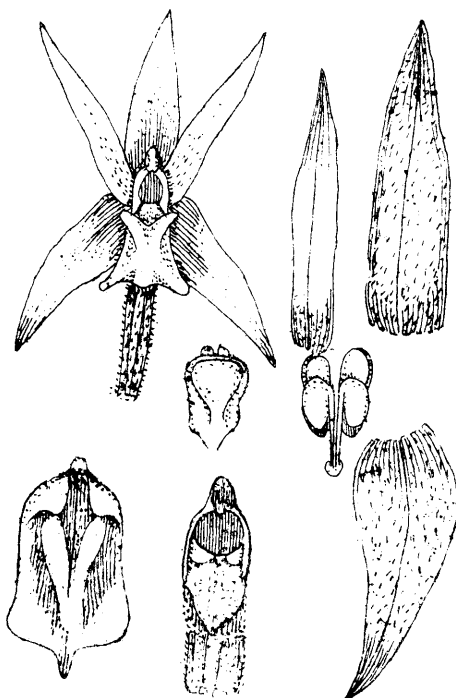
Plocoglottis pubiflora Schltr.



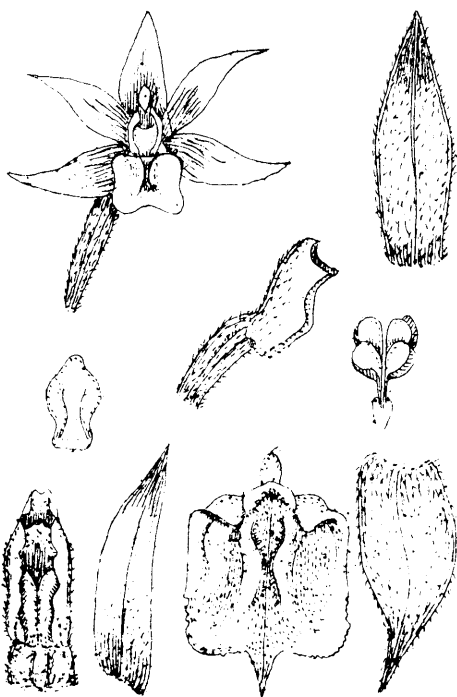
Plocoglottis neo-hibernica Schltr.



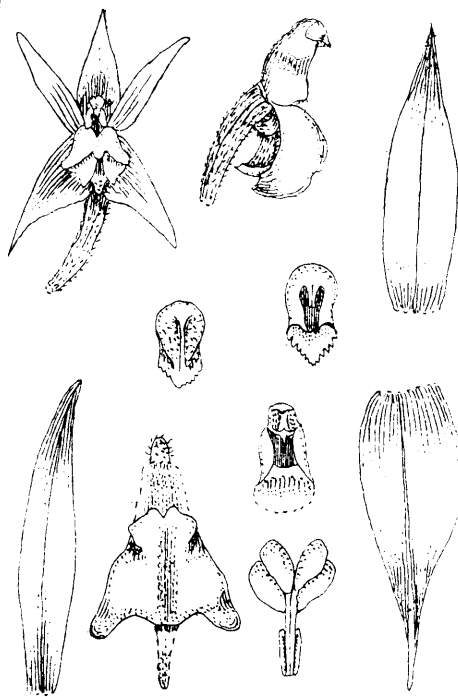
Plocoglottis sakiensis Schltr.



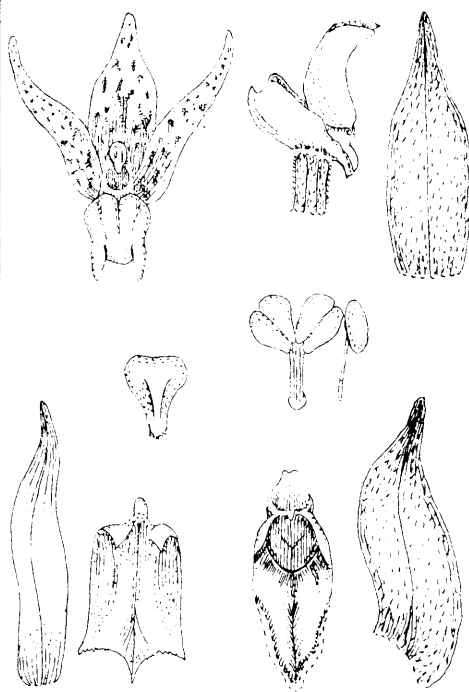
Plocoglottis kaniensis Schltr.



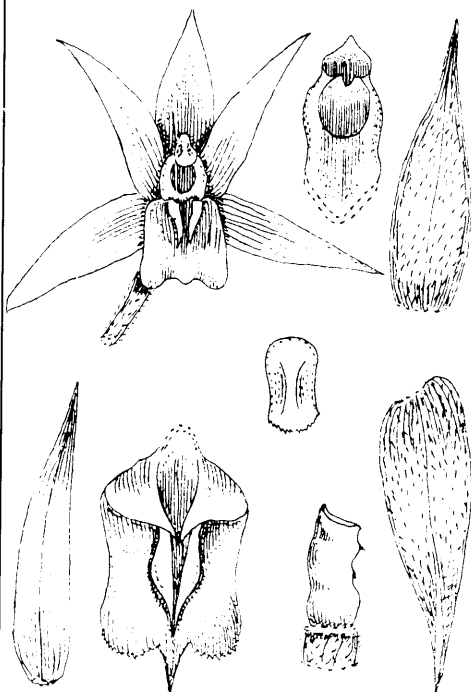
Plocoglottis papuana Schltr.



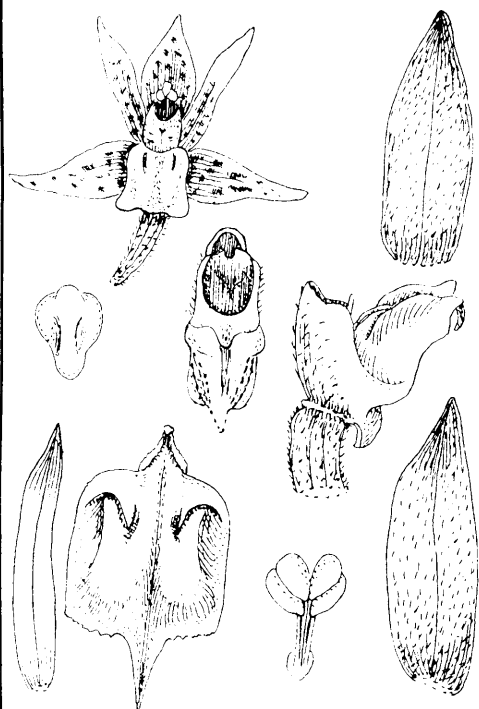
Plocoglottis pseudo-moluccana Schltr.



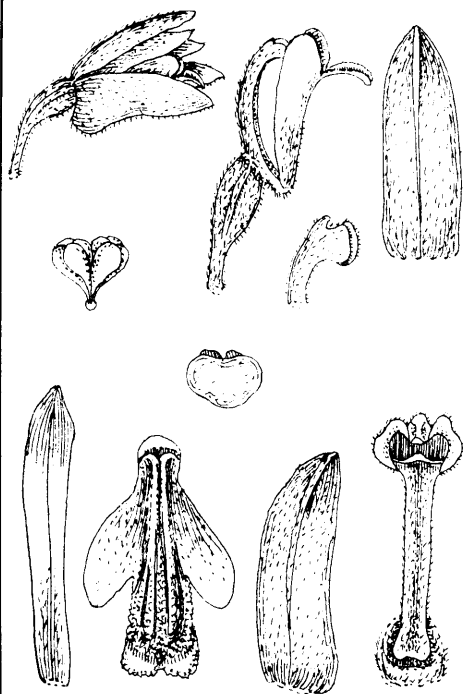
Plocoglottis glaucescens Schltr.



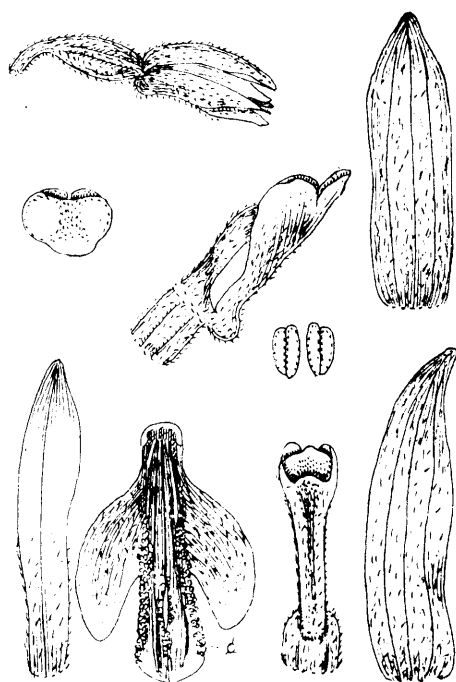
Plocoglottis torricellensis Schltr.



Plocoglottis maculata Schltr.



Pachystoma papuanum Schltr.



Pachystoma affine Schltr.

Group XIX *Cyrtopodiinae*

Amongst the orchids of New Guinea the *Cyrtopodiinae* play an insignificant role. The centre of distribution of the group is far beyond this Territory, viz. in Africa. In it Pfitzer has included nine genera, two of which, belonging to the *Corallorhizinae*, I have removed already. Of the remaining seven, three genera could be united, viz. *Eulophia* R. Br., *Lissochilus* R. Br. and *Pteroglossaspis* Rehb. f. Thus only five are left, viz. *Geodorum* Jacks., *Eulophia* R. Br., *Cyrtopodium* R. Br., *Govenia* Lindl. and *Warrea* Lindl. Of these five the last three are American. *Eulophia* R. Br. has a few American species, mainly about 200 African ones, and a few species in India and the monsoon-region. *Geodorum* Jacks. is Asiatic and Australian. The geographical distribution of the last two genera will be dealt with in more detail later on.

The group now probably contains in all about 300 species, while in 1899 Pfitzer estimated the number at about 100. This considerable augmentation of the species is ascribed principally to the exploration of Africa. There are, of course, several more species recorded both from India and the Malayan Archipelago, but all this is eclipsed by the great increase which the genus *Eulophia* R. Br. (including *Lissochilus* R. Br.) has received from Africa. From America, in contrast, there have been very few additions.

It is indisputable that the group has a close relationship with *Phajinae*, particularly as regards its vegetative characters. In fact, after close examination, the only difference remaining is in the pollinarium. This consists of pollinia, stipes and viscid glands. It is, therefore, the common pollinarium of Lindley's tribe *Vandaeae*, whereas the *Phajinae* may occasionally possess a viscid disc, but never a stipe.

68. *Eulophia* R. Br.

There are few genera amongst *Orchidaceae* with such a variety of flowers which offer so few characteristics for sectional division as *Eulophia* R. Br. This is explained by the individual characteristics weakening so gradually from species to species that it becomes hardly possible to find any boundaries between the separate form-groups. The same difficulty is experienced when we attempt a delimitation of *Lissochilus* R. Br. Every single characteristic of the typical *Lissochilus* species fades so gradually into other species or reappears again suddenly in otherwise typical *Eulophia* species, that as H. Bolus, a careful and acute observer and systematist, endeavoured to show, it would be impossible to keep the two genera separate unless a sharper boundary between them should be discovered. For this purpose, no doubt a careful monographic revision of all the species would be necessary. In treating the two genera for the 'Flora of Tropical Africa', R.A. Rolfe did not succeed either in establishing a more definite boundary, for the above-mentioned transients are still to be found in both of them. Only a few species of the genus come into consideration for New Guinea. These belong to four different sections which will be enumerated provisionally here. In contrast to most other orchids of New Guinea the *Eulophiinae* belong, for the most part, to very widely distributed species which are known beyond the Territory and widely dispersed in the Malay-Papuan area. In the Territory, they grow under conditions similar to those in neighbouring countries.

Besides the species mentioned here only one other has been described, viz. *E. papuana* Bail. from British Papua, a species unknown to me, but which possibly may be identical with *E. emarginata* Bl.

1. *E. emarginata* Bl., Fl. Jav. Orch., p. 152.

E. Dahliana Krzl., in Notizbl. Kgl. Bot. Gart. Berlin II (1898), p. 105 (nec l.c. I p. 243); Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 148.

Kaiser-Wilhelms-Land: In humus in the forests of Umbili, in the Minjem Valley, alt. c. 150 m—R. Schlechter no. 16325, flowering in July 1907; in more open places in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13916, flowering in Jan. 1902; in humus in the forests near Siu, on the Waria [River], alt. c. 100 m—R. Schlechter no. 19220, flowering in Apr. 1909.

Neu-Pommern: At the foot of the Beining Range in sandy coral soil, on the beach—R. Dahl, flowering in Mar. 1897; between undergrowth on hills between Massawa and Cape Lambert, alt. c. 50 m—R. Schlechter no. 13717, flowering in Nov. 1901.

I found it difficult to decide that this plant should not be regarded simply as a synonym of *E. macrostachya* Lindl., nevertheless, I have classed it here as a separate species, since I believe I can see certain differences which suggest that it could perhaps be placed next to *E. macrostachya* Lindl. Thus, the racemes are more lax and fewer-flowered and the flowers have longer stems with a more bladder-shaped spur. All related species, to which also belong *E. alismatophylla* Rchb. f. and *E. pulchra* Lindl., are inter-related very closely. *E. macrostachya* Lindl., which was classified by J.J. Smith from Dutch New Guinea, may also belong to this group, likewise *E. ambaxiana* J.J. Sm. with its synonym *E. papuana* Bail. The species is found often in the lower-lying forests of New Guinea in humus at damp places, but only as isolated specimens. Evidently, it is not found high up in the mountains, since I cannot remember finding it above the 350 m level. The flowers are yellow-green, the labellum white, later yellowish, with red and brownish red veins.

2. *E. Dahliana* Krzl., in Notizbl. Kgl. Bot. Gart. Berlin I (1897), p. 243 (nec l.c. II p. 105).

E. imperatifolia Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 148.

Kaiser-Wilhelms-Land: In more open places on the Nuru River, alt. c. 50 m—R. Schlechter no. 13799, flowering in Dec. 1901; in moist soil in undergrowth near Stephansort—B. Lewandowsky no. 19, flowering in Aug. 1899; on grassy hills near Jawer on the Minjem [River], alt. c. 100 m—R. Schlechter no. 17268, flowering in Feb. 1908, in open along clearings near Constantinhafen, alt. c. 20 m—R. Schlechter no. 14301, flowering in Mar. 1902; in the along-flats near the Saugueti Base, at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18875, flowering in Nov. 1908.

I had described this species previously as new, since I did not think it possible for two entirely different plants to be described as '*E. Dahliana*' by Kränzlin. I was guided by statements of Schumann and Lauterbach who enumerated only the second *E. Dahliana* Krzl., which now proves to be identical with *E. emarginata* Bl.

At first I thought that this species was isolated from the species in neighbouring regions, but I now see that it is related closely to the Asiatic *E. campestris* Lindl., although distinguished from it by the laxer racemes, more slender growth and narrower corolla-segments. The flowers are coloured from violet-red to pink, sometimes whitish towards the base.

3. *E. venosa* Rchb. f., in Benth., Fl. Austral. VI (1873), p. 300.

var. *papuana* Schltr., var. nov. [Ed.—comb. et stat. nov.]

Differt a forma typica floribus majoribus, labelli lobis lateralibus paulo minoribus, rarius subevanidis.

Cyrtopodium Parkinsonii F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 256.

Cyrtopera papuana Krzl., in Notizbl. Kgl. Bot. Gart. Berlin II (1898), p. 104.

Eulophia papuana (Krzl.) Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 148.

Eulophia Versteegii J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 24.

Eulophia neo-pommeranica J.J. Sm., in Nova Guinea VIII (1909), p. 26.

Kaiser-Wilhelms-Land: On the alang-plains near the Kenejia Base, alt. c. 150 m—R. Schlechter no. 18309, flowering in Sept. 1908; near Kelana, not far from Finschhafen—Hollrung no. 201, flowering in July 1886.

Neu-Pommern: Near Ralum—Parkinson no. 56; in grassland on volcanic soil near Ralum—Dahl no. 90, flowering in Oct. 1896; on open grassy locations near Herbertshöhe, alt. c. 40 m—R. Schlechter no. 13777, flowering in Nov. 1901.

Since I have now examined a whole series of flowers from different locations, I arrive at the conclusion that the species cannot be separated specifically from *E. venosa* Rchb. f. The only differences which I can find between the Papuan and the northern Australian ones are the slightly different proportions in size and the, usually, slightly broader petals. Likewise *E. Fitzalanii* F.v.M. should, probably, not retain specific rank.

The shape and size of the lobes of the labellum are different in each specimen. The lateral lobes of the specimens, for instance, which I collected at the same location as Parkinson and Dahl, are suppressed almost completely but, in the specimen of Parkinson they were quite distinct and a little larger even in that of Dahl. Likewise my specimens from Kaiser-Wilhelms-Land possess smaller lateral lobes than those collected by Hollrung.

Whether the Indian *E. bicarinata* Hook. f. represents the same species, I would not like to decide yet. My material of this species is not very good and it would be necessary in any case to examine a larger series of flowers from different locations in order to form an opinion concerning their varietal boundaries.

The above plant, with an almost divided labellum, I am not treating as a separate variety, since gradual transitions to the broader-lobed forms, such as *E. Versteegii* J.J. Sm., exist. I have noted the colour of the flowers as: sepals and petals whitish, brownish violet veins; labellum whitish, closely violet-veined, with white warts in the centre; column violet, anther yellow.

4. *E. macrorrhiza* Bl., Fl. Jav. Orch. (1858), p. 155 t. 63, p. 2.

var. *papuana* Schltr., var. nov. [Ed.—stat. et comb. nov.]

Differt a forma typica floribus majoribus, labello latiore, petalis apiculatis, nervo medio extus carinato, columnae pede leviter excavato, antherae cornubus majoribus.

Cryptopera papuana Ridl., in Journ. Bot. XXV (1886), p. 354.

Eulophia papuana (Ridl.) J.J. Sm., in Nova Guinea VIII (1909), p. 26.

Kaiser-Wilhelms-Land: In humus in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18399, flowering in Oct. 1908.

I cannot separate either this species, or the variety which I described from North Celebes, from the Javanese species. I can almost believe that *E. sanguinea* (Lindl.) Hook. f. also is not to be distinguished specifically. When I transferred the name *Cryptopera papuana* Krzl. to *E. papuana* Schltr. I had, already, seen the Type of Ridley's plant in the British Museum and was convinced that it was a form of *E. macrorrhiza* Bl. hence I disregarded this name.

The specimens from New Guinea are extremely similar to those from the Celebes, the differences between the two may, therefore, be determined only by analysis. The colour of the flowers, for both sepals and petals, is dark brown; the lip is whitish outside, dark violet-brown inside, white in the centre, thus almost the same as in the Celebes plant.

5. *E. squalida* Lindl., Bot. Reg. (1841), misc. 77.

var. *neo-guineensis* Schltr., var. nov.

Differt a forma typica petalis paulo angustioribus, anthera antice haud producta, brevius bilobulata.

Kaiser-Wilhelms-Land: In alang at the edge of the forest near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16993, flowering in Dec. 1907; at the edges of the forests near Kubai, in the Kenejia Valley, alt. c. 170 m—R. Schlechter no. 18939, flowering in Dec. 1908.

When I collected this plant first I did not consider it as only a variety of the widely distributed *E. squalida* Lindl., and yet there is no character to be found whereby these two may be separated. My drawings agree perfectly with those made by me of the same species in Singapore and in the Celebes, differing only in a few insignificant points. The Celebes variety, especially, comes very close to the one under consideration.

From our Territory I know only the pale-flowered form, but it is expected that the darker form also exists. The flowers of my specimens were greenish with white petals, and a white labellum with sulphur-yellow veins.

69. *Geodorum* Jacks.

I must confess that there is no characteristic by means of which it is possible to separate *Geodorum* from *Eulophia* R. Br., yet it has not occurred to any botanist to unite these two genera. There appear to be mainly two reasons for this. Firstly, the *Geodorum* species have a very characteristic habit due to the nodding inflorescence, and the flowers which are few in number possess a distinctive spoon-like labellum. This labellum shape may, however, be observed in some *Eulophia* species, viz. in *E. expandata* Lindl. The habit of the flowers indicates a characteristic group of the *Cyrtopodiinae*, in this instance *Geodorum* Jacks. To unite this genus and *Eulophia* R. Br. would render still more obscure the uncertain character of the latter. The second reason, which cannot be taken too lightly, is that *Geodorum* Jacks. was established in 1810, that is 22 years prior to *Eulophia* R. Br. and according to the rules of priority the whole of the species of the large genus *Eulophia* R. Br. would have to be renamed *Geodorum* [Jacks.] Such a proposal apalls even those botanists who would otherwise favour such a union. For my own part, I see in *Geodorum* Jacks. a closed group, which if united with *Eulophia* R. Br. would certainly have to be considered a section and I therefore uphold it here as a genus.

In treating the orchids for the 'Flora of British India', Hooker has included *Geodorum* Jacks. in the *Cymbidieae* and *Eulophia* R. Br. in the *Eulophieae* and the difference is stated to be that the lip of the latter is spurred and the column produced into a foot, whereas in the *Cymbidieae* the lip is spurless and the column footless. To this may be noted that a whole series of *Eulophia* species possess an unspurred lip and many of them a footless column, and, further, that *Geodorum* Jacks. always possesses a distinct, though short, column foot. We see therefore that even in this division, the differences collapse and we can depend only upon the habit in conjunction with the shape of the labellum.

Quite as difficult as the positive separation of the genus from *Eulophia* R. Br. is the distinction of the species 'inter se'. Fifteen acceptable species have been established up to the present, but there is no doubt that in a monographic revision of the whole material, several of the species will have to be reduced, since the differences between them are insufficient. I presume that in this genus we have under consideration widely distributed species (as we have seen already in the *Eulophia* species in our Territory), which as in many plants of the alang-formation (the principal habitat of the *Geodorum*

species), have conquered large areas without having undergone great variations. We can imagine how the extremely minute orchidaceous seeds easily cling to the wool of the alang seeds (*Imperata*) and are carried for long distances by the wind or other agencies. The vast distribution of the orchids of the alang-formation then becomes clearer. Herein we probably may find the explanation as to why such species as *Habenaria goodyeroides* Don, *Habenaria Rumphii* Lindl., *Nervilia crispata* (Bl.) Schltr., *Nervilia Aragoana* Gaud., the *Eulophia* species and other similar forms have penetrated our Territory.

1. *G. pictum* Lindl., Gen. et Spec. Orch. (1833), p. 175.

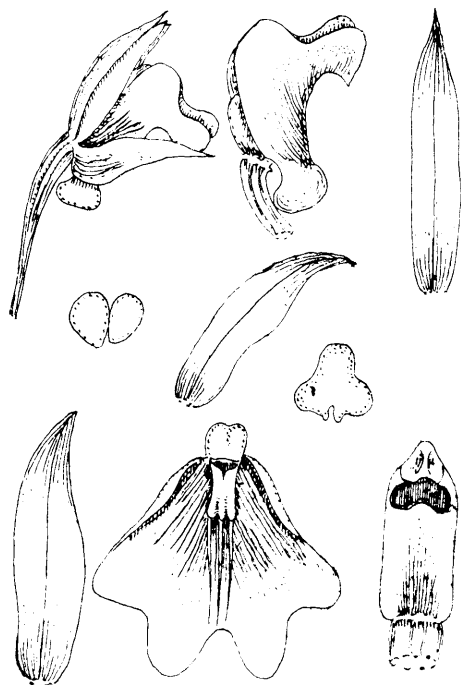
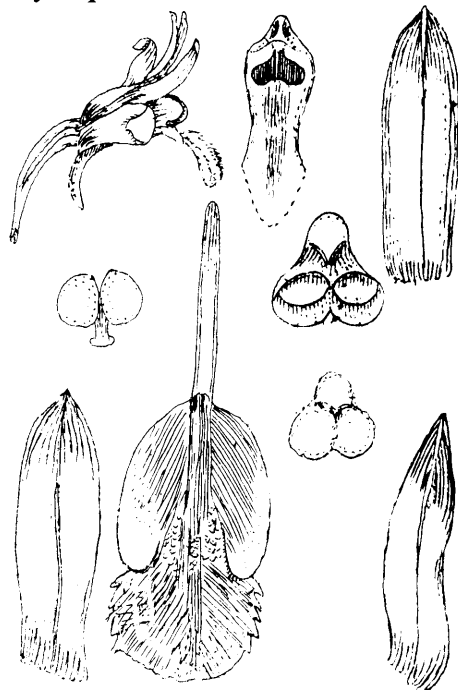
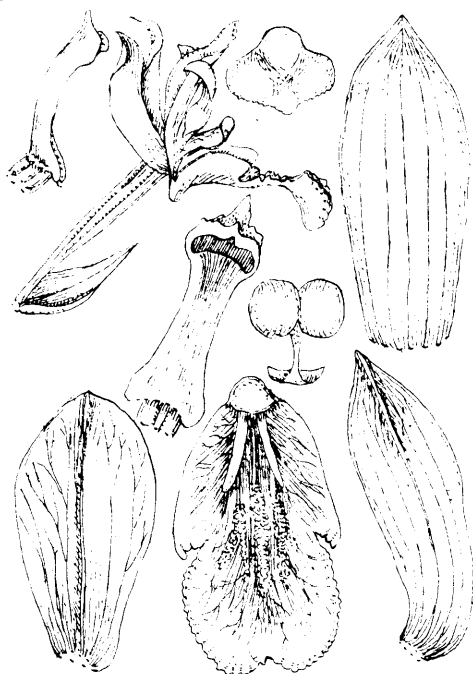
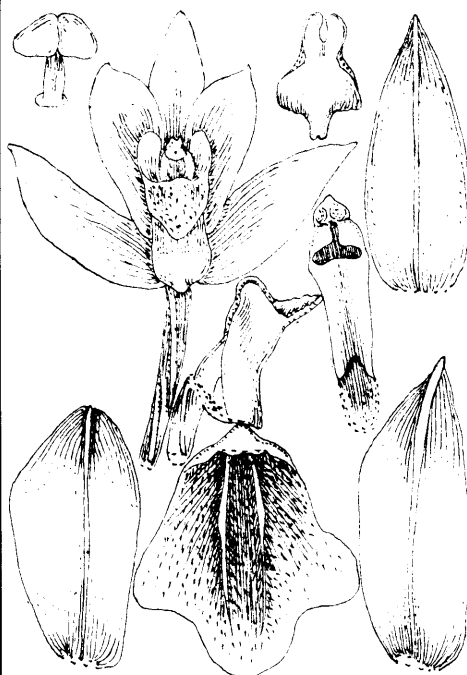
Kaiser-Wilhelms-Land: In open clearings between the alang on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13875, flowering in Jan. 1902; on the alang flats near the Keneja Base, alt. c. 150 m—R. Schlechter no. 18438, flowering in Oct. 1908; in clear undergrowth near the Saugueti Base, alt. c. 250 m—R. Schlechter no. 18900, flowering in Nov. 1908.

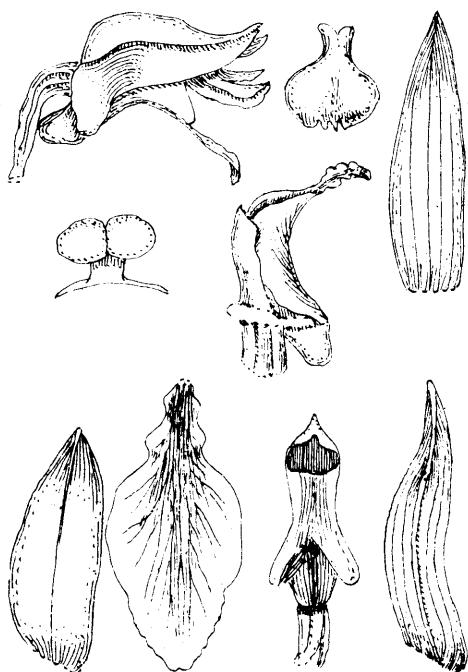
Neu-Mecklenburg: In alang near Käwieng, alt. c. 20 m—R. Schlechter in June 1902 (cf. comment in K. Schum. et Laut., Nachtr. [1905], p. 148).

I have not yet been able to separate the species of our Territory from those endemic to Australia. The flowers are pale rose-red with red veins and yellow calli on the lip.

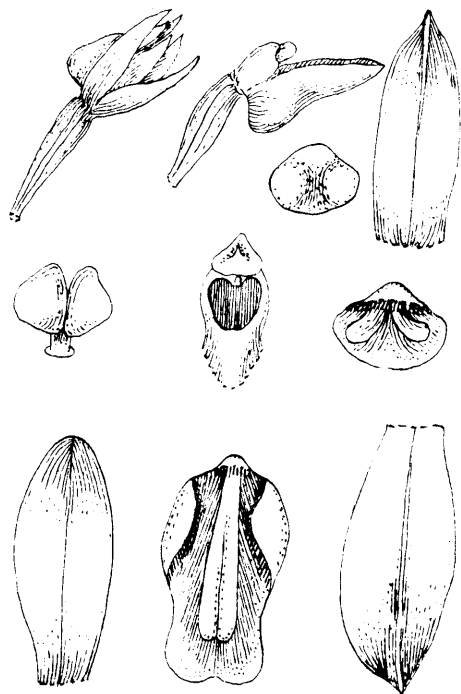
GROUP XIX

Cyrtopodiinae

*Eulophia emarginata* Bl.*Eulophia Dahliana* Krzl.*Eulophia venosa* Rechb. f.
var. *papuana* Schltr.*Eulophia macrorrhiza* Bl.
var. *papuana* Schltr.



Eulophia squalida Lindl.
var. *neo-guineensis* Schltr.



Geodorum pictum Lindl.

Group XX *Dendrobiinae*

Quite recently Kränzlin has treated the group *Dendrobiinae* in a monograph, so that in consequence it would appear superfluous to discuss in detail the composition and systematization of the group. However, those who have had the opportunity of examining this monograph closely and who, like myself, have made the despairing attempt to use it, will most likely understand why I have decided to treat the *Dendrobiinae* in the same way as the other groups. My many years of study on living material in the principal regions of occurrence of the *Dendrobiinae* have led me to conclusions which, in many respects, differ considerably from those of Kränzlin. Kränzlin assigns 11 genera to the group and arranges them in the following order: *Dendrobium* Sw., *Callista* Lour., *Inobulbon* Krzl., *Sarcopodium* Lindl., *Diplocaulobium* Rchb. f., *Desmotrichum* Bl., *Adrorhizon* Hook. f., *Eria* Lindl., *Trichotosia* Bl., *Porpax* Lindl. and *Chitonanthera* Schltr. It is evidently a matter of opinion to what extent you will accept the concept of the genus *Dendrobium*, but even if large concessions are made, it would seem impossible, for anyone knowing the group, to place the genera side-by-side as arranged by Kränzlin. In considering the genera which he mentions individually I arrive at the following conclusions:

[1] Regarding *Dendrobium* Sw.; nothing more need be said initially, except that from his concept of the genus, the conclusions mentioned below would follow naturally.

[2] *Callista* Lour. is a much-disputed plant which I now have examined very closely in London, and in consequence I must agree with the opinion of James O'Brien, who regards the Type as *Dendrobium densiflorum* Wall. O'Brien has even sent to the British Museum [of Natural History] a good example of *D. densiflorum* Wall., which resembles the Type of *Callista* Lour. exactly, even to the bracts, so that as far as I am concerned the question of identity is settled. The second *Callista* species, as defined by Kränzlin, does not even belong to the same section of *Dendrobium* Sw., and is identical with *D. hercoglossum* Rchb. f., hence *Callista* Lour. would belong to *Dendrobium* Sw., anyhow.

[3] *Inobulbon* Krzl., I would be inclined to accept on account of its divergent flower structure, were it not for the fact that it passes through intermediate forms, gradually, into a true *Dendrobium* [Sw.].

[4–6] The next three genera, *Sarcopodium* Lindl., *Diplocaulobium* Rchb. f. and *Desmotrichum* Bl., are typical *Dendrobium* in floral structure and habit too closely related in the different sections to admit of generic separation. All have been regarded subsequently by their authors as true *Dendrobium*.

[7] *Adrorhizon* Hook. f. is, in my opinion, non-*Dendrobiinae*, being related more closely to the *Coelogyninae*, and I had united it previously with the very closely related *Josephia* Wight, in the separate group *Adrorhizinae*.

[8] *Eria* Lindl. is a typical *Dendrobiinae*, but has nothing in common with *Mediocalcar* J.J. Sm. nor *Epiblastus* Schltr., which two genera were united with it by Kränzlin, although they belong actually to the *Agrostophyllinae*.

[9] *Trichotosia* Bl. cannot be separated from *Eria* Lindl., for the same reasons applying to *Sarcopodium* Lindl. and *Dendrobium* Sw. Why *Cylindrolobus* Bl. and *Trichotosia* Bl. have been placed together by Kränzlin is beyond my understanding; thereby the circumscription of *Trichotosia* Bl. has been reduced to utter confusion.

[10] *Porpax* Lindl. remains as a good genus.

[11] *Chitonanthera* Schltr. is a *Thelasinae*, which is related closely through *Octarrhena* Thw. to *Phreatia* Lindl. From these points of view, the eleven genera

constituting the *Dendrobiinae* are at present reduced to three. If one were to adopt the methods of Kränzlin, one would be compelled to accept not eleven genera but about twenty; because by the same reasoning that *Sarcopodium* Lindl. is separated from *Dendrobium* Sw., so also would one have to separate *Aporum* Bl., *Oxystophyllum* Bl., *Dendrocoryne* and many other sections such as *Trichotosia* Bl. from *Eria* Lindl., also *Cylindrolobus* Bl., *Mycaranthes* Bl., and others. We therefore accept initially for the *Dendrobiinae* the following three genera: *Dendrobium* Sw., *Eria* Lindl. and *Porpax* Lindl. Earlier (p. 298), I placed a further genus *Cryptochilus* Wall. here next to *Porpax* Lindl. As a fifth genus I would now like to reinstate the Blumean *Cadetia*, the species of which are distinguished from those of *Dendrobium* Sw., by their *Pleurothallis*-habit as well as by their flower characters. [Ed.—referring to p. 640 Schlechter makes the following comments.]

In the course of work on the Papuan species of Dendrobium, I have, lately, come to the conclusion that the group which I formerly named Pseudo-Eria, must be excluded from the genus; I have, therefore, treated it here as a separate genus—Pseuderia Schltr. Since I have formed this opinion only recently it is not contained in the synopsis of the genera of the Dendrobiinae [p. 422 of the German text] and must be inserted now after Dendrobium Sw.

All the species belonging to this new genus are distinguished strikingly from other genera of the group by their long creeping habit, either as undershrubs on the ground or scandent on trunks of tall-growing trees. They often reach very considerable size since I have seen them cover the tree stems for several metres. The leaves are also different in texture from those of Dendrobium Sw. The inflorescences are noteworthy for their shortened side shoots, as I have explained already. The chief characteristic, however, undoubtedly is found in the flower, which always has a small undivided labellum, a slender bent column from which the foot is absent. These are characters which militate against its insertion in the genus Dendrobium Sw. We have still to mention also that the anther differs considerably from that of Dendrobium and that the fruits are more reminiscent of species of Eria than Dendrobium.

[Ed.—We have arranged *Pseuderia* Schltr. in accordance with Schlechter's directions on p. 643 of the German text (p. 640). Appropriate synoptic notes have been included.]

A. *Pollinia* 4.

1. Small plants with the habit of *Pleurothallis* with moderately fleshy flowers, their sepals forming a spur at the base with the claw of the labellum and foot of the column. The column more-or-less markedly hairy in front. *Cadetia* Bl.
2. Plants with pseudobulbs or many-leaved stems. Sepals spreading in front or only connate at the base. Column glabrous *Dendrobium* Sw.
3. Undershrubs, creeping or with scandent branches, papery coriaceous, usually shining leaves. Labellum always entire. Column footless, glabrous, slender *Pseuderia* Schltr.

B. *Pollinia* 8.

1. Sepals not connate. *Eria* Lindl.
2. Sepals connate in a pitcher-shaped tube.
 - (a) Flowers in a unilateral raceme *Cryptochilus* Wall.
 - (b) Flowers single, pseudoterminal *Porpax* Lindl.

The division of the two large genera *Dendrobium* Sw. and *Eria* Lindl. will be dealt with later on when treating them specifically.

I would like to add a few words about the position of the group in the classification of the *Orchidaceae*. I believe that the *Dendrobiinae* is related closely to the *Agrostophyllinae* and the *Podochilinae*, and should follow directly after these two. I have not been able to make this alteration here, however, because my work on *Polystachyinae*, *Phajinae* and *Cryptopodiinae* was already in press, when I arrived at this conclusion. Contrary to the opinion of Pfitzer I consider the *Dendrobiinae* normal acranthous orchids, and examples of this occur regularly in several sections of *Dendrobium* Sw. and *Eria* Lindl. In their vegetative characters, some group-forms, e.g. the genus *Cadetia* Gaud., are related closely to *Ceratostylis* Bl., whilst several of the section *Grastidium* seem to indicate kinship with the *Podochilinae*.

The *Dendrobiinae*, in the sense here indicated, is distributed over a very large area. It, of course, belongs to the Old World, and is absent entirely from Africa. In Asia it is recorded already from the south-west region of India and from there is dispersed abundantly over the whole tropical and sub-tropical part of the continent with a few representatives in the temperate zones of north-east Asia. The area of its dispersion extends further over the whole of the east Asiatic and Malaysian Archipelagoes down to New Guinea and the Society Islands [Tahiti] in the Pacific Ocean. Towards the south, it extends through Australia and New Caledonia, where a large number of endemic species occur and has finally penetrated as far as New Zealand, where *Dendrobium Cunninghamii* Lindl. occurs. The latter is the most southern species of the genus. Resulting from the exploration of the Malayan Archipelago and the Papuan floral zone, the group has grown amazingly in species numbers during recent years. Pfitzer estimated the number of species in 1889 at about 400, while barely 20 years later Kränzlin has enumerated about 950 species. Of the latter, many still require a close screening to ascertain whether certain forms have been united which ought to have been separated, and frequently in a similar manner some have been placed twice or more in different sections. The number of new species here described is likewise unexpectedly large, even though many novelties from Papuasias have been described recently by J.J. Smith and myself. I am of the opinion that we still have to expect very large additions to the *Dendrobiinae* from New Guinea, because some regions, such as the mountains of Neu-Pommern, Neu-Mecklenburg and the Solomon Islands, which seem to possess a very local flora, have, as yet, remained unexplored completely. Likewise, very little is known from British Papua.

70. *Cadetia* Gaud.

I had hoped initially to retain this genus in *Dendrobium* Sw., to which it has been referred by recent authors, but the better I became acquainted with it, and the more living material which I inspected the more I became convinced that it would be better to separate this group from *Dendrobium* Sw. which had reached already such a considerable size. In the first place, all the *Cadetia* species are entirely different in habit from those of *Dendrobium* [Sw.] Not inappropriately, they have been compared by J.J. Smith with *Ceratostylis* Bl. which, in many respects, they resemble. Their habit is entirely that which I would call the *Pleurothallis*-habit. The flowers show a consistent divergence from those of *Dendrobium* [Sw.]; not only do the lateral sepals form a mentum; but through their cohesion anteriorly in their lower half, they form a perfect spur. Through the long claw, the labellum is articulated with the foot of the column. The column is more-or-less hairy in front. A similar pilosity is found generally in the labellum. All the species fall into a sharply-defined group, so that I think it is

appropriate to restore the genus. The genus is distributed from the Moluccas through the Papuan floral zone to Australia, where *C. Maideniana* Schltr.* and *C. Tylori* (F.v.M.) Schltr. (*Dendrobium Tylori* Fitzg.) are the farthest south-eastern species.

*I had noted already in K. Schum. et Laut., Nachtr. [1905], p. 156, that I considered as *D. Maidenianum* Schltr., the Australian plant previously identified as *D. hispidum* A. Rich. and illustrated by Fitzgerald. This appears to have escaped the notice of Kränzlin in compiling his monograph.

I consider it possible that with more thorough exploration of the eastern south sea islands, still further species will be found.

At present the island of Vanikoro [south-western Solomons] is to be regarded as the most eastern limit of its distribution. From German New Guinea I have now to enumerate no less than 22 species. Besides these, there are from the English part of the island [British Papua] *C. Sayeri* Schltr. (*Dendrobium Sayeri* Schltr.), *C. triquetra* (Ridl.) Schltr. (*Dendrobium triquetrum* Ridl.) and *C. albiflora* (Ridl.) Schltr. (*Dendrobium albiflorum* Ridl.). Also from the Dutch part [Dutch New Guinea] the following have been recorded: *C. funiformis* (Bl.) Schltr. (*Dendrobium funiforme* Bl.), *C. biloba* Bl., *C. heteroidea* (Bl.) Schltr. (*Dendrobium heteroideum* Bl.), *C. recurvata* Bl., *C. angustifolia* Bl., *C. similis* Bl., *C. ceratostyloides* (J.J. Sm.) Schltr. (*Dendrobium ceratostyloides* J.J. Sm.), *C. quinquecostata* (J.J. Sm.) Schltr. (*Dendrobium Rumphiae* Rchb. f. var. *quinquecostatum* (J.J. Sm.), *C. transversiloba* (J.J. Sm.) Schltr. (*Dendrobium transversilobum* J.J. Sm.), *C. aprina* (J.J. Sm.) Schltr. (*Dendrobium aprinum* J.J. Sm.), *C. goliathensis* (J.J. Sm.) Schltr. (*Dendrobium goliathense* J.J. Sm. and *C. macroloba* (J.J. Sm.) Schltr. (*Dendrobium macrolobum* J.J. Sm.).

The few other species occurring outside the Territory are: *C. umbellata* Gaud., *C. pseudo-umbellata* (J.J. Sm.) Schltr. (*Dendrobium pseudo-umbellatum* J.J. Sm.), and *C. hispida* (A. Rich.) Schltr. (*Dendrobium hispidum* A. Rich.). The genus thus consists of about 42 species, not less than 37 occurring on the island of New Guinea.

I divide the genus into three sections, defined as follows:

§ 1. *Sarco-Cadetia*

Species with creeping rhizomes, cylindrical, somewhat fleshy pseudobulbs, at the apex of which the flowers appear directly behind the leaf, by turning the axis of the pseudobulbs. The labellum of these species is undivided and without any transverse crests or lamellae. The Type of the section is *C. funiformis* (Bl.) Schltr.

§ 2. *Ptero-Cadetia*

Species with bushy habit, more-or-less angular, non-fleshy pseudobulbs, at the apex of which the flowers arise separately, at certain intervals from the sheath in front of the leaf. The labellum usually is three-lobed, very often provided with a transverse crest between the lateral lobes. The fruit is glabrous and more-or-less three-winged. The Type of the section is *C. trigonocarpa* Schltr.

§ 3. *Eu-Cadetia*

Species with the habit of the previous section but the pseudobulbs more-or-less terete. The flowers and inflorescences resemble those of the previous section but the ovary is round in cross-section and densely covered with soft prickles. The Type of the section is *C. umbellata* Gaud.

§ 1. *Sarco-Cadetia*

At present this section consists only of four Papuan species, of which three are described here as new, the fourth, *C. funiformis* (Bl.) Schltr., has its habitat in Dutch New Guinea. The species are epiphytes on the trunks of trees, firmly appressed to the bark; occasionally I found them on rocks. They appear to prefer the *Myrtaceae*, whose

dry fissured bark evidently suits them well. Two species, *C. parvula* Schltr. and *C. wariana* Schltr., are found in the hill-country at an altitude of 300–700 metres, whilst the third seems to occur only in the mist-forest formations.

1. *C. parvula* Schltr., sp. nov.

Epiphytica perparvula, decumbens, c. 1 cm alta; rhizomate radicante, dense pseudobulbis obsesso; pseudobulbis erectis vel adscendentibus, cylindræis, unifoliatis, 3–5 mm longis, 1.5–2.5 mm diametientibus; folio oblongo, obtuso, 5–8 mm longo, 2–4 mm lato, glabro; floribus singulis, apicalibus, in dorso folii natis, parvulis; bractea ovata, acuta, minuta, ovario pedicellato multo brevior; sepalis late ovatis, apiculatis, glabris, 2.5 mm longis, lateralibus obliquis, basi lobato-productis, antice usque ad medium connatis, cum pede columnæ mentum calcariforme oblongoideum, obtusum, c. 2.25 mm longum formantibus; petalis oblique ligulatis, subacutis, glabris, sepalis subaequilongis; labello e ungue ligulato, 1.75 mm longo, columnæ pedi marginibus adnato in laminam oblongam, apiculatam, basi paululo dilatata, 2.25 mm longam expanso, dimidio inferiore minutissime puberulo, caeterum glabro, lamina medio leviter incrassata; columna brevi, pede satis longo, facie minute puberula, clinandrio dorso in dentem producto; anthera quadrato-cucullata, antice retusa, bidentata; ovario trigono, circuito semilunato, pedicello incluso c. 3 mm longo; capsula dorso bialata, antice rotundata, glabra, c. 0.6 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji in the Waria Valley, alt. c. 450 m—R. Schlechter no. 19381, flowering in May 1909; on trees in the forests on the lower Govidjoa [Creek] (Waria District), alt. c. 600 m—R. Schlechter no. 19752, flowering in June 1909.

This is the smallest of all species of the genus. It is closest to *C. crassula* Schltr., but has a differently shaped labellum and a different anther. Its flowers are white, the labellum pale yellow in front, the anther pale green.

2. *C. crassula* Schltr., sp. nov.

Parvula, decumbens, 1–2 cm alta; rhizomate brevi, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis crassiusculis, cylindræis, unifoliatis, 0.4–1 cm altis, medio 0.2–0.4 cm diametientibus, unifoliatis; foliis oblongis vel ovalibus, obtusis, glabris, textura crassiuscule coriaceis, 0.5–1.2 cm longis, medio fere 2.5–3.5 mm latis; floribus terminalibus, singulis, juxta folium natis, in genere inter minores; bractea minuta, deltoidea; sepalis ovalibus, obtusis, glabris, 2.25 mm longis, lateralibus obliquis, apiculatis, basi margine anteriore lobato-ampliatis, usque ad medium fere connatis, mentum obtusum sacciforme c. 2 mm longum formantibus; petalis oblique ligulatis, obtusiusculis, glabris, sepalis subaequilongis; labello e ungue oblongo, concavo, marginibus pedi columnæ adnato in laminam oblongam rotundatam subito apiculatam producto, 3.5 mm longo, lamina medio 1 mm lata, ungue medio 0.8 mm lato, labello toto speculo incrassato basilari alioque rotundato in medio laminae exceptis minute puberulo; columna brevi, facie minute puberula, clinandrio dorso tridentato, dente intermedio majore; anthera late rhombo-cucullata, medio obtuse umbonata, dorso alte excisa, antice truncata; ovario pedicellato, glabro, dorso bicostato, antice rotundato, 0.5 cm longo; capsula alte bilata, antice rotundata, c. 0.7 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19124, flowering in Jan. 1909.

This species is related closely to the above-described *C. parvula* Schltr., but is more fleshy and more robust in the bulbs and especially in the leaves. The labellum and anther, in particular, are differently shaped in the floral segments. The colour of the flowers is yellowish white.

3. *C. wariana* Schltr., sp. nov.

Epiphytica, decumbens, ramosa, c. 3 cm alta; rhizomate elongato, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindræis, unifoliatis, 0.5–1 cm longis, medio fere 2–3 mm diametientibus; foliis erecto-patentibus, ligulatis, vulgo apiculatis, basin versus paulo attenuatis, glabris, 1–1.5 cm longis, medio fere 1.5–2.5 mm latis; floribus ad apices pseudobulborum in dorso folii singulis, in genere inter minores; bractea minuta, deltoidea, acuta, ovario multoties brevior; sepalis late ovatis, obtusis, glabris, vix 0.3 cm longis, lateralibus obliquis, basi lobato-productis et antice connatis cum pede columnæ mentum calcariforme, cylindricum, obtusum, c. 3 mm longum formantibus; petalis oblique ligulatis, apiculatis, glabris, sepalis subaequilongis; labello e basi lineari, 2.25 mm longo, marginibus columnæ pedi adnato in laminam

oblongam obtusam, basi minute puberulam, dimidio anteriore medio paulo incrassatam dilatato, toto 0.5 cm longo, lamina 2.75 mm longa, c. 1.25 mm lata; columna brevi, facie minute puberula, clinandrio trilobo, lobis lateralibus truncatis, auriculiformibus, dorsali dentiformi; anthera subreniformi-cucullata, antice truncata, glabra; ovario trigono, cum pedicello subclavato 0.6 cm longo, glabro; capsula triptera, alis dorsalibus anteriori latioribus, 0.8–1 cm longa.

Kaiser-Wilhelms-Land: On trees and on rocks on [Mount] Mimi in the Waria Valley, alt. c. 700 m—R. Schlechter no. 17838, flowering in Mar. [Ed.—possibly June] 1908, (flowering in June at the Kani Base); on trees in the mountain forests at Jaduna on the Waria [River], alt. c. 800 m—R. Schlechter no. 19342, flowering in Apr. 1909.

The species strongly resembles *C. funiformis* (Bl.) Schltr. but is recognised by the smaller bulbs and leaves, and by smaller, shorter-stemmed flowers; the shape of the labellum is different also. The plant grows in colonies, often covering large areas on rocks, or entire trunks of trees. The flowers are white; the labellum in front and anther pale yellow or orange-yellow.

§ 2. *Ptero-Cadetia*

The species which belong here are distinguished from those of *Eu-Cadetia* and *Sarco-Cadetia* by the absence of a creeping root-stalk, by their slender, more-or-less three-edged, non-fleshy pseudobulbs and by the terminal flower tufts in front of the leaf.

From *Eu-Cadetia* it is distinguished further by its three-winged glabrous fruit which in cross-section is not round, nor covered with soft prickles.

This section is the largest in the genus and I have enumerated not less than 14 species from our Territory. From British Papua are *C. Sayeri* Schltr., *C. albiflora* (Ridl.) Schltr. and *C. triquetra* (Ridl.) Schltr. From Dutch New Guinea are recorded: *C. angustifolia* Bl., *C. biloba* Bl., *C. heteroidea* (Bl.) Schltr., *C. recurvata* Bl., *C. similis* Bl., *C. quinquecostata* (J.J. Sm.) Schltr., *C. transversiloba* (J.J. Sm.) Schltr., *C. aprina* (J.J. Sm.) Schltr., *C. goliathensis* (J.J. Sm.) Schltr. and *C. macroloba* (J.J. Sm.) Schltr. Outside New Guinea, *C. Taylora* (F.v.M.) Schltr., is the only known species belonging to the section, so that at present this section contains 27 species. The reason for the extremely local distribution of the species is that those in German New Guinea differ from nearly all those in the other regions. All the species occurring in our Territory are epiphytic, growing by preference on the trunks of trees. Some, like *C. crenulata* Schltr., *C. lucida* Schltr., *C. collina* Schltr., *C. bigibba* Schltr., *C. obliqua* Schltr., *C. trigonocarpa* Schltr. and *C. heterochroma* Schltr., are found in the forests of the hill-country at altitudes of between 100 to 700 metres; only *C. lucida* Schltr., and *C. bigibba* Schltr. seem to occur down to the sea-coast. However, just as many species are found in the mist-forests of the mountains, in particular growing on the trunks of trees or on branches thickly covered with moss are the following species, viz. *C. chamaephytum* Schltr., *C. chionantha* Schltr., *C. dischorensis* Schltr., *C. imitans* Schltr., *C. stenocentrum* Schltr. and the largest species in the section, *C. major* Schltr.

Usually a whitish colour prevails in the flowers, occasionally mixed with yellow or less frequently with red; most species in the mist-forest formation have snow-white flowers. The flowers of *C. heterochroma* Schltr. are very varied in their colouring.

4. *C. chamaephytum* Schltr. [Ed.—comb. nov.]

Dendrobium chamaephytum Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 156.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1100 m—R. Schlechter no. 14463, flowering in Apr. 1902; no. 20075 flowering in Sept. 1909.

A very characteristic small species which is recognisable chiefly by the recurved dorsal sepal, but also is distinguished easily by the shape of the petals and lip. The flowers are purest snow-white. The plant described by J.J. Smith in 'Nova Guinea' VIII [1909], p. 51 as *D. chamaephytum* Schltr. and illustrated in t. XVIII, Fig. 58 is altogether different from *C. chamaephytum* Schltr. and is, therefore, now given the name *C. leucantha* Schltr.

5. *C. imitans* Schltr., sp. nov.

Epiphytica, caespitosa, pusilla, 2.5–4 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, cylindraceis, leviter angulatis, 0.8–3 cm longis, 1.5–2 mm diametentibus, unifoliatis; foliis erectis vel suberectis, oblanceolato-ligulatis, apiculatis, basin versus paulo angustatis, glabris, 0.8–2 cm longis, medio fere 2–3.5 mm latis; floribus terminalibus, vulgo singulis, interdum 2–3 succedaneis, e spatha compressa, c. 3 mm longa; bractea minuta, deltoidea, pedicello multoties brevior; floribus purissime niveis, suberectis; sepalis oblongis, apiculatis, glabris, 5.5 mm longis, intermedio recurvo, lateralibus basi margine anteriore longe productis, et alte connatis, cum pede columnae mentum rectum, cylindraceum, 0.5 cm longum, a dorso apice compressum formantibus; petalis oblique lanceolato-ligulatis, subacutis, glabris, sepalis paululo brevioribus; labello e ungue lineari marginibus columnae pedi adnato 0.5 cm longo, in laminam trilobulatam expanso, lobulis lateralibus basilaribus minutis dentiformibus, intermedio cuneato-obovato, antice subretuso-obtusissimo, lamina tota 3.5 mm longa, lobulo intermedio antice 2 mm lato; columna brevi facie puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus intermedio dentiformi multo longioribus, pede longo, apice breviter bilobulato; anthera cucullata, ovato-cordata, obtusa, apice papillosa; ovario trigono, cum pedicello gracili glabro, c. 1.3 cm longo; capsula decurva, triptera 1 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range in the Waria District, alt. c. 1300 m—R. Schlechter no. 19680, flowering in June 1909.

This species stands midway between *C. chamaephytum* Schltr. and *C. dischorensis* Schltr. I have found it occasionally growing with the latter, but both are distinguished always immediately. The flowers are snow-white.

6. *C. dischorensis* Schltr., sp. nov.

Epiphytica, caespitifica, pusilla, 3–6 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, leviter angulatis, unifoliatis, glabris, 1–3 cm longis, c. 1–1.5 mm diametentibus; foliis erectis vel suberectis, lineari-ligulatis, apiculatis, glabris, 1–2.7 cm longis, medio fere 1.5–2 mm latis, basin versus paulo angustatis; floribus singulis, e spatha parvula compressa c. 2–3 mm longa, suberectis, purissime niveis; sepalis late ovalibus, apiculatis, glabris, c. 5.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata et connata cum pede columnae mentum calcariforme, cylindricum, obtusum, c. 0.3 cm longum formantibus; petalis oblique linearibus, acuminatis, glabris, sepalis paululo brevioribus; labello e ungue ligulato-lineari, marginibus columnae pedi adnato in laminam supra basin trilobulatam expanso, lobulis lateralibus minutis dentiformibus, intermedio latissime cuneato, antice truncato-obtusissimo cum apiculo minuto, lamina c. 3.5 mm longa, antice 3.5 mm lata, basi puberula, lobulo intermedio basi obscure incrassatulo; columna brevi, infra stigma puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus, amplis, obtusis, intermedio minuto dentiformi; anthera quadrato-cucullata, apice truncata, antice minute papillosa; ovario 6-angulato, graciliter pedicellato, glabro, c. 1.5 cm longo; capsula hexaptera, decurva, c. 1 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19666, flowering in June 1909.

A close relative of *C. imitans* Schltr. and *C. chionantha* Schltr. but distinguished from both by the very broad middle lobe of the labellum; from the latter also by its compact growth. The flowers are snow-white.

7. *C. chionantha* Schltr. [Ed.—comb. nov.]

Dendrobium chionanthum Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 157.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300–1800 m—R. Schlechter no. 14013, flowering in Jan. 1902; no. 18569, flowering in Nov. 1908.

A charming little plant also with pure snow-white flowers. The species is related closely to *C. dischorensis* Schltr., but differs well from it in its more robust growth, rather larger flowers, broader blunt petals, and the three-winged (not six-winged) fruit. As in the other species of this relationship, it is found always growing in colonies.

8. *C. trigonocarpa* Schltr. [Ed.—comb. nov.]

Dendrobium trigonocarpum Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 159.

Kaiser-Wilhelms-Land: On trees on the banks of the Nuru [River], alt. c. 100 m—R. Schlechter no. 14224 (TYPE), flowering in Feb. 1902. On trees in the forests of Kelel, alt. c. 200 m—R. Schlechter no. 16159, flowering in June 1907; on trees on the banks of the Maijen [River], alt. c. 120 m—R. Schlechter [Ed.—no number cited], flowering in July 1908.

This species would appear to be restricted to the central part of Kaiser-Wilhelms-Land. The more recently collected specimens agree completely with the first from the Nuru [River]. It is noticeable how little these orchids tend to vary.

9. *C. crenulata* Schltr., sp. nov.

Epiphytica, erecta, 10–18 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, acute 4-angulatis, subbialatis, unifoliatis, glabris, 3–8 cm longis, c. 0.3 cm latis; foliis erectis, oblique ligulatis, obtusis, apice breviter excisis, glabris, 5.5–10.5 cm longis, medio fere 0.6–1.7 cm latis; spatha compressa, acuminata, 1–1.3 cm alta; floribus singulis vel fasciculatis, succedaneis; bractea minuta deltoidea, acuta, ovario pedicellato multoties brevior; floribus in genere inter mediocres, erectis vel suberectis, illis *C. angustifoliae* Bl. similibus; sepalo intermedio late ovato, obtuso, glabro, 4.5 mm longo, lateralibus oblique oblongis, obtusis, glabris, 5.5 mm longis, basi margine anteriore lobato-productis et alte connatis, cum pede columnae mentum calcariforme, cylindricum, obtusum, 0.4 cm longum formantibus; petalis oblique lineari-lanceolatis, subacutis, basi longius decurrentibus, sepalo intermedio subaequilongis, glabris; labello e ungue lineari, marginibus columnae pedi adnato in laminam infra medium trilobatam, 4.5 mm longam, infra medium 4 mm latam dilatato, glabro, lobis lateralibus oblique quadratis, margine anteriore irregulariter crenulatis, intermedio elliptico, retuso cum apiculo brevi obtuso, laterales conspicue superante, linea media incrassata verruculosa, verruculis pluribus medio utrinque additis; columna brevi, facie minute puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus obtusis, intermedio brevior dentiformi; ovario trigono, glabro, cum pedicello c. 1.7 cm longo; capsula nutante, triala, c. 1.2 cm longa.

Kaiser-Wilhelms-Land: On trees in the mountain forests at Jaduna on the Waria [River], alt. c. 350 m—R. Schlechter no. 19318, flowering in Apr. 1909; on shrubs on the declivities of the Mimi [Mountain] in the Waria Valley, alt. c. 600 m—R. Schlechter no. 17427 (TYPE), flowering in Mar. 1908.

I am not quite certain whether this plant is not perhaps the species which J.J. Smith illustrated in 'Nova Guinea' VIII [1909], p. 52, t. XIX, fig. 59 as *Dendrobium Rumphiae*. My plant is, undoubtedly, different from *Cadetia angustifolia* Bl., the Type of *Dendrobium Rumphiae* Rchb. f., and I suspect also of that illustrated by J.J. Smith. Blume's excellent illustration does not fit my species at all. The *Cadetia* species, especially in the section *Ptero-Cadetia*, are quite constant in their characters, and apparently extremely local in their distribution. Likewise, the plant described by J.J. Smith as *D. Rumphiae* Rchb. f. var. *quinquecostatum* J.J. Sm., should be treated, not as a variety, but undoubtedly as a good species, for which I have already used the name *C. quinquecostata* (J.J. Sm.) Schltr. The flowers are whitish, with a yellow middle lobe to the labellum.

10. *C. stenocentrum* Schltr. [Ed.—comb. nov.]

Dendrobium stenocentrum Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 158.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14505, flowering in Apr. 1902; no. 20047, flowering in Sept. 1909.

This species is related closely to *C. angustifolia* Bl., but differs in the smaller lateral lobes and broader middle lobe of the labellum; as in the spur and the colour of the flowers. The flowers are greenish white, the labellum white with lobes rose-red in front. The spur in the specimens collected last is somewhat blunter than in the first ones.

11. *C. obliqua* Schltr., sp. nov.

Epiphytica, erecta, 15–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis acute 4-angulatis, gracilibus, basi attenuatis, 6–11 cm longis, apice 3–3.5 mm latis, unifoliatis, glabris; foliis erecto-patentibus vel suberectis, subfalcato-obliquis, oblongo-ligulatis, obtusis, apice breviter excisis, 6.5–8 cm longis, 1.5–2 cm medio latis, glabris, textura subcoriaceis; spatha elliptica, apiculata, compressa, c. 1.5 cm longa; bracteis minutis deltoideis, acutis, ovario pedicellato multoties brevioribus; floribus erectis vel suberectis, in genere mediocribus, illis *C. angustifoliae* Bl. similibus; sepalis latius oblongis, obtusis, glabris, 5.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindricum obtusiusculum subrectum 0.5 cm longum formantibus; petalis oblique lineari-subspathulatis, obtusiusculis, basi longius decurrentibus, glabris, sepalis paulo brevioribus; labello e ungue lineari, 0.5 cm longo, marginibus columnae pedi adnato, in laminam alte trilobata, 4.5 mm longam, infra medium 5 mm latam dilatato, lobis lateralibus rhombeo-ellipticis, obtusis, concavis, intermedio cuneato-obovato, antice truncato, apice exciso cum apiculo minuto, longitudinaliter obscure 5-costato, lamina basi medio minute puberula, ima basi callo parvulo duplici oblongo ornata; columna brevi, facie puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus, obtusis, intermedio minore dentiformi; anthera late rhombeo-cucullata, antice emarginata, glabra; ovario 5-costato, glabro, cum pedicello gracili usque ad 2.2 cm longo; capsula 3-alata, c. 1.5 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests at Peso in the Eitape District, alt. c. 50 m—R. Schlechter no. 19970, flowering in Aug. 1909.

It is interesting how, despite their great similarity, the individual species, even in the dried condition, are recognisable by their differences in habit. Thus, *C. obliqua* Schltr. is distinguished by its very oblique, almost falcate and quite blunt broad leaves and large flower sheaths; in the flowers it comes closest to *C. quinquecostata* (J.J. Sm.) Schltr., but its sepal-spur is shorter, not thickened in front, and the shape of the labellum is different. The flowers are white, the lateral lobes of the labellum are red and the middle lobe has a red margin.

12. *C. bigibba* Schltr., sp. nov.

Epiphytica, erecta, 8–12 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, compressis, bilatis, latere utrinque unicastatis, basi attenuatis, unifoliatis, 2.5–6 cm longis, apicem versus 2–3 mm latis; foliis erectis vel suberectis, falcatis, ligulatis, obtusiusculis, apicem versus sensim paulo angustatis, glabris, textura subcoriaceis, 3–5 cm longis, medio fere 0.4–0.8 cm latis; vagina compressa, apiculata, c. 1 cm longa; floribus erectis vel suberectis, in genere mediocribus, illis *C. angustifoliae* Bl. similibus; sepalo intermedio ovato, obtuso, glabro, 5.5 cm longo, lateralibus obliquis, oblongis, obtusis, glabris, basi margine anteriore lobato-producta cum pede columnae mentum calcariforme, clavatum, rectum, apice a dorso compressum, 5.5 mm longum formantibus; petalis obliquis lanceolato-linearibus, acutis, basi longius decurrentibus, sepalis subaequilongis; labello e ungue lineari basi dilatato, 5.5 mm longo, in laminam e medio trilobatum, 5.5 mm longam, medio 4.5 mm latam expanso, lobis lateralibus oblique oblongis, subacutis, margine interiore irregularibus, intermedio obovato, apice exciso cum apiculo minuto, laterales plus duplo superante, toris quinque satis latis in apicem decurrentibus marginibus exceptis obecto, callo duplici puberulo rotundato, in medio laminae infra basin lobi intermedii; columna brevi, facie puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus obtusis, dorsali abbreviato, dentiformi; anthera late rhombeo-cucullata, glabra; ovario tricastato, glabro, cum pedicello 1–1.3 cm longo; capsula nutante 3-alata, c. 1 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests near Alexishafen, alt. c. 50 m—R. Schlechter no. 19204, flowering Mar. 1909.

Likewise, a species related to *C. angustifolia* Bl. and *C. quinquecostata* (J.J. Sm.) Schltr., but well distinguished by the labellum and falcate leaves. The middle lobe of the labellum is distinguished by its five thick pads, all of which extend up to the apex and entirely cover it, with the exception of the margin. The flowers are white, with a golden yellow front lobe to the labellum.

13. *C. collina* Schltr., sp. nov.

Epiphytica, erecta, 16–19 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, acute 4-angulatis, unifoliatis, 7–12 cm longis, infra apicem 3.5–4 mm latis; foliis erectis vel suberectis, obliquis, oblongis, obtusis, apice minute excisis, basi rotundatis, glabris, textura coriaceis, 6–8 cm longis, 1.8–2.5 cm latis; spatha elliptica, compressa, apiculata, c. 1 cm alta; floribus erectis vel suberectis, illis *C. angustifoliae* Bl. similibus; sepalis ovalibus, obtusis, glabris, 6.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta et connata cum pede columnae mentum calcariforme, cylindricum, obtusum, 4 mm longum formantibus; petalis oblique lineari-spathulatis, obtusis, basi longius decurrentibus, glabris, sepalis subaequilongis; labello e ungue lineari 4 mm longo, marginibus columnae pedi adnato in laminam e tertia parte basilari trilobatam, 4 mm longam, inter apices loborum lateralium 4 mm latam dilatato, lobis lateralibus oblique ovalibus vel suborbicularibus, obtusissimis, intermedio fere 3–4-plo majore, late obovato, antice exciso, toris 3 e basi usque in apicem decurrentibus brevioribus 2 lateralibus additis, umbonibus 2 rotundatis, puberulis, parvulis basi ornato; columna brevi, facie minute puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus obtusis, dorsali dentiformi breviore; anthera perlate rhomboideo-cucullata, glabra, antice emarginata; ovario acute tricostato, costis 2 obtusis lateralibus additis, glabro, cum pedicello c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the hills near Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter no. 19256, flowering in Apr. 1907. [Ed.—possibly 1909].

One of the more vigorously growing species of the section with broad leaves and acutely four-angled pseudobulbs. Externally, it is most like *C. lucida* Schltr., but is more robust; and the flowers are very different. In the Waria District it is found in company with *C. crenulata* Schltr. and *C. Takadui* Schltr. The flowers are white with pale pink lateral lobes and pink-coloured margins to the middle lobe of the labellum.

14. *C. lucida* Schltr., sp. nov.

Epiphytica, erecta, 10–13 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, obscure quadrangulis, unifoliatis, 3.5–6 cm longis, apicem versus c. 2.5 cm diametientibus; foliis erectis vel suberectis, ligulato-oblongis, obtusis, apice minute excisis, basi rotundatis, glabris, textura coriaceis, lucidis, 4–5.5 cm longis, medio vel infra medium 1.3–1.8 cm latis; spatha compressa, elliptica, apiculata, c. 0.7 cm longa; floribus erectis vel suberectis, in genere inter mediocres; sepalis intermedio oblongo, obtusiusculo, c. 4.5 mm longo, glabro, lateralibus late ovalibus, subapiculatis, obliquis, intermedio aequilongis, glabris, basi margine anteriore lobato-producta et connata cum pede columnae mentum calcariforme cylindraceo-conicum, obtusum, 2.5 mm longum formantibus; petalis linearibus, obtusis, subfalcatis, dorso basi angulato-dilatatis; antice longius decurrentibus, glabris, sepalis aequilongis; labello e ungue lineari-ligulato marginibus pedi columnae adnato, 2.5 mm longo, intus minute puberulo, in laminam e quarta parte basi trilobatam, 3.5 mm longam, antice 0.4 cm latam, basi medio minute puberulam expanso, lobis lateralibus oblique oblongis obtusis, intermedio multo majore, reniformi, antice exciso cum apiculo, latitudine lobos laterales utrinque distincte superante; columna brevi, facie usque ad apicem pedis minute puberula, clinandrio trilobulato, lobulis lateralibus auriculiformibus obtusis, intermedio triangulo dentiformi, paulo minore; ovario 6-costato, glabro, cum pedicello c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Danip, alt. c. 100 m—R. Schlechter no. 19209, flowering in Mar. 1909.

From all its relatives, this species is distinguished by its glossy leaves. In floral characters, it is closest to *C. Takadui* Schltr. but has a shorter spur, blunt petals and a less broad labellum. The flowers are white with a yellow middle lobe to the labellum and a red spot on the anther.

15. *C. Takadui* Schltr., sp. nov.

Epiphytica, erecta, 10–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis erectis, gracilibus, acute 4-angulatis, basi attenuatis, glabris, unifoliatis, 4–10 cm longis, infra apicem 2.5–3 mm diametientibus; foliis erectis vel suberectis, subfalcato-ligulatis, obtusiusculis, apice minute excisis, apicem versus sensim paululo angustatis, 5.5–11 cm longis, medio fere 0.7–1.3 cm latis; vagina terminali compressa, breviter acuminata, glabra, 1–1.5 cm longa; floribus erectis vel suberectis, illis *C. angustifoliae* Bl. similibus; sepalis oblongis, obtusis, glabris, 5.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta et connata cum

pede columnae mentum calcariforme, cylindricum subacutum, c. 3.5 mm longum formantibus; petalis oblique linearibus, acuminatis, antice decurrentibus; labello e ungue lineari, marginibus columnae pedi adnato, 3.5 mm longo, in laminam e tertia parte basilari trilobatam, 4.5 mm longam, medio fere 4.25 mm latam expanso, lobis lateralibus oblique oblongis, obtusis, intermedio fere 4-plo majore reniformi, antice retuso, margine incrassato subundulato, lamellis 2 brevibus parallelis fere in quarta parte basilari laminarum; columna brevi, facie puberula, clinandrio trilobo, lobis lateralibus obtusis, dorsali triangulo dentiformi minore; anthera quadrato-cucullata, antice truncata, glabra; ovaria tricostrata, glabra, cum pedicello c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji in the Waria Valley, alt. c. 400 m—R. Schlechter no. 19344, flowering in May 1909; on trees in the forests of [Mount] Dscheregi (Waria District), alt. c. 500 m—R. Schlechter no. 17422, flowering in Mar. 1908.

As previously mentioned above, this species is related most closely to *C. lucida* Schltr., but has much narrower, non-glossy leaves, a pointed sepal-spur, pointed petals and a broader labellum. The flowers are white with a red front lobe to the labellum. I have dedicated this species to the native Takadu of Bungaring on the east coast of New-Mecklenburg, who, with the native Sikin, gave me invaluable assistance in the collection of interesting plants. I have to thank these two natives for a considerable number of rare finds.

16. *C. quinqueloba* Schltr., sp. nov.

Epiphytica, erecta, 8–14 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, angulatis, unifoliatis, 3.5–8 cm longis, infra medium c. 2 mm diametientibus; foliis erectis vel suberectis, lineari-ligulatis, minute apiculatis, glabris, 4–8 cm longis, medio fere 4.5–8 mm latis; spatha nunc terminali ante folium, nunc dorsali, parvula, oblonga, obtusa, c. 0.3–0.4 cm longa; floribus erecto-patentibus, singulis, nunc succedaneis; sepalis quadrato-ovalibus, apiculatis, glabris, c. 0.6 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta et connata cum pede columnae mentum cylindrico-oblongoideum obtusum 0.4 cm longum formantibus; petalis oblique et anguste linearibus, obtusiusculis, basi in lobum decurrentem productis, glabris, sepalis paulo brevioribus; labello e ungue ligulato, marginibus pedi columnae adnato, c. 0.3 cm longo in laminam 5-lobatam 0.5 cm longam antice 0.4 cm latam expanso, lobis lateralibus posterioribus brevibus, oblique rotundatis, obtusis, anterioribus linearibus, obtusis, lamella transversa inter se conjunctis, c. 2.5 mm longis, lobo intermedio late reniformi, antice breviter exciso, labello toto glabro; columna brevi, facie puberula, clinandrio contracto, trilobulato, lobulis lateralibus auriculiformibus, obtusis, intermedio dentiformi, paulo brevioribus; anthera subquadrato-cucullata, glabra; ovario 3-costato, glabro, cum pedicello gracili c. 2 cm longo; capsula triptera c. 1.7 cm longa.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18712, flowering in Nov. 1908.

A charming little plant, which is related closely to *C. major* Schltr., but is well separated from it by its more feeble growth, smaller flowers with a larger sepal-spur and by the shape of the labellum. The flowers on the inside are pure white, on the outside sometimes with a greenish tinge.

17. *C. major* Schltr., sp. nov.

Epiphytica, erecta, 15–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, obscure angulatis vel teretiusculis, 7–12 cm longis, 1.5–2 mm diametientibus, unifoliatis; foliis erectis vel suberectis, lineari-ligulatis, obtusis, apice minute excisis, 5.5–7.5 cm longis, medio fere 0.3–0.6 cm latis; floribus erecto-patentibus, singulis, in genere inter majores; spatha oblonga, apiculata, 0.6–0.8 cm longa; sepalis late ovalibus, breviter acuminatis vel apiculatis, 8.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta et connata cum pede columnae mentum calcariforme conicum obtusum c. 3.5 mm longum formantibus; petalis oblique linearibus, acutis, medio paululo dilatatis, basi margine anteriore decurrentibus, sepalis fere aequilongis; labello e ungue brevi, c. 3 mm longo, columnae pedi marginibus adnato in laminam 5-lobatam c. 5.5 mm longam antice 6.5 mm latam expanso, lobis lateralibus posterioribus abbreviatis rotundatis, anterioribus linearibus obtusis, inter se lamella altiore incumbente conjunctis, c. 0.3 cm longis, lobo intermedio e basi perlate cuneata transverse bilobulato, lobulis semiorbicularibus, basi dente subulato brevi ornato; columna brevi, facie puberula, clinandrio acute trilobulato, lobulis subaequilongis; ovario acuto trigono, glabro, cum pedicello c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On isolated trees on open declivities in the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 18209, flowering in Sept. 1908.

I have commented already on the differences between *C. major* and *C. quinqueloba* Schltr. (described above). The species is, so far as its inflorescence is concerned, the largest in the genus. The flowers are snow-white, the labellum yellow-green in the middle.

18. *C. Finisterrae* Schltr., sp. nov.

Epiphytica, pusilla, erecta, 4–5 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, teretiusculis, 1–2 cm altis, c. 1.5 mm diametentibus, unifoliatis; foliis erectis vel suberectis, lineari-ligulatis, oblique apiculatis, glabris, 1.8–2.2 cm longis, medio fere 2.5–4 mm latis, basi sensim paulo angustatis; spatha parvula, terminali, 2–3 mm alta, compressa, apiculata; floribus erectis vel suberectis, singulis, in sectione inter minores; bractea minuta deltoidea, ovario pedicellato multoties brevior; sepalis ovalibus, apiculatis, 0.5 cm longis, glabris, lateralibus obliquis, basi margine anteriore producta et connata mentum calcariforme breviter conicum obtusum, c. 2 mm longum formantibus; petalis oblique linearibus, acutis, glabris, sepalis paululo brevioribus; labello e ungue brevi, marginibus columnae pedi adnato, 0.2 cm longo in laminam e medio trilobatam, circuito late cuneatam, 0.5 cm longam, antice 0.5 cm latam expanso, dimidio inferiore medio minute puberulo, lobis lateralibus oblique oblongis obtusiusculis, callo transverso obtuse apiculato inter se conjunctis, intermedio perlate obreniformi, antice emarginato cum apiculo interjecto, lobos laterales utrinque latitudine bene excedente; columna brevi, facie puberula, infra stigma foveolata, in specimine nostro erostellata, clinandrio contracto, trilobulato, lobulis lateralibus obtusis, dorsali dentiformi, minore; anthera quadrato-cucullata, antice papillosa, truncata; ovario trigono, glabro, cum pedicello c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 950 m—R. Schlechter no. 20244, flowering in Sept. 1909.

Of this species I found only a solitary plant with one flower which I used for analysis of the species. The flower was not quite normally constructed, since it was evidently cleistogamous and, therefore, the rostellum was undeveloped entirely. The species is characterised well by its small dimensions as well as by the shape of the labellum.

19. *C. heterochroma* Schltr., sp. nov.

Epiphytica, erecta, 10–15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis bialatis, latere utrinque acute unicostatis, basi attenuatis, glabris, unifoliatis, 4–8 cm longis, infra apicem usque ad 0.6 cm latis; foliis erectis vel suberectis, late oblongis, obtusis vel obtusissimis, nunc brevissime excisis, 5–8 cm longis, medio fere 2.5–3.5 cm latis, glabris, textura subcoriaceis; spatha apicali, compressa, obtusa vel apiculata, c. 0.8 cm longa; floribus in genere mediocribus, erectis vel suberectis; sepalis late ovatis, acutis, glabris, c. 5.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta et connata mentum calcariforme subgenuflexo-curvatum, subacutum, ostio constrictum, c. 0.5 cm longum formantibus; petalis oblique ovatis, acuminatis, glabris, sepalis paululo brevioribus; labello e ungue lineari antice cuneato, marginibus columnae pedi adnato, 0.5 cm longo in laminam infra medium trilobatam, basi minute puberulam, 0.5 cm longam, medio fere 0.4 cm latam dilatato, lobis lateralibus subfalcato-quadratis, subacutis, gibbo triangulo transverso inter se conjunctis, intermedio multo majore, obovato, apiculato, reflexo, basi minute puberulo; columna brevi, lobis lateralibus labelli bene brevior, facie minute puberula, clinandrio contracto, trilobulato, lobulis lateralibus rotundatis, obtusis, dorsali dentiformi, parvulo; anthera perlate quadrato-cucullata, antice truncata, glabra; ovario triquetro, glabro, cum pedicello c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River] in the Eitape District, alt. c. 50 m—R. Schlechter no. 20014, flowering in Sept. 1909.

At first I thought I would have to designate this species as *C. transversiloba* (J.J. Sm.) Schltr., but a careful comparison showed that it was different. The leaves are smaller, the flowers are differently coloured with an almost pointed sepal-spur, the middle lobe of the labellum is longer and the anther is much broader. The flowers are dark red, the sepals yellow at the tips, the labellum white and the anther golden yellow.

§ 3. *Eu-Cadetia*

In this section I place all those species which have the habit of *Ptero-Cadetia*, of course with less sharp-edged pseudobulbs, but with an ovary covered closely with soft prickles.

To it belong the three species described below, also *C. albiflora* (Ridl.) Schltr. from British Papua and *C. ceratostyloides* (J.J. Sm.) Schltr. from Dutch New Guinea. Besides these, from outside the Papuan region we have also: *C. umbellata* Gaud. (the Type of the genus), *C. hispida* (A. Rich.) Schltr., *C. pseudo-umbellata* (J.J. Sm.) Schltr. and the already mentioned *C. Maideniana* Schltr. It is incomprehensible to me, why Kränzlin in his monograph should have reduced *D. Taylori* [Ed.—F.v.M. in original text] to *D. hispidum* A. Rich. (now *Cadetia Maideniana* Schltr.) when these two distinct forms have been illustrated admirably by Fitzgerald, side-by-side, in his well-known and excellent works on Australian *Orchidaceae*. The species occurring in the German part of New Guinea are all inhabitants of the hill and mountain-forests, below the mist-forest formation. They always grow together in colonies, often in large numbers, especially in the hill-country, where trees overhang the rivers. Frequently I have seen thousands of specimens of the same species on such a tree.

At this point attention should be drawn to a peculiarity of the Papuan orchid flora, viz. the noticeably infrequent occurrence of hybrids. Thus I have found *Cadetia potamophila* Schltr. often with *C. stenopetala* Schltr. and *C. trigonocarpa* Schltr., growing thickly interspersed but never noticed a hybrid, although I have tried eagerly to find one.

20. *C. potamophila* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 5–8 cm alta; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, glabris; pseudobulbis gracilibus, teretiusculis, angulato-striatis, unifoliatis, 1.5–4 cm longis, c. 1.5 mm diametientibus; foliis erectis, lineari-ligulatis, apiculatis, nunc apice breviter excisis cum apiculo minuto interjecto, glabris, textura carnosulo-coriaceis, dorso nervo medio altius carinatis, 2.5–5 cm longis, medio fere 2.5–3 mm latis; spatha compressa obtusa, c. 0.5 cm alta; floribus erectis vel suberectis, illis *C. hispidae* (A. Rich) Schltr. similibus, in genere inter minores; sepalis late ovalibus, apiculatis, glabris, c. 3 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta et connata, mentum calcariforme oblongoideum apice retusum a dorso paulo depressum, c. 0.2 cm longum formentibus; petalis anguste linearibus, obtusis, glabris, sepalis aequilongis; labello e ungue ligulato-cuneato, columnae pedi dimidio inferiore puberulo connato in laminam trilobatam dilatato, lobis lateralibus triangulis acuminatis, dentiformibus, lamella transversa satis alta inter se conjunctis, parvulis, intermedio perlate reniformi obtuse apiculato vel subretuso, lateralibus multoties majore, columnae apicem haud superante; columna brevi, facie minute puberula, clinandrio trilobulato, lobulis lateralibus bidentatis, dente posteriore minuto, acuto, anteriore obtuso, lobulo dorsali dentiformi, triangulo; anthera quadrato-cucullata, glabra, antice obtusa, papilloso-serrulata; ovario clavato, dense papulis reflexis cylindricis obsessa, cum pedicello c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16158, flowering in June 1907.

This species comes remarkably close to *C. ceratostyloides* (J.J. Sm.) Schltr., but after dissecting both species side-by-side, I was convinced that they must be kept separate. In *C. ceratostyloides* (J.J. Sm.) Schltr., the soft prickles of the ovary are shorter, the lateral sepals are veined differently, the spur is more compressed laterally and the labellum longer than the column, with a very hairy claw.

var. *kenejiae* Schltr., var. nov.

Differt a forma typica foliis latioribus et florum pedicellis longioribus.

Kaiser-Wilhelms-Land: On trees in the gallery forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18357, flowering in Oct. 1908.

Differs from the Type form in its broader leaves and flowers with longer pedicels.

In the Type, as in the variety, the colour is identical; white with a yellow lamina to the labellum and red column tip.

21. *C. echinocarpa* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 6.5–13 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, teretiusculis, subcostato-striatis, glabris, unifoliatis, 2–7 cm longis, c. 1.5 mm diametientibus; foliis erectis vel suberectis, ligulatis, obtusis, apice breviter excisis, 3.5–5 cm longis, medio fere 0.6–1 cm latis; spatha compressa, obtusa, c. 0.5 cm longa, mox decadente; floribus erectis vel suberectis, in genere vix inter mediocres; sepalis late ovalibus, obtusis, glabris, c. 4.5 mm longis, lateralibus obliquis, subquadratis, basi margine anteriore lobato-producta et connata cum pede columnae mentum oblongoideo-cylindricum, obtusum, glabrum, c. 2 mm longum formantibus; petalis anguste linearibus, obtusiusculis, glabris, sepala superantibus, c. 0.6 cm longis; labello e basi oblongo-unguiculata marginibus columnae pedi adnata in laminam trilobatam, sepala haud excedentem dilatato, basi excepta superne sparsim puberulo, lobis lateralibus triangulis, acutis, glabris, parvulis, intermedio refracto, transverso, perlate reniformi-cordato (quasi bicurvi) obtuso, lobos laterales utrinque conspicue latitudine excedente, c. 0.4 cm lato; columna brevi, facie minute puberula, clinandrio trilobulato, lobulis lateralibus acutius bifidis, dorsali minuto, dentiformi; anthera reniformi-cucullata, antice truncata, glabra; ovario dense papulis vel appendicibus recurvis oblecto, echinato, clavato, cum pedicello glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17909, flowering in July 1908.

This species is also related closely to *C. ceratostyloides* (J.J. Sm.) Schltr., but is recognised easily externally by its more vigorous growth. Furthermore, the long petals and the lip with its hairy front lobe are very characteristic. The colour of the flower is exactly the same as in *C. potamophila* Schltr.

22. *C. karoensis* Schltr. [Ed.—comb. nov.]

Dendrobium karoense Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 157.

Neu-Pommern: On trees in the forests on the Karo River in the Beining Range, alt. c. 300 m—R. Schlechter no. 13691, flowering in Oct. 1901.

This species is related closely to the two preceding ones. I had hoped that one of the two latter might be identified with it, but the habit characters, as well as the very long pseudobulbs, show that *C. karoensis* Schltr. is a distinct species. The flowers are distinguished from those of related species by the broader petals and blunt lateral lobes of the labellum, which are so united by a transverse crest that it is difficult to recognise them.

71. *Dendrobium* Sw.

Unfortunately, the monograph on *Dendrobium* by Kränzlin has not brought us what might be justly expected of such a treatise, namely a division on the basis of which it is possible to determine the species of the genus, which already comprises approximately 700 species.

This unsatisfactory state of affairs is all the more regrettable, because after this attempt no one is likely, within the next few years, to venture to approach the task of writing another monograph on this subject, although it is now more necessary than ever. It is unfortunate that in this monograph, both in regard to the limitation of the separate sections and the definition of species, really important characters have been neglected completely and on the other hand characters have been used, which are of very little or no consequence. Therefore the final result, and it is not a pleasing one, is that in spite of this work, our task in determining species of *Dendrobium* has not in any way become easier; and since the descriptions are not infrequently based on wrongly determined specimens, we are often compelled to fall back on the original text, as before.

The classification of this extensive genus is of course very difficult, and to give a complete enumeration of the sections, it would be necessary to examine critically the whole material. However, this would take some years, and what is more it could not be done without an exhaustive study of the subject. I have been able to examine several hundred living species of *Dendrobium*, and I have sketched carefully the whole of this material, so that it was not altogether inappropriate for me at the time to propose a classification of the Papuan species into sections. Since then I have been working continually on the genus, and found that this classification brings the species together in a natural manner. At the time, this division was ignored completely and discarded by Kränzlin. I have, therefore, once more attempted to modify the systematization of the genus and have used the considerations which I deemed suitable in arriving at a more definite and surer delimitation of the sections. Since we are concerned with a special treatise on the orchids of [German] New Guinea, these have received special attention, although in order to co-ordinate the whole I have also mentioned the chief groups of the other floral regions.

I divide the genus into four sub-genera, which are founded upon vegetative characteristics.

The first of these sub-genera is practically the converse of the other three, in as much as here the leaves arise directly from the pseudobulbs or thin stems, whereas in the others they arise from distinct sheaths. For this sub-genus I would like to use the name *Athecebiium*, which expresses the absence of leaf sheaths. Occasionally, leaf-sheaths still appear on the pseudobulbs. It is mainly in this sub-genus that the purely terminal inflorescences occur, while in the others they are usually suppressed, e.g. in many *Podochilinae*. Likewise, single-jointed pseudobulbs are found here only. Later on these matters will be dealt with in more detail.

The second sub-genus, *Eu-Dendrobium*, comprises all those species with pseudobulbs or fleshy stems, with leaves arising from distinct sheaths. These sheaths remain on the stem when the leaf falls off. This sub-genus probably includes about one third of the total species in the genus, although to the east the abundance of species soon decreases, the bulk of the Asiatic members belong to it.

Through the third sub-genus, *Rhopalobium*, a connection is established between *Eu-Dendrobium* and the fourth sub-genus, *Xerobium*. Here we find, often limited to one or two joints, yet another fleshy part of the stem which at this point is thickened clavately, whereas all the remaining portion of the stems is of a wiry, partly semilignified, structure.

Finally, in *Xerobium*, the fourth sub-genus, occur wiry stems only, strongly lignified at the base and surprisingly slender, which are characterised by an extraordinary toughness, and though rigid, are never fleshy. Apart from *Eu-Dendrobium* this is the largest sub-genus and is even likely to surpass it in numbers of species, when the Moluccan-Papuan floral region has been investigated more thoroughly.

The above distinctions may be formulated into a key resulting in the following synopsis:—

- A. Leaves without sheaths at the base *Athecebiium*
- B. Leaves upon distinct sheaths:
 - 1. Pseudobulbs or stems fleshy, or with a fleshy tumid zone
 - (a) Pseudobulbs or stems fleshy for the whole length *Eu-Dendrobium*

- (b) Pseudobulbs or stems thickened on 1–3 internodes only *Rhopalobium*

2. Stems wiry, dry, always very slender *Xerobium*

These four sub-genera may be subdivided further into sections which I will now endeavour to circumscribe.

A review of *Athecebiium* shows that it contains two biologically very characteristic types of flowers from which we can form two very natural sectional groups, viz.

[a] Those whose flowers last a single day only, and which always appear singly.

[b] Those which are more robust (have a firmer consistence) and consequently last longer.

The flowers all appear in racemes which indeed, consist at times of a single flower only, but without thereby losing the morphological character of a raceme or spike, because in such cases the tendency for the development of a second flower [floral rudiment] is always present but only develops fully now and then, a condition which has been observed only once in the sections of the first (a) group.

I thus divide the sub-genus *Athecebiium* into the following sections.*

§ 1. *Desmotrichum* consisting only in Blume's concept of it. This section was, at a later period, explained incorrectly by Hooker, who called it *Cadetia*, whereas very different forms indeed should be included in *Cadetia* Gaud. During the last few years the section has increased very considerably in size and now probably comprises a total of about 30 species. Kränzlin has treated this section as a genus, but that he also did not consider it in a natural manner is shown by his inclusion in it of *D. Fargesii* Finet, which undoubtedly belongs to the section *Sarcopodium*. In habit this section may be recognised always by its much ramified elongated rhizome; by its pseudobulbs which are usually clavate, often flattened on one side and single-leaved, at the top of which or in front of, or if the bulb is turned, behind the fascicle of leaves a flower scape with a short peduncle, appears at intervals, either one at a time or two to five of them together.

§ 2. *Microphytanthe* is a new small section of which, at present, I know only two Papuan species which will be described later on. It is probably related most closely to *Desmotrichum*, but is distinguished from the latter by a series of single-leaved pseudobulbs, strung together like a 'string-of-pearls', which are more-or-less adjacent. The flowers are not fasciculated, but appear singly, each bulb producing a single flower at a time. The shape of the flowers is rather simple, especially where the labellum is not pectinate. As to the longevity of the flowers, I am not quite certain, where it exceeds a day, the correct position of the section would probably be next to *Rhizobium*.

§ 3. *Goniobulbon* now comprises quite a number of species which apparently are restricted to the Papuan floral region. In habit these species are related closely to those of the two preceding sections, in as much as they possess an elongated rhizome which creeps along to a fair length; on the other hand they also are related very closely to the section *Diplocaulobium*, whose inflorescence and flowers they possess. J.J. Smith combines the two sections, but I do not agree with him, on account of the difference in habit and in the shape of the pseudobulbs. Kränzlin has misunderstood completely this section, for he mixes up its species with *Oxyglossum*, *Cadetia*, *Sarcopodium*, *Bolbidium* and an *Eria* species into a single section which he calls *Bolbidium*.

*Since I am of the opinion that nouns should be used in describing the sections, I have replaced adjectives by nouns, where the Section already existed.

§ 4. *Diplocaulobium* has also, within the last few years, grown from a small section of five species to one of upwards of 30. In habit it is distinguished usually by its round, bottle-shaped, densely crowded pseudobulbs which end at the apex in a long neck, and by the long-stalked peculiar flowers. I have already drawn attention to the distinction between this and *Goniobulbon*. Some species are lacking the typical neck, which brings them nearer to the preceding section, but they are still always characterised by the densely crowded pseudobulbs.

§ 5. *Bolbidium* is a small section of four to six species. While the sections previously described had, in all cases, single-leaved pseudobulbs, consisting of one internode, here for the first time we find several-jointed pseudobulbs bearing more than one leaf. The Type of the section is *D. pumilum* Roxb.; furthermore it includes *D. quadrangulare* Par. et Rchb. f., *D. hymenanthum* Rchb. f., *D. Micholitzii* Rolfe and one or more doubtful species.

§ 6. *Euphlebiium* likewise, contains only a few species. These have clavate pseudobulbs with several joints and usually a double-leaved apex. The flowers, which last only a day, appear either on the side, or on the apex singly or, in the case of *D. amboinense* Hook., in short few-flowered racemes.

The Type of the section is *D. spurium* (Bl.) J.J. Sm. which furthermore includes *D. inaequale* Rolfe, *D. bicastatum* J.J. Sm., *D. amboinense* Hook. and *D. lacteum* Krzl. *D. purissimum* Krzl. is identical with *D. inaequale* Rolfe and *D. mattangianum* Krzl. does not differ from *D. bicastatum* J.J. Sm.

§ 7. *Rhizobium* is a typical Papuan-Australian section whose species, from the shape of the leaves, may be divided into two groups, viz.

[a] Those with flagellate, terete leaves

[b] Those with broader, oval or oblong, thick, fleshy or leathery leaves.

In habit, *Desmotrichum* repeats itself here in the long ramified rhizomes but in *Rhizobium* the formation of pseudobulbs is reduced considerably. Under this section I class all those forms which are grouped around *D. teretifolium* R. Br. on the one hand, and on the other around *D. linguiforme* Sw.

All of them have more substantial, longer-lasting flowers, which appear in one to multi-flowered racemes.

§ 8. *Sarcopodium* is a Malayan section with a single-jointed pseudobulb on a creeping rhizome, from which arise one to multi-flowered inflorescences.

This section has been raised again, recently, to the rank of genus by Rolfe and Kränzlin, but I have expressed already my reasons for placing such species here. Two years ago Rolfe ('Orchid Review' XVIII (1910), p. 237) grouped together the most important species belonging here.

Sarcopodium Beccarianum, recorded by Kränzlin, is *Eria longerepens* Ridl.

§ 9. *Dendrocoryne* is mainly an Australian section which, through such species as *D. Kingianum* Bidw., *D. aemulum* R. Br., *D. tetragonum* A. Cunn., *D. gracilicaule* F.v.M. and *D. Moorei* F.v.M., are sufficiently well known. The species have a pseudobulb with a terminal or pseudo-terminal raceme of flowers. The pseudobulb is usually clavate and multi-jointed, more rarely, as in *D. monophyllum* R. Br., it is single-jointed. In habit, they are similar to certain *Latourea* species, from which they are distinguished by the simpler shape of the labellum.

§ 10. *Latourea*, formerly classed by Blume as a genus but, subsequently, by Miquel, properly combined with *Dendrobium*. It is mainly Papuan, and at present probably comprises about 35 species, some of which have flowers externally covered with clavate glandular hairs, whereas in others the flowers are glabrous. The section is

related to *Dendrocoryne*, but a distinctive feature of the species is the raised callus of the labellum.

§ 11. *Inobulbon* comprises only two New Caledonian species, viz. *D. muricatum* Finet and *D. munificum* (Finet) Schltr. It is well separated from *Latourea* by the thick pseudobulbs and, in many cases, by its paniced inflorescences. It also shows certain variations in the structure of the flowers, although these do not vary so much from those of the basic *Dendrobium* form, as to render impossible a reconstruction of that form.

§ 12. *Callista* comprises those species which combine the habit of *Dendrocoryne* and *Latourea* together with the flowers of the genuine *Dendrobium* and which used to be designated as *Eu-Dendrobium*. The characteristics here are decidedly those of the sub-genus *Athecebiium*, i.e., sheathless leaves at the apex of the pseudobulbs. Since the flowers point to a close relationship with the sub-genus *Eu-Dendrobium*, I have placed it here, so it forms the last of the group. The Type of the section is *D. densiflorum* Wall. or the old *Callista amabilis* Lour. and, furthermore, *D. aggregatum* Roxb., *D. Farmeri* Paxt., *D. chrysotoxum* Lindl., *D. sulcatum* Lindl. and the related species also belong here.

The section *Callista* brings the sections of the sub-genus *Athecebiium* to an end, and we now turn to the second sub-genus, *Eu-Dendrobium*. The division of this sub-genus, as I give it here, must not be considered complete, since the sections *Eugenanthe* and *Pedilonum* will probably have to be divided still further, and I have been unwilling to proceed hastily without a precise consideration of all the material.

§ 13. *Eugenanthe* would correspond approximately to what is usually designated as the section *Eu-Dendrobium*, with exclusion of the section *Callista* mentioned above. How far a division into smaller sections is here possible or necessary, I will not decide for the present. My impression is that the section as given here is indeed fairly large, but nevertheless well circumscribed.

The species have the well-known characteristic habit of two to multi-flowered lateral inflorescences and spreading flowers, together with an undivided, rotund labellum which is, in most cases, provided internally with fine papillae.

§ 14. *Platycaulon*, with about six species, follows next. It is characterised by the flattened, very much compressed pseudobulbs. The flowers are very similar to those of some species of *Pedilonum*, the only difference being that in the sub-genus, for the first time, the veins in the labellum are thickened frequently into ridges.

§ 15. *Pedilonum*, in contrast to *Eugenanthe*, always shows a considerable elongation of the base of the column, and a glabrous labellum, with as yet, no tendency to division into lobes.

In another way, however, modifications of the lip occur. Corresponding to the prolongation of the foot of the column, the labellum has an elongated claw, and is often separated into two parts by a transverse lamella. The latter is extended posteriorly into an elongated appendage of a spur-like character. In habit the species are very similar to those of *Eugenanthe*.

§ 16. *Calypstrochilus* is mainly Papuan and already a fairly large section, strongly reminiscent of some species of *Pedilonum*, being well characterised by the labellum, which at the apex is turned inwards and cucullate, the margin of the apex being finely serrated. Here for the first time the tendency for the lateral margins of the labellum to become adnate to the foot of the column for a considerable distance becomes apparent. This clearly serves the purpose of receiving, into the spur so formed, the nectar which is secreted copiously by the species of this section.

§ 17. *Cuthbertsonia*, embracing some few Papuan species only, already shows that great shortening of the pseudobulbs so characteristic for *Oxyglossum* but which, so far as the flowers are concerned, is more akin to species of *Calypstrochilus*, since the labellum is still contracted in front or bent inwards and rounded off. However, it still differs from both these sections in the peculiar papillose covering of the leaves and outside of the flowers, particularly of the ovaries. These papillae consist of numerous tiny points standing upon one another.

The Type of the section is *D. Cuthbertsonii* Rehb. f. [Ed.—error for F.v.M.?

§ 18. *Oxyglossum* also is typically Papuan, only a very few species having been recorded from the Moluccas. They are much-abbreviated plants, their two to three-leaved pseudobulbs considerably reduced at the apex; the inflorescences being usually two-flowered, but occasionally multi-flowered. The section is characterised further by a three to ten, sharply angled or winged ovary. As in the case of *Calypstrochilus* or *Cuthbertsonia*, the foot of the column is elongated considerably, usually firmly appressed against the ovary and adnate, to a fair height, with the margins of the labellum. In all cases the labellum is attenuated into a sharp apex, which, as a rule, is rendered especially conspicuous by its showy bright colouring.

All those species of the sub-genus *Eu-Dendrobium* so far considered are distinguished by the absence of any longitudinal splitting of the labellum into well defined lobes; the contrary is the case in the sections following.

§ 19. *Brachyanthe*. This section comprises chiefly Indian species, which obviously have branched off from the *Eugenanthe*-form by an incipient division of the labellum. Thus, here we find associated with them, forms, which so far as habit is concerned, are still very similar to some isolated species of the section *Eugenanthe*, although usually more slender (as is *D. stuposum* Lindl. and its relatives) whereas, on the other hand, a shortening of the stems has taken place (as in *D. pygmaeum* Lindl. and *D. peguanum* Lindl.). These constitute a sort of transition stage to the next section. *D. bicameratum* Lindl. may be regarded as intermediate between these two extreme forms.

§ 20. *Stachyobium*. This section I would like to limit, so that it embraces only those forms which belong to the relatives of *D. eriaeflorum* Griff., i.e. those distinguished by very thin leaves which usually fall off before the plant flowers, viz. when the pseudobulbs or little stems are fully developed and have usually indications of slender lateral multi-flowered racemes. These species are all restricted to Asia.

§ 21. *Fytchianthe* immediately follows the preceding group because of its partial conformity in habit, although the structure of its considerably larger flowers is different. The most striking feature of the section is the strong development of the central lobe of the labellum and of the petals. It, therefore, already reminds one strongly of the next group, which, however, belongs mainly to tropical Australia, whereas *Fytchianthe* must be considered Indian. The Type of this section is *D. barbatulum* Lindl.

§ 22. *Phalaenanthe* is, as mentioned above, mainly tropical Australian, with some radiants in the Moluccas (*D. affinis* Dcne.) and Timor (*D. phalaenopsis* Fitzg.). It has been asserted often that this group stretches across to New Guinea, but I have not seen any really authentic material from there, although one really might expect it to occur.

This section is distinguished chiefly by the double mentum of the flowers, which has led to the Type of the section being called *D. bigibbum* by Lindl. As regards habit, the species on the one hand approach those of *Ceratobium* and, on the other, those of *Fytchianthe*.

Besides the Type the following belong here: *D. Sumneri* F.v.M., *D. superbiens*

Rchb. f., *D. dicuphum* F.v.M., *D. phalaenopsis* Fitzg. and their relatives.

§ 23. *Eleutheroglossum*, so far, embraces only five or six species, of which one, *D. canaliculatum* R. Br., is Australian, the remainder belonging to New Caledonia. The section on the one hand inclines towards *Phalaenanthe*, but *D. eleutheroglossum* Schltr. and its relatives show affinities with *Ceratobium*. The species have, in contradistinction to those two sections, certain characteristics in common, that made it appear advisable to consider them as a separate section. Thus *Eu-Dendrobium* has very short leaf-sheaths, a freer labellum and the shorter habit. Nevertheless, they are best placed here.

§ 24. *Ceratobium* is a very multiform group, but, nevertheless, one that in habit and flower characters is circumscribed fairly well. It is mainly Papuan. The species are difficult to distinguish, but are strikingly constant in their characteristics; some of them decidedly point to a relationship with *Phalaenanthe*, which indeed is obvious. I would regard *D. veratrifolium* Lindl. as the Type. The section probably contains about 40 species. Here again Kränzlin has included many a species whose place belongs, undoubtedly, elsewhere.

§ 25. *Trachyrhizum* is the name I have given to a small section of Papuan species, which as a whole comes near to *Ceratobium*, but usually has a more complicated labellum, which, as in the case of *Bulbophyllum* Thou., is movable. Besides this, all the species of this section exhibit the peculiarity of very rough roots, caused by peculiar papillae. Some species seem to point to a relationship with *Distichophyllum*.

§ 26. *Distichophyllum* is very well circumscribed in one direction but in the other it is connected so closely with the section which follows, that I have doubted repeatedly whether it would not be better to unite the two sections.

In its typical form, as in *D. uniflorum* Griff., the section is very characteristic, but then again in such forms as *D. pandaneti* Ridl. and *D. metachilinum* Rchb. f. it approaches very considerably those species contained in *Oxygenianthe*. As a section it is characterised by the fleshy and, in most cases, the furrowed stems, by flowers that usually stand singly in a lateral inflorescence and, probably in all cases, by the obtuse mentum.

§ 27. *Oxygenianthe*, as understood here, also comprises those species which were designated usually as '*Nigrohirsuta*'. It is not possible to keep these separate from those species with glabrous sheaths, in a similar manner existing for *Distichophyllum*. What causes me to retain this section at all alongside *Distichophyllum* are certain conformities in habit and flowers differing from those of the preceding section. Here the flowers are generally apical, standing in short multi-flowered inflorescences. The mentum of the larger flowers is, in almost every case, acute, and in most cases the labellum is adnate to the foot of the column to a greater height than in the case of *Distichophyllum*; also the keel of the labellum in *Oxygenianthe* is somewhat different from that in *Distichophyllum*. I consider *D. cariniferum* Rchb. f. as the Type of one group of the section and *D. formosum* Roxb. as the Type of the other group.

§ 28. *Amblyanthus* consists of a small number of Papuan species. I have placed this section here because, if it is related to any of the known sections at all, that relationship is to the two preceding sections. Nevertheless, its position is a very isolated one both in habit and in particular to the structure of the flowers. I have now and then considered affinities with *Pedilonum*, but the complicated structure of the lip is rather against this. In addition the consistency of the flowers is very pronounced and is more reminiscent of the species belonging to *Distichophyllum*.

§ 29. *Kinetochilus*, likewise, is a New Caledonian section, but is distinguished from its

relatives by its movable undivided labellum as in *Bulbophyllum*. The species are epiphytic or terrestrial and of various dimensions. *D. crassicaule* Schltr., *D. cleistogamum* Schltr. and *D. pectinatum* Finet belong here.

Regarding the third sub-genus, we must now discuss *Rhopalobium* whereby, to a certain degree, the transition from *Eu-Dendrobium* to *Xerobium* is established. Here the fleshy part of the stem is limited to one to three stem joints, whereas the other part, in its texture, is like the stems of *Xerobium*. I have limited this sub-genus to the one section, *Rhopalanthe*, which would have corresponded completely to the section formerly known as *Crumenata*, if I had not here admitted certain species, which on account of the shape of their leaves, would have been classed previously under *Aporum* or *Strongyle*.

§ 30. *Rhopalanthe*, which next to *Grastidium*, is the most widely distributed section of this genus. It comprises a total of about 35 species. At first it was my intention to make *D. Usterii* Schltr. the Type of a separate section, but I abandoned the idea because of my unwillingness to create monotypic sections. Besides this I have admitted species here, which were thought formerly to belong to *Strongyle*, to a section which appeared to me too artificial with some of the species being typical *Rhopalanthe* and the rest showing no differences from *Aporum*, as I have stated already. My opinion is that this section as a whole shows a distinct affinity to *Aporum*, especially, for example, in the flowers, which in their entire structure, in most cases hardly differ from those of *Aporum*, but perhaps in the majority of cases having a decidedly lobed labellum, although the latter is found also quite frequently in *Aporum*.

In all species of *Rhopalanthe*, as well as in those other sections where the flowers last for one day only, it is very characteristic that all the specimens growing in certain rain-zones always open their flowers on the same day, and just as quickly disappear and then again with the same precision repeat the process, as though at a 'word of command'. The same characteristic has been observed in most *Thrixspermum* and many *Sarcochilus* species as well as in quite a number of other orchid genera.

The fourth sub-genus, *Xerobium*, already comprising nearly as many species as *Eu-Dendrobium*, differs; as I have shown already, from the other sub-genera by having almost ligneous, rigid and very wiry stems. By dividing them into sections, I was again in a position to bring together various sectional groups which tend to render the analysis clearer. Initially, two sections had to be rejected because of their imbricate leaves, and then two others because of their inverted flowers, a very unusual feature for the genus. Biologically the remaining ones again form two divisions, one of which produces flowers of extremely delicate texture which last for a single day only, while the other division has flowers whose duration of life is considerably longer. Accordingly the following sections are obtained:

§ 31. *Aporum* is a very comprehensive section which, together with the section which follows, is distinguished by its imbricate leaves. Some of its species bear a decided relationship to *Rhopalanthe*; in fact they differ only in the absence of fleshy internodes in the lower part of the stems, for in *Rhopalanthe* some of the species also possess imbricate leaves.

Unfortunately, the two sections *Oxystophyllum* and *Aporum*, which quite rightly have been restored by J.J. Smith, have been jumbled up by Kränzlin. Some of the *Aporum* species have the perishable flowers of *Rhopalanthe*, whilst those of the remaining species last somewhat longer, as in *Oxystophyllum*.

§ 32. *Oxystophyllum* was separated quite correctly from *Aporum* by Blume, but was misunderstood subsequently by most authors and confused with the latter section. Recently, J.J. Smith has again urged the separation of the two sections. As a matter of

fact they are distinguished quite easily, because in *Oxystophyllum* the flowers stand singly upon short peduncles which are covered by several imbricated bracts, whereas in *Aporum* they originate in fascicles at the base with only a single bract, and open singly at certain time intervals.

The shape and thick fleshy consistence of the flowers of *Oxystophyllum* are also very different from those of *Aporum*.

§ 33. *Grastidium* corresponds exactly to what I formerly called *Dianthe*. This section is characterised very well by the flowers which always appear from the compressed lateral sheaths in two's, and last only one day. At present it comprises a very large number of species and is likely soon to outnumber *Eugenanthe*.

§ 34. *Dichopus*, classified by Blume as a genus, was afterwards combined by Reichenbach with *Dendrobium* Sw., and has been re-established recently as a genus by Finet. J.J. Smith considers that it belongs to *Grastidium*, but I would prefer to regard it as a separate section, on account of the peculiar movable appendage on the lower margin of the stigma. In habit it agrees exactly with *Grastidium*. Its flowers last also only one day.

§ 35. *Eriopexis* consists of a few Papuan species which also, in habit, closely approach *Grastidium*, but which nevertheless are better kept separate, because of their extraordinary flat stems and enormously developed column foot, which calls to mind the flowers of *Acanthephippium*.

§ 36. *Pleianthe* is also a small Papuan section. The three preceding sections are characterised by the perishable flowers, which in all cases rest upon very short stalks. *Pleianthe*, and the three succeeding sections, have long-lasting flowers which appear in quite different inflorescences. In the section under consideration the flowers emerge laterally through the sheaths, in a row of four to ten. I do not know of a similar inflorescence in any other member of the *Dendrobiinae*.

§ 37. *Macrocladium* already has been characterised by me. This section consists of New Caledonian species, most of which are terrestrial and some of which belong to the most highly developed forms of terrestrial orchids. It is probable that the New Zealand species, *D. Cunninghamii* Lindl., has its place here also. The species have few to many-flowered lateral inflorescences and fairly coarse flowers with variously shaped labella.

D. fractiflexum Finet, whose place I thought formerly was here, is probably better classed with *Kinetochilus*. Typical of this section are *D. steatoglossum* Rchb. f., *D. sarcochilus* Finet, *D. fractiflexum* Finet [Ed.—see comment two lines above!], *D. angraecifolium* Finet and *D. Finetianum* Schltr.

§ 38. *Dolichocentrum*. I have felt constrained to erect this section, on account of a single species, viz. *D. furcatum* Reinw. This plant, with its peculiar sepal-spur-formation, has a rather isolated position within the sub-genus *Xerobium*. It is a native of the Celebes.

§ 39. *Conostalix* always, until now, has been combined with *Distichophyllum* although it really shows considerable variation from it. Because of its dry wiry stems it assumedly belongs to the sub-genus *Xerobium*. The two best-known species of this section are *D. villosulum* Wall. and *D. conostalix* Rchb. f. The group is typically Malayan, including only one Papuan species, so far as is known.

§ 40. *Monanthos* corresponds to the former section *Biloba*. All the species of this and the following section are distinguished by inverted flowers, which remind one of *Polystachya*. The centre of distribution of this group is also the Papuan floral zone, and it really does not go far beyond the limits of the latter.

Most of the individual species are inter-related and therefore it is not always easy to distinguish them. *D. bilobum* Lindl. is typical of the section.

§ 41. *Herpethophytum* would appear to be purely a Papuan section with few species. It is separated from *Monanthos* (with which section I had combined it originally) by its habit, by its multi-ramified stems and by its small flowers lasting only one day. Besides these, a feature distinguishing it from all other sections is that its lateral sepals are coherent as far as the apices, also that the shape of the labellum is a very characteristic one and in many cases is strongly reminiscent of *Podochilinae*.

These then are the main features of the huge genus *Dendrobium* Sw., as I had arranged it. It goes without saying that space and time have been wanting for a thorough examination of each species; it is, therefore, not altogether impossible that some aberrant cases may still appear, although I probably have admitted all the main forms.

Those sections which occur in our region I shall describe in more detail at the appropriate place. It is, however, worthy of notice, that of the 41 sections specified here, no fewer than 27 occur in New Guinea.

The limits of distribution of the genus correspond completely to what I have said already about the dispersal of the whole group. But it is perhaps interesting to see how the individual groups are distributed within the limits of this region. Beginning in the west, it appears that in India the section richest in species is *Eugenanthe*; and, furthermore, in the western part *Stachyobium* and isolated species of *Desmotrichum*, *Aporum* and *Grastidium* occur. Going up into the mountainous districts, especially towards the east, for the first time we come across species belonging to the sections *Sarcopodium*, *Callista*, *Pedilonum*, *Brachyanthe*, *Fytchianthe*, *Distichophyllum*, *Oxygenianthe* and *Rhopalanthe*. To the north these all disappear soon and give precedence again to *Eugenanthe*.

On the Malay Peninsula the picture is changed considerably. Here the predominant sections are, above all, *Pedilonum* as well as *Aporum*, *Desmotrichum*, *Sarcopodium*, *Bolbidium*, *Distichophyllum* and *Rhopalanthe*. Here we meet for the first time forms of *Diplocaulobium* and *Oxystophyllum*. On the Great Sunda Islands, the conditions are almost the same, with the difference that four other groups come to the fore, viz. *Desmotrichum*, *Aporum*, *Oxystophyllum* and *Grastidium*. Further to the east, *Eugenanthe* and *Sarcopodium* disappear almost totally, being replaced by *Latourea* and *Ceratobium*, and in the Moluccas by *Oxyglossum*, *Pseuderia*, *Calypstrochilus*, *Monanthos* and then gradually appear the typical Papuan sections, which here are treated extensively in detail. The most striking feature of this flora is the richness in species of *Diplocaulobium*, *Latourea*, *Calypstrochilus*, *Oxyglossum* and *Grastidium*, not to mention also the many endemic sections. Turning now first of all to the south, to Australia, we find here the sections *Rhizobium*, *Dendrocoryne* and *Phalaenanthe* predominant, but further to the east these soon disappear, or rather appear more rarely, and in New Caledonia they make room chiefly for *Macrocladium* and *Kinetochilus*. On the eastern south sea islands the group soon diminishes and is represented mainly by a mixture of Australian and Papuan forms. Thus a few species of *Diplocaulobium*, *Desmotrichum*, *Rhizobium*, *Pedilonum*, *Calypstrochilus*, *Ceratobium*, *Rhopalanthe* and *Grastidium* are still found; and finally on the Society Islands, the most eastern outposts of the genus are represented by such forms.

Almost all the species of the genus are epiphytes, and only a few, especially sub-tropical ones, are true terrestrial orchids. Amongst the latter, the species of *Macrocladium* in New Caledonia are especially worthy of notice, where they reach a height of about 2.5 metres above ground, forming rigid woody stems, which have

earned them the very descriptive name 'orchidées à canne'. Some of the Australian species have a preference for growing on rocks, especially *Dendrocoryne* species, in which *D. speciosum* R. Br. [sic] may be mentioned. This orchid is said to have been very numerous formerly, on rocks at the entrance to Sydney Harbour (at Sydney Heads) but now has almost disappeared from there.

§ 1. *Desmotrichum*

The main centre of distribution of this section lies in the Sunda Islands and the Malay Peninsula, which explains why the region under discussion [New Guinea] is relatively poor in species of this section. In briefly describing the distribution area of this 'form-circle', it should be mentioned that the most western species, *D. Macraei* Lindl., comes from Ceylon. The further east we go the more numerous the *Desmotrichum* species become, until reaching its maximum in Java and Sumatra. Further east the species diminish in number, until finally the most remote limits of the section are found in the Samoan Islands in a plant which I cannot separate specifically from *D. thysanochilum* Schltr. It is noticeable that the species do not penetrate to any extent to the north or the south, so that *D. scopu* Lindl. of the Philippines can be regarded as the most northern representative. To the south, New Guinea already marks the boundary of its distribution.

Unfortunately, in Kränzlin's monograph of *Dendrobiinae*, the species of this section are left in a state of absolute confusion; this too after Rolfe, Ridley, J.J. Smith and I had succeeded in clearing up some critical species. As a result of that monograph, it has become absolutely impossible for anyone to determine these species, unless he has plentiful and correctly determined material at his disposal. In many cases it is certain that the descriptions of Kränzlin have been prepared from incorrectly determined specimens, so that even these cannot be used as a basis for determination. In consequence the confusion has been increased still further. A glance at the synonymy which, I regret to say, has had to be added to the species here discussed, will throw a glaring light on the circumstances as they have now developed in respect to *Desmotrichum*.

Before I enter more closely into the distribution of the species in our Territory, I will try to correct some of Kränzlin's mistakes. *Desmotrichum pristichilum* Krzl. is to be added as a synonym of *D. angulatum* Lindl. *Desmotrichum criniferum* Krzl. is a mixture of at least two species, since the plant from New Guinea belongs to *D. thysanochilum* Schltr. *Desmotrichum scopu* Krzl. is, probably, a mixture of three species, since *Dendrobium thysanochilum* Schltr. is quite different, but the plant recorded from the Celebes is undoubtedly *Dendrobium comatum* Lindl. [Ed.—correct author citation is (Bl.) Lindl.] *Dendrobium comatum* Bl. [(Bl.) Lindl.] must therefore have as synonyms, *Desmotrichum scopu* Krzl. p.p. and *Desmotrichum criniferum* Krzl. p.p. *Dendrobium rhopalobulbon* Schltr. is quite different from *D. Schinzii* Rolfe. *Desmotrichum fimbriatum* Krzl. (nec Bl.) is a mixture of at least three species since *Dendrobium Macraei* Lindl., as well as *Dendrobium rhipidolobum* Schltr., are completely different species. *Desmotrichum Fargesii* (Finet) Krzl. has no affinity to this group, but belongs to another section, *Sarcopodium*.

A closer inspection would reveal much more to correct, but for want of time I cannot enter into further details.

Besides the species of the section mentioned here, only one other, *D. quadrilobum* Rolfe, has been recorded from other parts of New Guinea as probably having originated in that island. From Dutch New Guinea J.J. Smith records, furthermore, *D. rhipidolobum* Schltr. and *D. comatum* Lindl., [(Bl.) Lindl.] but regarding the latter I

surmise that the plant examined by him was *D. thysanochilum* Schltr.

The *Desmotrichum* species in our Territory are mainly epiphytes of the hill-forests and appear to be distributed widely, as shown by the specimens of *D. thysanochilum* Schltr. and *D. rhipidolobum* Schltr. *D. Pemae* Schltr., also, is a native of the hills and does not seem to reach above 400 m altitude. The two remaining species, *D. flabelliforme* Schltr. and *D. homoglossum* Schltr., are natives of the mist-forest zone, where both occur, likewise, as epiphytes.

1. *D. thysanochilum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 152.

Desmotrichum criniferum Krzl., in Engl. Pflanzr. IV, 50, II, B. 21, p. 348 (p.p.).

Desmotrichum scopae Krzl., in Engl. Pflanzr. IV, 50, II, B., 21, p. 349 (p.p.).

Kaiser-Wilhelms-Land: On trees in the mountain forests near Wobbe, alt. c. 400 m—R. Schlechter no. 16469, flowering in Sept. [Ed.—possibly Aug.] 1907.

Neu-Pommern: On rocks in the forest between Massawa and Cape Lambert, alt. c. 20 m—R. Schlechter no. 13720, flowering in Nov. 1901.

This species is related to *D. comatum* Lindl., but is quite different in the labellum which is longer, moreover the lateral lobes always are distinctly toothed in front, and the lower part of the lip is here always provided with five keels, whereas *D. comatum* Lindl. has only three. When both plants are compared side-by-side, they are undoubtedly different.

2. *D. flabelliforme* Schltr., sp. nov.

Epiphyticum, ramosum, usque ad 60 cm longum; rhizomate cauliformi, rigido, tereti; pseudobulbis distantibus, compressis, ovalibus vel oblongis, unifoliatis, mox longitudinaliter sulcatis, 6–7 cm longis, medio fere 1.7–2.8 cm latis; folio erecto vel erecto-patente, ovato-lanceolato, obtusiusculo, basi angustato, 18–22 cm longo, infra medium 6–6.5 cm lato, glabro, textura subcoriaceo; floribus in fasciculis terminalibus ante folium, illis *D. flabellum* Rchb. f. similibus; sepalis oblongo-ligulatis, obtusiusculis, glabris, c. 1.2 cm longis, lateralibus obliquis, basi margine anteriore dilatato-producta, mentum conicum, obtusum, 4.5 mm longum formantibus; petalis oblique ligulatis, acutis, basi angustatis, glabris, sepalis subaequilongis; labello e basi cuneata infra medium trilobo, 1.7 cm longo, inter apices loborum lateralium 6.5 mm lato, lobis lateralibus triangulis, acutis, antice truncatis, irregularibus, lobo intermedio cuneato, flabellato-plicato, marginibus lateralibus crenato-inciso, antice truncato, cum apiculo minuto, apice explanato, c. 1.2 cm lato, carinis 3 e basi, intermedia recta usque in apicem labelli, lateralibus in lobo intermedio flexuosis, usque infra apicem labelli decurrentibus, supra basin latere exteriori dente vel squamula minuta acutis; columna brevi, clinandrio trilobulato, lobulis lateralibus emarginatis minute denticulatis, dorsali paulo brevioribus, pede latiore apice obtuse bifoveolato; anthera quadrato-cucullata, glabra; ovario cylindraco, glabro, c. 6.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20306, flowering in Sept. 1909.

This species is a near relative of *D. flabellum* Rchb. f., but differs in its broader leaves, shorter mentum, the shorter lateral lobes of the lip, and in the column-foot.

The flowers are pale yellow, with a few red veins on the side lobes of the labellum.

3. *D. rhipidolobum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 151.

Desmotrichum fimbriatum Krzl., in Engl. Pflanzr. IV, 50, II B. 21, p. 354 (p.p.) (nec Bl.).

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Kaulo, alt. c. 200 m—R. Schlechter no. 16695, flowering in Oct. 1907; on trees in the forests between the upper Ramu [River] and the coast, alt. c. 100 m—R. Schlechter no. 14116, flowering in Jan. 1902; on trees in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18860, flowering in Nov. 1908; on trees in the forests near Unu in the Waria Valley, alt. c. 150 m—R. Schlechter no. 17375, flowering in Mar. 1908; on trees in the forests of [Mount] Gomadjidji (Waria District), alt. c. 250 m—R. Schlechter no. 19920, flowering in July [Ed.—possibly June] 1909; on trees in the hill-forests near Udu, (Waria

District), alt. c. 300 m—R. Schlechter no. 19898, flowering in July [Ed.—possibly June] 1909.

This species was united incorrectly with *D. fimbriatum* Lindl. by Kränzlin, from which, as J.J. Smith also agrees, it is entirely different. From the latter it always may be recognised at once by its habit and the colour of the flowers. The flowers are whitish or yellowish with white petals and labellum.

4. *D. Pema* Schltr., sp. nov.

Epiphyticum, ramosum, suberectum vel patulum, usque ad 40 cm longum; rhizomate elongato, cauliformi, rigidulo; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 3–5 cm distantibus, compressis, anguste oblongoideis vel ellipsoideis, unifoliatis, 3–3.5 cm longis, medio fere 0.7–1 cm latis; folio elliptico, apiculato, basi angustato, glabro, subcoriaceo, 8–11 cm longo, infra medium 2.5–3.2 cm lato; floribus illis *D. xantholeuci* Rchb. f. fere aequimagnis, erectis, fasciculatis, fasciculis ad apices pseudobulborum juxta folium ortis; bracteis minutis; sepalis ovatis, apiculatis, glabris, 6.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum triangulum obtusum, c. 5 mm longum formantibus; petalis oblique ovato-lanceolatis, obtusiusculis, glabris, sepalis paulo brevioribus; labello e basi cuneata infra medium trilobato, c. 1 cm longo, inter apices loborum lateralium c. 6.5 mm lato, lobis lateralibus erectis, oblique triangulis, obtusis, brevibus, intermedio oblongo-quadrato, antice paulo dilatato, breviter bilobulato, lobulis oblique rhombeis, obtusis, toto c. 5.5 mm longo, basi 0.3 cm lato, antice 3.75 mm lato, carinis 3 subparallelis e basi labelli usque infra apicem decurrentibus, lateralibus in lobo medio flexuosis; columna brevi, clinandrio trilobulato, lobulis lateralibus majoribus, triangulis, margine posteriore paucidentatis; anthera rotundato-cucullata, antice truncata, glabra; ovario cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the hill-forests near Pema, alt. c. 400 m—R. Schlechter no. 19908, flowering in June 1909.

In habit this species possesses a certain similarity to *D. rhipidolobum* Schltr., however, the pseudobulbs are usually rather shorter and broader, and the leaves somewhat broader, relative to their length. Both species are quite different in the structure of their flowers, especially in the labellum. The flowers are whitish yellow.

5. *D. homoglossum* Schltr., sp. nov.

Epiphyticum, ramosum, suberectum vel patulum, c. 35 cm longum; rhizomate cauliformi, rigidulo, teretiusculo; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis anguste ellipsoideis, compressis, unifoliatis, 2.5–4 cm longis, medio fere 0.7–1 cm latis; folio erecto, ovato-lanceolato, acuto cum apiculo, basi rotundato, utrinque plus minus lucido, glabro, textura subcoriaceo, dorso nervo medio carinato, 7.5–10.5 cm longo, infra medium 2.5–3.2 cm lato; fasciculis florum apicalibus, in dorso folii, paucifloris; bracteis minutis; floribus erectis, in sectione inter minores; sepalis late ovatis, apiculatis, c. 0.7 cm longis, glabris, lateralibus obliquis; petalis oblique ovato-lanceolatis, obtusiusculis, glabris, sepalis paulo brevioribus, labello e basi cuneata oblongo-quadrato, integro, medio paululo dilatato, antice truncato cum apiculo minuto, laevi, 0.7 cm longo, medio fere 0.4 cm lato; columna perbrevis, apoda, glabra, erostri, clinandrio acute trilobulato, lobulis lateralibus dorsali majoribus; anthera subreniformi-quadrata, dorso cordata, acute apiculata, glabra; ovario cylindraceo-clavato, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19155, flowering in Jan. 1909.

I have described this undoubted pelorial species here as new, since, in the comparison of the material available from New Guinea, it is fairly certain that it represents a still unknown species of the familiar *Desmotrichum* form. The flowers are pale yellow.

§ 2. *Microphytanthe*

The two species of this new section seem in one respect to be allied closely to *Desmotrichum*, and in another appear to have affinities with the smaller forms of *Rhizobium*. Unfortunately, it was not possible for me, owing to the scarcity of the material found, to decide whether or not the flowers have a longer life, than in the case

of *Desmotrichum*. For this reason it is quite possible that later on the section may have to be placed near *Rhizobium*. In habit the species resemble *Bulbophyllum*, rather than *Dendrobium*, but from the position and structure of the flowers, they undoubtedly belong to the latter. I have mentioned already the chief characteristics of this section. At present I know only two species of the section. Both are described here for the first time and both are natives of the mountain forests. *D. bulbophylloides* Schltr. seems to occur only in the mist-forest zone. On the other hand, as specimens from the Waria region show, *D. nummularia* Schltr. also occurs below this zone; however, in association with other species which likewise reach these lower regions only in exceptional cases. Both species are epiphytic.

6. *D. bulbophylloides* Schltr., sp. nov.

Epiphyticum, longe repens, pusillum; rhizomate elongato, laxe pseudobulbis obsesso, vaginis arcuatis amplexantibus oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, unifoliatis, vulgo plus minus obliquis, paulo depressis, 4–6 mm longis, medio fere 2–3.5 mm diametentibus; folio erecto, oblongo vel elliptico, apiculato, coriaceo, 1–1.3 cm longo, medio fere 3–5.5 mm lato; floribus singulis, pro magnitudine plantae magnis, glabris, apicalibus; bractea parvula, ovata, ovario multo brevior; sepalis late ovatis, apiculatis, glabris, c. 5 mm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum oblongoideum conicum obtusum 5.5 mm longum formantibus; petalis oblique ligulato-lanceolatis, acuminatis, margine subserulatis, sepalis paululo brevioribus; labello e basi cuneata medio incrassato contracto, antice in laminam late obovatam obtusam carnosulam expanso, medio utrinque minute bidentato, 0.7 cm longo, medio 2.5 mm lato, infra apicem 0.3 cm lato, linea medio incrassata e basi usque in medium decurrente; columna brevi, glabra, clinandrio obtusiuscule trilobulato, lobulis lateralibus dorsali paulo majoribus; anthera subreniformi-cucullata, glabra; ovario cum pedicello brevi, c. 0.7 cm longo, glabro, subclavato.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17709, flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18247, flowering in Sept. 1908.

In habit and floral characters, this species stands alone in the genus, if one disregards a comparison with *D. grandiflorum* Lindl., which belongs, however, to the section *Desmotrichum*. This species cannot be confused with the second species of the section *Microphytanthe* either.

The flowers are yellow-brown, with a shining dark brown-striped labellum.

7. *D. nummularia* Schltr., sp. nov.

Epiphyticum, perpusillum, cortici arborum arcte apressum; rhizomate decumbente, vaginis mox in fibris solutis omnino oblecto, pseudobulbis perdense obsesso; pseudobulbis depressis, rhizomati alte adnatis, oblongoideis vel ovalibus, 0.3–0.7 cm longis, medio fere 1.5–3 mm latis, unifoliatis; folio ovato vel elliptico, apiculato, marginato, exsiccatione utrinque reticulato-nervato, 0.4–0.8 cm longo, medio vel infra medium 2.5–4.5 mm lato; floribus singulis ad apices pseudobulborum, basi vaginulis mox in fibris solutis primum protectis, pro magnitudine plantae magnis; bractea minuta deltoidea; sepalis ovatis, obtusis, glabris, c. 4.5 mm longis, lateralibus obliquis, basi margine anteriore valde ampliata cum pede columnae mentum oblongoideum obtusum c. 5.5 mm longum formantibus; petalis oblique ligulatis, obtusis, glabris, sepalis paululo brevioribus, sed distincte angustioribus; labello cuneato-ligulato, antice bilobo cum apiculo lato calliformi interposito, lobis quadrato-suborbicularibus, obtusissimis, minutissime ciliolatis, labello toto caeterum glabro, lobis inclusis c. 0.7 cm longo, antice c. 3.25 mm lato; columna brevi, clinandrio obtuse trilobulato, lobulis lateralibus intermedio bene latioribus; anthera rotundato-cucullata, antice truncata, glabra; ovario cylindrico, cum pedicello brevi c. 0.4 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20181, flowering in Sept. 1909; on trees in the mountain forests near Jaduna (Waria District), alt. c. 450 m—R. Schlechter no. 450 [sic] (TYPE) [Ed.—possibly 19450] flowering in May 1909.

A peculiar plant, which is somewhat reminiscent of Australian species of the section *Rhizobium*.

The specimens from the Torricelli Range differ from those of the Waria Valley, in that the sheaths of the rhizome appear to loosen later, but in other respects the flowers of both agree well. The colour of the flowers is dark violet with yellow tips to the sepals, petals and labellum; quite unusual features for the genus.

§ 3. *Goniobulbon*

I am compelled to retain my section *Goniobulbon* beside *Diplocaulobium*, not only on account of the shape of the pseudobulbs, but also because of the whole habit of the species. For, while in *Diplocaulobium* the rhizome always is shortened considerably and the pseudobulbs, therefore, closely crowded, in *Goniobulbon* long-creeping sympodia are formed and the pseudobulbs, which are always angular and never narrowed (as nearly always in the case of *Diplocaulobium*), are appressed more-or-less against the rhizome. In some cases, as for example in *D. dichrotropis* Schltr., the sympodia hang from the trees after the fashion of some *Bulbophyllum* species.

All of the species of this section are from the Papuan region. From British Papua only one species, *D. Ridleyanum* Schltr., has been recorded. This has been renamed *D. humifusum* by Kränzlin unnecessarily, in whose monograph the previous name has been overlooked, as well as many others. Had he taken the trouble to peruse my remarks concerning *D. chrysotropis* Schltr. he might have saved himself this bother. At present I know only two species from Dutch New Guinea, viz. *D. glabrum* J.J. Sm. (which occurs also in our Territory) and *D. crenulatum* J.J. Sm.

Most species like the drier parts of the plains, and grow by preference on the moss-free, dry cracked bark of tree-trunks at forest borders. *D. glabrum* J.J. Sm. occurs on hills in the drier forests up to an altitude of 450 m. Only a few species ascend into the mist-forest zone, e.g. *D. chrysotropis* Schltr., *D. tropidophorum* Schltr. and *D. dichrotropis* Schltr.

The species are related closely, but in spite of this we find, according to Kränzlin, of the four species belonging here, two under *Dendrobium* mixed up with *Cadetia* species and placed under *Bolbidium*, quite a different section from this one, whilst the other two are under *Diplocaulobium*.

8. *D. glabrum* J.J. Sm., in Bull. Dep. Agric. Ind. Néerl. V (1907), p. 4; Nova Guinea VIII, p. 56, t. XX, p. 64.

Kaiser-Wilhelms-Land: On trees in the forests on [Mount] Gomadjidji on the Waria [River], alt. c. 400 m—R. Schlechter no. 19343, flowering in May 1909.

My specimens differ in several respects from the Type from Dutch New Guinea. The pseudobulbs are rather more angular, the flower-sheath in front of the leaf is larger, the flowers themselves are somewhat shorter, the shape of the lip is slightly aberrant and the middle keel of the latter is noticeable only as such in front. But in other respects the peculiar plant agrees too well with the illustration and material of *D. glabrum* J.J. Sm., kindly forwarded to me, to warrant separation.

9. *D. chrysotropis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 159.

Epiphyticum, decumbens vel patulum, usque ad 15 cm longum; rhizomate elongato, tereti, densius pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis suberectis vel adscendentibus, 4–5-angulatis, cylindræis, 1.5–2.5 cm altis, 0.4–0.6 cm infra medium diametientibus, apicem versus sensim paulo angustatis, unifoliatis; foliis erectis vel suberectis, ligulatis vel oblongo-ligulatis, obtusatis, apice breviter excisis cum apiculo, basi angustatis, glabris, 3–5 cm longis, medio fere 0.4–0.8 cm latis; spatha compressa mox decadente, 0.5–0.7 cm alta; floribus singulis succedaneis, erectis, in sectione inter majores, glabris; sepalis lanceolato-ligulatis, obtusiusculis, medio fere paululo constrictis, c. 1.7 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede labelli mentum obtusum, conicum, c. 5.5 cm longum formantibus; petalis oblique linearibus,

obtusiusculis, medio paulo attenuatis, sepalis paulo brevioribus; labello integro, oblongo-ligulato, acuto, supra medium paulo dilatato, carinis 2 subparallelis, medio approximatis, dimidio superiore flexuosis, e basi usque infra apicem decurrentibus, carina intermedia interjecta e medio usque in apicem auctis; columna brevi, glabra, clinandrio trilobulato, lobulo dorsali breviter tridentato; anthera subreniformi-cucullata, glabra, antice truncata; ovario clavato, superne 4-alato, inferne 2-costato, pedicello gracili incluso c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17818, flowering in May 1908; on trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 13985, flowering in Jan. 1902.

I have described this species here again because the material which I brought back on my last journey is far better than that present at the time of the first description, since the whole collection from the Bismarck Range in Jan. 1902 was damaged badly by sea water on loading into the ship.

Very characteristic of this species are the wings of the ovary. In the shape of the lip it resembles most closely *D. tropidophorum* Schltr., described below, but the latter has an entirely different habit. The flowers are white with yellow tips, the labellum has yellow crests and is sometimes marked with red in its lower half.

10. *D. tropidophorum* Schltr., sp. nov.

Epiphyticum, dependens, usque ad 40 cm longum; rhizomate elongato, laxe pseudobulbis obsesso, teretiusculo, vaginis mox fissis primum obiecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, apicem versus paululo angustatis, unifoliatis, 4–6-angulatis, rhizomati plus minus appressis, 2–2.7 cm longis, infra medium 0.4–0.5 cm diametientibus; folio elliptico-ligulato, apice inaequaliter et obtusiuscule bilobulato, basi sensim angustato, 4.5–7.5 cm longo, medio fere 0.7–1.1 cm lato; spatha apicali, compressa, mox fissa, 5–8 mm longa; floribus paucis, succedaneis, erectis, graciliter pedicellatis; sepalo intermedio e basi dilatata lanceolato, obtusiusculo, glabro, c. 1 cm longo, lateralibus subfalcato-lanceolatis, obtusiuscule acuminatis, basi margine anteriore ampliata cum pede columnae mentum breve obtusum vix 0.4 cm longum formantibus, glabris, sepalo intermedio aequilongis; petalis oblique linearibus, acutis, infra medium vix paulo attenuatis, glabris, sepalis paululo brevioribus; labello oblongo-ligulato, supra medium subtrilobulato, apiculato, 1 cm longo, medio fere 3.75 mm lato, carinis 3 e basi usque infra medium decurrentibus, distantibus, subparallelis, lateralibus medio fere paulo flexuosis; columna brevi, glabra, clinandrio trilobulato, lobulis lateralibus brevibus, inaequaliter bidentatis, dorsali lineari, lateralibus paulo longiore, pede gracili; anthera subgloboso-cucullata, antice truncata; ovario subclavato-cylindraceo, glabro, cum pedicello c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17203, flowering in Jan. 1908.

This species is not difficult to distinguish from all others of the section with the exception of *D. dichrotropis* Schltr., which has a quite differently shaped labellum.

In the structure of its flowers it comes nearest to *D. chrysotropis* Schltr. and *D. glabrum* J.J. Sm., but has a blunter labellum; and in the already discernable indication of side lobes, here approaches *D. cyclobulbon* Schltr. which, however, is very different in habit. I have observed this plant frequently, but only once in flower. It grows always rather high up in the mountains, but always below the mist-forest formation. The flowers are white with yellow crests on the lip, the latter with red marble-graining to the lower half.

11. *D. cyclobulbon* Schltr., sp. nov.

Epiphyticum, decumbens, cortici arborum arcte appressum, pusillum, usque ad 25 cm longum; rhizomate elongato, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ancipiti-compressis, suborbicularibus, rhizomati appressis, unifoliatis, 0.8–1.2 cm longis, medio fere 0.7–0.9 cm latis; foliis oblongo-vel elliptico-ligulatis, obtusiusculis, margine vulgo plus minusve undulatis glabris, textura coriaceis, 2–2.5 cm longis, medio fere 0.5–0.7 cm latis; floribus ad apices pseudobulborum singulis vel paucis, succedaneis; bracteis erectis, parvulis; sepalis e basi dilatata lanceolato-triangularibus, obtusiusculis, glabris, 1 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum conicum obtusum c. 5 mm longum formantibus; petalis sepalis

subaequilongis, oblique linearibus, obtusis, basi margine anteriore paululo dilatatis; labello circuitu ligulato-oblongo, subintegro, tertia parte apicali margine leviter undulato, apiculato, 1.2 cm longo, medio et infra apicem c. 0.4 cm lato, carinis 2 minute pulvereis e basi supra medium approximatis, parallelis, deinde glabris leviter curvatis usque infra apicem decurrentibus, linea tenuiore incrassata intermedia praesertim dimidio superiore conspicua interjecta; columna perbrevis, glabra, clinandrio trilobulato, lobulis lateralibus late triangulis oblique apiculatis, dorsali dentiformi distinct majoribus; anthera subquadrato-cucullata, antice truncata, glabra; ovario subclavato, glabro, cum pedicello c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Peso in the District of Eitape, alt. c. 40 m—R. Schlechter no. 19983, flowering in Aug. 1909; on trees at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18650 (TYPE), flowering in Nov. 1908; on trees in the forests at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19957, flowering in July 1909; on trees in the forests at Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter no. 19339, flowering in Apr. 1909.

This species is found chiefly in drier forests of the plains and on solitary large trees in the along-savannah. It is distinguished by the flat, almost circular pseudobulbs, and the very compact growth.

The flowers are pale yellow, sepals and petals pale orange at the tips, the lower half of the labellum with violet-red veins.

12. *D. dichrotropis* Schltr., sp. nov.

Epiphyticum, dependens, usque ad 40 cm longum; rhizomate elongato, laxe pseudobulbis obsessio; radicibus filiformibus, valde elongatis, flexuosis, glabris; pseudobulbis cylindraceis, 4–6-angulatis, rhizomati vulgo arctius appressis, unifoliatis, 2.5–3.5 cm longis, medio vel infra medium 3.5–5 mm diametentibus; folio ligulato obtuso, minute exciso, glabro, textura coriaceo, 5–6.5 cm longo, medio fere 0.8–1 cm lato; spatha compressa, subacuta, apicali, 0.6–0.8 cm longa; floribus paucis succedaneis, illis *D. Ridleyani* Schltr. similibus; sepalis lanceolatis, apicem versus attenuatis, obtusiusculis, glabris, c. 1.4 cm longis, lateralibus subfalcato-obliquis, basi margine anteriore bene ampliata cum pede columnae mentum conicum, obtusum, c. 0.5 cm longum formantibus; petalis linearibus, subacutis, basin versus margine anteriore paululo dilatatis, sepalis paulo brevioribus, glabris; labello e basi subcuneato-oblonga e medio trilobato, c. 1.5 cm longo, inter apices loborum lateralium 0.4 cm lato, lobis lateralibus abbreviatis obtusatis, intermedio elliptico acuto, leviter undulato, 0.7 cm longo, medio fere 3.5 mm lato, carinis 3 e basi labelli usque infra apicem decurrentibus, intermedia recta, lateralibus e basi leviter divergentibus infra medium approximatis, deinde parallelis flexuosis, in lobo medio furcato-bifidis; columna brevi, glabra, clinandrii lobis lateralibus semiorbicularibus, margine posteriore paucidentatis, lobo dorsali triangulo, acuto, laterales superante; anthera quadrato-cucullata, glabra, antice subretusa, dorso gibbo obscuro donata; ovario gracili, cylindraceo, glabro, cum pedicello c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20323, flowering in Sept. 1909.

This species is recognised easily amongst its relatives by the much elongated pendant rhizome. In other respects it resembles *D. Ridleyanum* Schltr. (cf. K. Schum. et Laut., Nachtr. [1905], p. 160), but differs in habit, as well as in the larger flowers, and the lateral keels of the lip which are forked in front.

The flowers are white, the labellum in its lower half sparsely spotted with red and with yellow keels.

13. *D. Jadunae* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 15 cm longum; rhizomate elongato, dense pseudobulbis obsessio; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi rhizomati appressa adscendentibus, cylindraceo-ovoideis, 6-angulatis, 0.8–1.3 cm altis, supra basin 0.5–0.8 cm diametentibus, unifoliatis; foliis erecto-patentibus, ligulatis, obtusis, apice breviter excisis, glabris, textura coriaceis, 1.3–1.8 cm longis, medio fere 3.5–5.5 mm latis; spatha apicali compressa, obtusiuscula, c. 0.5 cm longa; floribus paucis, succedaneis, erectis; sepalis lanceolatis, apicem versus angustatis, obtusiusculis, glabris, c. 1.2 cm longis, lateralibus falcatis, obliquis, basi margine anteriore ampliata cum pede columnae mentum late conicum obtusum c. 4.5 mm longum formantibus; petalis subfalcatis, linearibus, subacutis, medio paululo angustatis, glabris, sepalis paululo brevioribus, labello

e basi cuneato-ligulata e medio trilobato, 1.3 cm longo, inter apices loborum lateralium 0.4 cm lato, lobis lateralibus abbreviatis, triangulis, obtusis, intermedio c. 6.5 mm longo, elliptico, subacuminato, margine leviter undulato, carinis 2 parallelis distantibus, medio approximatis, deinde leviter bicurvatis, paululo divergentibus, usque in medium lobi intermedii decurrentibus, carina paulo crassiore intermedia e basi lobi intermedii usque infra apicem interposita; columna brevi, glabra, clinandrii lobulis lateralibus parvulis inaequaliter paucidentatis, dorsali longiore; ovario gracili, tereti, cum pedicello c. 1.2 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19332, flowering in Apr. 1909.

This species is related indisputably to the following ones, but is well separated by the shape of the sepals and petals; and by the lip, which has shorter lateral lobes and different keels.

The flowers are white, the lip has red-margined lateral lobes and yellow keels.

14. *D. savannicola* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 15 cm longum; rhizomate elongato, dense pseudobulbis oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis compressis, 4-angulatis, unifoliatis, rhizomati vulgo arctius incumbentibus, ovatis vel late ellipticis, 0.7–1.2 cm longis, medio vel infra medium 0.6–0.9 cm latis; foliis erecto-patentibus, ligulatis, obtusis, minute excisis, basin versus sensim subpetiolato-angustatis, glabris, textura coriaceis, 1.7–3 cm longis, medio vel supra medium 0.4–0.8 cm latis; spatha apicali compressa, c. 6 mm longa; floribus paucis succedaneis, illis *D. Ridleyani* Schltr. similibus; sepalis e basi lanceolata attenuatis, acutis, glabris, 1.3 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum conicum, obtusum, 0.4 cm longum formantibus; petalis oblique linearibus, acutis, glabris, basin versus paululo dilatatis, sepalis subaequilongis; labello e basi oblonga infra medium trilobo, c. 1.3 cm longo, inter apices loborum lateralium c. 0.3 cm lato, lobis lateralibus triangulis subacutis parvulis, intermedio amplo, e basi angustata elliptico, apiculato, margine leviter undulato, carinis 3 e basi usque supra medium lobi intermedii decurrentibus, intermedia recta, dimidio inferiore minute puberula, lateralibus dimidio inferiore subparallelis basin lobi intermedii versus paululo dilatatis, in basi lobi intermedii flexuosis deinde paululo divergentibus; columna brevi, glabra, clinandrii lobulis lateralibus bidentatis, dorsali dentiformi fere aequilongis; anthera subquadrato-cucullata, antice truncata, dorso bigibba, glabra; ovario cum pedicello gracili glabro, subclavato, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the savannahs at the foot of the Bismarck Range near the Saugueti Base, alt. c. 200 m—R. Schlechter no. 18659, flowering in Nov. 1908.

In habit the species most resembles *D. cyclobulbon* Schltr., but in the structure of the flowers decidedly comes closer to *D. Jadunae* Schltr., although the lateral lobes of the lip are here more developed and the middle lobe, contracted at the base, is different. Furthermore the crests of the lip do not agree.

The flowers are pale yellow with the lip carmine-red-bordered in the lower half.

15. *D. minjemense* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 12 cm longum; rhizomate elongato, dense pseudobulbis oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis compressis, 4-angulatis, unifoliatis, late ellipticis, 0.7–0.9 cm longis, medio fere 0.6–0.8 cm latis; foliis oblongo-ligulatis, apice minute excisis, glabris, coriaceis, subrigidis, 1.3–1.5 cm longis, medio fere 3.5–5 mm latis; spatha compressa obtusiuscula, 3.5–5 mm longa; floribus paucis, succedaneis, erectis vel erecto-patentibus; sepalis anguste lanceolatis, acutis, apicem versus sensim attenuatis, glabris, 1.2 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum conicum obtusum, c. 3.5 mm longum formantibus; petalis oblique linearibus, acutis, basi subdilatatis, glabris, sepalis paululo brevioribus; labello e basi subcuneato-oblonga infra mediam trilobato, 1.2 cm longo, inter apices loborum lateralium 0.3 cm lato, lobis lateralibus triangulis, subacutis, parvulis, intermedio lanceolato, acuto, margine leviter undulato, lamellis 3, lateralibus leviter arcuatis in basi lobi intermedii approximatis, deinde leviter flexuosis, parallelis e basi labelli usque in apicem labelli decurrentibus, in lobo medio utrinque latere lamella exteriore auctis; columna brevi, clinandrii lobulis lateralibus inaequaliter bidentata, lobulo dorsali dentiformi subaequilongo; ovario cum pedicello glabro, gracili, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On tall trees on the Minjem [River] near Kelel, alt. c. 180 m—R. Schlechter no. 16245, flowering in July 1907.

I consider that this species is placed best beside *D. crenulatum* J.J. Sm., from which it differs in the shape and size of the pseudobulbs, and the size of the flowers. In the shape of the lip and keels thereon both species are alike, but the lateral lobes are more complete, and the middle lobe shorter in *D. minjemense* Schltr. The flowers are pale yellow with dark red at the apices of the lateral lobes of the labellum.

§ 4. *Diplocaulobium*

The species of this section were placed by Kränzlin in a separate genus, *Diplocaulobium*, together with some of the section *Goniobulbon*. How invalid this is, is shown by his leaving some closely related species of the latter under *Dendrobium* Sw. Moreover, there is a whole series of forms in *Dendrobium*, which constitute a gradual transition to such species as have been left in *Dendrobium* by Kränzlin. For instance, many of the *Rhizobium* forms, which, according to his determination key given on page 25 [of his text] were excluded from *Dendrobium*, but which, nevertheless, have been quietly left there without further comment.

When treating *Goniobulbon*, I explained the reasons that induced me to keep the two sections separate after J.J. Smith had favoured their unification.

We find species of *Diplocaulobium* distributed from the hinterland of India across the Moluccas through New Guinea and its associated islands and through New Caledonia to Samoa, where *D. fililobum* F. v M., the most eastern representative of the genus, occurs. Kränzlin, in some inexplicable way, has united the latter with *D. longicolle* Lindl., a totally different plant, and that too, after describing it as a species only a few pages earlier. New Guinea, thus, must be regarded geographically as the centre of distribution and it is here in the mountains where such a striking multiplicity of forms of the section is found. With the exception of those described here as new, the section comprises about 30 known species, of which at least 20 are endemic to New Guinea. How many more we may expect may be inferred from the considerable number included in nearly every collection sent from there. In that connection it is interesting to observe the striking variations in the flowers between species by studying the whole series from the tiny *D. cadetioides* Schltr. to the magnificent forms such as *D. auricolor* J.J. Sm. and *D. regale* Schltr.

All the species which I have collected in our Territory are epiphytes of the mountain forests, by far the greatest number of which belong to the mist-forest formation, with only a few extending downwards to about the 500 m level, and all requiring a fairly high degree of humidity to thrive. The following species have been described so far from Dutch New Guinea: *D. aratriferum* J.J. Sm., *D. bidentiferum* J.J. Sm., *D. hydrophilum* J.J. Sm., *D. inconstans* J.J. Sm., *D. lageniforme* J.J. Sm., *D. phalangillum* J.J. Sm., *D. tipula* J.J. Sm., *D. validicolle* J.J. Sm., *D. auricolor* J.J. Sm. and *D. centrale* J.J. Sm.

It is peculiar that so far, with the exception of *D. inauditum* Rchb. f. from British Papua, no other species of the section have been recorded, although a considerable number surely must occur there. However, I omit *D. nitidissimum* Rchb. f. which, perhaps, has its habitat in the British Solomons, although its place of origin has not been mentioned specifically.

In the following arrangement I have placed the smallest species first, and the largest, with blunt perianth segments, conclude the section. The latter species, with their large, bright orange-yellow or scarlet-red flowers, belong to the most magnificent

in the genus. Unfortunately, the life of these flowers is, as with all species of the section, of one day's duration only.

16. *D. abbreviatum* Schltr., sp. nov.

Epiphyticum, pro sectione abbreviatum, caespiticum, 4–7 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, teretibus, apicem versus sensim paulo attenuatis, unifoliatis, 1.3–2 cm longis, infra medium 0.2–0.3 cm diametientibus; folio lineari, obtuso vel obtusiusculo, minute exciso, glabro, textura subcoriaceo, 2–4 cm longo, medio fere 0.2–0.4 cm lato; spatha apicali, compressa, obtusiuscula, pauciflora, c. 0.7 cm longa; floribus succedaneis, illis *D. brevicollis* J.J. Sm. similibus, erectis; sepalis lanceolatis, elongato-acuminatis, glabris, c. 1.3 cm longis, lateralibus basi margine anteriore conspicue ampliata cum pede columnae mentum breve obtusum, 2.5 mm longum formantibus; petalis anguste linearibus, attenuatis, sepalis subaequilongis, glabris; labello e basi cuneata infra medium trilobato, 0.9 cm longo, infra medium 3.5 mm lato, lobis lateralibus abbreviatis, obtusatis, intermedio producto, oblongo-ligulato, breviter acuminato, carinis 2 antice ampliatis e basi labelli usque supra medium lobi intermedii decurrentibus, parallelis, glabris, pulvillo lanceolato-elliptico utrinque acuto dense farinoso-puberulo e basi lobi intermedii usque in apicem per medium ornato; columna brevi, glabra, clinandrio acute trilobulato; anthera cucullata, dorso umbonata, antice truncata, glabra; ovario gracili, cum pedicello c. 1.6 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the mountain forests not far from Keel in the Minjem Valley, alt. c. 500 m—R. Schlechter no. 16598, flowering in Sept. 1907; on trees in the forests on slopes of the Kani Range, alt. c. 600 m—R. Schlechter s.n., flowering in June 1908.

A charming little species related to *D. brevicolle* J.J. Sm., but well separated from this by the shorter pseudobulbs and the shape of the lip.

The flowers are rose-red on the outside, paler inside; the lip is white with brown-red markings.

I have placed this species first in the section since it and *D. brevicolle* J.J. Sm., among all the *Diplocaulobium* species, approach nearest to section *Goniobulbon* in their relatively short pseudobulbs.

17. *D. cadetioides* Schltr., sp. nov.

Epiphyticum, caespitificum, pusillum, gracile, 10–17 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracillimis, petioliformibus, unifoliatis, teretibus, 5–12 cm longis, medio c. 1.5 mm diametientibus, basin versus vulgo paulo ampliatis; folio erecto, lineari vel ligulato-lineari, obtuso, apice minute exciso, 2.5–3.5 cm longo, medio fere 2.3–3.5 mm lato; spatha apicali compressa, c. 1 cm longe, pauciflora; floribus erectis, succedaneis, in sectione parvulis; sepalis lanceolatis, obtusiuscule elongato attenuatis, c. 1 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum breve obtusum c. 1.5 mm longum formantibus; petalis obliquis, anguste linearibus, obtusiusculis, glabris, sepalis subaequilongis; labello e basi ovali, medio paulo angustato, in tertia parte anteriore dilatato, rhombeo, angulis lateralibus triangulis subacutis, apice acuminato, marginibus e basi usque in apicem irregulariter crenulato, toto 0.6 cm longo, supra basin 0.3 cm lato, medio 0.2 cm lato, tertia parte apicali 0.3 cm lato, toto glabro, carinis 3 parallelis e basi usque infra apicem decurrentibus; columna glabra, brevi, clinandrii lobis lateralibus rotundatis, minute denticulatis, dorsali dentiformi, brevi; anthera subgloboso-cucullata, glabra, antice leviter retusa; ovario cum pedicello gracillimo, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19505, flowering in May 1909.

If one observes this plant superficially, one might mistake it for a *Cadetia*, but in its flowers it is a typical *Dendrobium* species of the section *Diplocaulobium*. It does not approach closely any species so far described. Already the shape of the labellum distinguishes it excellently.

The flowers are white, slightly flushed with red on the outside, and with a yellow labellum.

18. *D. gracilentum* Schltr., in K. Schum. et Laut., Nachtr. (1903) [1905], p. 153.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–900 m—R. Schlechter no. 14380, flowering in Apr. 1902; no. 20324, flowering in Sept. 1909.

The specimens collected on my last journey differ insignificantly from the Type (no. 14380); the keels of the lip are somewhat thicker and the lip is provided with an apiculum. The flowers are white or pale pink with a white labellum.

19. *D. tentaculatum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 155.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 14354, flowering in April 1902; no. 20333 flowering in Sept. 1909.

It is not difficult to distinguish this species from its nearest relatives, *D. araneola* Schltr. and *D. arachnoideum* Schltr., by its very delicate but short pseudobulbs and leaves; moreover, in addition the labellum of *D. tentaculatum* Schltr. does not possess the peculiar cushion beset with stalked capitate hairs, which the two other species have in common with most others.

The colour of the flowers is rose-red, the labellum white or yellowish with red-margined lateral lobes.

20. *D. araneola* Schltr., sp. nov.

Epiphyticum, erectum, gracile, caespitificum, 14–20 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi obclavato-incrassata in collem gracilem valde attenuatis, unifoliatis, 5–12 cm longis, supra basin 3.5–6 mm diametientibus, colle 1.5–2 mm diametiente; folio erecto, lineari, apice subacutis et inaequaliter bilobulato, glabro, 5.5–9 cm longo, medio fere 0.3–0.4 cm lato, textura subcoriaceo; spatha compressa obtusiuscula, usque ad 1.5 cm longa; floribus paucis succedaneis, illis *D. tentaculati* Schltr. similibus; sepalis anguste lanceolatis, elongato-attenuatis, glabris, c. 2.5 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum c. 0.5 cm longum formantibus; petalis obliquis, anguste lanceolatis, attenuato-elongatis, glabris, sepalis paulo brevioribus; labello circuitu subpandurato, tertia parte inferiore trilobato, c. 1.3 cm longo, inter apices loborum lateralium vix 0.5 cm lato, lobis lateralibus abbreviatis, obtusissimis, intermedio e istmo oblongo dimidio anteriore ovato, obtusiusculo, margine leviter undulato-subcrenulado, carinis 2 parallelis e basi usque supra medium lobi intermedii decurrentibus, antice pulvillo lanceolato-elliptico intermedio carinas haud excedente ornato; columna brevi, glabra, clinandrio obtuse trilobulato, lobulo dorsali laterales paulo superante; anthera quadrato-cucullata, glabra, antice subretusa; ovario cum pedicello gracili, 1.7–2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900–1000 m—R. Schlechter no. 20245; no. 20295, flowering in Sept. 1909.

This species is related closely to the previous one, but differs in its taller growth and the presence of a cushion of stalked, capitate hairs on the labellum. The following species, *D. arachnoideum* Schltr., is likewise related, but has longer flowers and a differently shaped labellum.

The flowers of *D. araneola* Schltr. are white, with the lip red-margined at the base and a pale yellow cushion on the lamina.

21. *D. arachnoideum* Schltr., sp. nov.

Epiphyticum, erectum, caespitificum, 17–22 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi obclavata petioliformibus, gracillimis, teretibus, 7.5–9.5 cm longis, supra basin 0.6–1 cm diametientibus, medio et apice c. 1.5–2 mm diametientibus, unifoliatis; folio erecto vel suberecto, lineari, obtusiuscule et inaequaliter bilobulato, glabro, textura subcoriaceo, 8.5–11.5 cm longo, medio fere 0.4–0.5 cm lato; spatha apicali compressa, subacuta, c. 1.5 cm longa; floribus paucis succedaneis, erectis vel suberectis; bractea minuta, deltoidea; sepalis lanceolatis, attenuato-elongatis, c. 5 cm longis, glabris, lateralibus obliquis, basi margine anteriore dilatata, cum pede columnae mentum obtusum, c. 0.6 cm longum formantibus; petalis sepalis intermedio similibus sed angustioribus et paulo brevioribus, obliquis; labello subpandurato-ligulato, medio marginibus undulato, antice obtuso cum lobis lateralibus subobsoletis, 1.3 cm longo.

tertia parte basilari 0.4 cm lato, carinis 2 parallelis e basi usque ad medium decurrentibus, pulvillo oblongo farinoso-puberulo intermedio anteposito; columna brevi, glabra, clinandrio trilobulato, lobulis lateralibus abbreviatis, truncatis, intermedio triangulo, acuto, bene longiore; anthera subreniformi-cucullata, glabra, antice truncata; ovario cum pedicello gracili, glabro, c. 3.5–4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19653, flowering in June 1909.

Species of the section *Diplocaulobium* are not always easy to distinguish, the present species being related to *D. araneola* Schltr., but distinguished by its larger, differently coloured flowers and the labellum.

The flowers are red, the labellum white with red markings on the lower half, rose-red on the upper half with a yellow cushion.

22. *D. nitidissimum* Rchb. f., in Journ. Linn. Soc. XV (1876), p. 112; in Linnaea XLI (1876), p. 41.

Solomon Islands: No specific location details—Moseley, in Mar. 1875.

This species is unknown to me at present. I have included it since I am not certain whether the plant originates from the British or German Solomon Islands. The species described by Kränzlin (in 'Engl. Pflanzenr.' IV, 50, II. B., 21, p. 337) and illustrated (p. 338) as *Diplocaulobium nitidissimum* Krzl. certainly does not belong here, but perhaps to *D. mekynosepalum* Schltr.

23. *D. phalangium* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 154.

Diplocaulobium phalangium Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21, p. 339.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1100 m—R. Schlechter no. 14345, flowering in Apr. 1902; no. 20322 flowering in Sept. 1909.

Undoubtedly, this species is related closely to the following ones, but it appears to me to differ in the shape of the labellum which is here distinctly tri-lobed and broader in front.

The flowers are rose-red, the labellum is white with brown-violet veins and white cushion.

24. *D. fariniferum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, 10–16 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi obclavata petioliformibus, gracilibus, teretibus, 3–11 cm longis, supra basin 0.4–0.7 cm diametientibus, medio et apice c. 0.2 cm diametientibus, unifoliatis; folio erecto vel suberecto, lineari-ligulato, apice subacutae et inaequaliter bilobulato, glabro, textura subcoriaceo, 5–7 cm longo, medio fere 5.5–7.5 mm lato; spatha apicali, compressa, subacuta, c. 1.5 cm longa; floribus paucis, succedaneis, erectis vel suberectis; sepalis anguste lanceolatis, attenuato-elongatis, obtusiusculis, c. 2.8 cm longis, glabris, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum, 0.6 cm longum formantibus; petalis lineari-lanceolatis, elongato-attenuatis, obliquis, glabris, sepalis paulo brevioribus; labello impartito, ligulato-oblongo, obtuso, supra medium leviter margine undulato, 1 cm longo, infra medium c. 0.4 cm lato, carinis 2 parallelis, e basi usque ad medium fere decurrentibus, pulvillo oblongo, farinoso, parvulo intermedio anteposito; columna brevi, clinandri lobulis lateralibus trifidis, dorsali dentiformi, acuto; anthera galeato-cucullata, antice obtusissima, dorso obtuse umbonata, glabra; ovario cum pedicello gracili, glabro, c. 3.8 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the mountain forests of Bolobo, alt. c. 900 m—R. Schlechter no. 16526, flowering in Sept. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17817, flowering in May 1908.

The species is related closely to *D. phalangium* Schltr., but has narrower leaves; the lip is somewhat less distinctly tri-lobed and is narrowed in front, the clinandrium is lacerated. From *D. pulvilliferum* Schltr. it differs in the smaller flowers and in the labellum. The flowers are whitish with yellow tips and in its lower half the labellum is red-veined.

25. *D. pulvilliferum* Schltr., sp. nov.

Epiphyticum, erectum, 12–22 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi obclavata gracilibus, teretibus, petioliformibus, 3.5–11 cm longis, supra basin 0.6–0.8 cm diametientibus, medio et apice 1.5–2 mm diametientibus, unifoliatis; folio erecto vel suberecto, ligulato, apice subacute bilobulato, basi cuneato, 6–9 cm longo, medio fere 1–1.6 cm lato; spatha apicali obtusiuscula, c. 2 cm alta, compressa; floribus illis *D. phalangium* Schltr. similibus; sepalis lanceolatis, elongato-attenuatis, glabris, c. 4.25 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum breve obtusum c. 0.6 cm longum formantibus; petalis obliquis, linearibus, elongato-attenuatis, sepalis paulo brevioribus; labello subpandurato-ligulato, e medio obscure trilobato, c. 1.4 cm longo, infra medium 0.5 cm lato, lobis lateralibus valde abbreviatis, obtusissimis, subobsoletis, intermedio oblongo-elliptico, subapiculato, margine valde undulato-crenato, glabro, carinis 2 subparallelis, puberulis e basi usque in tertiam partem apicalem decurrentibus, pulvillo farinoso-puberulo, elliptico-lanceolato, utrinque acuto, intermedio e medio labelli usque infra apicem ornato; columna brevi, glabra, clinandrii lobis lateralibus paucidentatis, dorsali triangulo, majore; anthera suborbiculari-cucullata, antice truncata, dorso gibbo donata, glabra; ovario cum pedicello gracili, glabro, c. 5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna on the Waria [River], alt. c. 500 m—R. Schlechter no. 19241, flowering in April 1909; on trees in the forests of [Mount] Mimi (Waria District), alt. c. 700 m—R. Schlechter no. 19477 (TYPE), flowering in May 1909.

This is also a close relative of *D. phalangium* Schltr., but differing from it in its broader leaves and usually less robust growth, as well as in the labellum.

The flowers are reddish white with brown tips, the labellum white with dark red-veined and margined lateral lobes, and a yellow cushion.

26. *D. mischobulbum* Schltr., sp. nov.

Epiphyticum, erectum, caespitificum, 15–20 cm altum; rhizomate brevi, squamis longe vaginantibus oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, petioliformibus, basin versus sensim paululo ampliatis, glabris, 6–12 cm longis, supra basin 0.2–0.3 cm diametientibus, apice 1.5–2 mm diametientibus, unifoliatis; folio erecto vel suberecto, lineari-ligulato, subacute et inaequaliter bilobulato, glabro, basi subpetiolato-cuneato, 6.5–9 cm longo, medio fere 0.5–0.7 cm lato; spatha apicali, compressa, subacuta, glabra; floribus erectis vel suberectis, illis *D. phalangium* Schltr. similibus; sepalis lanceolatis, attenuato-elongatis, glabris, c. 2.8 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum, c. 4.5 mm longum formantibus; petalis lineari-lanceolatis, attenuato-elongatis, glabris, sepalis subaequilongis; labello e basi oblonga infra medium trilobato, 1.1 cm longo, infra medium 0.4 cm lato, lobis lateralibus obtusatis, abbreviatis, intermedio pandurato, marginibus recurvulis, basi undulato-crenulato producto, carinis 2 parallelis apice paulo dilatatis e basi labelli usque in medium decurrentibus, pulvillo parvulo ovali farinoso-puberulo, antice in rostrum glabrum producto ornato; anthera subgloboso-cucullata, glabra, antice truncata; columna brevi, glabrata, clinandrii lobis lateralibus paucidentatis, brevibus, dorsali subulato, multo longiore, glabra; ovario cum pedicello glabro, gracili, c. 4.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000–1300 m—R. Schlechter no. 18030, flowering in July 1908; no. 19121, flowering in Jan. 1909.

The first specimen of this species which I found formed a patch about 50 cm in diameter. The species is very similar in its flowers to *D. phalangium* Schltr., but differs externally in the very slender pseudobulbs.

The flowers are white with yellow tips; the labellum white, with red veins in its lower half, pale yellow in front.

27. *D. ischnopetalum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 153.

Diplocaulobium ischnopetalum Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 333.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 550 m—R. Schlechter no. 14631, flowering in July 1902.

Evidently, this species is related to *D. nitidissimum* Rchb. f. mentioned above, but is distinguished easily by its labellum.

The colour of the flowers noted at the time is pink, the labellum yellow in the middle.

28. *D. pleurothalloides* Krzl., in Österr. Bot. Zeitschr. XLV (1895) p. 178.

Diplocaulobium inauditum Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 341 (p.p.).

Neu-Mecklenburg: Near Port Praslin—Micholitz in 1894.

This species has been united by Kränzlin with *D. inauditum* Rchb. f., with which it is certainly not identical. Apart from its growth I find very considerable differences in the lip of the Type previously sent to me by its author. The plant evidently stands close to *D. mekynosepalum* Schltr.

29. *D. mekynosepalum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 154.

Diplocaulobium mekynosepalum Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 337, fig. 33, A–C.

?*Diplocaulobium nitidissimum* Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 341 (excl. synon.).

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16750, flowering in Oct. 1907; on trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 14061, flowering in Jan. 1902.

The specimens from the Kani Range agree well with the Type from the Bismarck Range. I am not quite certain whether *Diplocaulobium nitidissimum* Krzl. described and illustrated by him belongs here or to *D. ischnopetalum* Schltr.; from the very poor illustration this cannot be decided.

The species certainly belongs alongside *D. pleurothalloides* Krzl. and *D. guttulatum* Schltr., but it is distinguished by the shorter keels on the labellum. *D. ischnopetalum* Schltr. also belongs to this relationship.

30. *D. guttulatum* Schltr., sp. nov.

Epiphyticum, gracile, 25–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi obclavata petioliformi-attenuatis, teretibus, 15–23 cm longis, basi usque ad 1 cm diametientibus, medio et apice 2–3 mm diametientibus, unifoliatis; folio erecto vel suberecto, oblongo, obtuso, apice breviter exciso, 5–7 cm longo, medio fere 1.4–1.6 cm lato; spatha apicali, compressa, acuta, usque ad 1 cm longa; floribus paucis, succedaneis, erectis vel suberectis; bracteis minutis, deltoideis; sepalis e basi lanceolata elongato-attenuatis, glabris, c. 3 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 0.3 cm longum formantibus; petalis oblique lineari-lanceolatis, attenuato-elongatis, glabris, sepalis paululo brevioribus; labello e basi cuneata quarta parte basali trilobulato, c. 1.2 cm longo, inter apices loborum lateralium 0.4 cm lato, infra apicem 0.6 cm lato, lobis lateralibus brevibus oblique oblongis, obtusis, intermedio e isthmo oblongo in laminam reniformem obtusissimam, margine ciliatam expanso, carinis 2 subparallelis, medio flexuosis e basi labelli, infra apicem confluentibus, glabris ornato, pulvillo farinoso intermedio addito; columna brevi, clinandrii lobis lateralibus abbreviatis, serrulatis, dorsali dentiformi, parvulo; anthera reniformi-cucullata, antice subretusa, dorso gibbo ornata, glabra; ovario cum pedicello gracili, glabro, 2.5–3 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests of Bolobo, alt. c. 700 m—R. Schlechter no. 16528, flowering in Sept. 1907; on trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19892 (TYPE), flowering in May [Ed.—possibly June] 1909.

The species is related most closely to *D. mekynosepalum* Schltr., but readily distinguished by the labellum, on which the keels extend as far as the tip. Furthermore, the colour of the flowers is different in that the lower half of the labellum is red-spotted. I have found this species only twice and on both occasions the specimens carried few flowers.

31. *D. iboense* Schltr., sp. nov.

Epiphyticum, erectum, 15–20 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, basin versus paulo ampliatis, ancipitibus, unifoliatis, 7–11 cm longis, basi usque ad 5 cm latis; folio erecto vel suberecto, lineari, obtuso, apice valde inaequaliter bilobulato, glabro, textura subcoriaceo, 4.5–7 cm longo, 0.3–0.5 cm lato; spatha apicali, compressa, acuta, c. 1.5–1.7 cm longa; floribus paucis, succedaneis, erectis vel suberectis; sepalis anguste lanceolatis, elongato-acuminatis, glabris, c. 4 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum oblongoideum, obtusum, c. 0.5 cm longum formantibus; petalis linearibus filiformi-elongatis, glabris, sepalis paulo brevioribus, glabris, labello e basi cuneata tertia parte basilari trilobato, c. 0.9 cm longo, inter apices loborum lateralium c. 4.5 mm lato, lobis lateralibus falcato-oblongis, obtusis, intermedio fere 3-plo longiore, e ungue ligulato reniformi, 5.5 mm lato, obtusissimo, glabro, carinis 2 subparallelis e basi labelli usque supra medium lobi intermedii, carina brevi intermedia infra apicem interposita; columna brevi, glabra, clinandrii lobis minute serrulatis; anthera quadrato-galeata, antice obtusissima, glabra; ovario cum pedicello gracili, glabro, c. 4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17799, flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 17978, flowering in July 1908.

This species may be distinguished always from its relatives by the two-edged, straw-coloured pseudobulbs. Apparently it occurs generally singly, for I have never collected more than two specimens at a time.

The flowers are pale yellow with brown tips; the lateral lobes of the labellum are dotted light brown; the middle lobe is white.

32. *D. pentanema* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 155.

Diplocaulobium pentanema Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 339.

Neu-Mecklenburg: On trees in the mountain forests of Punam, alt. c. 600 m—R. Schlechter no. 14679, flowering in July 1902.

A very characteristic species resembling *D. xanthocaulon* Schltr. most closely in habit, but it is quite different in the shape of the labellum. *D. longicolle* Lindl. also belongs to this relationship, but approaches *D. xanthocaulon* Schltr. more closely than *D. pentanema* Schltr.

The flowers are white with yellowish tips; the labellum white, with purple-veined lateral lobes and a yellow-green centre.

33. *D. xanthocaulon* Schltr., sp. nov.

Epiphyticum, caespitificum, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cauliformibus vel petioliformibus, gracilibus, ancipitibus, unifoliatis, basin versus paululo ampliatis, 15–26 cm longis, basi 0.7–1.2 cm latis; folio erecto vel suberecto, ligulato, subacuto, glabro, 14–18 cm longo, medio fere 2.3–3 cm lato, basi cuneato; spatha apicali compressa, acuta vel acuminata, c. 2.5 cm longa; floribus paucis, succedaneis, erectis vel suberectis; sepalis anguste lanceolatis, elongato-attenuatis, glabris, 3–4 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 4 mm longum formantibus; petalis oblique lineari-lanceolatis, elongato-attenuatis, sepalis paulo brevioribus; labello e basi cuneata in quarta parte basali trilobato, c. 1.4 cm longo, inter apices loborum lateralium 4.25 mm lato, lobis lateralibus oblique triangulis, obtusis, abbreviatis, intermedio e isthmo obcuneato-ligulato in laminam reniformem apiculatam, basi crenato-undulatam subito dilatato, glabro, lamina c. 4.25 mm longa, supra basin c. 5 mm lata, carinis 2 parallelis e basi labelli usque ad apicem isthmi lobi intermedii decurrentibus, glabris; columna brevi, glabra, clinandrii lobis lateralibus obtusatis, dorsali dentiformi acuto; ovario cum pedicello glabro, gracili c. 11 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18915, flowering in Dec. 1908; on trees in the forests of the mountain near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19282, flowering in Apr. 1909.

Of all the species in the section, this has the most resemblance to *D. longicolle* Lindl. from Singapore. It is, however, distinguished readily by its more robust growth and the shape of the lip. All the above-mentioned species have great similarity in the sepals and petals, so that the species can never be distinguished by these segments. The flowers are pale yellow with white tips, the labellum golden yellow with red dots and red tips to the lateral lobes. The column-foot has a red spot.

34. *D. auricolor* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XLV (1911), p. 3.

var. *major* Schltr., var. nov.

Differt a forma typica floribus bene majoribus, lobo intermedio labelli magis producto, apiculato.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20295, flowering in Sept. 1909; on tall trees in the forests of the Kani Range, alt. c. 1800 m—R. Schlechter no. 17042, flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 19082, flowering in Jan. 1909; on trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19887 flowering in May [Ed.—possibly June] 1909.

The specimens are distinguished from *D. auricolor* J.J. Sm. chiefly by the size of the flowers. Evidently the plant is distributed widely in the Territory.

The flowers are orange-yellow with red crests on the labellum.

var. *minor* Schltr., var. nov.

Differt a forma typica floribus minoribus, petalis angustioribus, labelli lobo intermedio pro magnitudine labelli longiore.

Kaiser-Wilhelms-Land: On trees in the forests near the Djamu Gorge, alt. c. 400 m—R. Schlechter no. 16685, flowering in Oct. 1907.

Perhaps also merely a variety which possibly may have originated by the plant descending to lower levels.

The flowers are reddish on the outside and paler inside.

35. *D. regale* Schltr., sp. nov.

Epiphyticum, erectum, gracile, 50–70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi obclavato-ampliata attenuatis, petioliformibus, teretibus, 40–60 cm longis, unifoliatis, supra basin usque ad 2 cm diametientibus, medio et apice 2.5–3.5 mm diametientibus; folio erecto vel suberecto, oblongo-ligulato, obtuso, apice minute exciso cum apiculo minuto, 12–20 cm longo, medio fere 2.7–3.5 cm lato, glabro, textura coriaceo; spatha apicali, compressa, c. 2 cm alta; floribus paucis succedaneis, erectis vel suberectis, speciosis; sepalis oblongo-ligulatis, obtusis, c. 3.7 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum breve, c. 0.7 cm longum formantibus; petalis oblique ellipticis, obtusis, glabris, sepalis subduplo latioribus, fere aequilongis; labello curvato perlate rhombeo, supra medium trilobato, c. 1.2 cm longo, explanato c. 1.4 cm lato, lobis lateralibus erectis, brevibus, rotundatis, intermedio late triangulo, obtuse apiculato, laterales superante, carinis 2 satis altis antice leviter divergentibus e basi labelli usque in basin lobi intermedii decurrentibus; columna brevi, glabra, labello plus duplo brevior, clinandrio lobulato; anthera quadrato-cucullata, antice truncata, glabra; ovario cum pedicello glabro, gracili, 5–6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19068, flowering in Jan. 1909; on trees in the forests of the Dischore Range above Dschischungari (Waria District) alt. c. 1200 m—R. Schlechter no. 19583, flowering in May 1909.

A magnificent plant, closely related to *D. auricolor* J.J. Sm., but is well distinguished by the colour of the flowers and shape of the labellum. This species, more than any other, deserves to be introduced in a living state into European collections.

The flowers are dark rose-red, the lip is white with purple-red-stripes, the column is white.

var. *euanthum* Schltr., var. nov.

Differt a forma typica floribus paulo majoribus, petalis latioribus, labello antice magis producto.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16966, flowering in Dec. 1907.

It is probable that this variety, which is still prettier than the Type-form, will later on prove to be a separate species. It is distinguished not only by the above-mentioned characteristics, but also by the colour of the flowers. The latter are purple-red with a pale yellow front lobe to the lip, and a white column.

§ 5. *Bolbidium*

At present only one species, *D. Micholitzii* Rolfe, has been recorded from our Territory. Perhaps *D. quinarium* Rolfe, which is reputed to come from British Papua, belongs to this section. I may, however, state immediately that I have never collected a species of the section in New Guinea and I consider it possible that the origin of the first-mentioned is to be sought further west. Thus, for example, *D. Micholitzii* Rolfe bears such a striking resemblance to *D. hymenanthum* Rchb. f. from the Philippines that I consider it possible for the two to be identical. Since the collector Micholitz has often visited the Philippines such a mistake could very easily have occurred. I include the species here despite my doubts about its origin.

36. *D. Micholitzii* Rolfe ex Ames, Proc. Biol. Soc. Wash. XVII (1904), 119; Orchidaceae I (1905), p. 41 t. 11.

Deutsch-Neu-Guinea—(No locality given)—Micholitz.

This species awaits further comparison with *D. hymenanthum* Rchb. f. According to Micholitz, two coloured varieties exist; one is creamy white with a greenish orange-yellow spot, the other has red veins.

§ 6. *Euphlebia*

Only five species from this small section are known at present, viz. *D. spurium* (Bl.) J.J. Sm., *D. amboinense* Hook. f., *D. lacteum* Krzl., *D. inaequale* Rolfe and *D. bicostatum* J.J. Sm. Perhaps *D. quinarium* Rolfe also belongs here. *D. chrysocrepis* Par. et Rchb. f., placed here by Kränzlin, would perhaps be placed better in *Eugenanthe*.

The species are distributed over a region beginning in the west on the Malay Peninsula and extending through the Greater Sunda Islands, the Philippines and the Moluccas to the eastern part of New Guinea, including the Bismarck Archipelago.

The characteristics of the section have been described in detail already, therefore I need mention only that we meet here for the first time in the section a racemose inflorescence in *D. amboinense* Hook. f. In other respects the flowers still retain the characteristic of the previous sections, viz. only lasting one day.

The species are well distinguished from each other and may, in particular, be recognised easily by the shape of the lip. Three species occur in our Territory, viz. *D. lacteum* Krzl., the widely distributed *D. inaequale* Rolfe, and a very characteristic species, *D. coeloglossum* Schltr., which is described here for the first time. Both [sic] are inhabitants of the forests of the hill-country in which they reach to the lower boundary of the mist-forest formation.

They occur always as epiphytes not very high above the ground on smooth, moss-covered tree-trunks where they grow in an oblique upright position or hanging slightly downwards.

37. *D. lacteum* Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 334.

Neu-Mecklenburg: Near Port Praslin—Micholitz, 1894.

According to a piece of the Type which I exchanged with the author a few years ago, the plant gives the impression of being a poor specimen of *D. amboinense* Hook. f.

Otherwise it strongly resembles *D. inaequale* Rolfe. Unfortunately, I have too little material to be able to decide to which of the two species it stands closest. The flowers are reputed to be white with orange-yellow tubercles and lines on the labellum.

38. *D. inaequale* Rolfe, in Kew Bull. (1901), p. 147; Bot. Mag. t. 7745

D. purissimum Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 264.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17620, flowering in Apr. 1908; on trees in the forests of [Mount] Gomadjidji (Waria District), alt. c. 450 m—R. Schlechter no. 19925, flowering in June 1909; on trees in the forests of [Mount] Dscheregi (Waria District), alt. c. 500 m—R. Schlechter no. 17436, flowering in Mar. 1908; on trees in the forests of the Dischore Range (Waria District), alt. c. 900 m—R. Schlechter no. 19647, flowering in May 1909.

Evidently the species is distributed widely in the Territory, for it occurs both in Dutch New Guinea and in British Papua, and seems to extend westwards to the Aru Islands. *D. purissimum* Krzl., established by Kränzlin, I cannot separate from this species. The flowers are ephemeral, not only in this, but in all other species.

39. *D. coeloglossum* Schltr., sp. nov.

Epiphyticum, erectum, c. 20 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis clavatis, vulgo 4–5-angulatis, basin versus conspicue attenuatis, vaginis paucis mox caducis primum obsessis, apice unifoliatis, 6.5–11 cm altis, supra medium 1–1.5 cm crassis, lucidis; folio erecto vel suberecto, elliptico-lanceolato, acuto vel subacuto, glabro, textura subcoriaceo, 7–12 cm longo, infra medium 2–2.7 cm lato; floribus ad apices pseudobulborum sublateralibus, in inflorescentia uniflora (an semper?), pulchris, illis *D. inaequalis* Rolfe similibus et fere aequimagnis; pedunculo perbrevis; bractea minuta deltoidea; sepalis oblongis, obtusis, glabris, c. 2.6 cm longis, lateralibus obliquis, extus carinatis, basi margine anteriore sensim paulo ampliata cum pede columnae mentum breve obtusum, c. 0.5 cm longum formantibus; petalis oblique oblongo-spathulatis, subacutis, glabris, sepalis subaequilongis; labello cochleari-concavo, explanato late rhombeo obscure trilobato, subcuspidato-apiculato, c. 2.3 cm longo, supra medium 2.8 cm lato, basi squama oblongo-quadrata apiculata ornato, lamellis vel squamis 2 divergentibus obliquis tridentatis antepositis, medio serie duplici carinarum 5 instructo; columna brevi, illo *D. inaequalis* Rolfe simili, glabra; anthera quadrato-cucullata, antice truncata, apice puberula; ovario cum pedicello cylindrico, glabro, curvato, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji, near Pema on the Waria [River], alt. c. 400 m—R. Schlechter no. 19910, flowering in June 1909.

A very pretty, attractive species which may best be placed alongside *D. inaequale* Rolfe. It is recognised easily by the broader sepals and petals, and by the labellum.

The flowers are white-yellow, the labellum sulphur-yellow with a brown keel in the centre.

§ 7. *Rhizobium*

Here we have a typical Australian section of which a few radiants towards the north and east have become known. The former species are represented by three Papuan ones; the latter by species in New Caledonia, the Viti [Fiji] and Samoan Islands, with the most eastern sentinel being *D. crispatum* Sw. from the Tahitian group of islands. As might be expected in Australian forms the species exhibit a distinctly xerophytic character. This has been retained by the few species found outside the Australian continent and applies also to the three species recorded from New Guinea, of which *D. chordiforme* Krzl. and *D. flagellum* Schltr. come from German New Guinea, and *D. desmotrichoides* J.J. Sm. from Dutch New Guinea.

The section is divided easily, since about half the species have rather broad and

mostly flat leaves, those of the others being terete, whip-shaped. The above-mentioned *D. desmotrichoides* J.J. Sm. belongs to the first group, the two species from German New Guinea to the second.

Concerning those occurring in our Territory, I can give details only of *D. flagellum* Schltr., since *D. chordiforme* Krzl. is unknown to me in the living state and the statements about its occurrence are only general. *D. flagellum* Schltr. is found on isolated trees in the hot along-plains at the foot of the Bismarck Range, where it is exposed often to considerable continuous heat and appreciable drought, thus having selected a location completely resembling that of its relatives in Australia.

40. *D. chordiforme* Krzl., in Engl. Pflanzenr. IV, 50, II, 21 (1910), p. 292.

Kaiser-Wilhelms-Land: In the primary forest of the Sattelberg, epiphytic—C. Lauterbach no. 484.

This species is still unknown to me. The flowerless Type in the Berlin Herbarium resembles *D. flagellum* Schltr., but, according to Kränzlin's description, the flower varies so much that it is impossible to compare the two more closely.

41. *D. flagellum* Schltr., sp. nov.

Epiphyticum ramosum, dependens, usque ad 50 cm longum; rhizomate basi tantum radicante, elongato, cauliformi, vaginis arcte amplexantibus oblecto, flexuoso; radicibus filiformibus elongatis, flexuosis, glabris; pseudobulbis valde distantibus, more sectionis minutis, vix 0.5 cm longis, cylindraceutis, unifoliatis, folio crassitudine fere aequalibus, 6–10 cm distantibus; foliis filiformi-flagelliformibus, teretibus, carnosulis, subacutis, 30–37 cm longis, medio fere c. 2.5 mm diametentibus; racemis subaxe multifloris, usque supra basin floriferis 8–13 cm longis, gracilibus; bracteis minutis deltoideis, pedicello filiformi multoties brevioribus; floribus patentibus illis *D. crispatis* Sw. similibus; sepalis oblongo-lanceolatis, acutis, glabris, c. 1.4 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum, breve, c. 3.5 mm longum formantibus; petalis lineari-subspathulatis, acutis, obliquis, sepalis subaequilongis; labello e basi cuneata infra medium trilobato, vix 1.3 cm longo, inter apices loborum lateralium c. 4.5 mm lato, lobis lateralibus brevibus, oblique triangulis, subacutis, intermedio lanceolato, acuminato, margine undulato, laterales multo superante, carinis 2 e basi labelli infra medium approximatis, dimidio superiore leviter divergentibus, subflexuosis, usque infra apicem lobi intermedii decurrentibus, carina intermedia recta e medio usque in apicem interposita; columna brevi, glabra, clinandrio trilobato, lobulis lateralibus intermedio dentiformi paulo brevioribus; columna rhomboideo-galeata, antice minute papillosa, truncata; ovario subclavato, glabro, cum pedicello filiformi gracillimo c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On isolated trees in the grass flats on the Malia [River], near the Keneja Base, alt. c. 150 m—R. Schlechter no. 18402, flowering in Oct. 1908.

In habit this species resembles *D. chordiforme* Krzl. very closely, but the latter, of which I have never seen a flower, must be quite different, for, according to the description, the flowers are smaller and have a rather differently shaped labellum.

The colour of the flowers in *D. flagellum* Schltr. is snow-white with a pale yellow anther.

§ 8. *Sarcopodium*

No species of this section are as yet known from German New Guinea and its associated islands, but two species, *D. simplex* J.J. Sm. and *D. uncipes* J.J. Sm., were discovered in the Goliath Mountains of Dutch New Guinea early in 1911 and also later on. It is possible therefore that related species may be found in our Territory.

The section comprises roughly those species which Kränzlin in his repeatedly mentioned treatise has enumerated under the genus *Sarcopodium*, with the exception of *S. prasinum* (Lindl.) Krzl., *S. parvulum* (Rolfe) Krzl. (*Dendrobium*, Section *Oxyglossum*), *S. Beccarianum* Krzl. (*Eria longepens* Ridl.), *S. Treacherianum* (Rchb. f.) Krzl., but with the inclusion of *D. Nakahareii* Schltr., *D. Fargesii* Finet, *D. speculum*

J.J. Sm., *D. radicosum* Ridl. and several others. Nearly all the species are native to the mountains and in our Territory, occurring probably at higher altitudes only.

§ 9. *Latourea*

The species of this already rather important section belong to the most beautiful orchids of New Guinea. Evidently, its centre of distribution must be considered this island, for comparatively only a few occur outside the Territory. These few species have found their way westwards to Java, where *D. macrophyllum* A. Rich. represents the furthest sentinel. Towards the east in the Viti [Fiji] and Samoan Islands we find *D. Gordoni* S. Moore as the most remote representative of the section.

Its distinction from the section *Dendrocoryne* is not always easy, because certain species appear to be transitional, but in general the Australian *Dendrocoryne* species are, in spite of the xerophytic character of their native land, of much thinner or less fleshy consistency in their flowers and with a much looser attachment of their labellum, which is provided with thinner, finer crests, instead of the thick fleshy excrescences in the *Latourea* labellum.

Altogether, the Australian *Dendrocoryne* species give a different impression from those of *Latourea*, so much so that I would urge the separation of the two sections. Kränzlin, who otherwise has united some fairly heterogeneous elements in his subgenus *Dendrocoryne*, has, in his sectional divisions, fairly well separated *Dendrocoryne* from my opinion of *Latourea*. His sections *Leiotheca* and *Trachytheca*, after removing some of the less related species, would be about the equivalent of what I have designated *Latourea*, while his section *Speciosa* would fairly well represent *Dendrocoryne*. His four other sections, *Tokai*, *Superbientia*, *Euphlebia* and *Platycaula* belong, in my opinion, to an altogether different relationship.

It would with certainty appear that the section *Dendrocoryne* has not been identified in New Guinea, but *Latourea* already includes 21 species from German New Guinea alone and there is little doubt that this number will increase appreciably. A number of these species have been described already from other parts of the region, and the following can now be added: from British Papua, *D. Hodgkinsonii* Rolfe, *D. convolutum* Rolfe (which is entirely different from *D. bifalce* Lindl.) *D. atrovioleaceum* Rolfe and *D. Forbesii* Ridl. with which *D. Ashworthiae* O'Brien seems almost identical. From Dutch New Guinea we know *D. brachythecum* F.v.M. et Krzl. (a rather doubtful species which perhaps will have to be united with *D. macrophyllum* A. Rich.) *D. biloculare* J.J. Sm. and *D. subquadratum* J.J. Sm. To the species from British Papua there must be added another plant established as a separate genus of the *Bulbophyllinae* by Kränzlin, but which, evidently, represents a *Dendrobium* related to *D. aberrans* Schltr. I refer to *Sayeria paradoxa* Krzl., to which I would like to apply the name *D. Sayeria* Schltr.

The species of the section can be divided into two species-groups which have been recognised also by Kränzlin in his two sections *Leiotheca* and *Trachytheca*. These, however, should not be regarded as separate sections because the species of the one often are related closely to some of the other group and we would then be obliged to admit too many small sections to the genus, a practice which in this case especially I wished to avoid. In the descriptions which follow, I have placed first those species which correspond to *Leiotheca*, i.e., those which have an ovary without soft prickles; then come the *Trachytheca* species, the ovary of which is covered with soft prickles, the former being related more closely to the section *Dendrocoryne* than the latter. At the beginning are a series of aberrant species, which are a little isolated by their habit and floral construction.

Nearly all *Latourea* species are natives of the mist-forest zone in the mountains, therefore requiring a great deal of humidity with ample rain and being averse to continuous high temperature. Only a single species, *D. bifalce* Lindl., is found in the hot coastal zone, growing there usually on tall trees over-hanging the sea, where it receives a certain amount of coolness. That it is capable also of bearing severe heat and much sun is proved by specimens which I observed for two years on some dead trees, where they flowered regularly and seemed to thrive. A few species such as *D. pachystele* Schltr., *D. Sikini* Schltr. and the beautiful *D. spectabile* Miq. descend to about 300 m altitude, but they prefer cool, shady localities, such as between moss on trees and near rivers and creeks arising in the mountains. Nearly all the other species occur on tree-trunks in the mist-forests and very occasionally on the thicker branches of giant trees in the primary forest. This applies in particular to those related to *D. polysema* Schltr. I have found only one species, *D. torricellense* Schltr., growing always terrestrially. This is found between shrubs in the peaty layers of roots, which are often formed on mountain ridges in the mist-forest zone.

42. *D. aberrans* Schltr., sp. nov.

Epiphyticum, pro sectione parvulum, gracile, 14–25 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi gracili sensim clavato-fusiformibus, apice bifoliatis, 7–18 cm longis, supra medium 0.4–0.7 cm diametientibus, mox longitudinaliter sulcatis; foliis erecto-patentibus vel subpatentibus, ellipticis vel ovato-ellipticis, obtusiusculis, glabris, textura coriaceis, 4–6.5 cm longis, medio vel infra medium 1.7–2.5 cm latis; racemis ex axillis foliorum superiorum gracillimis, usque ad 7 cm longis, laxe paucifloris, pedunculo tenui, vaginulis paucis dissitis squamiformibus obsesso, satis longo; bracteis ovalibus vel ovato-lanceolatis, breviter acuminatis, ovario multo brevioribus; floribus in sectione inter minores, textura crassiusculis, glabris; sepalis late oblongis, obtusis, 0.7 cm longis, lateralibus apiculatis, margine anteriore basi ampliata cum pede columnae mentum oblongoideum, obtusum c. 5 mm longum formantibus; petalis oblique lanceolato-ligulatis, acutis, margine minute ciliato-serratis, subfalcatis, 5.5 mm longis; labello articulado, hypochilio (vel ungue) quadrato-concavo, intus basi callo triangulo concavo donato, 3.5 mm longo, epichilio (lamina) circuitu late trapezoideo, usque infra medium trifido, segmentis lateralibus oblique oblongo-falcatis, obtusis, intermedio oblongo-ligulato apice obtuse bilobulato, lateralibus haud longiore, callis 2 parvulis in basi hypochilii carinis 3 divergentibus utrinque latere auctis; columna brevi crassiuscula, glabra, clinandrii lobis lateralibus falcato-triangularis, acutis, dorsali aequilongo rotundato, pede antice excavato, apice inflexo; anthera subreniformi-cucullata, obtusiuscule apiculata, glabra; ovario cum pedicello gracili glabro, 1.3–1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, (Waria District), alt. c. 1300 m—R. Schlechter no. 19550, flowering in May 1909.

I know only one species which appears to have some relationship with this one, viz. *D. Sayeria* Schltr. from British Papua mentioned above, but in the latter the structure is much less complicated than in *D. aberrans* Schltr.

The species grows always in colonies and appears to be common in the Waria region. I have seen specimens also from British Papua at the Kew Herbarium.

The flowers are whitish, occasionally dotted with violet on the outside; the lip is pure white.

43. *D. pleurodes* Schltr., sp. nov.

Epiphyticum, erectum, gracile, 15–35 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis gracilibus, dimidio superiore anguste fusiformi-incrassatis, unifoliatis, vaginis 3–5 hyalinis primum obsessis, 8–30 cm longis, supra medium 0.3–0.6 cm diametientibus, basi 1–1.5 mm diametientibus; folio erecto vel suberecto, anguste lanceolato vel lanceolato-ligulato, acuto glabro, textura coriaceo, 7–15 cm longo, medio vel infra medium 0.5–1 cm lato; racemis valde abbreviatis, vulgo bifloris, nunc unifloris, pedunculo erecto, 0.5–0.8 cm longo; bracteis ovato-lanceolatis, acutis, ovario brevioribus; floribus erecto-patentibus, in genere inter minores, carnosulis; sepalis ovalibus, breviter acuminatis, glabris, 0.8 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongum obtusum c. 0.5 cm longum formantibus; petalis anguste linearibus, supra medium paulo dilatatis, acuminatis, incurvulis,

basi paulo decurrentibus; labello oblongo, antice trilobato, lobis lateralibus erectis, oblongo-quadratis, antice truncatis, 0.6 cm longis, 0.3 cm latis, intermedio ovato-triungulo acuto, lateralibus fere duplo brevioribus, callo alto erecto, bifido, supra medium labelli ad basin loborum lateralium; columna brevi, crassiuscula, glabra, clinandrio tridentato, pede apice excavatione obovata ornato; anthera rotundato quadrata, cucullata, glabra; ovario cylindraco, cum pedicello c. 0.8 cm longo, glabro; capsula ellipsoidea, triangulari.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19580, flowering in May 1909.

This also is an aberrant species of the section. It is conspicuous for its *Cadetia*-like habit; the flowers being on a very short stalk, generally in pairs, but the stem is so short that one might at first consider to be dealing with a sessile inflorescence. Very characteristic also are the large lateral lobes of the lip.

The flowers are greenish, the petals white at the base, the labellum with brown lobes and a white callus.

I have named the species on account of the narrow, rib-like petals bent inwards.

44. *D. pachystele* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudo-bulbis gracilibus, e basi attenuata, sensim paululo ampliatis, mox longitudinaliter sulcatis, unifoliatis, 10–25 cm longis, infra apicem rarius 0.7 cm crassitudine excedentibus; folio lanceolato vel anguste elliptico-lanceolato, acuto vel obtusiuscule acuminato, glabro, textura coriaceo, 18–30 cm longo, medio vel infra medium 3.7–4.3 cm lato; racemis lateralibus brevibus, laxe 3–6-floris, pedunculo incluso usque ad 5 cm longis; pedunculo brevi, c. 2–2.5 cm longo, basi vaginulis 2–3 obsessis; bracteis late ovatis apiculatis, ovario pedicellato plus duplo brevioribus; floribus in genere inter mediocres, carnosulis, glaberrimis; sepalis ovatis, obtusiusculis, c. 1.2 cm longis, lateralibus obliquis, basi margine anteriore conspicue ampliata cum pede columnae mentum late conicum obtusiusculum c. 0.9 cm longum formantibus; petalis oblique ligulato-lanceolatis, acutis, glabris, sepalis paulo brevioribus, 1 cm longis; labello concavo-curvedo, petalis fere aequilongis, subtus apiculato, explanato rhombeo, supra medium 1.2 cm lato, apice subretuso, supra medium obscure trilobato, callo lineari, longitudinaliter leviter bifoveolato apice trilobulato e basi usque in medium fere instructo; columna perbrevis, crassa, clinandrio dorso in lobum oblongum producta, pede curvato; anthera subreniformi-cucullata, antice truncata, subtridentata, glabra; ovario cum pedicello cylindraco, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Finisterre Range on the Kambaran [River], alt. c. 400–500 m—R. Schlechter no. 19182, flowering in Jan. 1909.

In the structure of the flowers this species is related to *D. leucohybos* Schltr., but inasmuch as the inflorescence is always produced laterally on the single-leaved pseudobulb, often far below the leaf, it deviates from the usual *Latourea* species. The flowers are whitish cream-coloured.

var. *homoeoglossum* Schltr., sp. nov.

Differt a forma typica petalis latioribus, labello ovali, acuto, ecallosso, columna erostellata.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 600–800 m—R. Schlechter no. 17255, flowering in Jan. 1908.

A semi-peliorial variety of the Type, the colour of the flowers is identical.

45. *D. leucohybos* Schltr., sp. nov.

Epiphyticum, erectum vel subpatulum, 20–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindracois, basin versus vulgo paulo attenuatis, bifoliatis, 10–17 cm longis, supra medium 5–7 mm diametentibus; foliis erecto-patentibus, elliptico-lanceolatis, acutis vel acuminatis, glabris, textura subcoriaceis, 11–14 cm longis, medio vel infra medium 2.8–3.2 cm latis; racemis erecto-patentibus, ad apices pseudobulborum singulis, folio fere duplo brevioribus, dimidio superiore sublaxe 3–5-floris; bracteis ovatis, apiculatis, glabris, ovario pedicellato multo brevioribus; floribus erecto-patentibus in sectione mediocribus, glabris; sepalis ovalibus, acutis vel subacutis, nunc subacuminatis, c. 1.1 cm longis, lateralibus obliquis, basi margine

antere ampliata cum pede columnae mentum late conicum obtusiusculum c. 0.7 cm longum formantibus; petalis oblique oblongo-lanceolatis, acutis, glabris, sepalis subaequilongis; labello e basi cuneata late rhomboideo, obtusissimo, indiviso, curvato-concavo, callo satis alto, lineari, adscendente, superne tenuiter carinato, apice minute bilobulato in basi; columna brevi, crassiuscula, clinandrio trilobulato, pede apice excavatione semioblunga donata; anthera subreniformi, antice truncata, facie gibbo transversa triangulo ornata, glabra; ovario cum pedicello cylindrico clavato, glabro, c. 1.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 900 m—R. Schlechter no. 17097, flowering in Dec. 1907.

In the structure of its flowers this species is very similar to *D. pachystele* Schltr., described above, but in habit it resembles *D. euryanthum* Schltr. From the latter it may be recognised easily by its undivided lip, which, in *D. euryanthum* Schltr. and its nearer relatives, is always deeply tri-lobed.

The flowers are white, the lip orange-yellow with a white callus.

var. *leucanthum* Schltr., var. nov.

Differt a forma typica floribus concoloribus albidis, labelloque albedo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17486 [Ed.—no date cited, possibly Mar. 1908], on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18000, flowering in July 1908. Both specimen numbers are colour variants of the Type-form.

46. *D. punamense* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 163.

Neu-Mecklenburg: On trees in the mountain forests of Punam, alt. c. 600 m—R. Schlechter no. 14690, flowering in July 1902.

In habit this species is very similar to *D. leucohybos* Schltr., but has broader leaves and in the structure of its larger flowers more nearly approaches *D. euryanthum* Schltr. From the latter it is distinguished by its larger flowers of a different colour, and by the shape of the labellum the middle lobe of which in its breadth equals that of the apices of the lateral lobes; whereas in *D. euryanthum* Schltr. it is much narrower. The flowers of *D. punamense* Schltr. are creamy white with green veining.

47. *D. euryanthum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 162.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14501, flowering in Apr. 1903. [Ed.—probably 1902.]

This species also resembles *D. leucohybos* Schltr. appreciably in habit, but may be distinguished easily by its deeply tri-lobed labellum. The distinctions between it and *D. punamense* Schltr. have been discussed above already.

Other relatives are *D. Sikini* Schltr. and *D. subquadratum* J.J. Sm., both of which differ in the shape of the lip.

The flowers are yellow, with an orange-red labellum veined fox-brown.

48. *D. Sikini* Schltr., sp. nov.

Epiphyticum, erectum vel subpatulum, 20–28 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, basin versus sensim attenuatis, 1–2-foliatis, 6–12 cm longis, 0.4–0.5 cm diametentibus, mox longitudinaliter sulcatis; foliis erecto-patentibus, lanceolato-ellipticis, obtusiuscule acuminatis, basi cuneatis, 12–15 cm longis, medio vel infra medium 2.5–3.5 cm latis; racemis gracilibus, folio duplo vel subduplo brevioribus, graciliter pedunculatis, apice laxe paucifloris, pedunculo filiformi 3.5–5 cm longo; bracteis erecto-patentibus, ovatis vel ovalibus, breviter acuminatis, glabris, ovario pedicellato 3–4-plo brevioribus; floribus erecto-patentibus in genere vix inter mediocres, glabris; sepalis oblongis, breviter acuminatis 1.3 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 5.5 mm longum formantibus; petalis oblique lanceolato-ligulatis, acutis vel acuminatis, c. 1.1 cm longis; labello e ungue ligulato dilatato, tertia parte anteriore trilobo, 1.1 cm longo, inter apices loborum lateralium c. 0.7 cm lato, lobis lateralibus, falcato-oblongis obtusis, intermedio subquadrato-cuneato, antice

truncato cum apiculo minuto, 0.5 cm lato, laterales plus duplo superante, callo ligulato antice dilatato et incrassato obtusissime e basi labelli usque supra basin lobi intermediarii decurrente; columna brevi, clinandrii lobo dorsali laterales superante; anthera late rotundato-cucullata, truncatula, glabra; ovario cum pedicello gracili c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests alongside mountain creeks in the Minjem Valley above Kelel, alt. c. 300–500 m—R. Schlechter no. 16283, flowering in July 1907.

Among the species known at present this one is related most closely to *D. subquadratum* J.J. Sm. from Dutch New Guinea. From the latter it may be recognised by the colour of the flowers, the shape of the middle lobe and tubercle on the lip. In other respects the two species seem to be very much alike.

I have dedicated this species to the Melanesian [native] Sikin from Neu-Mecklenburg, who together with the Melanesian Takadu, has collected so many botanical rarities for me, as well as a whole series of new orchids.

The flowers are white.

49. *D. bifalce* Lindl., in Journ. Bot. II (1843), p. 237.

Doritis bifalcis Rchb. f., Xen. Orch. II (1862), p. 7.

D. chloropterum Rchb. f. et S. Moore, in Journ. Bot. (1878), p. 137, t. 196.

Bulbophyllum oncidiochilum Krzl., in Engl. Bot. Jahrb. XVIII (1894), p. 485.

Latourea oncidiochila Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 336.

D. breviracemosum Bail., in Queensl. Agric. Journ. III (1898), p. 158.

Kaiser-Wilhelms-Land: Near Friedrich-Wilhelmshafen on trees near the beach—Micholitz, flowering in June 1893; on trees at the beach near Bulu—R. Schlechter no. 16974, flowering in Dec. 1907; on trees near the Kenejia Base, alt. c. 150 m—R. Schlechter no. 18391, flowering in Oct. 1908.

Neu-Pommern: Gazelle Peninsula, in the forest—Lauterbach no. 304, flowering in May 1890; Parkinson, in the year 1886; on trees at the beach near Herbertshöhe—R. Schlechter no. 13779 flowering in Nov. 1901; at the beach near Ralum—Dahl no. 79, flowering in Nov. 1896.

Neu-Lauenburg: On the Main Island—E. Betcher; in sparse forest on Kerawara Island—C. Lauterbach no. 94, flowering in May 1890.

Neu-Mecklenburg: Frequently on trees at the beach—Micholitz; R. Schlechter in July 1902.

This very characteristic species is most abundant in our Territory and occurs likewise both in Dutch New Guinea and British Papua. According to a statement by Micholitz it is reputed to extend in a western direction as far as Timor Laut [Tanimbar Islands].

Kränzlin has united it with *D. convolutum* Rolfe, but this is quite a different plant, which, as was very correctly stated by Rolfe, is distinguished by the broader and larger lateral lobes of the lip and the completely differently shaped middle lobe, quite apart from its very different colour. On the other hand, identical with *D. convolutum* Rolfe, is probably a plant from Dutch New Guinea, which some years ago was described as *D. biloculare* J.J. Sm., but this supposition requires a more exact comparison than is possible for me at present.

50. *D. torricellense* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 164.

Kaiser-Wilhelms-Land: In peaty ground in the forests on ridges in the Torricelli Range, alt. c. 900–1100 m—R. Schlechter no. 14358, flowering in Apr. 1902; no. 20060, flowering in Sept. 1909.

This species is distinguished easily in habit from all others of the section by its long slender pseudobulbs. In the flowers it does not really approach closely any known species of the section *Latourea*, since the mentum is directed backwards.

I have mentioned already above that *D. torricellense* Schltr. is the only *Latourea* which I have found growing terrestrially. The flowers are white, violet-flecked and spotted.

51. *D. magnificum* Schltr., sp. nov.

Epiphyticum, erectum, 60–100 cm altum; rhizomate valde abbreviato; radicibus crassiusculis, elongatis, flexuosis, glabris; pseudobulbis cylindraceis cauliformibus, apicem versus paululo incrassatis, subaxe 4–5 foliatis, mox longitudinaliter striato-sulcatis, 40–80 cm longis, apicem versus 0.7–1 cm diametientibus; foliis erecto-patentibus vel subpatentibus, ovalibus, obtusis, apice breviter excisis, glabris, textura coriaceis, 8–11 cm longis, medio fere 3–4.5 cm latis; racemo erecto ad apicem caulis, laxo 5–8-floro, usque ad 20 cm longo, pedunculo 6–8 cm longo, vaginis paucis obsessis; bracteis ellipticis, acuminatis, ovario plus duplo brevioribus; floribus speciosis, in genere satis magnis, erecto-patentibus; sepalis oblongis, subacuminato-apiculatis, nervo medio extus carinato-incrassatis, glabris, c. 2.6–2.7 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata mentum obtusum late conicum 0.4–0.5 mm longum formantibus; petalis obliquis, e basi late ligulata cuneato-spathulatis, apiculatis, sepalis aequilongis, infra apicem paulo latioribus; labello concavo, circuito obovato, quarta parte anteriore trilobato, 2.7 cm longo, inter apices loborum lateralium 1.7 cm lato, lobis lateralibus brevibus subtruncatis, intermedio semiorbiculari, apiculato, laterales excedente, callo lineari 4-carinato e basi usque ad medium labelli decurrente apiculo terminato; columna brevi crassa, clinandri lobis lateralibus subfalcatis, auriculiformibus, dorsali dentiformi, pede concavo; anthera subquadrato-cucullata, antice truncata, gibbo obscure donata; ovario cum pedicello subclavato glabro, c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2200 m—R. Schlechter no. 18750, flowering in Nov. 1908.

This plant is one of the most beautiful species of the genus in New Guinea which I know at present. It is not so much the size of the flowers as their most surprising colouring, which prompts this remark. It is truly worthy of early culture in Europe. It is altogether astonishing that New Guinea should have been so neglected by orchid collectors.

The colour of the flowers is orange-yellow with red dots and small spots contrasting markedly with the olive-green of the labellum, veined inside with red. This colour combination is quite surprising.

52. *D. chloroleucum* Schltr., sp. nov.

Epiphyticum, erectum, 12–22 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus e basi gracili paulo fusiformi-incrassatis, bifoliatis, longitudinaliter mox sulcatis, 6–17 cm longis, supra medium 0.4–0.6 cm diametientibus; foliis patentibus, oblongo-ellipticis, obtusiusculis, glabris, textura subcoriaceis, 2.3–5 cm longis, medio fere 1–2.3 cm latis; racemis singulis, apicalibus, usque ad 7 cm longis, apice laxo 1–4-floris, pedunculo gracili, pedicellis fere aequilongis; bracteis ellipticis, apiculatis, pedicello multoties brevioribus; floribus erectis vel erecto-patentibus, illis *D. rhodosticti* F.v.M. et Krzl. similibus, sed paulo minoribus; sepalis oblongis apiculatis, c. 1.4 cm longis, lateralibus obliquis, nunc subacuminatis, basi margine anteriore ampliata cum pede columnae mentum oblongoideo-conicum obtusum c. 0.7 cm longum formantibus; petalis oblique obovato-spathulatis, apiculatis, sepala distincte superantibus, 2.3 cm longis, infra apicem 1.2 cm latis; labello e ungue brevi cuneato infra medium in laminam quadrato-rhombeam, angulis obtusis apice retusam cum apiculo minuto dilatata, c. 2 cm longam, medio fere 1.6 cm latam dilatato callo ligulato superne antice obtuse carinato e basi labelli usque infra medium decurrente; columna brevi, clinandrio obtuse trilobulato; anthera subreniformi-quadrata, antice truncata, glabra; ovario graciliter pedicellato, glabro, cum pedicello c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19096, flowering in Jan. 1909; on trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19673, flowering in June 1909.

One easily could mistake this plant for *D. rhodostictum* F.v.M. et Krzl., unless it is viewed closely. It is, however, smaller in all parts, the shape of the sepals and petals is somewhat different, and, above all things, the labellum and callus at the base of the latter are of a completely different shape.

The flowers are white, with a greenish violet-veined labellum.

53. *D. rhodostictum* F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV [1894], p. 300.

D. Madonnae Rolfe, in Bot. Mag. (1903), t. 7900; Kew Bull. (1906), 32.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the Govidjoa [Creek], in the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19765, flowering in June 1909.

In recent years this species has been brought repeatedly from British Papua to Europe in the living state and now is distributed in many collections.

I must agree that Kränzlin was correct when he united *D. Madonnae* Rolfe with this species which he had described previously. In the description of *D. chloroleucum* Schltr., I have already commented on the differences between it and *D. rhodostictum* F.v.M. et Krzl. The flowers are white, the labellum is furnished on the inside near the margin with a series of violet-pink spots.

54. *D. Johnsoniae* F.v.M., in Wing's South. Sc. Record II (1882), p. 95.

D. MacFarlanei Rchb. f., in Gardn. Chron. II (1882), p. 520 (nec F.v.M.).

D. monodon Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 254.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17644, flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 600 m—R. Schlechter no. 18040, flowering in July 1908; in primary forest near the [Mount] Sattelberg, alt. c. 800 m—C. Lauterbach no. 489, flowering in July 1890; Finschhafen, near Kako—Nymann no. 314, flowering in July 1890; on trees in the forests of the Dischore Range, alt. c. 1000–1200 m—R. Schlechter no. 19646, flowering in May 1909.

According to Kränzlin, *D. niveum* Rolfe also belongs to this species, but I would not be willing to accept this without having seen the former. It is certain that *D. monodon* Krzl. in no way differs from *D. Johnsoniae* F.v.M., although Kränzlin has placed the two in different sections.

The species belongs to those whose importation into Europe should be encouraged further, for the large beautiful white flowers with their red-spotted labellum would be very much in demand as cut flowers, since they are very long-lasting. The species would seem to be distributed fairly widely, as it is found also on the south coast of New Guinea and is supposed to occur on the northern point of Australia. [Ed.—an erroneous record.]

55. *D. spectabile* (Bl.) Miq., Fl. Ind. Bat. III (1855), p. 645.

Latourea spectabilis Bl., Rumphia IV (1850), p. 41, t. 195, p. 1, t. 199, C.

D. tigrinum Rolfe ex Hemsl., Ann. Bot. V (1891), p. 507.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 14334, flowering in Apr. 1902; on tall trees in the forests on the Djamu [River], alt. c. 350 m—R. Schlechter no. 17603, flowering in Apr. 1908; on trees in the forests on the hills near Jaduna (Waria District), alt. c. 200–300 m—R. Schlechter no. 19254, flowering in Apr. 1909.

Only a few specimens from locations in German New Guinea are at hand. The plant is distributed much more widely and is by no means rare. I have noticed it in many other localities. It is most peculiar that it has not been brought from our

Territory by any other collector. The species was described originally from Dutch New Guinea, and it has been collected repeatedly from the British part of the island [British Papua], so that we may expect it to be distributed over the entire island. In recent years it often has been in cultivation, especially in England and Belgium, and I also saw it in several gardens in Singapore. Until recently it was rather isolated, but now a near-relative has been found in *D. Alexandrae* Schltr. (described below) which even surpasses in beauty the very attractive *D. spectabile* (Bl.) Miq.

The plant has been well illustrated repeatedly, so that it is not necessary to describe again the colour of the flowers.

56. *D. Alexandrae* Schltr., sp. nov.

Epiphyticum, erectum, robustum, 50–70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, dense rugulosis, glabris; pseudobulbis cauliformibus e basi attenuata, apicem versus sensim paulo ampliatis, mox longitudinaliter sulcatis, apice 3–4-foliatis, usque ad 55 cm longis, basi 0.4 cm diametientibus, infra apicem 1–2 cm diametientibus; foliis erecto-patentibus, ellipticis, acuminatis, basi cuneatis, subpetiolatis, 11–16 cm longis, medio fere 3.5–5.5 cm latis, glabris, textura coriaceis; racemis versus apices pseudobulborum singulis, usque ad 25 cm longis, suberectis, laxe 3–7-floris, pedunculo substricto, foliis fere aequilongis; bracteis erecto-patentibus, lanceolatis, acutis, ovario 3–5-plo brevioribus; floribus erecto-patentibus, speciosis, in genere inter maximos; sepalis lanceolatis, longius acuminatis, c. 5 cm longis, lateralibus obliquis, falcatis, basi margine anteriore ampliata cum pede columnae mentum obtusum late conicum c. 1.3 cm formantibus; petalis patentibus oblique lanceolatis, margine conspicue undulatis, sepalis subaequilongis; labello e ungue brevi cuneato, in laminam trilobam dilatato, petalis aequilongo, inter apices loborum lateralium arte explanato c. 3 cm lato, lobis lateralibus erectis columnam amplectentibus quadratis margine exteriori subcrenatis, c. 1.2 cm latis; lobo intermedio ovato, longe acuminato, c. 3.7 cm longo, infra medium c. 2 cm lato, callo erecto cuneato exciso cum apiculo interjecto in ungue, callo tripartito anteposito; columna brevi crassiuscula, clinandrio trilobulato, lobulis lateralibus parvulis falcatis, obtusis, dorsali paulo majore incurvulo, pede apice excavatione triangula ornato; anthera quadrato-cucullata, antice truncata, glabra; ovario cylindraco, leviter 6-costato, cum pedicello glabro, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Gobi in the Waria Valley, alt. c. 900–1100 m—R. Schlechter no. 19857, flowering in June 1909.

This magnificent species represents the first close relative of *D. spectabile* (Bl.) Miq., but it differs completely in the labellum.

The colour of the flowers is yellowish with dark red spots on the outside of the sepals and petals, the labellum pale violet with brown-violet veins and spots. The leaves are a blue-green.

I have dedicated this species to my wife Alexandra, nee Sobennikoff, who, especially in the compiling of this book on the *Orchidaceae* of German New Guinea, has always been a faithful and valuable assistant in my activities.

57. *D. musciferum* Schltr., sp. nov.

Epiphyticum, erectum, robustum, 45–65 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi attenuata fusiformi-incrassatis, mox longitudinaliter sulcatis, apice 2–3-foliatis, glabris, 25–40 cm altis, basi 0.5–0.7 cm diametientibus, infra apicem usque ad 2 cm diametientibus; foliis erecto-patentibus, ellipticis, subacutis, apice obliquis, basi cuneatis, 20–35 cm longis, medio fere 5–8.3 cm latis; racemis erecto-patentibus, folia vulgo paulo superantibus subdense 6–20-floris, pedunculo tereti, glabro, usque ad 17 cm longo, vaginulis paucis distantibus obsesso; bracteis erecto-patentibus, ovario pedicellato vulgo brevioribus, nunc subaequilongis; floribus erecto-patentibus, illis *D. macrophylli* A. Rich. similibus; sepalis oblongis, obtusiuscule et breviter acuminatis, extus praesertim basin versus setis reversis carnosissimis, c. 2.2 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum, 0.8 cm longum formantibus; petalis e basi angustiore ovali-spathulatis, oblique apiculatis, glabris, sepalis subaequilongis; labello e ungue brevi trilobo, petalis aequilongo, arte explanato inter apices loborum lateralium c. 2 cm lato, lobis lateralibus semiquadratis, truncato-obtusissimis, columnam amplectentibus, intermedio e isthmo brevi transverse ovali, apiculato, c. 1.2 cm longo, medio fere latitudine 2 cm subattingente, callo basali oblongo, leviter bilobulato, brevi; columna perbrevis, clinandrio trilobulato, lobis lateralibus obtusis, dorsali tridentato paulo longiore, pede antice

excavatione oblonga ornato; anthera late rhomboideo-cucullata, dorso emarginata, antice truncata, glabra; ovario clavato pedicellato, setis reversis carnosissimis longis densissime (quasi musciformi) oblecto, pedicello incluso c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16920, flowering in Nov. 1907; on trees on the Schibruba [Creek] above Toliba, alt. c. 700 m—R. Schlechter no. 18958, flowering in Dec. 1908; on trees in the mountain forests on the Waube [Creek] (Waria District), alt. c. 650 m—R. Schlechter no. 19455, flowering in May 1909.

This species is related closely to *D. macrophyllum* A. Rich. and I thought at first it was identical, but it was established that the flowers were more compact, the pedicels and ovaries covered more closely with bristle-like excrescences, the shape of the labellum differed considerably when spread out, and the callus at the base of the lip also differed. A comparison with a flower from the Type of *D. brachythecum* F.v.M. et Krzl. showed that the latter, which has a strong resemblance to *D. macrophyllum* A. Rich., was also not relevant.

The flowers are green, covered on the outside and on the petals with sparse violet spots. The labellum is whitish, with violet veins on the back half and violet spots in front (front lobes); callus white.

58. *D. Finisterrae* Schltr., sp. nov.

Epiphyticum, erectum, robustum, 55–75 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi attenuata fusiformi-increassatis, 35–50 cm altis, basi 0.7 cm diametentibus, infra apicem usque ad 2.5 cm diametentibus, mox longitudinaliter sulcatis, apice 2–3-foliatis, caeterum in statu juvenili vaginis 5–7 amplis alte amplexentibus apiculatis oblectis; foliis erecto-patentibus, late ovalibus, apice acutis vel breviter acuminatis, glabris, 17–23 cm longis, medio fere 7–7.9 cm latis; racemis erectis, juxta apicem pseudobulborum, c. 30 cm longis, laxe 8–10-floris, pedunculo vaginis paucis amplexentibus obsessis, tereti, glabro, foliis subaequilongis; bracteis ovato-lanceolatis, acuminatis, glabris, ovario pedicellato plus duplo brevioribus; floribus illis *D. macrophylli* A. Rich. similibus sed majoribus, erecto-patentibus; sepalis ovalibus, acuminatis, setis recurvulis carnosissimis longis extus obsessis, c. 3.3 cm longis; petalis oblique cuneato-spathulatis, apiculatis, glabris sepalis paululo brevioribus; labello e basi breviter unguiculato trilobato, c. 3.2 cm longo, inter apices loborum lateralium c. 2.7 cm lato, lobis lateralibus oblique quadratis, truncato-obtusissimis, columnam amplexentibus, intermedio transverse oblongo, apiculato, c. 1.3 cm longo, medio fere 2.2 cm lato, callo basali bene amplo bifoveolato, antice minute trilobulato, basi superne dente aucto, juxta basin utrinque ligula minuta bidentata ornato; columna perbrevis trilobulata, lobulis lateralibus falcatis obtusis, dorsali aequimagno obtuse tridentato, pede antice infra medium dente erecto ornato; anthera rhombo-cucullata, truncata, glabra; ovario clavato, cum pedicello dense setis reversis carnosissimis longis oblecto, pedicello incluso c. 5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 19179, flowering in Jan. 1909.

Also a relative of *D. macrophyllum* A. Rich., but differing entirely in the larger, longer-stemmed flowers and in the shape of the labellum and its callus. The soft bristly covering on the outside of the sepals is here much closer than in *D. macrophyllum* A. Rich. and its relatives, and extends uniformly to the tip. The bracts are relatively shorter.

The flowers are a whitish green with brown-red spots on the outside; the petals white, sparsely spotted dark brown-red on the outside; the lip white with violet veins and spots and a white callus; the anther green.

var. *polystictum* Schltr., var. nov.

Differt a forma typica floribus densius maculatis, petalis paulo angustioribus, labelli lobo intermedio paulo minore, callo medio leviter contracto, columnae pedis dente decurvo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18589, flowering in Aug. [Ed.—possibly Nov.] 1908.

A more spotted variety with a more intense colour and minor differences in the

floral parts, but not sufficient to be considered as a separate species. I think the more intense colouring is due to the higher altitude of its locality.

59. *D. polysema* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 163.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 14066, flowering in Jan. 1902.

Unfortunately, I did not find this interesting species again during my last journey. Kränzlin wants to unite this species with *D. macrophyllum* A. Rich., from which it is completely different. Every floral segment has a different shape from that of *D. macrophyllum* A. Rich. Especially striking are the relatively narrow lateral lobes of the lip cohering at the apex, and the very large middle lobe. The column also is entirely different.

I wonder why Kränzlin has not taken the trouble to examine the plant more closely before he simply placed it as a synonym of *D. macrophyllum* A. Rich.

The flowers are yellowish, densely covered with brown spots.

60. *D. pulchrum* Schltr., sp. nov.

Epiphyticum, erectum, validum, 50–65 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi attenuata fusiformi-incrassatis, bifoliatis, mox longitudinaliter sulcatis, 25–45 cm altis, supra basin c. 0.5 cm diametientibus, infra apicem 2–2.5 cm diametientibus; foliis erecto-patentibus, ellipticis, obtusiusculis vel breviter acuminatis, glabris, textura coriaceis, 16–24 cm longis, medio fere 5.5–7.5 cm latis; racemis apicalibus, erectis, usque ad 30 cm longis, subaxe 8–12-floris, pedunculo tereti, glabro, foliis fere aequilongo vel brevioribus, vaginis paucis dissitis amplectentibus obsessis; bracteis erecto-patentibus, elliptico-lanceolatis, acuminatis, ovario pedicellato duplo vel plus duplo brevioribus; floribus erecto-patentibus, in sectione inter mediocres; sepalis ovatis, breviter acuminatis, extus sparsim setis recurvis carnosissimis obsessis, margine leviter undulatis, c. 3 cm longis, lateralibus obliquis, basi margine anteriore paululo dilatata cum pede columnae mentum obtusum breve, c. 0.6 cm longum formantibus; petalis subspathulato-ligulatis, oblique acuminatis, glabris, recurvis, margine conspicue undulato-recurvis, sepalis fere aequilongis; labello breviter unguiculato, trilobato, c. 2.8 cm longo, inter apices loborum lateralium c. 2.3 cm lato, lobis lateralibus erectis, oblique triangularibus, obtusis, intermedio reniformi-suborbiculari, obtuso, antice marginibus incurvo, c. 1.5 cm longo, medio fere c. 2.1 cm lato, callo basali oblongo-ligulato, medio paulo constricto, superne carinato, usque infra basin lobi intermedii; columna perbrevis, glabra, clinandrio obtuse trilobulato, lobulo dorsali majore; anthera quadrato-cucullata, dorso leviter excisa, antice subretusa, glabra; ovario clavato, cum pedicello basi glabrato setis recurvulis carnosissimis dense oblecto, c. 5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19605, flowering in May 1905 [Ed.—probably 1909].

This species represents another magnificent new *Latourea* which is eye-catching not so much for its extraordinarily large flowers as by their colouring. I could not relate this species closely with any of those previously described. Even the shape of the flowers, the triangular, upright lateral lobes of the lip, and the large middle lobe, with its inbent margins, distinguish it sufficiently. The flowers are yellow, lightly violet-spotted on the outside; the labellum violet-dotted and striped. The anther is green.

61. *D. eximium* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 162.

D. bellum J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XXXIX (1910), p. 7.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range (northern slopes), alt. c. 600 m—R. Schlechter no. 14316, flowering in Apr. 1902; on trees in the forests of the Torricelli Range near Akur (southern slopes), alt. c. 700 m—R. Schlechter no. 20114, flowering in Sept. 1909.

I have mentioned above the two localities individually since they are separated from one another by a series of mountain ridges, the one being exposed to the sea winds and the other faces inland towards the valley of the Kaiserin-Augusta River.

Amongst the *Latourea* species it is related most closely to *D. Forbesii* Ridl., with which *D. Ashworthiae* O'Brien must be identical.

The flowers are white, with sepals yellowish on the outside and a violet-red-marked lip. The front lobe is pure white.

62. *D. Forbesii* Ridl., in Journ. Bot. XXIV (1886), p. 323.

D. Ashworthiae O'Brien, in Gardn. Chron. I (1901), p. 86, p. 36.

var. *praestans* Schltr., var. nov.

Differt a forma typica habitu robustiore et foliis latioribus, floribus majoribus, sepalis extus altius carinatis.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16913, flowering in Nov. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19012, flowering in Dec. 1908; on trees in the forests of the Bismarck Range, alt. c. 100 m—R. Schlechter no. 18513, flowering in Oct. 1908.

Likewise a wonderful species, the flowers of which would certainly be in demand in Europe as cut flowers. The variety described here is certainly larger than the Type form. I have compared it at the British Museum [Natural History] with the Type from British Papua. I cannot separate *D. Ashworthiae* from Ridley's species.

The variety is by no means rare in the central parts of Kaiser-Wilhelms-Land on the ranges in the mist-forest region. It would be easy to collect large quantities there for importation to Europe. The flowers are white with a cream-coloured middle lobe to the lip.

§ 10. *Eugenanthe*

All sections hitherto dealt with belong to the sub-genus *Athecebiium*. In *Eugenanthe* we have the first section of *Eu-Dendrobium*.

The species which I include here agree with those which were placed by Kränzlin in the following sections of his sub-genus *Eu-Dendrobium*; viz. *Nobilia*, *Aurea*, *Macrostachya* and a portion of *Chrysotoxa*. I say they correspond approximately with these species, since some have been added which are not of this relationship, and on the other hand individual species are to be found in other sections which should definitely be placed here. The entire section comprises about 60 species. The eastern boundary of their distribution area lies evidently in New Guinea. Commencing in India and Ceylon, it reaches its centre of development in Siam and Burma, and then extends on the one hand via China to Japan, and on the other across the Sunda Islands, Celebes and the Philippines to our Territory. Under these circumstances it is not surprising that this section is represented rather poorly in New Guinea. Indeed, in *D. Mastersianum* F.v.M. et Krzl., we have from there the only species (and that from British Papua) known up to the present. I have not yet seen this species, and since the Type is not accessible to me, I am unable to decide to what relationship the plant belongs. According to Kränzlin, it should be placed near *D. primulinum* Lindl.

I now have to describe a second species which is, of course, related very closely to *D. superbum* Rchb. f. from which, however, it differs so constantly in various points that it seems advisable to regard it as a separate species.

This plant is distributed widely in the Territory and grows, as a rule, singly on trees at the edges of forests or along rivers in the plains. I have never found this species at altitudes above 150 m.

63. *D. leucorhodum* Schltr., sp. nov.

Epiphyticum, patulum, 60–110 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus cylindraceis, carnosius, bene foliatis, vaginis mox hyalinis, alte amplexantibus omnino obtectis; foliis oblongo-vel elliptico-ligulatis, apice inaequaliter bilobulatis, basi cuneatis, 10–15 cm longis, medio fere 2.2–3.5 cm latis, mox caducis; racemis lateralibus, valde abbreviatis, 1–3-floris, pedunculo vix 0.5–0.7 cm longitudine excedente, vaginis brevibus obtusis obteco; bracteis vaginis conformibus, ovario pedicellato multoties brevioribus; floribus speciosis, illis *D. superbi* Rchb. f. bene similibus, sed minoribus, in sectione tamen inter majores; sepalis elliptico-ligulatis, obtusiusculis cum apiculo, glabris, 3 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve c. 0.7 cm longum formantibus; petalis oblique ellipticis, apiculatis, margine minutissime subciliato-serrulatis, sepalis aequilongis, sed distincte latoribus, medio fere 1.4–1.6 cm latis; labelli linguae brevi, quadrato, c. 0.4 cm longo, lamina orbiculari, apiculata, margine minutissime serrulato-ciliata, superne minutissime, papilloso-puberula, subtus glabra, 2.1 cm longa, medio 2.1 cm lata, callo basali subquadrato, superne leviter carinato basi apiceque subincrassato, antice gibbis 3 terminato, nervo medio superne leviter elato usque ad apicem decurrente; columna brevi, glabra, c. 0.7 cm alta, clinandrio trilobato, lobis lateralibus triangulis, dorsali dentiformi paululo longiore; pede apice excavatione orbiculari ornato; anthera late quadrato-cucullata, dorso leviter retusa, antice truncata, minute serrulata, glabra; ovario cum pedicello cylindraceo, gracili, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Peso not far from Eitape, alt. c. 40 m—R. Schlechter no. 19985, flowering in Aug. 1909; on trees at the Minjem Gorge, alt. c. 100 m—R. Schlechter no. 17846 (TYPE), flowering in June 1908; on trees in the forests on the Maijen [River] alt. c. 50 m—R. Schlechter no. 17922, flowering in July 1908; on trees in the gallery-forests on the Kenejia [River] alt. c. 150 m—R. Schlechter no. 18331, flowering in Oct. 1908; on trees at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19940, flowering in July 1909.

This species is related very closely to *D. superbum* Rchb. f., but has shorter flowers, broader petals with a short apiculus, and a circular labellum glabrous on the lower side. I cannot imagine that it agrees with *D. Mastersianum* F.v.M. et Krzl. since that is stated to have sepals 3.2–3.5 cm long, the petals the same length but narrower; the labellum, however, only 2 cm long and acute; the callus, likewise is also different. The colour of the flowers, which is usually very characteristic of species in this group, could also not agree. In *D. leucorhodum* Schltr. the flowers are whitish on the outside, violet-pink inside, the labellum furnished in the centre with two darker spots, and the anther dark red.

§ 11. *Platycaulon*

The first species in this section which became known is *D. lamellatum* (Bl.) Lindl., originally described by Blume in 1825 as *Onychium lamellatum* Bl. More than 50 years passed before a second species, *D. platygastrium* Rchb. f. from the Viti [Fiji] Islands became known in 1878. Again, after a long interval, *D. platycaulon* Rolfe appeared in 1892 as the third species, and in 1905 and 1906 three more were added, viz. *D. Treubii* J.J. Sm., *D. lamprocaulon* Schltr. and *D. camptocentrum* Schltr. I now have to describe one other new species from our Territory, which makes a total of seven. How Kränzlin is able to unite my *D. camptocentrum* Schltr. with *D. Goldfinchii* F.v.M., and to amalgamate the latter, especially with species of this relationship, is a riddle which I have been unable to solve to this day, because *D. Goldfinchii* F.v.M. is, in the Kränzlin sense, as typical an *Aporum* as ever existed.

The distribution area of this small section is fairly large. Commencing in the Malay Peninsula, it extends across the Sunda Islands to the Philippines then over the Moluccas, New Guinea, New Caledonia to the Viti [Fiji] Islands.

The only species known so far from New Guinea is *D. lamprocaulon* Schltr., which is a native of the Bismarck Archipelago. I have here to mention also another

species which appears to be widely dispersed on the mainland, but where it is found only as scattered specimens, growing always in the mountain forests, to the lower boundaries of the mist-forest zone. The species are inter-related closely, but are distinguished easily by their large flowers, shape of the separate segments and by the number of lamellae on the lip.

63. [63a] *D. lamprocaulon* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 166.

D. platygastrium Krzl., in Engl. Pflanzenr. IV, 50, II B., 21 (1910), p. 267 (p.p.).

Neu-Mecklenburg: On trees in the forests near Punam, alt. c. 600 m—R. Schlechter no. 14652, flowering in July 1902.

Kränzlin has, without hesitation, identified this species with *D. platygastrium* Rchb. f. from the Viti [Fiji] Islands. He says that he has not seen either of the Types. I can assume therefore that the description of the latter was very poor, and applicable to all species of section *Platycaulon*. Considering that in the flora of the Viti [Fiji] Islands and that of New Guinea, with the exception of a few ubiquitous species, hardly any of the native plants are identical, one's own conclusions may be drawn with regard to such a statement in a monograph. The description published by Kränzlin evidently has been prepared from mine.

In habit the species strongly resembles *D. lamellatum* (Bl.) Lindl., since the pseudobulbs seem always to remain fairly short, but next to *D. Treubii* J.J. Sm. it has the largest flowers in the section. It is distinguished from *D. discocaulon* Schltr. by the much longer mentum and the two lamellae on the lip.

The white flowers are flushed with rose-red.

64. *D. discocaulon* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 20–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis e basi attenuata valde applanatis et sensim dilatatis, 10–30 cm longis, infra apicem usque ad 3 cm latis, 2.5–3 mm diametentibus; dimidio superiore 3–7-foliatis; foliis erecto-patentibus, elliptico-lanceolatis vel ellipticis, breviter et obtusiuscule acuminatis, apice ipso oblique bilobulatis, basi cuneatis, 7–12 cm longis, medio vel infra medium 2–3.5 cm latis, glabris, textura tenuioribus, mox caducis, vaginis mox desiccantibus artissime cauli appressis, perlate amplexentibus; racemis versus apices pseudobulborum ex axillis foliorum vel subterminalibus, laxe 3–5-floris, erectis vel suberectis, usque ad 7 cm longis, pedunculo gracili, glabro, 2–3 cm longo, vaginulis paucis squamiformibus obsesso; bracteis parvulis, deltoideis, apiculatis, ovario pedicellato multo brevioribus; floribus erecto-patentibus illis *D. lamprocaulon* Schltr. similibus, sed minoribus; sepalis ovatis, apiculatis, glabris, c. 1.7 cm longis, lateralibus valde obliquis, basi margine anteriore lobato-ampliata, cum pede columnae mentum cylindraceo-conicum obtusum rectum c. 1.2 cm longum formantibus; petalis oblique oblongo-ellipticis, apiculatis, glabris, sepalis paulo brevioribus; labello e ungue ligulato-cuneato late rhomboideo, 1.7 cm longo, tertia parte anteriore c. 1.1 cm lato, obscure trilobato, lobis lateralibus patentibus, late triangulis, obtusis, intermedio quadrato, obtusissimo, margine leviter undulato-crenulato, 0.6 cm longo, nervo medio e basi usque in tertiam partem apicalem carinato-incrassato, medio carinulis 2 brevioribus parallelis additis, tertia parte anteriore nervis secundariis nonnullis utrinque (vulgo 2) leviter incrassatis auctis; columna brevi, glabra, clinandrio paulo contracto, lobulis lateralibus subquadratis, apice truncatis, dorsali valde abbreviato, pede apice excavatione oblonga ornato; anthera galeato-cucullata, apice obtusata, minute serrulata, glabra; ovario cum pedicello gracili, glabro, subclavato, 1.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17673, flowering in May 1908; on trees in the hill-forests by the mouth of the Waria [River], alt. c. 200 m—R. Schlechter no. 19954, flowering in July 1909; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 19320, flowering in Apr. 1909; on trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19918, flowering in June 1909.

This species resembles *D. lamprocaulon* Schltr. very much in the shape of the lip, but the keels on the lamina differ; in habit it may be recognised in that the fully

developed pseudobulbs are very much longer, and that, furthermore, the flowers are smaller and have a much shorter mentum.

I consider it possible that the plant illustrated by Kränzlin as *D. Goldfinchii* (Krzl. nec F.v.M.) in 'Engl. Pflanzenr.' IV, 50, II, B. 21 [1910] p. 268, represents my *D. lamprocaulon* Schltr., except that the illustration of the labellum does not match.

§ 12. *Pedilonum*

Next to *Eugenanthe*, this section could be the largest one in the sub-genus *Eudendrobium*. It is difficult to estimate how many species belong to it, since such a computation would be very laborious. In Kränzlin's monograph we find its members placed in the most different places. In the limitation planned here I am inclined to think that it will exceed *Eugenanthe* in numbers. Personally, I hope and believe that it will be possible to sub-divide it still further later on, because at present we find different groups which seem to be well separated from each other, but which are difficult to define without a close study of the material of all the species. I am thinking partly of those species related to *D. hymenopterum* Hook. f. and *D. cornutum* Hook. f.; partly of those which approach *D. secundum* Lindl., and partly of those which group themselves around *D. Smilliae* F.v.M., and also of others.

The section, as such, forms a link between *Eugenanthe* and *Calypstrochilus*. Kränzlin has combined these two together with *Oxyglossum* and *Amblyanthus* to form a single section. This is altogether wrong, for although some *Pedilonum* species approach the section *Calypstrochilus*, it is never difficult to recognise the latter by its labellum which is cowl-shaped at the apex with an inturned and dentate or pectinate margin. The section *Oxyglossum* also is well defined by its general habit and may be distinguished immediately at first glance by anyone who has viewed it correctly.

To regard *Pedilonum* as a sub-genus of *Dendrobium* Sw. as Kränzlin has done, is, in my opinion, untenable, and I am convinced that everyone who has studied the genus thoroughly will agree with me. Of how little use *Pedilonum* would be as a sub-genus may be gathered from the fact that the larger number of species referred to it by Kränzlin have been placed in entirely different relationships by previous and more recent authors. Here we are not dealing with species belonging together in groups, but a mixture of species, some of which belong here, others elsewhere. In the division of a genus it should be our endeavour not to separate species which are associated naturally, but to try and assess the value of their various distinguishing characters.

On the mainland of New Guinea and the adjacent small islands a large number of species in this section are known already, and we shall probably have to expect still more from there. Besides the species considered here, there have been recorded from British Papua: *D. pleiostachyum* Rchb. f., *D. bracteosum* Rchb. f., *D. capituliflorum* Rolfe and *D. coelandria* Krzl. (Kränzlin even records *D. hymenophyllum* Lindl., but his determination is incorrect.)

From Dutch New Guinea we know, in addition to some of the species mentioned here, *D. constrictum* J.J. Sm., *D. molle* J.J. Sm. (*D. scabripes* Krzl.), *D. glomeratum* Rolfe and, according to Kränzlin, *D. Reinwardtii* Lindl. The species which occur in German New Guinea are distributed fairly evenly over the different altitudes and vegetation zones. Thus, *D. Holrungii* Krzl. is found generally in the immediate vicinity of the sea coast on tall trees, often exposed to the glaring sun and great heat. If we proceed further inland, we meet first *D. capituliflorum* Rolfe as a fairly common plant and likewise as an epiphyte on tall trees. Penetrating still further into the hill-forests, we meet *D. mimiense* Schltr., *D. roseipes* Schltr. and *D. bracteosum* Rchb. f.

The rest of the species are inhabitants of the mist-forest formation. They grow always between thick pads of moss on the branches of trees, or more seldom on their trunks.

65. *D. bracteosum* Rchb. f., in Gardn. Chron. II (1886), p. 809; in *Lindenia* II (1886), t. 7.

D. chrysolabium Rolfe, in Gardn. Chron. I (1889), p. 770.

D. Novae Hiberniae Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 301.

D. Dixonii Bail., in Queensl. Bot. Bull. Dep. Agr. XIII (1896), p. 33.

D. trisaccatum Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 107.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema on the Waria [River], alt. c. 500 m—R. Schlechter no. 19411, flowering in May 1909.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 500 m—R. Schlechter no. 14629, flowering in July 1902; near Port Praslin—Micholitz.

This species evidently is distributed widely, since it is recorded also from British Papua as well as Dutch New Guinea. Two varieties, one with red, the other with yellow flowers, generally grow together. With the exception of *D. chrysolabium* Rolfe, I have examined the Types of all the synonyms enumerated here, and I find no difference by means of which *D. bracteosum* Rchb. f. could be maintained as a separate species. The flowers are rose-red or white-yellow, with orange-yellow lip laminae.

66. *D. eitapense* Schltr., sp. nov.

Epiphyticum erectum vel patulum, 30–40 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus curvatis cylindraceis, laxe foliatis, mox longitudinaliter sulcatis, vaginis foliorum arcte amplexantibus omnino vestitis, usque ad 40 cm longis, 0.4–0.6 cm diametentibus, basi attenuatis; foliis erecto-patentibus, anguste ligulatis, obtusis, glabris, subcoriaceis, 6.5–7.5 cm longis, medio 0.8–1.2 cm latis; racemis lateralibus, capitiformi-abbreviatis, decurvis, dense 5–10-floris; bracteis ovato-lanceolatis, acuminatis, ovarium vulgo plus duplo superantibus; floribus illis *D. bracteosi* Rchb. f. similibus, paulo minoribus; sepalis oblongo-lanceolatis, acutis, dorso nervo medio carinatis, glabris, 1.3 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum conicum obtusum 5.5 mm longum formantibus; petalis oblique linearibus, acutis, dimidio superiore leviter dilatatis, glabris, sepalis paulo brevioribus; labello e ungue brevi oblonga basi marginibus columnae pedi adnata tertia parte inferiore in laminam oblongo-ligulatam, apiculatam, dimidio anteriore paulo angustatam dilatato, glabro, ad basin laminae lamella semilunata transversa ornato, apice margine subinconspicue ciliolato, 1.2 cm longo, medio fere 0.3 cm lato; columna brevi, glabra, clinandrio trilobulato, lobulis lateralibus obtusis, dorsali dentiformi brevioribus, pede apice excavatione suborbiculari donato; ovario cum pedicello brevi, cylindraceo-subclavato, glabro, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Peso in the District of Eitape, alt. c. 20 m—R. Schlechter no. 12976 [Ed.—no. possibly 19976], flowering in Aug. 1909.

This is a close relative of *D. bracteosum* Rchb. f., which it also resembles in habit. It may be recognised outwardly by its taller growth and colour of the flowers. It is distinguished easily by its narrow petals, the shape of the lip, finely and shortly ciliate in front, and the column-foot excavated at the apex.

The flowers are whitish, with a pale violet lip-plate and column.

67. *D. rarum* Schltr., sp. nov.

Epiphyticum, patulum, pluricaule, usque ad 45 cm longum, gracile; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, leviter arcuatis vel substrictis, bene foliatis, teretiusculis, vaginis foliorum omnino obtectis, usque ad 42 cm longis; medio fere 0.3–0.4 cm diametentibus; foliis erecto-patentibus, linearibus, acutis, glabris, 7.5–11 cm longis, medio vel infra medium 3.5–4.5 mm latis; racemis subdense plurifloris, lateralibus, patulis, usque ad 3 cm

longis, pedunculo gracili c. 0.8 cm longo; bracteis ovatis, breviter acuminatis, parvulis, ovario pedicellato multo brevioribus; floribus erecto-patentibus, in sectione inter minores; sepalis ovalibus, obtusis cum apiculo minuto, extus minute et sparsim papilloso-punctatis, 0.5 cm longis, lateralibus obliquis, basi margine anteriore lobato ampliata et antice connata cum pede columnae mentum conicum obtusum 0.5 cm longum formantibus; petalis oblique lanceolato-ligulatis, subacutis, dimidio superiore margine microscopice serrulatis, vix 0.4 cm longis; labelli ungue e basi attenuata pedi columnae adnata quadrato-dilatato, lamina oblonga antice breviter et obtuse acuminata, apice minute serrulato-ciliolata, apici unguis paulo latiore, carina e basi labelli antice bicuri, cruribus ad margines in basin laminae decurrentibus, labello toto 0.9 cm longo, lamina 6.5 mm longa, medio fere 3.25 mm lata; columna brevi, clinandrio trilobulato, lobulis lateralibus abbreviatis, antice rotundatis, postice acutis, dorsali dentiformi, laterales paulo superante; anthera rhomboideo-cucullata, dorso excisa, gibbo obtuso ornata, antice truncata minute papilloso-punctata, ovario cum clavato pedicello gracillimo glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in clearings on the slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18252, flowering in Sept. 1908; on trees in the forests of the Maboro Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19512, flowering in May 1909.

In the structure of the labellum this species almost seems to be isolated. I have seen it only twice and always as solitary specimens, so that I believe it belongs to the rarer *Dendrobiums* of our Territory.

In the specimen from the Finisterre Range the petals at the apex are finely papillose.

The flowers are rose-red, with white tips.

68. *D. fulgidum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 40 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus leviter curvatis, cylindraceis, teretibus, bene foliatis, basi apiceque paululo attenuatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus vel suberectis, lanceolatis vel lanceolato-ligulatis, apice breviter bifidis, inaequaliter et acute bilobulatis, glabris, subcoriaceis, 6–8 cm longis, infra medium 0.8–1.2 cm latis; racemis subdense multifloris, erecto-patentibus, usque supra basin floriferis, 4–5 cm longis; bracteis erecto-patentibus, lanceolatis, subacutis, ovario graciliter pedicellato multo brevioribus; floribus subpatentibus, in sectione vix inter mediocres, laete aurantiacis; sepalis ovalibus, obtusis, glabris, 0.8 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conicum leviter curvatum recurvum subacutum c. 0.9 cm longum formantibus; petalis oblique ovalibus, obtusis, glabris, 0.8 cm longis; labello ligulato, obtusiusculo, dimidio inferiore cuneato-attenuato, medio leviter dilatato, basi concavulo, glabro, 1.7 cm longo, medio fere 0.4 cm lato; columna brevi, glabra, clinandrii lobulis brevibus, lateralibus truncatulis; anthera reniformi-cucullata, obtusissima, glabra; ovario cum pedicello gracili glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on exposed ridges of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19053, flowering in Jan. 1909.

This species is distinguished easily from its relatives by the shape and colour of the flower and the shape of the labellum. It seems to be very rare also, for I have seen it only once, as a single specimen.

The flowers are a bright orange-red.

69. *D. capituliflorum* Rolfe, in Kew Bull. (1901), p. 46.

D. confusum J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XLV (1911), p. 5.

D. constrictum J.J. Sm., p.p. in Nova Guinea VIII (1908) [1909], p. 79, t. XXVII, 87 Fig. a.

Kaiser-Wilhelms-Land: On trees in the forests on the Minjem Gorge, alt. c. 100 m—R. Schlechter no. 16092, flowering in May 1909 [Ed.—probably 1907]; on trees in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17930, flowering in July 1908; on trees in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19924, flowering in June 1909; on trees on the

Baube [Waupe?] Creek (Waria District), alt. c. 300 m—R. Schlechter no. 17443, flowering in Mar. 1908.

This species is a widely distributed orchid of the lowland and hill-forests in our Territory, it has been found also in British Papua and Dutch New Guinea. It may be distinguished easily from the related species by its leaves which are grey-green on the upper side and reddish underneath. Amongst the species in our Territory it is related most closely to *D. mimiense* Schltr., the leaves of which are green on both sides together with broader petals and a differently shaped labellum plate.

The flowers are white with a pale green centre to the lamina of the labellum and a pale green anther.

70. *D. mimiense* Schltr., sp. nov.

Epiphyticum, suberectum, 15–25 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus cylindraceis, dimidio superiore, 3–6-foliatis, vaginis foliorum obiectis, 5–10 cm longis, medio fere 0.7–1.2 cm diametientibus; foliis erecto-patentibus ligulatis, obtusiusculis, apice obliquis, 10–14 cm longis, medio fere 1.4–2.3 cm latis, glabris subcoriaceis; racemis dense multi-floris abbreviatis, c. 3–3.5 cm longis, usque supra basin floriferis; bracteis ovatis apiculatis, ovario pedicellato multo brevioribus; floribus in sectione inter minores, illis *D. capituliflori* Rolfe similibus sed paulo majoribus; sepalis ovatis, acuminatis, glabris, 0.8 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conico-oblongoideum obtusum 0.7 cm longum formantibus; petalis oblique oblongo-ellipticis, apiculatis, dimidio superiore serratis, 5.5 mm longis; labello e ungue oblongo, basi columnae pedi adnato infra medium leviter constricto et in laminam oblongam medio leviter angustatam apice rotundatam serratam paulo dilatato, glabro, carinula curvata transversa ad basin laminae, toto 1.2 cm longo, lamina supra basin et infra apicem c. 3.5 mm lata; columna brevi, glabra, clinandrio trilobulato, lobulis lateralibus falcato-ovatis subapiculatis, dorsali dentiformi brevioribus; anthera subquadrato-cucullata, dorso leviter retusa, antice truncata minute papillosa, caeterum glabra; ovario cum pedicello glabro, subclavato, pedicello incluso c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Mimi (Waria District), alt. c. 700 m—R. Schlechter no. 19473, flowering in May 1909.

The species externally resembles *D. constrictum* J.J. Sm. and *D. capituliflorum* Rolfe. It is related closely to the first, but differs in its longer mentum, more pointed sepals, sharper serrate petals, and the shape of the lamina of the lip.

The flowers are pure white.

71. *D. dichaeoides* Schltr., sp. nov.

Epiphyticum, decumbens, ramosum, usque ad 50 cm longum; rhizomate cauliformi, elongato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus radicanibus, repentibus, perdense foliatis, vaginis foliorum omnino obiectis, 2.5–3.5 mm diametientibus; foliis patentibus, lanceolato-oblongis, apice inaequaliter biaristato-apiculatis, obliquis, glabris, 1–1.5 cm longis, infra medium 0.3–0.5 cm latis; racemis abbreviatis, dense 4–8-floris, capitiformibus, versus apices ramorum natis; bracteis ovato-lanceolatis, acuminatis, ovario brevioribus; floribus in sectione inter minores, roseis; sepalo intermedio ovato-lanceolato, subacuto, glabro, 0.6 cm longo, lateralibus obliquis subacuminatis, intermedio aequilongis, basi margine anteriore valde ampliato-lobata cum pede columnae mentum oblongoideum obtusum, c. 5 mm longum, rectum formantibus; petalis oblique elliptico-lanceolatis, subacutis, glabris, sepalis subaequilongis; labello concavo-ligulato, tertia parte basilari leviter constricto, lamella transversa humili donato, apicem versus sursum paululo dilatato, apice breviter acuminato, glabro, c. 8.5 mm longo, infra apicem 0.3 cm lato; columna brevi, glabra, clinandri lobis lateralibus, semiorbicularibus, dorsali dentiformi minore; anthera quadrato-cucullata, antice truncata leviter papilloso-puberula; ovario cum pedicello clavato, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17295, flowering in Feb. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17999, flowering in July 1908.

This species is distinguished in habit from all others in the section by the branches which are appressed firmly to the substratum, and creep exactly in the same way as the American species of *Dichaea* which it resembles very much in the shape of the leaves.

The flowers are rose-red.

72. *D. roseipes* Schltr., sp. nov.

Epiphyticum, erectum, 35–70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, mox sulcatis, bene foliatis, vaginis foliorum omnino obtectis, 3–4 mm diametentibus; foliis erecto-patentibus, lanceolato-linearibus, obtusiusculis cum apiculo obliquo, 6–11 cm longis, infra medium 0.5–1 cm latis, glabris, textura coriaceis; racemis versus apicem caulibus lateralibus vel rarius terminalibus, brevibus, subdense 6–10-floris, usque ad 4 cm longis; bracteis ovato-deltoides, apiculatis, ovario multoties brevioribus; floribus erecto-patentibus, in sectione vix inter majores; sepalis ovalibus, obtusis, glabris, 0.8 cm longis, lateralibus valde obliquis, basi margine anteriore lobato-dilatata cum pede columnae mentum oblongoideum, obtusum, subrectum, c. 1.5 cm longum formantibus; petalis oblique oblongo-subspathulatis, obtusis, glabris, sepalis paulo minoribus; labello ligulato, e basi concava marginibus columnae pedi adnata sensim usque ad medium fere subangustato, deinde sursum paulo dilatato, antice laminam ellipticam subacutam margine minute serrulatam formante, lamella transversa semilunata in tertia parte basali ornato, glabro, 1.9 cm longo, supra basin 0.4 cm lato, medio 2.5 mm lato, infra apicem 0.7 cm lato; columna brevi glabra, clinandrii lobis lateralibus quadratis, antice rotundatis, postice acutis, dorsali dentiformi, parvulo, pede elongato, apice excavatione oblonga intus donato; anthera quadrato-cucullata, apice subretuso minute papilloso-puberula; ovario cum pedicello glabro gracili, subclavato, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19914, flowering in June 1909.

This species may not be regarded as being very closely related to any species in the Territory, but it has a certain resemblance to *D. glomeratum* Rolfe from Dutch New Guinea. It is recognised easily by the peculiar colour of the flowers, apart from the shape of the labellum and the column.

The flowers are whitish with a pink mentum and ovary.

73. *D. obtusum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 177.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14451, flowering in Apr. 1902.

To a certain extent a connection is established through this and the following species with the section *Calypstrochilus*, since the labellum in the front is very concave in all of them, but without being bent down and lacerated, as in section *Calypstrochilus*. It is related most closely to *D. fornicatum* Schltr., but has shorter leaves and smaller flowers of a pale rose-red shade.

74. *D. fornicatum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 100 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus parum ramosis, teretibus, bene foliatis, vaginis foliorum arcte amplexentibus omnino obtectis; foliis erecto-patentibus, ligulatis, apiculatis, 5–8 cm longis, medio fere 0.6–1.1 cm latis, glabris, textura subcoriaceis; racemis glomeriformi-abbreviatis, dense 6–15-floris; bracteis ovalibus, apiculatis, ovario pedicellato multo brevioribus; floribus in sectione mediocribus, erecto-patentibus, laete roseis; sepalis latius ellipticis, obtusis, glabris, 0.7 cm longis, lateralibus valde obliquis, basi margine anteriore valde lobato-dilatata cum pede columnae mentum oblongoideum obtusum 0.7 cm longum formantibus; petalibus oblique oblongo-spathulatis, obtusis, glabris, sepalis paululo minoribus; labello circuitu oblongo-ligulato, fornicato-concavo, in tertia parte basali leviter constricto, apice marginibus fornicato-incurvulis, minute subserrulatis, lamella humili, semilunata transversa in tertia parte basali (constricta) ornato, 1.5 cm longo, explanato medio fere 0.7 cm lato; columna brevi, glabra; clinandrii lobis lateralibus inaequaliter bilobulatis, dorsali dentiformi aequilongo, pede apice excavatione late trapezoidea donato; anthera quadrato-cucullata, apice subretuso-truncato minute papillosa, caeterum glabra; ovario cum pedicello gracili, glabro, subclavato, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1300 m—R. Schlechter no. 19539 (TYPE), flowering in May 1909; on trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19722, flowering in June 1909.

Doubtless a close relative of *D. obtusum* Schltr. from the Torricelli Range. It may

be recognised externally by the longer leaves and larger flowers. In *D. obtusum* Schltr. the flowers are of a paler shade, and have a shorter mentum, a narrower labellum, the transverse lamella which is much nearer the centre than in *D. fornicatum* Schltr. Otherwise, the two species are very much alike.

The flowers are bright rose-red.

75. *D. chrysoglossum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, usque ad 70 cm longum, ramosum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus teretibus, bene foliatis, vaginis foliorum alte amplexantibus omnino obtectis; foliis erecto-patentibus, oblique oblongo-ligulatis, apice oblique apiculatis, glabris, textura subcoriaceis, 5–7 cm longis, medio fere 1.4–1.7 cm latis; racemis glomeriformi-abbreviatis, dense 10–20-floris, lateralibus vel apicalibus; bracteis elliptibus, apiculatis, recurvulis, ovario pedicellato multo brevioribus; floribus erecto-patentibus, in genere vix inter mediocres; sepalis ellipticis, obtusissimis, glabris, c. 8.5 mm longis, lateralibus obliquis, basi margine anteriore valde lobato-ampliata cum pede columnae mentum oblongoideum obtusum 0.7 cm longum formantibus; petalis obliquis, late obovato-spathulatis, obtusissimis, glabris, sepalis subaequilongis; labello fornicato-ligulato, obtusissimo, in tertia parte basali constricto, lamella transversa humili donato, apicem versus sensim paulo dilatato, marginibus fornicato-incurvis infra apicem margine utrinque obtusangulis, labello toto glabro, 1.7 cm longo, infra apicem c. 0.6 cm lato, apice margine integerrimo; columna brevi, glabra, clinandrii lobis lateralibus rotundatis, obtusis, integris, dorsali dentiformi laterales paululo superante, pede concavulo glabro, haud excavatione distincta ornato; anthera quadrato-cucullata, glaberrima, dorso subcordata, antice retusa; ovario cum pedicello clavato, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19172, flowering in Jan. 1909.

Unfortunately, I have only once found this species which, despite its small flowers, is rather pretty. It is related closely to *D. obtusum* Schltr. and *D. fornicatum* Schltr., but has broader leaves, differently coloured flowers, broader petals and a differently shaped labellum, the latter provided on the sides of the margin below the apex with a triangular projection. Since these margins are turned inwards like a cowl, the open part (the entrance) of the lip assumes a fiddle-like shape. Otherwise the margin of the labellum is entire and non-denticulate.

The flowers are violet-pink with a golden yellow lip, yellow column with a red foot and brownish anther.

76. *D. Hollrungii* Krzl., in K. Schum. et Hollr., Fl. Kaiser-Wilhelms-Land (1889), p. 32.

D. Kaernbachii Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 163.

D. pachyceras F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 164.

D. Smilliae Krzl. (p.p.), in Engl. Pflanzenr. IV, 50, II. B., 21 (1910), p. 134, (nec F.v.M.).

Kaiser-Wilhelms-Land: On tall trees in the coastal-forest, near Paub (Eitape District), alt. c. 20 m—R. Schlechter no. 20004, flowering in Sept. 1909; near the second Kaiserin-Augusta-River Station—Hollrung no. 699, flowering in Sept. 1887; on tall trees in the coastal-forest near Bulu, alt. c. 30 m—R. Schlechter no. 18262, flowering in Sept. 1908.

I have not seen the Type of *D. Kaernbachii* Krzl., but I have no doubt that the plant is as identical with *D. Hollrungii* Krzl. as is *D. pachyceras* F.v.M. et Krzl., of which I possess flowers from the Type. The plant, 'Hollrung no. 699', enumerated by Kränzlin as '*D. Smilliae*' also belongs here, since it is also the Type of *D. Hollrungii* Krzl., a fact which the author must have overlooked. It appears doubtful to me now whether *D. Smilliae* F.v.M. even occurs on the north coast of New Guinea, since all

specimens so marked which I have seen up to the present prove to be *D. Hollrungii* Krzl., which has much thicker and larger flowers.

The flowers are generally yellowish white, with a lip dark green at the apex. The yellowish white sepals and petals occasionally have a reddish tinge.

§ 13. *Calyptrorchilus*

In 1905, when I established the section, I would not have believed that it would ever expand to the extent that it has done. Besides the new species described here, twenty others are known already and it is to be expected that the further exploration of New Guinea will bring a far larger number to light. The number of species occurring outside New Guinea is very small; indeed up to the present only four are known to me, viz. *D. Mohlianum* Rchb. f. from Samoa and Fiji, *D. subclausum* Rolfe from the Moluccas, (from which *D. aphanochilum* Krzl. perhaps does not differ) and *D. neo-ebudantum* Schltr. which, in spite of Kränzlin's assertion to the contrary, has nothing in common with *D. Lawesii* F.v.M. nor with *D. vitellinum* Krzl. from the New Hebrides.

With the exception of the few widely distributed species, which also occur in our Territory, a whole series of endemic species is found in other parts of New Guinea.

From British Papua the following species belonging to this section are known: *D. rutriferum* Rchb. f., *D. puniceum* Rolfe, *D. inamoenum* Krzl., *D. Bäuerleni* Krzl. and *D. navicula* Krzl.

From Dutch New Guinea we also know: *D. trichostomum* Rchb. f., *D. cochleatum* J.J. Sm., *D. mitriferum* J.J. Sm., *D. uliginosum* J.J. Sm., *D. Vannouhuysii* J.J. Sm., *D. Wentianum* J.J. Sm., *D. conicum* J.J. Sm., *D. aristiferum* J.J. Sm., *D. calyptratatum* J.J. Sm. and *D. obtusipetalum* J.J. Sm.

The section is related closely to certain forms of *Pedilonum*, of which some have been described already. However, it may be recognised always by the apex of the labellum, which is abruptly cowl-shaped, toothed, bent and folded inwards.

All the species in the Territory are epiphytes, and inhabit the higher mountains, where it appears they are found only in the mist-forest zone, for I have not found a single species below the border of this formation.

77. *D. aemulans* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 176.

Epiphyticum, erectum, validulum, usque ad 70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus cylindraceis, simplicibus, dense foliatis, mox longitudinaliter sulcatis, vaginis foliorum omnino obtectis, 5–6 mm diametientibus; foliis erecto-patentibus, lanceolato-ligulatis, oblique apiculatis, glabris, 6–9.5 cm longis, medio fere 1.3–2.2 cm latis; racemis lateralibus, abbreviatis, dense multifloris; bracteis ovato-triangularibus, acuminatis, ovario graciliter pedicellato multo brevioribus; floribus erecto-patentibus vel patentibus, gracillime pedicellatis, illis *D. aemulantis* Schltr. similibus; sepalis late ovalibus, obtusiusculis, glabris, c. 0.8 cm longis, lateralibus obliquis, basi margine anteriore valde lobato-dilatata cum pede columnae mentum oblongoideum obtusum medio leviter constrictum c. 1.2 cm longum formentibus; petalis oblique obovatis, subapiculatis, apicem versus margine subserrulatis, sepalis paululo brevioribus; labello cucullato-cochleari, circuitu ligulato-subpandurato, medio leviter constricto, infra medium septo transverso humili donato, apice cucullato-refracto truncato, marginibus dense lacerato-serrulato, 1.5 cm longo, supra basin 0.5 cm lato, medio 0.4 cm lato, infra apicem 0.6 cm lato, apicem columnae sub-excedente; columna brevi, pede concavulo, glabro, clinandrii lobis lateralibus inaequaliter bidentatis, dorsali dentiformi; anthera quadrato-cucullata, dorso excisa, antice truncata, minutissime serrulata; ovario cum pedicello glabro, gracili, c. 2.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17111, flowering in Jan. 1908; on trees in the forests of the Torricelli Range, alt. c. 700–900 m—R. Schlechter no. 14329, flowering in Apr. 1902; no. 20340, no. 20271, flowering in Sept. 1909.

Since I am now in possession of better material, I have re-described this species

here. I have placed it first in the section, because the shape of its flowers is more reminiscent of the immediately preceding, than the other species of the section.

Kränzlin, without having seen it, places the species under *D. Lawesii* F.v.M. from which it differs entirely in the shape of its flowers and whole habit. It stands, however, tolerably isolated in the section, and as remarked above already, is more like certain *Pedilonum* species.

The flowers are coloured pink or violet-pink.

78. *D. Lawesii* F.v.M., in Melb. Chemist, June 1884.

D. Warburgianum Krzl., in Engl. Bot. Jahrb. XIII (1891), p. 281.

D. pseudo-Mohlianum Krzl., in K. Schum. et Laut., Nachtr. (1905), p. 178.

D. Mohlianum Krzl., in Engl. Pflanzenfam. IV, 50, II. B., 21 (1910), p. 114, p.p. (nec Rchb. f.).

Kaiser-Wilhelms-Land: On trees in the mountain forests near Bolobo, alt. c. 1000 m—R. Schlechter no. 16535, flowering in Sept. 1907; on trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter 17108, flowering in Dec. 1907; on trees in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 13962, flowering in Jan. 1902; in the summit forest of the [Mount] Sattelberg, alt. c. 950 m—O. Warburg no. 20890, Hellwig no. 535, flowering in April 1889; on trees in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19488, flowering in May 1909; on trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19692, flowering in June 1909.

I have scarcely any doubt that *D. Warburgianum* Krzl. is identical with *D. Lawesii* F.v.M. I have examined the flowers of both Types, side by side, and I do not see the slightest difference. How little Kränzlin knows about *D. Lawesii* F.v.M. is shown by the fact that specimens of this species, collected by Beccari in the Arfak Mountains, were placed by Kränzlin under *D. Mohlianum* Rchb. f. Evidently the plant is distributed widely in New Guinea, and may be regarded as one of the most common *Calypstrochilus* species.

The specimens from the eastern part of the Territory are distinguished by their thicker stems.

The flowers are purple-red with a whitish lip.

var. *salmonicolor* Schltr., var. nov.

Differt a forma typica floribus pallide salmonicis.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19131, flowering in Jan. 1909.

A very peculiar colour variety which I have seen only once in a few specimens. These very pale salmon-coloured flowers give the form a rather strange appearance.

79. *D. macrogenion* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, dense foliatis, vaginis foliorum omnino obtectis, 5–7 mm diametentibus; foliis erecto-patentibus, lanceolatis, acutis vel acuminatis, glabris, textura tenuioribus, 7–8.5 cm longis, infra medium 1.3–1.6 cm latis; racemis abbreviatis, dense plurifloris, lateralibus; floribus erecto-patentibus vel patentibus, illis *D. Lawesii* F.v.M. similibus, sed longioribus; bracteis ovatis, breviter acuminatis, ovario pedicellato multoties brevioribus; sepalis late ovatis, obtusis vel minute apiculatis, glabris, 0.8 cm longis, lateralibus valde obliquis, basi margine anteriore perlonge lobato-productis, cum pede columnae mentum cylindraceo-conicum obtusiusculum, leviter curvatum c. 2.5 cm longum formantibus, antice usque ad medium fere connatis; petalis oblique elliptico-ligulatis, obtusis, glabris, sepalo intermedio subaequilongis; labello e ungue lineari-ligulato concavo apicem versus sensim subrhombeo-cucullato, apice subito incurvo fimbriato-dentato, plicato, medio fere septo humili transverso ornato, 3.2 cm longo, infra apicem c.

0.7 cm lato, glaberrimo, apicem columnae paululo superante; columna brevi, glabra, pede perlongo, apice excavatione ovali ornato, clinandrii lobis lateralibus semirhombeis, dorsali dentiformi; anthera late quadrato-cucullata, dorso retusa, antice truncata, minute papillosa; ovario cum pedicello gracili, glabro, c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19600, flowering in May 1909.

The most striking character of this species is the very long mentum of the flowers. It otherwise reminds one strongly of *D. Lawesii* F.v.M., to which, undoubtedly, it is related closely. The shape of the lateral sepals is also different from those of *D. Lawesii* F.v.M. in so far as they gradually attenuate towards the tip of the mentum, whereas in *D. Lawesii* F.v.M. a conspicuous expansion takes place.

The flowers are bright red with darker veins, the labellum whitish with violet veins, the column violet towards the apex, and the anther violet with a white apex.

80. *D. roseum* Schltr., sp. nov.

Epiphyticum, patulum vel suberectum, usque ad 50 cm longum, gracile; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus leviter flexuosis, simplicibus, teretibus, mox longitudinaliter sulcatis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, linearibus, acutis, apice inaequaliter bilobulatis, glabris, 7–11 cm longis, medio fere 0.3–0.7 cm latis; racemis abbreviatis, dense plurifloris; bracteis minutis, deltoideis, ovario pedicellato multoties brevioribus; floribus erecto-patentibus vel patentibus, roseis, glabris; sepalo intermedio late ovali, obtusiusculo, 0.5 cm longo, lateralibus valde obliquis, intermedio aequilongis, basi margine anteriore perlonge ampliatio-dilatatis, cum pede columnae mentum cylindraceo-conicum obtusum subrectum 1.4 cm longum formantibus, antice basi connatis; petalis oblique elliptico-spathulatis, obtusis, glabris, sepalo intermedio subaequilongis; labello e ungue angusto concavo anguste oblanceolato-ligulato, cucullato-concavo, antice subinfracto, apice pectinato-serrato, apicem columnae paulo superante, in tertia parte basali septo V-formi humili ornato, 1.7 cm longo, infra apicem 0.4 cm lato; columna brevi, glabra, pede lineari-ligulato, clinandrii lobis lateralibus rotundato-truncatis, intermedio dentiformi; anthera quadrato-cucullata, antice truncata, glabra; ovario cum pedicello gracili glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20223, flowering in Sept. 1909.

In the shape of the flowers the species reminds one of *D. macrogenion* Schltr., but it is much smaller and of a different colour. The leaves of the two species are, however, quite different, for in *D. roseum* Schltr. the leaves are linear.

The flowers are rose-red.

81. *D. phlox* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 70 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, validiusculis, dense foliatis, teretibus, vaginis foliorum dense et minute ruguloso-verruculosi omnino obtectis; foliis subpatentibus, lanceolato-ellipticis vel elliptico-ligulatis, oblique apiculatis vel acutis, glabris, 2.5–8.5 cm longis, medio fere 0.8–1.9 cm latis; racemis abbreviatis, subdense plurifloris; bracteis ovatis vel lanceolatis, acuminatis, glabris, ovario graciliter pedicellato pluries brevioribus; floribus patentibus vel erecto-patentibus, pulchris, illis *D. Lawesii* F.v.M. fere aequimagnis, glabris; sepalis ovalibus, obtusis vel minute apiculatis, 1.1 cm longis, lateralibus valde obliquis, basi margine anteriore perlonge lobato-dilatatis, cum pede columnae mentum oblique conicum, obtusum plurifloris, c. 2 cm longum formantibus; petalis oblique ellipticis, obtusiusculis, glabris, sepalis paulo brevioribus; labello e basi angustiore dimidio superiore circuitu obovato-cucullato, antice infracto-cucullato, apice pectinato-lacerato, 2.4 cm longo, infra apicem c. 0.8 cm lato; columna brevi, pede lineari concavulo, usque ad medium fere labelli marginibus adnato, clinandrii lobis lateralibus rotundatis, dorsali dentiformi; ovario cum pedicello gracili glabro, 2.6–2.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200–1300 m—R. Schlechter no. 18193 (TYPE), flowering in Sept. 1908; no. 19094, no. 19144, flowering in Jan. 1909.

This species is a magnificent plant, the effects of which are due to the number and colour of the flowers, rather than their size. In shape the flowers are similar to those of *D. Lawesii* F.v.M., but it has no transverse partition in the lower half of the lip.

The flowers are golden yellow, the mentum, the lip and ovary are orange-red.

82. *D. dichroma* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 60 cm longum, gracile; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, subflexuosis, bene foliatis; vaginis foliorum apice subverruculosis obtectis; foliis erecto-patentibus, linearibus vel lanceolato-linearibus, acutis, glabris, 3–7 cm longis, medio fere 2.5–5 mm latis; racemis abbreviatis, dense 10–20 floris; bracteis lanceolatis, acuminatis, ovario graciliter pedicellato multo brevioribus; floribus illis *D. phlox* Schltr. similibus, sed paulo minoribus, glabris; sepalis ovalibus, obtusiusculis vel apiculatis, c. 0.9 cm longis, lateralibus obliquis, basi margine anteriore lobato-dilatatis, cum pede columnae mentum oblongoideum obtusum, c. 1.1 cm longum formantibus; petalis oblique oblongis, obtusiusculis, glabris, sepalis paululo brevioribus; labello e basi ligulato-concava antice subito paulo dilatato semioblongo-cucullato, apice infracto-cucullato pectinato-dentato, toto 1.5 cm longo, medio 3.5 cm lato, infra apicem 0.7 cm lato; columna brevi, pede lineari infra apicem facie dente apresso parvulo acuto donato, clinandrii lobis lateralibus rotundatis, dorsali dentiformi; anthera subreniformi-cucullata, antice emarginata papillosa; ovario cum pedicello gracili, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18763, flowering in Nov. 1908.

The flowers refer this species to the relationship of *D. phlox* Schltr. The leaves are much smaller and the mentum of these little flowers is blunter and different in shape.

The flowers are orange-red, the dorsal sepal and the petals yellow, the lateral sepals yellow at the apex.

83. *D. flammula* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus plus minus ramosis, gracilibus, bene foliatis, vaginis foliorum granuloso-verruculosis omnino obtectis; foliis erecto-patentibus vel subpatentibus, lanceolato-ligulatis, acutis vel oblique apiculatis, glabris, 2–3 cm longis, infra medium 2.5–4 mm latis; racemis valde abbreviatis, fasciculi-formibus, pauci-(3–5)-floris; bracteis ovatis, acuminatis, ovario graciliter pedicellato pluries brevioribus; floribus erecto-patentibus, in sectione inter minores, illis *D. salmonei* Schltr. similibus, sed paulo majoribus, glabris; sepalis late ovalibus, apiculatis, 0.8 cm longis, lateralibus valde obliquis, margine anteriore lobato-dilatatis cum pede columnae mentum oblongoideum obtusum 1.3 cm longum formantibus, tertia parte basali connatis; petalis oblique oblongis, obtusis, sepalis paululo brevioribus, basin versus paulo angustatis; labello e ungue lineari-concavo marginibus columnae pedi adnato, dimidio superiore circuitu obovato-cuneato, cucullato, antice truncato, apice infracto-cucullato pectinato-dentato, columnae apicem paulo superante; columna brevi, pede lineari concavulo, apice excavatione ovali ornato; clinandrii lobis lateralibus obtuse truncatis, dorsali dentiformi; anthera late quadrato-cucullata, dorso excisa, antice truncata, papillosa; ovario cum pedicello gracili, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19696, flowering in June 1909.

I regard this species as most closely related to *D. dichroma* Schltr., from which it differs in the shape of its much smaller leaves and smaller flowers. It also reminds one of *D. salmoneum* Schltr. in many respects, but in the latter the lip is much shorter than the column, while it exceeds the column in *D. flammula*.

The flowers are a bright cinnabar-red with golden yellow sepal-tips and petals, and a yellow column.

84. *D. melinanthum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel subsimplicibus, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, elliptico-lanceolatis, acutis, glabris, 4.5–5 cm longis, medio vel infra medium 1.2–1.5 cm latis; racemis abbreviatis, dense plurifloris; bracteis ovatis apiculatis, ovario graciliter pedicellato pluries brevioribus; floribus illis *D. salmonei* Schltr. similibus, glabris; sepalis ovalibus, obtusiusculis

vel apiculatis, 0.7 cm longis, lateralibus obliquis, basi margine anteriore lobato-dilatata cum pede columnae mentum conicum obtusum c. 1 cm longum formantibus; petalis oblique elliptico-subspathulatis, apiculatis, sepalis subaequilongis; labello e ungue concavo ligulato circuitu cuneato-cucullato, antice truncato, infracto-cucullato, apice pectinato-serrulato, leviter plicato, toto 1.3 cm longo, medio 0.3 cm lato, infra apicem 5.5 mm lato, apicem columnae subexcedente; columna brevi, pede lineari, concavo, apice excavatione ovali ornato, dimidio inferiore labelli marginibus adnato; anthera quadrato-cucullata, dorso retusa, antice truncata, papillosa; ovario cum pedicello gracili grabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees on open slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18240, flowering in Sept. 1908.

Also a relative of *D. salmoneum* Schltr., *D. flammula* Schltr. and *D. cochleatum* J.J. Sm., especially of the latter. It is distinguished from the latter by the shape of the mentum and length of the labellum.

The flowers are cinnabar-red.

85. *D. nubigenum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, humile, 12–15 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, pro sectione crassiusculis, dense foliatis, mox sulcatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus vel suberectis, oblongis, obusiusculis, glabris, textura pro sectione rigidulis, 1.5–2 cm longis, medio fere 5.5–8 mm latis; racemis valde abbreviatis, fasciculiformibus, paucifloris; bracteis late ovalibus, apiculatis, ovario multo brevioribus; floribus erecto-patentibus, in sectione mediocribus, illis *D. aperti* Schltr., similibus, glabris; sepalis ovalibus, obtusiusculis, c. 1 cm longis, lateralibus valde obliquis, basi margine anteriore valde lobato-productis, cum pede columnae mentum subcylindricum obtusum 1.4 cm longum antice apertum formantibus; petalis oblique oblongo-subspathulatis, obtusis, sepalis subaequilongis; labello e ungue concavo ligulato, antice rhombeo-cucullato cum apiculo gibbiformi obtuso, apice ipso refracto-cucullato pectinato-dentato plicato, toto 1.8 cm longo, medio 0.3 cm lato, infra apicem 0.6 cm lato; columna perbrevis, pede lineari concavulo, usque infra basin marginibus columnae adnato, clinandrii lobis lateralibus brevibus denticulatis, dorsali longiore subulato; anthera subquadrato-cucullata, dorso retusa, antice truncata papillosa; ovario cum pedicello gracili, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18827, flowering in Nov. 1908.

From all the other species of this section, this one is recognisable by the short, compact (almost alpine) habit. In the structure of the flowers, opening in front, it stands nearest to *D. apertum* Schltr.

The flowers are violet-pink, with an orange-red lip, and column of the same colour.

86. *D. apertum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, subsimplicibus vel ramosis, dense foliatis, vaginis foliorum omnino obtectis; foliis patentibus, ellipticis vel elliptico-ligulatis, aristato-apiculatis, glabris, 1.5–3 cm longis, medio vel infra medium 5.5–10.5 mm latis; racemis valde abbreviatis, fasciculiformibus, 3–5-floris; bracteis ovatis, aristato-apiculatis, ovario graciliter pedicellato multo brevioribus; floribus erecto-patentibus, roseis, glabris; sepalis ovalibus, obtusis, 1.1 cm longis, lateralibus patentibus, valde oblique, basi margine anteriore lobato-productis, cum pede columnae mentum subcylindraceum obtusum leviter curvatum antice apertum c. 1.4 cm longum formantibus; petalis oblique oblongo-subspathulatis, obtusis, sepalis subaequilongis; labello e ungue anguste concavo-ligulato apicem versus sensim paulo dilatato, antice rhombeo-cucullato, obtuso, apice ipso cucullato-infracto pectinato-denticulato facie 5-plicato, toto c. 1.8 cm longo, infra medium 3.5 mm lato, infra apicem 0.6 cm lato, columnae apicem bene superante; columna brevi, pede lineari, infra apicem dente decurvo appresso ornato, marginibus labelli omnino adnato, clinandrii lobis lateralibus brevibus rotundato-truncatis, dorsali dentiformi; anthera quadrato-cucullata, dorso subretusa, apice truncato-papillosa; ovario cum pedicello gracili, glabro, c. 2.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18593 (TYPE), flowering in Nov. 1908; on trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19717, flowering in June 1909.

This species is recognised easily by the flowers, opening widely in front. In habit it is characterised by very slender stems and spreading leaves. The specimens from the Bismarck Range and the Dischore Range agree so entirely that one could be led to believe they come from the same locality, a proof of how little these orchids tend to vary.

87. *D. oreodoxa* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus subsimplicibus vel ramosis, flexuosis, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, lanceolatis, apiculatis, 2.5–6 cm longis, infra medium 0.4–1.5 cm latis, glabris; racemis valde abbreviatis, fasciculiformibus, 1–3-floris; bracteis ovatis, apiculatis, ovario graciliter pedicellato multoties brevioribus; floribus erecto-patentibus, illis *D. flammulae* Schltr. similibus, glabris; sepalis late ovalibus, minute apiculatis, 1.1 cm longis, lateralibus obliquis, basi margine anteriore valde dilatatis, cum pede columnae mentum conicum obtusiusculum obliquum c. 1.3 cm longum formantibus; petalis oblique oblongo-ellipticis, subacutis, sepalis paululo brevioribus; labello e ungue angustiore apicem versus sensim dilatato, antice obovato-cucullato, rotundato, apice ipso cucullato-infracto, pectinato-dentato, pluriplicato, toto 1.7 cm longo, columnae apicem vix attingente, infra medium 0.3 cm lato, infra apicem 0.7 cm lato; columna brevi, pede ligulato-concavo, apice excavatione ovali ornato, clinandrii lobis lateralibus brevibus rotundatis, dorsali subulato paulo longiore; anthera subquadrato-cucullata, dorso excisa, apice truncato papillosa; ovario cum pedicello gracili, glabro, 1.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18804, flowering in Nov. 1908.

All species of this section, already described, have one floral character in common, viz. that the labellum reaches to, or exceeds, the apex of the column.

In *D. oreodoxa* there is a certain transition to the three following species in which the labellum is definitely shorter than the column, so that the side lobes of the clinandrium are plainly visible, while in the preceding species they were half-covered by the margins of the lip.

The flowers are scarlet-red with an orange-red lip and column.

88. *D. verruculosum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 45 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, bene foliatis, vaginis foliorum dense verruculosus omnino obtectis; foliis patentibus, lanceolato-ligulatis, acutis cum apiculo, 4.5–5.5 cm longis, infra medium 0.8–1.2 cm latis; racemis valde abbreviatis, fasciculiformibus, 5–7-floris; bracteis ovatis, breviter acuminatis, ovario graciliter pedicellato multo brevioribus; floribus erecto-patentibus, illis *D. oreodoxa* Schltr. similibus, glabris; sepalo intermedio ovato-elliptico, obtusiusculo, 0.8 cm longo, lateralibus circuitu perlate triangularibus, apiculatis, valde obliquis, basi margine anteriore ampliata cum pede columnae mentum conicum obtusiusculum 1.3 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusiusculis, sepalo intermedio distincte brevioribus, c. 6.5 mm longis; labello e basi unguiculata apicem versus sensim paululo dilatato, cucullato, antice truncato, apice ipso cucullato-refracto serato-dentato, quinesulcato, toto 1.5 cm longo, infra apicem 0.5 cm lato, columna distincte brevior; columna brevi, pede elongato, basi excavatione ovali dente donata ornato, usque supra medium marginibus labelli adnato; anthera rotundato-cucullata, apice obtusissimo papillosa; ovario cum pedicello gracili, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19635, flowering in May 1909.

D. cochleatum J.J. Sm., from Dutch New Guinea, can be regarded as its nearest relative. From this the species may be distinguished by its more slender mentum, the narrower non-dentate petals and the smooth sepals. Both species have the fine warty leaf-sheaths in common.

The flowers are orange-yellow with paler tips, pale yellow column and violet anther.

89. *D. brevilabium* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 55 cm longum; rhizomate valde abbreviato; radicibus

filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, gracilibus, bene foliatis, subflexuosis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, linearibus, acutis, glabris, 6–9 cm longis, medio fere 0.4–0.7 cm latis; racemis valde abbreviatis, fasciculiformibus, 4–7-floris; bracteis ovalibus, acutis, ovario pedicellato multo brevioribus; floribus erecto-patentibus, in sectione mediocribus, glabris; sepalis intermedio oblongo, obtuso vel subacuto, glabro, 1 cm longo, lateralibus intermedio aequilongis valde obliquis, triangulis, basi margine anteriore valde dilatatis, cum pede columnae mentum conicum, obtusum, 1.2 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusis, c. 8.5 mm longis; labello circuitu e basi angustiore oblongo-subspathulato, cucullato, apice ipso cucullato-infracto, pectinato-dentato, pluriplicato, toto 1.2 cm longo, columnae conspicue brevioris, infra apicem 0.4 cm lato; columna brevi, glabra, pede producto, concavulo, apice excavatione dente brevi superne ornata donato, clinandri lobis lateralibus oblique et obtuse triangulis, dorsali dentiformi paulo longiore; anther subreniformi-cucullata, apice subretuso-papillosa; ovario cum pedicello gracili, glabro, 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19587, flowering in May 1909.

Is distinguished from all short-lipped species of the section by the narrow leaves. The shape of the flower reminds one of *D. flammula* Schltr., but this belongs to the group with a longer lip.

The colour of the flowers is also very characteristic. They are pale rose-red, mentum scarlet-red, ovary violet, labellum cinnabar-red towards the apex.

90. *D. salmoneum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 178.

D. trichostomum Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 112, p.p. (nec Rchb. f.).

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16655, flowering in Oct. 1907; on trees in the forests of the Ibo Range, alt. c. 1000–1100 m—R. Schlechter no. 17083, flowering in Dec. 1907; no. 19023, flowering in Dec. 1908; on trees on the creeks of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 14082, flowering in Jan. 1902.

I just cannot understand how Kränzlin in his monograph of the genus *Dendrobium* could unite this species with *D. trichostomum* Rchb. f., if I rightly understand the mark of exclamation after 'A.B. Meyer n. 1', as his having seen the Type. In fact, *D. trichostomum* Rchb. f., *D. oreogenum* Schltr. and *D. Loesenerianum* Schltr. are distinguished from all other *Calyptrochilus* species by the lip considerably exceeding the apex of the column, sometimes double its length (inclusive of the column-foot), and by the cowl-shaped apex of the lip being comparatively low. In *D. oreogenum* Schltr., however, the lip is so much shortened that it hardly reaches the lower margin of the stigma, and, as in all other species of this relationship, is strikingly cowl-shaped. The differences in the length of the mentum, and therefore in the entire shape of the flowers, are so considerable that one cannot but be surprised when, in a 'critical' treatise of a genus, such noticeable characters as these are overlooked.

Kränzlin's description seems chiefly to fit *D. salmoneum* Schltr., without consideration of the Type in the Kew Herbarium, which, if I remember correctly, consists of two well-covered herbarium sheets. I now have been able to collect very good material of *D. salmoneum* Schltr. The spreading leaves (not described previously) are elliptical lengthwise, acute or almost acute, 3.4 cm long and 1.1–1.6 cm broad in the middle.

The flowers are orange-yellow or orange-red.

91. *D. oreogenum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 177.

D. rutriferum Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 131, p.p. (nec Rchb. f.).

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14308, flowering in Apr. 1902; no. 20031, flowering in Sept. 1909.

Amongst the species described previously this has only one close relative, viz. *D. trichostomum* Rchb. f., the Type of which I have been able to examine at the Kew Herbarium, but it has nothing whatever to do with *D. rutriferum* Rchb. f., from which it is distinguished in habit, as well as by the floral characters, in about the same way as *Orchis simia* Rchb. f. is from *Orchis morio* L. In spite of all this, Kränzlin has thought it advisable to unite my species with *D. rutriferum* Rchb. f. The material collected in 1909 agrees well with the Type of 1902. *D. trichostomum* Rchb. f., from Dutch New Guinea, has rather smaller flowers with shorter sepals and broader petals.

The flowers of *D. oreogenum* are scarlet-red or purple-red.

92. *D. Loesenerianum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, gracilibus, bene foliatis, vaginis foliorum omnino obtectis, mox sulcatis; foliis erecto-patentibus vel subpatentibus, lanceolatis, apice oblique aristato-apiculatis, glabris, textura tenuioribus, 5.5–8 cm longis, infra medium 1.1–1.3 cm latis; racemis valde abbreviatis, fasciculiformibus, 3–8-floris; bracteis ovatis, apiculatis, ovario pedicellato multo brevioribus; floribus illis *D. trichostomi* Rchb. f. similibus, erecto-patentibus, glabris; sepalis oblongo-ellipticis, obtusis, c. 1.1 cm longis, lateralibus obliquis, basi margine anteriore dilatato-decurrente cum pede columnae mentum conicum obtusiusculum, c. 0.6 cm longum formantibus; petalis oblongo-ligulatis, oblique subspathulatis, obtusis, sepalis paululo brevioribus; labello e basi cuneato-unguiculata circuitu obovato, antice cucullato-incurvo, margine undulato pectinato-denticulato, toto 1.9 cm longo, infra apicem 0.7 cm lato; columna brevi, supra basin latere utrinque breviter unidentata, pede ligulato, medio obscure calloso-incrassato, clinandrii lobis lateralibus falcato-triangularis, subacutis, dorsali dentiformi longioribus; anthera subreniformi-quadrata, dorso retusa, antice truncata, glabra; ovario cum pedicello gracili, glabro, c. 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20280, flowering in Sept. 1909.

A close relative of *D. trichostomum* Rchb. f. and *D. oreogenum* Schltr., easily distinguished from both by the colour of the flowers and the wave-like, twisted margin of the lip. The petals are broader than in *D. oreogenum* Schltr., but narrower than in *D. trichostomum* Rchb. f. Very characteristic and peculiar to this species are the two lateral teeth or projections above the base of the column.

The flowers are a salmon colour with purple-red veins and purple-red apex to the labellum and with a violet anther.

Hybrid of Section [13] *Calypstrochilus*

***D. x intermedium* Schltr., hybr. nov.**

D. Lawesii x *flammula* Schltr.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, between the parents, alt. c. 1200 m—R. Schlechter no. 19659, flowering in June 1909.

This plant stands close to *D. Lawesii* F.v.M. in the shape of the flowers, but it has a rather more pointed mentum.

The colour of the flowers is exactly intermediate between that of the parents, viz. purple-red with orange-yellow in the upper half. As regards size, the petals and sepals are more reminiscent of *D. flammula* Schltr., but the labellum is almost the same as that of *D. Lawesii* F.v.M., with a lower transverse lamella below the centre.

§ 14. *Cuthbertsonia*

This new section consists of a few purely Papuan [Papuanian] sub-alpine species which, in habit, remind one of *Oxyglossum*, but differ in the ventricose, concave and usually

blunt lip. In the shape of the lip they come closer to certain species of *Pedilonum* and *Calypstrochilus*, but from which they must be separated by their habit. Their most striking feature is the remarkable hairiness of the ovary, which they all have in common. This hairiness consists of crystal-like tubercles thickly covered with short, sharp prickles. Very similar hairs are found on the upper side of the leaves and occasionally also on their underside.

Up to the present I know with certainty the three species of this section enumerated here as well as *D. asperifolium* J.J. Sm. from Dutch New Guinea, but it is possible that *D. Agathodaemonis* J.J. Sm. from Dutch New Guinea also belongs here. However, this latter species differs somewhat in habit, and the author does not mention the peculiar hairiness, so it seems possible that it belongs to *Pedilonum*.

The four species, *D. Cuthbertsonii* F.v.M., *D. sophronites* Schltr., *D. trachyphyllum* Schltr. and *D. asperifolium* J.J. Sm., are inter-related closely, though they nevertheless appear well separated specifically. All of them are inhabitants of exposed mountain peaks and are of typical alpine habit. The large, round, shiny red flowers remind one very much of the American *Sophronites* species. I hardly know a prettier sight than a small patch of *D. sophronites* Schltr. or *D. Cuthbertsonii* F.v.M. on which the many large, magnificently bright red flowers contrast so wonderfully with the dark foliage. By the insignificance of the foliage and the size of the erect flowers one is reminded vividly of the alpine *Primulus*. It is to be hoped that these very beautiful plants will soon find admission to our European green-houses.

All the species require much moisture for their cultivation and under no circumstances will they tolerate high, continuous heat. Where they occur, particularly during the mornings during their growth periods, the temperature drops to 5°C and below.

93. *D. Cuthbertsonii* F.v.M., in Trans. et Proc. Roy. Soc. Vict. XXIV (1888), p. 175.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19152, flowering in Jan. 1909; on trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19664, flowering in June 1909.

One of the most charming species of *Dendrobium* known to me. The characteristics of the species are referred to above.

This plant was placed by Kränzlin in his section *Dendrocoryne-Leiotheca* which somewhat resembles my section *Latourea* with which, however, it has no connection. The leaf-sheaths and structure of the flowers, as well as the habit, refer it undoubtedly to the vicinity of *Oxyglossum* from which, however, I would like to keep it separate, on account of the above-mentioned differences.

The flowers are a lustrous scarlet-red with an orange-yellow labellum, red-margined in front.

94. *D. sophronites* Schltr., sp. nov.

Epiphyticum, nanum, usque ad 5 cm altum, caespitificum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis abbreviatis, cylindraceis, apicem versus paulo angustatis, 2–3 foliatis, 0.7–1.5 cm altis, infra medium 2.5–3.5 mm diametientibus; foliis erecto-patentibus, linearibus vel lineari-ligulatis, papillis sparsis muriculatis superne asperatis, subacutis vel apiculatis, 1–3 cm longis, medio fere 2.5–4 mm latis; inflorescentiis apicalibus, ut videtur semper unifloris, valde abbreviatis, pedunculo subnullo; bractea ovali-cucullata obtusa, ovario pedicellato multoties brevior; floribus erectis, illis *D. Cuthbertsonii* F.v.M. similibus, sed majoribus; sepalis ovalibus, obtusis, 1.5 cm longis, lateralibus obliquis basi margine anteriore valde lobato-decurrentibus, cum pede columnae mentum e basi conica subcylindricum, subacutum, 1.5 cm longum formantibus, usque infra medium connatis; petalis late obovatis, obtusis, obliquis, sepalis paulo brevioribus; labello e basi unguiculata sensim oblanceolato-dilatato, subcucullato-concavo, obtuso, 2.5 cm longo, infra

apicem 0.7 cm lato; columna perbrevis, pede elongato, clinandrii lobis lateralibus auriculiformibus rotundatis, dorsali subulato aequilongo; ovario cum pedicello gracili, dense papulis patentibus crystalliformibus muricatis obsesso.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2200 m—R. Schlechter no. 18800, flowering in Nov. 1908.

The species is related closely to *D. Cuthbertsonii* F.v.M., but is distinguished by its larger flowers, longer mentum and narrower lip. The crystal-like papillae on the ovary are here considerably longer than in the two other species, so that the short prickles, with which they are covered, may be recognised with a simple lens.

The flowers are lustrous scarlet-red, the lip orange, marked with brown veins, especially dark in front.

95. *D. trachyphyllum* Schltr., sp. nov.

Epiphyticum, erectum, nanum, caespitificum, 2–3.5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, apicem versus paulo attenuatis, 1–1.5 cm altis, apice bifoliatis, infra medium 3–5 mm diametientibus; foliis erecto-patentibus, late ovalibus, apiculatis, basi subpetiolato-contractis, superne dense papulis brevibus muricatis obtectis, subtus glabris, 1–1.6 cm longis, 0.7–1.1 cm medio fere latis; inflorescentiis apicalibus, unifloris, pedunculo subnullo; bractea ovali-cucullata, obtusa, ovario pedicellato multoties brevior; floribus erectis, illis *D. Cuthbertsonii* F.v.M. similibus, sed angustioribus; sepalis oblongis, subacutis, extus papuloso-puberulis, 8.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindraceo-conicum obtusiusculum, c. 1.1 cm longum formantibus; petalis oblique elliptico-spathulatis obtusiusculis, glabris, sepalis subaequilongis; labello e ungue lineari, apicem versus circuitu lanceolato-elliptico, naviculiformi-cucullato, acuto (explanato obtuso), infra medium incrassatione V-formi, transversa donato, medio sparsim papilloso-muriculato, 1.7 cm longo, in tertia parte apicali 4.5 mm lato; columna brevi, pede angusto, apice excavatione ovali vel oblanceolata donato, clinandrii lobis lateralibus oblique triangulis, acutis, dorsali dentiformi brevior; ovario dense papulis minutis muriculatis obtecto, cum pedicello gracili c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19678, flowering in June 1909.

This species is recognised externally from the two preceding ones by the broad leaves, densely papillose above. In addition, the flowers are covered with a similar indumentum and all the segments of the flowers are considerably narrower. The mentum is also relatively longer and almost open in front down to the base. It can thus be seen that we have a good species to consider. The indumentum of the ovary is more like that of *D. Cuthbertsonii* F.v.M. than of *D. sophronites* Schltr.

The flowers are rose-red with yellow-white petals and lip.

§ 15. *Oxyglossum*

Like *Calyptrochilus*, the small section *Oxyglossum*, of which only two species were known to me in 1905, has increased to quite a considerable extent. When, in 1905, I wrote that only two species were known to me, it should not be assumed that only two species of the section had at that time been described, since a closer study of the genus has shown that about six species actually had been described (besides those published by me), but had been placed in quite different sections. The centre of dissemination of the section lies undoubtedly in New Guinea, from where it may be traced to the Celebes where *D. parvulum* Rolfe and *D. masarangense* Schltr., two typical species of the section, occur. *D. subacaule* Reinw., also a true *Oxyglossum*, is recorded from Java, though the habitat may be incorrect.

The Moluccas may be regarded as the western boundary of the section. Towards the east no species has become known outside the Papuan [Papuanian] floral zone, but I am led to believe that a thorough exploration of the higher western islands of the south-seas will reveal the presence of the section there.

From British Papua six endemic species have been described so far, viz. *D. cerasinum* Ridl., *D. puniceum* Ridl., *D. pentagonum* Krzl., *D. violaceum* Krzl., (the last two unknown to me) and *D. brevicaula* Rolfe.

The last exists in a folder, where two or even three species are mixed, as I proved to Rolfe at Kew, so that it would be difficult now to determine the species exactly, since the description has been made from these different Types. It is to be hoped that Rolfe will soon determine the correct Type of this species.

The number of species which have been described in recent years from Dutch New Guinea is very considerable. We are acquainted with seven from there, viz. *D. vexillarius* J.J. Sm., *D. begoniicarpum* J.J. Sm., *D. calcarium* J.J. Sm., *D. Dekockii* J.J. Sm., *D. retroflexum* J.J. Sm., *D. rupestre* J.J. Sm. and *D. subuliferum* J.J. Sm.

The species which are included in Kränzlin's monograph are found under the numbers 172, 173, 220, 224, 532, 533, 534. From this it will be noticed how this author found room to accommodate related species in his classification at widely different places. The whole of the species of the section, so far as I have had the opportunity of observing them under their natural conditions, are to be regarded as true mist-forest epiphytes. I hardly believe that any one of them occurs below the mist-forest zone.

They always grow on more-or-less horizontal branches of trees in the primary forests. Only once did I find *D. cyanocentrum* Schltr. on thinner, perpendicular tree-trunks. Most of the species occur in colonies, growing on the same tree, very often in large individual numbers.

96. *D. cyanocentrum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 160.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20129, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16898, flowering in Nov. 1907; on trees by the creeks in the Bismarck Range, alt. c. 900 m—R. Schlechter no. 13930, flowering in Jan. 1902; on trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19882, flowering in June 1909; on trees in the forests on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19815, flowering in June 1909.

A splendidly characterised species, distinguished from all others in this section by the spreading of the lateral sepals. The flowers are often hidden deep amongst the leaves and therefore not seen easily from a distance. The species grows in colonies and forms small patches firmly adherent to the bark of the tree. The flowers are whitish with a bluish centre; the lip brownish with violet veins, the anther blue.

97. *D. pumilio* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 2.5–4 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus pseudobulbosis, cylindraceo-lageniformibus, apice vulgo bifoliatis, rarius trifoliatis, 0.5–1.2 cm altis, infra medium 2–3 mm diametentibus; foliis erecto-patentibus erectis, angustissime linearibus vel subfiliformibus, acutis, 1–3 cm longis, vix 1 mm latis; inflorescentiis terminalibus, vulgo bifloris, abbreviatis, subsessilibus; bracteis lanceolatis, acuminatis, ovario pedicellato multo brevioribus; floribus in sectione inter minores, erectis, glabris; sepalis lanceolatis, acuminatis, 0.6 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindraceo-conicum, subacutum, leviter subincurvulum 6.5 m longum formantibus; petalis oblique lineari-ligulatis, acutis, glabris, 0.5 cm longis; labello oblanceolato-ligulato, antice obscure bilobulato, 1 cm longo, ad basin loborum lateralium 1.75 mm lato, lobulis lateralibus obscuris, abbreviatis, oblique truncatis, intermedio triangulo acuto cuspidiformi; columna brevi, glabra, clinandrii lobis lateralibus brevibus, dorsali dentiformi longiore; ovario 5-costato, cum pedicello gracili glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20267, flowering in Sept. 1909; on trees in the forests of the Kani Range, above Bolobo, alt. c. 1000 m—R. Schlechter no. 16545, flowering in Nov. [Ed.—possibly Sept.] 1907; on trees in the forests of the Finisterre Range, alt. c. 1000–1100 m—R. Schlechter no. 17998, flowering in July 1908; no. 19165, flowering in Jan. 1909.

The species is related most closely to *D. theionanthum* Schltr. described below. From this it may be distinguished readily by the flat and less rigid leaves, by the colour of the flowers, by the somewhat bent mentum and the somewhat shorter front lobe of the lip. The species occurs in dense colonies, consisting of large numbers of individuals. The flowers are white with a golden yellow apex to the lip.

98. *D. theionanthum* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 2.5–3.5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceo-lageniformibus, apice 3–4-foliatis, 0.5–1.5 cm altis, infra medium 2–2.5 mm diametientibus; foliis erectis vel erecto-patentibus, subulatis, rigidulis, apiculatis, 1.3–1.7 cm longis, c. 0.75 mm diametientibus; inflorescentiis terminalibus, subsessilibus, abbreviatis, bifloris; bracteis ovatis, apiculatis, ovario pedicellato multoties brevioribus; floribus erectis, glabris, in genere inter minores; sepalis oblongo-lanceolatis, apiculatis; 0.6 cm longis, lateralibus basi margine anteriore lobato-producta cum pede columnae mentum rectum cylindraceo-conicum obtusiusculum 0.7 cm longum formantibus; petalis oblique lineari-ligulatis, acutis, basin versus paululo angustatis, dimidio superiore margine minutissime serrulato-irregularibus; labello lineari, apicem versus sensim paululo dilatato, antice obscure trilobulato, 1.2 cm longo, infra apicem vix 0.2 cm lato, dimidio inferiore columnae pedi marginibus adnato, lobis lateralibus abbreviatis obtusissimis, intermedio cuspidiformi, acuto; columna perbrevis, pede gracili, clinandrii lobis lateralibus auriculiformibus subdentulatis, dorsali minuto, dentiformi; anthera rotundato-cucullata, dorso leviter excisa, apice paulo contracta, truncata, minute papillosa; ovario 6-costato, cum pedicello gracili glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District) alt. c. 1200 m—R. Schlechter no. 19630, flowering in May 1909.

It is not always easy, with pressed specimens, to distinguish this species from *D. pumilio* Schltr., but it is certainly well distinguished and characterised by the rigid leaves, colour of the flowers and elongated, straight mentum, apart from other floral distinctions. The flowers are pale sulphur-yellow; the lip golden yellow beneath the apex.

99. *D. nardoides* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 1.5–5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceo-obclavatis, apice 2–3-foliatis, 0.5–1.2 cm longis, infra medium 1.5–2.5 mm diametientibus; foliis erecto-patentibus, subulato-filiformibus, acutis, superne sulcatis, textura rigidulis, 1–3.5 cm longis, 0.5–0.75 mm latis; inflorescentiis terminalibus, subsessilibus, bifloris, valde abbreviatis; bracteis ovatis, apiculatis, ovario pedicellato multo brevioribus; floribus erectis, in genere inter minores; sepalis oblongo-lanceolatis, acuminatis vel apiculatis, glabris, c. 5.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum subcylindricum obtusum c. 5.5 mm longum formantibus; petalis oblique lineari-ligulatis, breviter acuminatis, glabris, sepalis paululo brevioribus; labello lineari-ligulato, usque infra medium columnae pedi marginibus adnato, apicem versus paululo dilatato, 0.9 cm longo, infra apicem vix 1.75 mm lato, glabro, antice trilobulato, lobulis lateralibus parvulis anguliformibus obtuse truncatis, intermedio cuspidiformi-triangulo acuto; columna perbrevis, pede gracili, clinandrii lobis lateralibus rotundatis, subbilobulatis, dorsali subulato longiore; anthera circuitu suborbiculari-cucullata, antice emarginata, glabra; ovario trigono, cum pedicello gracili glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18722, flowering in Nov. 1908.

From specimens not in flower, the species bears a striking resemblance to small *Nardus*-fascicles which caused me to give it the above name. It is related most closely

to the two preceding species, especially to *D. theionanthum* Schltr. It can be distinguished easily from both by its shorter and blunter mentum, and the colour of the flowers. *D. oligoblepharon* Schltr., described below, comes very close to this species, but is distinguished by the ciliated petals and apex of the labellum. The flowers are violet-pink, with a scarlet-red apex to the labellum.

100. *D. oligoblepharon* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 2–3 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceo-obclavatis, apice 2–3-foliatis, 0.4–0.7 cm longis, infra medium 2–2.5 mm diametientibus; foliis erecto-patentibus, subulatis, acutis, vulgo curvatis, 1.2–2 cm longis, subrigidulis; inflorescentiis terminalibus, subsessilibus, abbreviatis, vulgo bifloris; bracteis lanceolatis, acuminatis, ovario pedicellato multoties brevioribus; floribus erectis, in sectione inter minores, illis *D. nardoidis* Schltr. similibus et fere aequimagnis; sepalis lanceolatis, acuminatis, glabris, c. 5.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindricum obtusum 0.5 cm longum formantibus; petalis oblique linearibus, acutis, margine breviter ciliolatis, sepalis paululo brevioribus; labello lineari, quarta parte basilaris marginibus columnae pedi adnato, apicem versus sensim paululo dilatato, 1 cm longo, infra apicem vix 0.2 cm lato, antice subtrilobulato-acuminato, margine minute ciliolato, caeterum glabro; columna perbrevis, glabra, pede gracili, clinandrii lobis lateralibus rotundatis, brevibus, dorsali subulato paulo brevior; anthera trapezoideo-globosa, cucullata, dorso leviter excisa, apice retuso minute papillosa; ovario utrinque bicostato glabro, cum pedicello gracili c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19801 (TYPE), no. 19633, flowering in June [Ed.—possibly May for 19633] 1909.

I have had considerable difficulty in deciding to separate this from *D. nardoides* Schltr. Certain characters, however, induced me to regard it as a distinct species. Thus, the colour of the flowers is somewhat different, the mentum is shorter and blunter, the petals and the lip not adherent so high up, and shortly ciliated, the anther somewhat differently shaped, and the ovary not triangular, but quadrangular. The flowers are violet-pink, the apex of the labellum luminous cinnabar-red, the anther purple-red and the pollinia grey-green.

101. *D. lapeyrouseiodes* Schltr., sp. nov.

Epiphyticum, erectum, pusillum, caespitificum, 5–6.5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavato-cylindraceis, 1–1.5 cm longis, bifoliatis, supra basin 2–3 mm diametientibus; foliis erecto-patentibus, linearibus, acutis, basi angustatis, glabris, 3.5–4.5 cm longis, medio fere 1.5–2.5 mm latis; inflorescentiis subterminalibus, subsessilibus, abbreviatis, bifloris; bracteis ovato-lanceolatis, longius acuminatis, glabris, ovario pedicellato multo brevioribus; floribus erectis, in genere mediocribus, glabris; sepalis lanceolatis, acuminatis, 7.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindraceo-conicum obtusiusculum leviter curvatum 1 cm longum formantibus; petalis oblique lineari-ligulatis, breviter acuminatis, basin versus paululo angustatis, sepalis paulo brevioribus; labello e basi angustiore ligulato, apice acuminato, tertia parte basali marginibus columnae pedi adnato, medio incrassatione V-formi ornato, glabro, 1.4 cm longo, infra apicem 0.2 cm lato; columna perbrevis, glabra, pede gracili, clinandrii lobis lateralibus brevibus subtruncatis, dorsali dentiformi sublongiore; anthera rotundato-cucullata, glabra, antice truncata; ovario triquetro, cum pedicello gracili glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees on more open slopes of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18054, flowering in July 1908.

In habit this plant reminds one of certain African *Lapeyrousea* species. In the shape of its flowers it is similar to *D. pumilio* Schltr., but is well distinguished by the relative size and the shape of the leaves. The last characteristic brings it nearer to the following species. The flowers are whitish rose-red, with white mentum, golden yellow labellum plate with white apex, and a green anther.

102. *D. coerulescens* Schltr., sp. nov.

Epiphyticum, decumbens, pusillum, c. 1.5–2 cm altum; rhizomate decumbente, elongato, laxius

pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, apicem versus paulo angustatis, 1–2-foliatis, 0.3–0.5 cm altis, infra medium vix 1.5 mm diametientibus; foliis erecto-patentibus, lanceolato-ligulatis, cuspidatis, basi attenuatis, glabris, c. 1 cm longis, medio fere c. 0.2 cm latis; inflorescentiis subterminalibus, valde abbreviatis, subsessilibus, 1–2-floris; bracteis ovatis, acuminatis, ovario pedicellato multo brevioribus; floribus erectis, in sectione inter minores; sepalis lanceolatis, acuminatis, glabris, 4.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindraceo-conicum obtusiusculum subrectum 4.5 mm longum formantibus; petalis oblique lanceolato-ligulatis, longius acuminatis, glabris, sepalis paulo brevioribus; labello lineari, apicem versus sensim paululo dilatato, apice ipso acuminato, glabro, quarta parte basilari marginibus columnae pedi adnato, 7.5 mm longo; columna brevi, pede gracili, clinandrii lobis lateralibus rotundatis, dorsali dentiformi aequilongo; anthera quadrato-cucullata, antice apice papillosa; ovario trigono cum pedicello gracili glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20151, flowering in Sept. 1909.

In the shape of the flower this species resembles *D. nardoides* Schltr., but in consequence of its creeping habit and elongated rhizome, it comes closer to *D. minutum* Schltr. and *D. parvulum* Rolfe from the Celebes, described below. Unfortunately, I have found only one specimen of this interesting species, and this with a solitary flower. It may, therefore, be assumed that the species is rare, for I have tried repeatedly to obtain more material. The flowers have a pale blue colour, the labellum orange-red in front with a pale blue apex.

103. *D. minutum* Schltr., sp. nov.

Epiphyticum, decumbens, minutum, vix 1 cm altum, usque ad 9 cm longum; rhizomate elongato, laxe pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ellipsoideis, 0.5–0.8 cm distantibus, bifoliatis, 0.3–0.5 cm altis, medio fere 2–3 mm diametientibus; foliis patentibus, ellipticis vel ovato-ellipticis, apiculatis, glabris, subtus plurinerviis, 0.3–0.8 cm longis, medio fere 0.2–0.4 cm latis; inflorescentiis apicalibus, subsessilibus, abbreviatis, bifloris; bracteis ovatis, acuminatis, ovario pedicellato pluries brevioribus; floribus in sectione inter minores, erectis, glabris; sepalis oblongo-lanceolatis, acutis vel acuminatis, 3.75 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum cylindraceo-conicum apice leviter incurvulum obtusum 4.5 mm longum formantibus; petalis oblique ligulatis subacutis, supra medium paululo dilatatis, sepalis paulo brevioribus; labello anguste ligulato, breviter acuminato, usque infra medium marginibus columnae pedi adnato, supra medium carina transversa arcuata superne ornato, 0.7 cm longo, infra apicem 1.75 mm lato; columna brevi, pede gracili, clinandrii lobis lateralibus rotundatis, dorsali triangulo paululo longiore; anthera perlate rhombeo-cucullato, dorso et apice retusa, apice ipso minute papillosa; ovario 5-costato, glabro, cum pedicello gracili c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18754, flowering in Nov. 1908.

A charming little species, closely related to *D. parvulum* Rolfe from the Celebes, but is even smaller in all its parts. In habit these two plants might be regarded, when not in flower, as *Bulbophyllum* species. The flowers are dark violet with an ochre-red apex to the labellum.

104. *D. delicatulum* Krzl., in Engl. Bot. Jahrb. XVI (1893), p. 17.

D. subacaule Krzl. in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 279 (nec Reinw.), p.p.

Kaiser-Wilhelms-Land: Finisterre Range, alt. c. 1700 m—Hollrung no. 303, flowering in Oct. 1888, on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 17990, flowering in July 1908.

This small species was later withdrawn mistakenly by Kränzlin and united with *D. subacaule* Reinw., which most probably comes from the Moluccas (Tidore) and not from Java, as usually stated in error. Kränzlin's species does not appear to be identical with Ridley's *D. puniceum* in-so-far as Forbes' Types from the Sogeri Expedition are concerned, but I believe that I can identify *D. delicatulum* Krzl. with the plants

collected by Sayer on Mt. Obree in British Papua. Ridley's species is much larger and, in my opinion, altogether different from *D. delicatulum* Krzl. as well as from *D. subacaule* Reinw. The flowers are red-lead coloured, the labellum with a golden yellow tip.

105. *D. tricostatum* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 1.5–2 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavatis, vulgo vix 0.5 cm altitudine excedentibus, bifoliatis, infra medium 0.2 cm diametientibus; foliis erecto-patentibus vel patentibus, lanceolato ellipticis, acutis, basi angustatis, glabris, subtus 7-nerviis, 0.5–0.8 cm longis, medio fere 2.5–3.5 mm latis; inflorescentiis terminalibus, subsessilibus, abbreviatis, bifloris; bracteis ovatis, acuminatis, ovario pedicellato pluries brevioribus; floribus erectis, illis *D. subaculis* Reinw. similibus; sepalis ovatis, apiculatis, glabris, 0.5 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum anguste conicum subacutum subrectum 0.6 cm longum formantibus; petalis oblique lineari-ligulatis, acutis, glabris, sepalis paulo brevioribus; labello lineari, acuminato, apicem versus sensim paululo dilatato, glabro, c. 1 cm longo, infra apicem 1.5 mm lato; columna brevi, pede gracili, satis longo, clinandrii lobis lateralibus brevibus inaequaliter bilobulatis, dorsali dentiformi paulo longiore; anthera late rhomboideo-cucullata, dorso retusa, apice truncato papillosa; ovario acute tricostato, cum pedicello gracili glabro, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20207, flowering in Sept. 1909.

This species may be regarded as the nearest relative of *D. subacaule* Reinw., but the latter has rather larger flowers and much more pointed sepals and lip, a longer mentum and apparently a five-keeled ovary. *D. oreocharis* Schltr., described below, also is related very closely to these two species, but has finely ciliated petals. The flowers are violet-red with an orange-yellow apex to the labellum.

106. *D. oreocharis* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 2–2.5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavatis, apice 2–3-foliatis, 0.5–1 cm longis, supra basin 0.2–0.3 cm diametientibus; foliis erecto-patentibus, lanceolato-ellipticis vel lanceolato-ligulatis, acutis vel apiculatis, 0.5–1 cm longis, medio fere 1.75–2.5 mm latis; inflorescentiis subsessilibus, abbreviatis; bifloris; bracteis ovatis, apiculatis vel acuminatis, ovario pedicellato pluries brevioribus; floribus erectis, illis *D. subaculis* Reinw. similibus sepalis oblongo-lanceolatis, apiculatis, glabris, 0.7 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum oblique conicum apice leviter contracto subincurvulum subacutum 0.8 cm longum formantibus; petalis oblique lineari-ligulatis, breviter acuminatis, margine minute ciliolatis, sepalis paulo brevioribus; labello lineari, apicem versus vix dilatato, glabro, apice breviter apiculato marginibus incurvulo, 1.25 mm longo, infra apicem 2 mm lato; columna brevi, glabra, pede ligulato-lineari, clinandrii lobis lateralibus oblique triangulis obtusis, dorsali breviter dentiformi brevior; anthera late trapezoideo-cucullata, apice truncato minute papillosa; ovario tricostato, glabro, cum pedicello gracili c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18753, flowering in Nov. 1908.

Initially I thought this species to be identical with *D. subacaule* Reinw., but it was found that the latter had much longer-pointed sepals and non-ciliated petals. *D. tricostatum* Schltr. also has glabrous petals and, in addition, smaller flowers. Furthermore, it is probable that *D. subacaule* Reinw., like *D. tricostatum* Schltr., has a deeper violet-red flower colour, while *D. oreocharis* Schltr. is distinguished by its lustrous scarlet-red flowers with golden yellow labellum and its apex orange-yellow. The small patches often are covered completely with their pretty flowers, which, in spite of their small size, give the plant a beautiful appearance.

107. *D. frigidum* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 2–2.5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavatis, vulgo bifoliatis, 0.3–0.4 cm altis,

supra basin 1.25–2 mm diametientibus; foliis erecto-patentibus, linearibus, apiculatis, glabris, textura subrigidulis, 0.5–0.8 cm longis, 1–1.25 mm latis; inflorescentiis subsessilibus, abbreviatis, bifloris; bracteis ovatis, breviter acuminatis, ovario pedicellato pluries brevioribus; floribus erectis, in sectione inter minores; sepalis oblongis, apiculatis, c. 5.5 mm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum e basi conica cylindricum apice minute bilobulatum rectum 6.5 mm longum formantibus; petalis oblique lineari-ligulatis, apiculatis, glabris, dimidio inferiore paululo angustatis, sepalis subaequilongis; labello lineari, usque infra medium marginibus columnae pedi adnato, tertia parte apicali paululo dilatato, apice reflexo breviter acutato, glabro, 1.15 cm longo, infra apicem c. 0.2 cm lato; columna brevi, glabra, pede gracili; clinandrii lobis lateralibus brevibus rotundatis cum apiculo minuto, dorsali subulato paulo longiore; anthera late rhomboideo-cucullata, dorso minute trilobulata, apice truncato minute papillosa; ovario semitereti, dorso leviter tricostato, dense et breviter papilloso, cum pedicello gracili glabro c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18723, flowering in Nov. 1908.

Unfortunately, I found only a single plant of this interesting species. It is distinguished from the rest by the strongly recurved apex of the lip, and the densely papillose ovary. The leaves are fairly rigid and thick. The entire little plant is like other species of the section, a distinctly alpine form of the genus. The flowers are greenish yellow, the labellum green with red-lead-coloured apex, the pollinia grey-black.

108. *D. sulphureum* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 2.5–3 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ellipsoideo-obclavatis, apice vulgo bifoliatis, 0.6–1 cm altis, infra medium 0.3–0.4 cm diametientibus; foliis erecto-patentibus patentibusve, elliptico-ligulatis, subacutis, glabris, textura rigidulis, 0.7–1.3 cm longis, medio fere 2.5–4 mm latis; inflorescentiis apicalibus, subsessilibus, abbreviatis; bracteis ovatis vel deltoideis, apiculatis, ovario pedicellato multo brevioribus; floribus erectis, in sectione mediocribus; sepalis elliptico-lanceolatis, acuminatis, glabris, 0.8 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum anguste conicum subacutum obliquum 1.1 cm longum formantibus; petalis oblique elliptico-ligulatis, acutis, basin versus sensim paulo angustatis, glabris, sepalis paulo brevioribus; labello e basi angustiore ligulato, breviter acuminato, medio marginibus incurvulo, quarta parte basali marginibus columnae pedi adnato, glabro, 1.5 cm longo, infra apicem 0.3 cm lato; columna brevi, glabra, pede gracili; ovario trigono, glabro, cum pede gracili c. 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20076, flowering in Sept. 1909.

A very well-defined species, which has comparatively large flowers relative to the inferior size of the pseudobulbs and leaves. It is best placed next to *D. frigidum* Schltr. from which, by even a superficial observation, it is recognised easily by the robust growth. The flowers are pale sulphur-yellow with an orange-yellow-coloured labellum in front, the apex being grass-green.

109. *D. puniceum* Ridl., in Journ. Bot. XXIV (1886), p. 324.

D. subacaule Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 279 (nec Reinw.) p.p.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19595, no. 19658, [both] flowering in May–June 1909.

There is no doubt that the plant described here is identical with Ridley's species, with which I have compared it accurately. The species is very characteristic in its ovary, which in transverse section (just below the apex) shows ten ridges, varying in height. In floral structure and habit, *D. scarlatinum* Schltr. is the closest species, but it has larger flowers, a blunter mentum and only five keels on the ovary. The flowers in *D. puniceum* Ridl. are scarlet-red, the labellum golden yellow with a scarlet-red apex.

110. *D. scarlatinum* Schltr., sp. nov.

Epiphyticum, humile, caespitificum, 4–6 cm altum; rhizomate valde abbreviato; radicibus

filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavato-ellipsoideis, 0.7–1.5 cm altis, medio fere 0.3–0.5 cm diametientibus, apice vulgo bifoliatis, rarius trifoliatis; foliis erecto-patentibus, angustius ligulatis, obtusiusculis vel breviter apiculatis, basin versus sensim paululo angustatis, glabris, textura subcoriaceis, 2–4 cm longis, medio fere 0.3–0.6 cm latis; inflorescentiis apicalibus, subsessilibus, abbreviatis, bifloris; bracteis ovatis, acuminatis, glabris, ovario pedicellato plus duplo brevioribus; floribus erectis, illis *D. punicea* Ridl. similibus, sed paulo majoribus, glabris; sepalis ovato-lanceolatis, acutis, 0.8 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum subcylindricum obtusum apice paululo attenuatum rectum 0.8 cm longum formantibus; petalis oblique lineari-ligulatis, acutis, basin versus paululo angustatis, sepalis paulo brevioribus; labello anguste ligulato, acuminato, quinta parte basali marginibus columnae pedi adnato, medio fere incrassatione obscura V-formi transversa vix conspicua donato, 1.4 cm longo, dimidio superiore c. 2.5 mm lato; columna brevi, pede gracili, clinandrii lobis lateralibus brevibus, breviter bilobulatis, dorsali subulato paulo longiore; anthera late rhomboideo-cucullata, dorso excisa antice truncata, glabra; ovario 5-costato, glabro, cum pedicello gracili, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 17966, flowering in July 1908.

In this species we have again one of those forms about which one could be in doubt as to whether to treat it as a species or a variety. It is related very closely to *D. puniceum* Ridl., but it has shorter pseudobulbs, larger flowers, and a relatively shorter and blunter mentum, a somewhat differently shaped labellum, a column-foot less concave at the apex, and above all a very different ovary in transverse section. All these characters together seemed to indicate that the two species should be kept separate. The flowers are a bright scarlet-red, with orange-yellow labellum.

111. *D. Hellwigianum* Krzl., in Engl. Bot. Jahrb. XIII (1893), p. 16.

Kaiser-Wilhelms-Land: On the Finisterre Range, alt. c. 2300 m—Hellwig no. 323, flowering in Oct. 1888.

This species is known to me at present only by the Type in the Berlin Herbarium. I have not collected it myself. It is distinguished from the other larger-flowered species by its very narrow leaves. A comparison of the plant with *Maxillaria* seems to me not very satisfactory. Up to the present the colour of the flowers is not known with certainty, but they seem to have been reddish.

112. *D. tenuicalcar* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XLV (1911), p. 6; in Nova Guinea VIII (1911), p. 574, XCV, Fig. C.

Kaiser-Wilhelms-Land: On trees in the central range on the upper Kaiserin-Augusta River, alt. c. 1500 m—K. Gjellerup no. 390, flowering in Nov. 1910.

This species, unknown to me, must be a near relative of *D. quinquecostatum* Schltr., from which, however, it is distinguished easily by the colour of the flowers. According to the collector the flowers are a deep rose-red with a pale violet tint.

113. *D. quinquecostatum* Schltr., sp. nov.

Epiphyticum, erectum, pro sectione satis validum, 14–22 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavato-cylindraceis, apice trifoliatis, 3.5–5 cm longis, infra medium 4.5–6 mm diametientibus; foliis erectis, anguste linearibus, subacutis, 12–15 cm longis, 3–4 mm latis, glabris, textura coriaceis; inflorescentiis lateralibus, subsessilibus, abbreviatis, bifloris; bracteis late ovatis, apiculatis, ovario pedicellato multoties brevioribus; floribus erectis, in sectione inter majores, glabris; sepalis ovato-lanceolatis, acuminatis, 1.2 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum e basi anguste conica cylindricum obtusiusculum leviter incurvulum 2.2 cm longum formantibus; petalis oblique lanceolato-ellipticis, acuminatis, basin versus subspathulato-angustatis, sepalis paulo brevioribus; labello lineari, apicem versus sensim paululo dilatato, acutato, glabro, usque infra medium marginibus columnae pedi adnato, 3.2 cm longo, infra apicem 0.3 cm lato; columna brevi, pede gracili, clinandrii lobis lateralibus rotundatis, brevibus, dorsali dentiformi, parvulo; anthera late rhomboideo-cucullata, dorso subexcisa, apice truncato minute puberula; ovario quinquecostato vel potius quinquealato, glabro, cum pedicello gracili 3.5 cm longo, costis vel alis leviter undulatis.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19743, flowering in June 1909.

As I already stated under *D. tenuicalcar* J.J. Sm., the species described here must be related closely to the latter. It does not seem likely that the two are identical, because apart from the differences in the measurements, the shape of the mentum is considerably different and, above all, the colour of the flowers is quite different from the uniform colouring of the other species in the section.

Very characteristic is the whole lateral arrangement of the inflorescences, which often arise from midway up the pseudobulbs. The flowers are a muddy violet-red with blue tips, the labellum with a lustrous scarlet-red apex.

114. *D. dryadum* Schltr., sp. nov.

Epiphyticum, erectum, pro sectione validum, 20–25 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis fusiformibus, apice 2–3-foliatis, 3–5 cm longis, medio fere 3–5 mm diametientibus; foliis erectis vel suberectis, anguste linearibus, apiculatis, basin versus sensim attenuatis, 13–17 cm longis, medio fere 2.5–4 mm latis; inflorescentiis versus apices caulium, subsessilibus, abbreviatis vulgo 2-floris; bracteis ellipticis, apiculatis, ovario pedicellato multo brevioribus; floribus erectis, in sectione inter majores, glabris; sepalis ovato-lanceolatis, apiculato-acuminatis, 1.7 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conicum subacutum, 1.7 cm longum formantibus; petalis oblique oblongo-ellipticis, apiculatis, sepalis distincte brevioribus; labello anguste oblanceolato-ligulato, acuminato, marginibus infra apicem incurvulis, tertia parte basilari marginibus columnae pedi adnato, 2.2 cm longo, infra apicem 0.4 cm lato; columna brevi, pede gracili, clinandrii lobis lateralibus triangulo-rotundatis, dorsali dentiformi vix longiore; anthera late rhombeo-cucullata, dorso leviter excisa, apice truncato minute papillosa; ovario 5-alato, dorso costis 4 interjectis, glabro, cum pedicello gracili c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees on open slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18211, flowering in July [Ed.—possibly Sept.] 1908.

In the shape of the flowers this species reminds me of *D. pentapterum* Schltr., but from this it is distinguished by the long narrow leaves and the colour of the flowers. Likewise, it somewhat resembles *D. Hellwigianum* Krzl., but has much narrower leaves and smaller flowers with a relatively longer mentum. The very characteristic flower colouring is violet-pink, with a muddy, dark violet labellum which is conspicuous with a scarlet-red apex.

115. *D. uncinatum* Schltr., sp. nov.

Epiphyticum, erectum, pro sectione validum, c. 15 cm altum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, apicem versus paulo attenuatis, 2–3-foliatis, 4–5.5 cm altis, medio fere 2.5–3.5 mm diametientibus; foliis erecto-patentibus vel suberectis, anguste lanceolato-ligulatis, acutis vel subacutis, basi sensim paulo attenuatis, 5–8 cm longis, medio fere 0.6–1 cm latis; inflorescentiis subapicalibus, subsessilibus, abbreviatis, vulgo bifloris; bracteis ovatis, breviter acuminatis, ovario pedicellato multo brevioribus; floribus erectis, in sectione inter majores; sepalis oblongis vel ovalibus, apiculatis, 1.2 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conicum apice attenuatum obtusiusculum vix incurvulum c. 2 cm longum formantibus; petalis e basi subunguiculato-angustata oblique ellipticis, acutis, glabris, sepalis paulo brevioribus; labello e basi angustiore lineari-ligulato, apice acuminato uncinato-recurvo, 2.7 cm longo, infra apicem 0.5 cm lato, tertia parte basilari marginibus columnae pedi adnato, glabro; columna brevi, glabra, pede lineari apice excavatione lanceolata ornato, clinandrii lobis lateralibus rotundatis, brevibus, intermedio subulato vix longiore; anthera quadrato-rhomboidea, cucullata, dorso breviter excisa, apice truncato papillosa; ovario triquetro, glabro, cum pede gracili c. 2.4 cm longo.

Kaiser-Wilhelms-Land: On trees on the more open slopes of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18223, flowering in Sept. 1908.

Unfortunately, I found only a solitary specimen of this interesting plant. In habit it most resembles *D. pentapterum* Schltr., but is distinguished by quite appreciable

differences in floral colouring and structure, even though it apparently stands closest to that species. From *D. dryadum* Schltr. it is distinguished externally already by its much broader and shorter leaves and the longer pseudobulbs; quite apart from these considerations, its triangular ovary does not quite agree with that of *D. dryadum* Schltr. The colour of the flowers is similar to that of *D. dryadum* Schltr., viz. a pale carmine-red with a dark violet labellum, the apex a pale scarlet-red, recurved and hook-shaped.

116. *D. pentapterum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 161.

D. brevicaule Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 127 (nec Rolfe), p. p.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m (quite rare)—R. Schlechter no. 14434, flowering in Apr. 1902; on trees in the forests of the Kani Range above Bolobo, alt. c. 1000 m—R. Schlechter no. 16531, flowering in Sept. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19011, flowering in Dec. 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18255, flowering in Sept. 1908; on trees in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 13983, flowering in Jan. 1902.

It was quite unjustified of Kränzlin to unite this species with *D. brevicaule* Rolfe, although, as it appears, he had seen neither of the two species. In fact, the Type of *D. brevicaule* Rolfe consists of at least two species of the section *Oxyglossum*, neither of which, however, is really related closely to *D. pentapterum* Schltr. If such superficialities are due to undue hurried determinations of related species they may be excused eventually but if they are repeated from almost every page in the critical treatment of an entire genus, it cannot be condemned sufficiently, for what a terrible confusion it may lead to was shown by Kränzlin in his monograph on *Calceolaria**, as well as in his monograph on *Dendrobium*. For instance, he has also united *D. eleutheroglossum* Schltr., *D. ngoyense* Schltr. and *D. Poissonianum* Schltr., three entirely different New Caledonian species which can be distinguished at once even without analysis, although the three Types, with accurate illustrations, had been examined by him.

D. pentapterum Schltr. seems to be common, especially in the central parts of Kaiser-Wilhelms-Land and is a striking plant owing to the colour of the flowers. I have observed it only once as a single specimen in the Torricelli Range; whereas in the western mountains it occurs in colonies so that on a single tree a hundred or more specimens may be seen together. The colour of the flowers is best described as pale greenish yellow, with an orange-red apex to the labellum.

117. *D. nebularum* Schltr., sp. nov.

Epiphyticum, erectum, pro sectione satis validum, 8–10 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis subfusiformi-obclavatis, apice vulgo bifoliatis, 1.5–2.5 cm longis, infra medium 0.3–0.5 cm diametentibus; foliis erecto-patentibus vel suberectis, ligulatis, apiculatis vel subacutis, basin versus paulo angustatis, glabris, 4–6 cm longis, medio fere 0.5–0.8 cm latis; inflorescentiis apicalibus subsessilibus, abbreviatis, bifloris; bracteis ovatis vel ovato-lanceolatis, apiculatis vel breviter acuminatis, glabris, ovario pedicellato multo brevioribus; floribus erectis, in sectione inter majores, glabris; sepalis ovato-lanceolatis, apiculatis vel acuminatis, 1.2 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conicum subacutum apice vix incurvulum 1.3 cm longum formantibus; petalis anguste elliptico-ligulatis, acuminatis, obliquis, sepalis subaequilongis, glabris; labello circuitu anguste oblanco-ligulato-ligulato, acuminato, marginibus dimidio anteriore leviter incurvulis, tertia parte basilari pedi columnae marginibus adnato, 1.9 cm longo, infra apicem c. 3.5 mm lato; columna brevi, pede

* cf. J. Witasek, in Österr. Bot. Zeitschr., 1907.

gracili, clinandrii lobis lateralibus rotundatis, obtusissimis, dorsali dentiformi vix longiore; ovario acute 5-costato, glabro, cum pedicello c. 1.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18752, flowering in Nov. 1908.

I consider that this species is best placed alongside *D. pentapterum* Schltr., to which it is related closely in habit, as well as in the shape of the flowers. One of my specimens possesses a pseudobulb more thickened at the base, but I have not described this, since I suspect it may be caused by a fungus or gall formation. The flowers are violet-pink with an ochre-red apex to the labellum.

118. *D. trialatum* Schltr., sp. nov.

Epiphyticum, humile, erectum, pro sectione validum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavato-cylindraceutis, 1.2–1.6 cm altis, infra medium vix 0.3 cm diametientibus, bifoliatis; foliis erecto-patentibus ligulatis, apiculatis, 3.5–4 cm longis, medio fere 0.4–0.5 cm latis, glabris; inflorescentiis subapicalibus, subsessilibus, abbreviatis, bifloris; bracteis ovalibus, apiculatis, ovario pedicellato multo brevioribus; floribus erectis, in genere inter majores, illis *D. uncinati* Schltr. similibus; sepalis ovatis vel ovato-lanceolatis, apiculato-acuminatis, glabris, 1.1 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conicum apice paululo contractum subacutum vix curvatulum 1.5 cm longum formantibus; petalis oblique obovato-oblongis, apiculatis, minute ciliolatis, sepalis paulo brevioribus; labello lineari-ligulato, apicem versus sensim paululo dilatato, antice recurvo, subito in apicem lanceolatum acutum paulo angustato, minute ciliolato, toto 2.2 cm longo, infra apicem 3.75 mm lato; columna brevi, pede lineari, gracili, clinandrii lobis lateralibus obscure trilobulatis margine minute denticulatis, dorsali subulato paulo longiore; ovario trilato, cum pedicello glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18785, flowering in Nov. 1908.

In a dried state this species, externally, chiefly resembles *D. nebulareum* Schltr., but it is, however, distinguished by its compressed habit; ciliated petals; the labellum also ciliated, recurved and fork-shaped at the apex; and by the three-winged ovary. The flowers remind one chiefly of those from *D. uncinatum* Schltr., but they have ciliated petals and lip, and the entire plant differs externally somewhat by its much taller pseudobulbs.

The flowers are almost exactly the same colour as those of *D. uncinatum* Schltr.

119. *D. petiolatum* Schltr., sp. nov.

Epiphyticum, humile, pro sectione satis validum, 10–15 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavatis, apice vagina persistente folii coronatis, unifoliatis, 2–3 cm longis, infra medium 0.5–0.7 cm diametientibus; folio erecto, oblongo-ligulato, apiculato, basi sensim in petiolum attenuato, vagina petioliformi, lamina 5–8 cm longa, medio fere 1.1–1.5 cm lata, petiolo vagina inclusa 2.7–4.5 cm longo; racemis ad apices pseudobulborum perbreviter pedunculatis, abbreviatis, dense 10–20-floris; bracteis ovatis, acuminatis, ovario fere duplo brevioribus; floribus erecto-patentibus, inversis, in sectione inter mediocres; sepalis oblongo-lanceolatis, valde acuminatis, glabris, 1.1 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum oblongum obtusum c. 0.9 cm longum formantibus; petalis oblique lanceolato-ligulatis, acutis, glabris, sepalis distincte brevioribus; labello ligulato, antice trilobulato, lobulis lateralibus obtusatis, abbreviatis, intermedio lanceolato, acuto, producto, labello toto glabro, tertia parte basilari columnae pedi marginibus adnato, medio carina curvata humili transversa ornato, 1.4 cm longo, infra apicem c. 2.5 mm lato; columna brevi, pede satis longo, clinandrii lobis lateralibus rotundatis brevibus, dorsali triangulo fere aequilongo; anthera subquadrato-cucullata, dorso minute excisa, glabra, apice truncata; ovario 5-costato, glabro, cum pedicello gracili, 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800–2400 m—R. Schlechter no. 18710, flowering in Nov. 1908.

All species of the Section *Oxyglossum* previously described had in common the normal two-flowered inflorescence. The present species begins those with a shortened

multi-flowered raceme, and, apparently, always single-leaved pseudobulbs. Amongst these, *D. petiolatum* Schltr. is distinguished by its stalked leaves and longer flowers.

The colour of the flowers is bright violet-red with a yellow apex to the labellum.

120. *D. undatialatum* Schltr., sp. nov.

Epiphyticum, erectum, humile, pro sectione validum, 6–10 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, elongatis, glabris; pseudobulbis obclavatis, unifoliatis, 1.5–3 cm altis, 3.5–7 mm diametientibus; folio erecto, elliptico vel elliptico-lanceolato, acuto vel subacuminato, glabro, 4–8.5 cm longo, medio fere 1.1–2.2 cm lato, glabro, textura pro sectione tenuiore; racemis perbrevis pedunculatis, abbreviatis, 3–8-floris; bracteis ovato-lanceolatis, acuminatis, ovario pedicellato duplo vel plus duplo brevioribus; floribus erecto-patentibus, in sectione mediocribus; sepalis oblongis, extus alticarinatis, apiculatis, glabris, c. 1.5 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum conicum subacutum pro sectione perbreve (3.2 mm longum) formantibus; petalis anguste elliptico-ligulatis, obliquis, breviter acuminatis, basin versus paulo angustatis, glabris, sepalis subaequilongis; labello circuitu oblongo, infra medium leviter constricto, apice in lobulum lanceolatum acutum, margine minute subdenticulato-ciliatum producto, 0.9 cm longo, infra medium 0.2 cm lato, lobulo apicali c. 0.3 cm longo; columna brevi, pede pro sectione brevi, clinandrii lobis lateralibus brevissimis, truncatis, dorsali subulato multo longiore; anthera late rhomboideo-rotundata, dorso leviter retusa, apice truncato minutissime ciliolata; ovario 5-alato cum alis undulatis, glabro, pedicello gracili incluso 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20147, flowering in Sept. 1909; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17960 (TYPE), flowering in July 1908.

Of the species described so far, *D. undatialatum* Schltr. does not come very close to any. The short mentum and the ovary with its wave-like twisted wings allows the species to be distinguished easily. It is related only to *D. maboroense* Schltr., described below, where I will discuss the differences in more detail. These two species should be regarded as somewhat aberrant forms for this section, but may be included here still. The flowers are snow-white, with a lip orange-yellow in front, the apex of which is white. The labellum, furthermore, shows, in the middle, five red veins, becoming gradually fainter towards the base.

121. *D. maboroense* Schltr., sp. nov.

Epiphyticum, erectum, humile, 5–7 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis obclavatis, unifoliatis (in specimine singulo), 1.5 cm longis, c. 0.4 cm infra medium diametientibus; folio oblongo-ligulato, breviter acuminato, basi cuneato, glabro, textura pro sectione tenuiore, c. 5 cm longo, medio fere 1.3 cm lato; racemo perbrevis pedunculato, abbreviato, c. 4–7-floro; bracteis ovato-lanceolatis, acutis, ovario pedicellato fere triplo brevioribus; floribus erecto-patentibus, in sectione mediocribus, illis *D. undatialati* Schltr. similibus, sed paulo minoribus; sepalis ellipticis, breviter apiculatis, extus carinatis, glabris, 0.8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum breve obtusiusculum conicum c. 0.3 cm longum formantibus; petalis oblique ellipticis, apiculatis, basin versus paulo angustatis, glabris, sepalis subaequilongis; labello pandurato-oblongo, infra medium distincte constricto, transversim incrassato, apice in acumen lanceolatum 1.75 mm longum producto, tertia parte anteriore margine papulis ciliiformibus pectinato-ciliato, 0.8 cm longo, infra medium 0.2 cm lato, supra basin et supra medium 0.3 cm lato; columna brevi, pede ligulato, clinandrii lobis lateralibus brevissimis, serrulatis, dorsali subulato longiore; ovario 6-costato, costis undulatis, glabro, cum pedicello gracili c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19509, flowering in May 1909.

The only species known to me which is related closely to *D. undatialatum* Schltr. It can be distinguished easily from this by the shorter flowers, broader petals, broader and shorter pointed labellum with rather long cilia, and the conspicuous six-keeled ovary. In other respects the two species resemble each other closely. The flowers are whitish, the labellum with an orange-yellow spot in the middle, the foot of the column

with a similar spot. Unfortunately, I have only one specimen to hand. When I found the plant, I regarded it initially as *D. undatiale* Schltr., otherwise I would have collected more material.

§ 16. *Phalaenanthe*

Up to the present, no species from this section (which corresponds with the *Bigibbum* group) have been recorded from German New Guinea. From Dutch New Guinea *D. affine* Steud. is recorded. From British Papua we know of *D. Leeatum* O'Brien, the doubtful *D. Williamsianum* Rchb. f. and *D. MacGregorii* F.v.M. et Krzl. (which hardly belongs here). As an extremely doubtful species, *D. Brandtiae* Krzl. may have to be included eventually.

It would appear that the section is distributed chiefly over a land-complex, whose central line is located in the Torres Strait and the Arafura Sea; hence I consider it improbable that species of this relationship will be found also in German New Guinea.

The section is, as I have mentioned already, related closely to *Ceratobium*, being connected closely with the latter through such species as *D. superbiens* Rchb. f., [Ed.—*D. x superbiens*], but it seems better to separate them on account of the clear difference to be found in the double chin and in the shape of the lamellae on the labellum.

The species, apparently, are nearly all epiphytes, and grow almost exclusively at lower altitudes in areas where they are subjected to a pronounced warm, dry season, which is absolutely necessary for their prosperity.

§ 17. *Ceratobium*

This section, established by Lindley, corresponds with the group *Antennata* Rchb. f. and my own group *Strebloceras*. At present it embraces about 30 species of which more than half are endemic to New Guinea. The distribution area extends from east Java, through the Moluccas, south Philippines, New Guinea, northern Australia into the Polynesian Islands, and finally the Viti [Fiji] Islands, where so far *D. Tokai* Rchb. f. is found as the most eastern representative.

The section as such, is well-defined and, in my opinion, well separated from *Phalaenanthe*. It has been difficult always to distinguish the individual species accurately, because there are few sections in which we meet such absolute similarity in habit, or in which such a large number is so closely related and yet well separated in floral characters. Hitherto, great confusion was caused by making determinations without reference to Types so that I fear we have to face a still greater chaos after treatment of the section by Kränzlin, in whose monograph only a few of the determinations (which form the basis of his work in 'Pflanzenreich') agree with the original Type specimens. Unfortunately, I have not been able to see a large proportion of the Types of species placed by him in this, or other, sections, otherwise it might have been possible for me to clear up some of his species. Until such a re-adjustment has been made, I fear a new monograph will be impossible. It is to be hoped that these Types will be made available for critical appraisal. In addition to the species considered below, the following have, unquestionably, been found in New Guinea, although not hitherto recorded from the German Territory.

From Dutch New Guinea we know: *D. undulatum* R. Br. (according to J.J. Sm.), *D. Mirbelianum* Rchb.f., *D. arachnanthe* Krzl., *D. Odoardi* Krzl., *D. leporinum* J.J. Sm., *D. Gouldii* Rchb. f. and *D. trilamellatum* J.J. Sm.

From British Papua, the number of known species is considerably greater, and, it

seems to me that there the section has undergone a quite special development, provided that all the species are retained without alteration. From there, with the exception of a few species widely distributed in New Guinea, we know the following, viz. *D. d'Albertisii* Rehb. f., which may be united with *D. antennatum* Lindl. (perhaps a variety), *D. vandiflorum* Rehb. f. (a very doubtful species), *D. Guilianetii* Bail., *D. prionoichilum* F.v.M. et Krzl., *D. robustum* Rolfe, *D. montis-Yulei* Krzl. (also very doubtful) and *D. rigidifolium* Rolfe, the latter is known only by a very poor specimen from which one can decide little of its closer relationship. Finally, from the British Solomons we have *D. Woodfordianum* (Maid.) Schltr. (*D. undulatum* R. Br. var. *Woodfordianum* Maiden*).

From German New Guinea, at present, I know the species discussed below which are distributed over the whole Territory, but unlike most from the other sections, the greater proportion here occur in the coastal zones.

Only comparatively few are found in the mountains so far, only *D. cochliodes* Schltr. being known from the mist-forest zone. It can be expected that more species will be found there, but it is certain they can only be few in number, whereas we may with certainty expect more from the plains, and in particular from the coastal zone.

122. *D. cochliodes* Schltr., sp. nov.

Epiphyticum, erectum, validum, 60–120 cm altum; rhizomate valde abbreviato; radicibus teretibus, elongatis, flexuosis, glabris; caulibus simplicibus, crassiusculis, teretibus, dimidio inferiore vaginis alte amplexentibus obsessis, dimidio superiore bene foliatis, vaginis foliorum fere omnino obtectis; foliis erecto-patentibus vel subpatentibus, oblongis vel oblongo-ellipticis, apice inaequaliter atque obtuse bilobulatis, glabris, textura coriaceis, 5–8 cm longis, medio fere 2–2.6 cm latis; racemis pedunculatis, versus apicem caulis lateralibus, erecto-patentibus, 7–15-floris, usque ad 35 cm longis, pedunculo racemo ipso fere aequilongo; bracteis minutis deltoideo-rotundatis, obtusis, ovario pedicellato multoties brevioribus; floribus in sectione mediocribus, erecto-patentibus, glabris; sepalis lanceolato-ligulatis, obtusis, margine undulatis et plus minus tortis, c. 2.5 cm longis, glabris, lateralibus obliquis, basi margine anteriore lobato-dilatata cum pede columnae mentum conicum obtusiusculum, c. 1.3 cm longum formantibus; petalis linearibus, obtusis, glabris, sepala distincte superantibus, c. 4 cm longis, spiraliter tortis; labello e basi perbreviter unguiculato cuneato, tertia parte anteriore trilobato, 3.5 cm longo, medio fere 1.4 cm lato, lobis lateralibus brevibus rotundatis, obtusis, intermedio multo longiore, oblongo, apiculato, 1.2 cm longo, carinis 3 angustis parallelis e basi labelli usque infra medium lobi intermedii decurrentibus; columna brevi crassiuscula, lobis lateralibus brevibus oblique apiculatis, dorsali triangulo dentiformi haud longiore; anthera quadrato-cucullata, glabra, antice truncata, dorso subretusa; ovario cum pedicello gracili, c. 2.7 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17491 (TYPE), flowering in Mar. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18147, flowering in Sept. 1908; on trees in the mountain forests on the Waria [River] near Gobi, alt. c. 850 m—R. Schlechter no. 19853, flowering in June 1909.

This rather attractive species should be placed near *D. stratiotes* Rehb. f., from which it is distinguished by the longer inflorescences, shorter petals, and the crests on the labellum gradually disappearing towards the front. The flowers are green-yellow with a brown-veined labellum and a golden yellow anther.

123. *D. antennatum* Lindl., in Hook., Journ. Bot. II (1843), p. 236.

Kaiser-Wilhelms-Land: On trees at the beach on Tamara Island, alt. c. 15 m—R. Schlechter no. 13670, flowering in Oct. 1901; on trees in the gallery forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18426, flowering in Oct. 1908.

* *D. undulatum* R. Br. var. *Woodfordianum* Maiden, in Proc. Linn. Soc. New South Wales (1899), part IV, p. 652, is more closely related to *D. veratrifolium* Lindl. than to *D. undulatum* R. Br.

Neu-Lauenburg: Without location details—Micholitz (ex Kränzlin).

Neu-Mecklenburg: Near Nusa—C. Lauterbach no. 354, flowering in June 1890; without location details—Micholitz.

It has been remarked repeatedly how closely related are this species and *D. d'Albertisii* Rehb. f. Personally, I am of the opinion that the latter should be regarded only as a variety of *D. antennatum* Lindl. This species is distributed widely and has been recorded from both the Dutch and British parts of New Guinea. It occurs most frequently on the coast, especially on *Calophyllum* trees, and has been observed only infrequently further inland. The flowers are whitish with green-yellow petals and a violet-veined labellum.

124. *D. veratrifolium* Lindl., in Hook., Journ. Bot. II (1843), p. 236.

D. Cogniauxianum Krzl., in Engl. Bot. Jahrb. XIII (1891), p. 281, (p.p.).

D. lineale Rolfe, in Gardn. Chron. II (1889), p. 381, (ex J.J. Sm.).

D. Auguste-Victoriae Krzl., in Gartenfl. (1894), p. 115.

D. imperatrix Krzl., in Gardn. Chron. II (1895), p. 34.

Kaiser-Wilhelms-Land: Near Berlinhafen—Kärnbach; on trees at the beach on Tamara Island, alt. c. 15 m—R. Schlechter no. 13672, flowering in Oct. 1901; on trees in the coastal forest near Bulu, alt. c. 20 m—R. Schlechter no. 16132, flowering in May 1907; on trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 17537, flowering in Apr. 1908; on trees in the gallery forests on the Keneja [River], alt. c. 150 m—R. Schlechter no. 18390, flowering Oct. 1908; near Konstantin-hafen (Melamu)—Hollrung; on the beach near Hatzfeldhafen—Hollrung no. 348, flowering in Oct. 1888, near Finschhafen in primary forest—O. Warburg; Hellwig no. 199, flowering in Jan. 1889; C. Lauterbach no. 1379, flowering in Jan. 1891.

Possibly the prettiest species in the section. I have seen specimens which had up to 35 flowers on their 30 plus beautiful inflorescences (up to 80 cm long). I cannot understand why this orchid, widely distributed on the coast of New Guinea, has not been introduced [Ed.—to Europe] in larger quantities for cut flower cultivation, because it has all the requisites. Kränzlin's species, mentioned above, undoubtedly all belong here, whilst *D. lineale* Rolfe I have included on the authority of J.J. Smith. *D. Cogniauxianum* Krzl. is a mixture of *D. veratrifolium* Lindl. and *D. validum* Schltr.; for instance Warburg's specimen from Finschhafen belongs to *D. veratrifolium* Lindl., and that from Mioko [Is.] to *D. validum* Schltr. The description seems to have been made chiefly from the first, but the statements concerning the colour of the flowers are made from the latter.

125. *D. validum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 165.

D. veratrifolium Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 144 (nec Lindl.) p.p.

D. Cogniauxianum Krzl., in Engl. Bot. Jahrb. XIII (1891); p. 281 p.p.

Neu-Mecklenburg: On trees at the beach between Silum and Kanebo, alt. c. 15 m—R. Schlechter no. 14622, flowering in June 1902.

I simply cannot explain how Kränzlin, having seen the Type of my species, could ever unite it with *D. veratrifolium* Lindl. I can only believe that he has not taken the trouble to examine the flowers. Even externally both plants are so basically different that they may be distinguished easily without examination, furthermore the colours of the two flowers are quite different. These distinguishing characteristics I stressed especially in my description in 1905. *D. Cogniauxianum* Krzl., as explained, only in part belongs to this species. The flowers are golden brown, with a few darker veins on the labellum.

126. *D. Mirbelianum* Gaud., in Freyc. Voy. (1826), 423, t. 38.

D. prionochilum F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 761 (ex Kränzlin).

Kaiser-Wilhelms-Land: On trees in the forests at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19934, flowering in July 1909.

It is with some hesitation that I publish this determination. The present material agrees well with a flower from a cultivated specimen, furthermore the statements published by J.J. Smith about this species agree well with my plant. Authentic material, however, I have not seen, so I cannot vouch completely for the correctness of this determination, since, especially in a group like this, the species approach each other so closely. The plant, *D. aruanum* Krzl., is evidently very close to this one. The flowers are brown-yellow, finely dotted with brown inside; the labellum is pale yellow, violet-veined and marked.

127. *D. warianum* Schltr., sp. nov.

Epiphyticum validum, erectum, usque ad 120 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus crassiusculis, cylindraceis, basin et apicem versus paululo attenuatis, basi vaginata excepta bene foliatis, 1.3–1.5 cm diametentibus, foliorum vaginis bene obtectis; foliis erecto-patentibus ovalibus, inaequaliter et obtuse bilobulatis, glabris, textura coriaceis, usque ad 13.5 cm longis, medio fere usque ad 5 cm latis; racemis erectis, pedunculatis, subaxe multifloris, usque ad 50 cm longis, pedunculis c. 15 cm longis, vaginulis paucis amplexentibus obsessis; bracteis lanceolatis, acuminatis, ovario graciliter pedicellato multo brevioribus; floribus erecto-patentibus, in sectione mediocribus, illis *D. Mirbeliani* Gaud. similibus; sepalis oblongis, obtusis, margine leviter undulatis, glabris, 2.3 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum conicum obtusiusculum 0.7 cm longum formantibus; petalis e basi attenuata oblique oblanceolatis, obtusis, glabris, c. 3 cm longis, infra apicem 0.7 cm latis; labello circuitu oblongo, supra medium trilobo, 2.3 cm longo, inter apices loborum lateralium vix 0.9 cm lato, lobis lateralibus oblique oblongis, obtusis, rotundatis, intermedio multo longiore oblongo, minute apiculato, carinis 3 parallelis, separatis, apicem versus leviter flexuosis e basi labelli usque infra apicem lobi intermedii decurrentibus, glabris; columnae brevi, crassiuscula, glabra, pede ligulato, clinandrii lobis lateralibus paucidentatis, brevibus, intermedio dentiformi sublongiore; anthera late rhomboideo-cucullata, dorso excisa, facie 3-umbonata, apice truncato papillosa; ovario cum pedicello gracili, 3–3.5 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19951, flowering in July 1909.

The most closely related species are *D. Mirbelianum* Gaud. and *D. Rimannii* Rchb. f. from which it is distinguished by the shape of the labellum and the keels. The species appears to be restricted to the coastal areas like a number of its relatives. The flowers are olive-green or paler, violet-marked inside; the labellum with violet veins and white centre; the column flushed inside with violet.

128. *D. buluense* Schltr., sp. nov.

Epiphyticum, erectum, validum, usque ad 1 m altum et ultra; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus crassiusculis, cylindraceis, basi vaginata excepta dense foliatis, basin et apicem versus paulo attenuatis, medio c. 1.5 cm diametentibus, vaginis foliorum fere omnino obtectis; foliis erecto-patentibus, ovalibus, obtusis, inaequaliter et obtuse bilobulatis, glabris, textura coriaceis, 12–14 cm longis, medio fere 5.5–6.5 cm latis; racemis erecto-patentibus, longius pedunculatis, subaxe multifloris, usque ad 50 cm longis; bracteis minutis, deltoideis, acutis, ovario longipedicellato multo brevioribus; floribus erecto-patentibus, illis *D. Mirbeliani* Gaud. similibus, glabris; sepalis oblongo-ligulatis, subacutis, 2.8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum conicum obtusiusculum 0.7 cm longum formantibus; petalis oblique oblanceolato-ligulatis, subacutis, basin versus sensim sub-unguiculato-angustatis, 3.5 cm longis, supra medium 6.5 mm latis; labello circuitu ovali, infra medium trilobato, 2.6 cm longo, infra apices loborum lateralium 1.5 cm lato, lobis lateralibus oblique oblongis, obtusis, intermedio plus duplo longiore, oblongo-elliptico, subacuto vel apiculato, margine leviter undulato, carinis 3 parallelis separatis e basi labelli usque supra medium lobi intermedii decurrentibus

apicem versus leviter flexuosis, intermedia tenuiore, carinulis 2 usque ad basin lobi intermedi lateri exteriori carinarum exteriorum appressis additis; columna brevi, crassiuscula, glabra, clinandrii lobis lateralibus brevibus rotundatis, dorsali dentiformi haud longiore; anthera late rhomboideo-cucullata, dorso excisa, facie latiumbonata, apice truncato papillosa; ovario cum pedicello gracili, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the coastal forest near Bulu, alt. c. 30 m—R. Schlechter no. 19038, flowering in Dec. 1908.

Likewise a relative of *D. Mirbelianum* Gaud. from which it is distinguished by the shape of the lip with a very long, more elliptic front lobe and also by the keels of the labellum. Like *D. Mirbelianum* Gaud., it is a rather stately, robust plant. The flowers are pale brown-yellow, brown flushed inside; the labellum yellow with brown veins.

var. *kauloense* Schltr., var. nov.

Differt a forma typica habitu humiliore, racemis laxius 10–15-floris, petalis paulo brevioribus, labelli lobo intermedio magis undulato.

Kaiser-Wilhelms-Land: On trees in the mountain forests near the Kaulo Base, alt. c. 400 m—R. Schlechter no. 16833, flowering in Nov. 1907.

This is distinguished chiefly by the lesser robust development of the vegetative organs together with minor differences in the flowers, such as shorter petals. The colour of the flowers in the variety is the same as in the Type form.

129. *D. conanthum* Schltr., sp. nov.

Epiphyticum, erectum, validulum, certe 60 cm altum et ultra; caulibus simplicibus, teretibus, crassiusculis, bene foliatis, vaginis foliorum obtectis, medio fere 1.2 cm diametientibus, apicem versus sensim paululo attenuatis; foliis nondum notis, sine dubio illis *D. veratrifolii* Ldl. haud dissimilibus et fere aequimagnis; racemis erecto-patentibus, plus minus flexuosis, pedunculatis, sublaxe multifloribus, c. 35–40 cm longis, pendunculo c. 10 cm longo; bracteis oblongo-deltoides, ovario graciliter pedicellato multo brevioribus; floribus erecto-patentibus, in sectione mediocribus, glabris; sepalis oblongo-lanceolatis, subacutis vel apiculatis, margine leviter undulatis, 2.2 cm longis, lateralibus obliquis, margine anteriore dilatata cum pede columnae mentum late conicum subacutum vel obtusiusculum 1.3 cm longum formantibus; petalis oblique ligulatis, apiculatis, margine leviter undulatis, c. 2.5 cm longis; labello circuitu elliptico, quarta parte anteriore trilobato, c. 3 cm longo, medio fere 1.6 cm lato, lobis lateralibus oblique semirhombeis, subacutis, parvulis, margine anteriore denticulatis, intermedio elliptico, apiculato, margine subdentato, laterales multo excedente, carinis 3 valde approximatis e basi labelli, 2 lateralibus mox interpositis, exterioribus in medio labelli evanidis, interioribus usque infra medium lobi intermedi decurrentibus, intermedia apice elevata subito truncata usque in medium lobi intermedi; columna brevi, crassiuscula, clinandrio tridentato; anthera late rhomboideo-cucullata, dorso excisa, antice truncata; ovario graciliter pedicellato glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pro, Eitape District, alt. c. 20 m—R. Schlechter no. 19996, flowering in Aug. 1909.

The flowers of this species are very characteristic with the broad conical mentum. The only piece of the species which I have consists of the upper leafless stem with an inflorescence. It was brought to me by a native of the village of Pro from the surrounding forest. The species is recognised very easily from all related plants by the shape of the lip, with the smaller middle lobe. The flowers are yellow-green, tinged and veined with brown; the labellum with white crests slightly violet at the base; the column white with a yellow anther.

130. *D. ionoglossum* Schltr., sp. nov.

Epiphyticum, erectum, validum, usque ad 150 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, basi vaginam excepta bene foliatis, crassiusculis, cylindraceis, medio fere 1.3 cm diametientibus, vaginis foliorum obsessis; foliis erecto-patentibus, ovalibus, obtusis, apice breviter et obtuse bilobulatis, glabris, textura coriaceis, 5–8 cm longis, medio fere 2.7–4.5 cm latis; racemis longis pedunculatis, strictis vel substrictis, subdense multifloris, usque ad 5.5 cm longis; bracteis parvulis, oblongis vel deltoides, obtusis, ovario graciliter

pedicellato multoties brevioribus; floribus speciosis, in sectione inter majores, erecto-patentibus, glabris; sepalis oblongis, obtusis, c. 2.5 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum late conicum obtusiusculum 1.5 cm longum formantibus; petalis oblique ligulatis, obtusis, basin versus sensim paulo angustatis, sepalis vix longioribus, infra apicem 5.5 mm latis; labello circuitu late ovali antice trilobato, 2.8 cm longo, infra medium 2.2 cm lato, lobis lateralibus abbreviatis, margine exteriori undulatis, intermedio late reniformi vel transverse oblongo, apiculato, 0.5 cm longo, 0.8 cm lato; carinis 2 parallelis, basi ampliatis e basi labelli usque in basin lobi intermedii ornato, lamella intermedia e medio labelli usque supra basin lobi intermedii interjecta: columna brevi, semitereti, glabra, clinandrii lobis lateralibus subfalcato-obliquis, abbreviatis, dorsali minuto, dentiformi; ovario cum pedicello gracillimo, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19936, flowering in July 1909.

A magnificent plant which is especially conspicuous in the section, not only for the size, but also for the colour of the flowers. Its place is in the neighbourhood of *D. taurinum* Lindl., but its flowers are even larger than those of the latter, from which it may be distinguished by the shape of the labellum and the crests on that segment. The flowers are white, with a violet-blue lip and a tinge of violet on the inside of the sepals and petals.

var. *potamophilum* Schltr., var. nov.

Differt a forma typica floribus paulo minoribus, colore pallidioribus labello distinctius trilobato, lobo intermedio majore quadrato, carinis 3 parallelis separatis e basi labelli usque in lobum intermedium decurrentibus.

Kaiser-Wilhelms-Land: On isolated trees, on the banks of the Giagoro [River] (Kenejia Valley), alt. c. 200 m—R. Schlechter no. 18103, flowering in Aug. 1908.

The variety is not as beautiful as the Type form, in as much that the violet-blue of the lip is absent. The flowers are coloured a pallid violet-pink, with the lip greenish white in the middle. The differences in the shape of the labellum and its crests are quite considerable. Perhaps later on it may be necessary to consider it as a separate species.

131. *D. arachnoglossum* Rehb. f., in Gardn. Chron. I (1877), p. 334.

Kaiser-Wilhelms-Land: Without location details—Gerbich (ex Kränzlin).

This plant is still entirely unknown to me. According to the description it is related to *D. leporinum* J.J. Sm. I include it here since Kränzlin stated it as coming from Kaiser-Wilhelms-Land.

Hybrid of Section [17] *Ceratobium*

D. x. Schumannianum Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 165 (in observ.).

D. antennatum Lindl. x *D. veratrifolium* Lindl.

Kaiser-Wilhelms-Land: On trees at the beach on Tamara Island, between the parents—R. Schlechter no. 13671, flowering in Oct. 1901.

This plant is almost exactly intermediate between the two parents, but is more slender in its growth than *D. antennatum* Lindl. The labellum shows, towards the front, the higher crests of *D. veratrifolium* Lindl. The flowers are whitish with rose-red veins on the labellum and green-yellow tips to the petals.

§ 18. *Trachyrhizum*

During my stay in New Guinea, I had the opportunity of studying repeatedly a small group of *Dendrobium* which in habit reminded me most of *Ceratobium*, but from which it differed considerably in the structure of the flowers. Later on I was able to examine a species in the Beccari Collection, which appeared to belong to

Distichophyllum in habit but whose flower was shaped definitely like that of the small Papuan [Papuasian] group I had been unable to place in any other section, and which I called *Trachyrhizum* on account of its peculiar roots. I described the species in the Beccari Collection as *D. ansusanum* Schltr., but I am fairly certain now that it is identical with *D. Zippelii* J.J. Sm. This plant has made clear to me the position of *Trachyrhizum*, viz. between *Ceratobium* and *Distichophyllum*. The chief characters of the section do not lie in the roots, which are covered with peculiar sharp excrescences, but in the structure of the flowers, especially in that of the labellum. The column-foot is turned up in front like a spur, and bears on its apex a very movable labellum which appears to be mostly tri-lobed, the middle lobe being usually deeply two-tailed. The most striking feature is a spur-like prolongation at the back of the labellum, shaped exactly like the prolongation of the lip in *Appendicula* B1. Six species of this section are known to me at present, three of which are new descriptions. Only one species, *D. angustipetalum* J.J. Sm. (*Trichotosia Wallaceana* Krzl.), occurs away from Ternate Island. The above-mentioned *D. Zippelii* J.J. Sm. from Dutch New Guinea bears a greater resemblance to *Distichophyllum* than any of the other species of the section.

From British Papua, up to the present, only *D. Chalmersii* F.v.M., with which *D. cinnatum* F.v.M. is identical, is known to me. I have to thank the late M. Luehmann for allowing me to examine the flowers of both these Types. Furthermore, according to the description, perhaps the very doubtful *D. Copelandianum* F.v.M. et Krzl. may belong here. The three species which occur in German New Guinea, *D. trachyrhizum* Schltr., *D. cyrtolobum* Schltr. and *D. prosthecioglossum* Schltr., are all natives of the mist-forest zone; the first two are epiphytes growing on comparatively moss-free trees, while the latter is terrestrial, and is found usually at the base of tree-trunks on open slopes or on limestone rocks.

132. *D. trachyrhizum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, 30–60 cm altum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, dense papulis dentiformibus exasperatis; caulibus simplicibus, teretibus, mox plurisulcatis, dimidio superiore vel infra laxe foliatis, vaginis foliorum arcte amplexantibus obsessis, 4–5 mm diametentibus; foliis erecto patentibus, oblongo-ligulatis, inaequaliter et obtusiuscule bilobulatis, glabris, 5–10 cm longis, medio fere 1.2–2.2 cm latis; racemis axillaribus, gracilibus, erecto-patentibus, laxe 3–8-floris, usque ad 9 cm longis; bracteis minutis, oblongis, obtusiusculis, ovario graciliter pedicellato multo brevioribus; floribus vix mediocribus, erecto-patentibus, illis *D. Chalmersii* F.v.M. paulo minoribus; sepalis perlate semiovalibus, obtusiusculis, glabris, c. 0.5 cm longis, lateralibus valde obliquis basi margine anteriore lobato-producta cum pede columnae mentum oblongoideum obtusum c. 0.8 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusiusculis, basi decurrentibus, sepalis fere aequilongis; labello circuito subflabellato-cuneato, antice subreniformi-dilatato, bilobato cum apiculo minuto obtuso interjecto, marginibus antice subcrenato, appendice oblonga, intus acute bicarinata dorso biloba, in alas 2 lanceolatas acutas usque supra medium labelli decurrente ornato, dente subulato acuto adscendente in medio labelli interjecto, labello toto 0.9 cm longo, infra apicem 0.8 cm lato; columna brevi, pede e basi lata puberula angustato, apice uncinato-incurvo, clinandrio humili; anthera subreniformi-cucullata, glabra; ovario cum pedicello gracili, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20237, flowering in Sept. 1909; on tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17836, flowering in June 1908; on tree-trunks in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18256, flowering in Sept. 1909. [Ed.—probably 1908.]

Of those species of the section so far described this one is nearest to *D. Chalmersii* F.v.M.; in habit it also resembles *D. angustipetalum* J.J. Sm., but differs in the absence of lateral lobes. The species usually occurs in larger individual numbers and grows almost always only on perpendicular, moderately moss-free trees. The flowers are yellowish with a violet-brownish tip to the spur.

133. *D. cyrtolobum* Schltr., sp. nov.

Epiphyticum, erectum, c. 60 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, dense verruculoso-exasperatis; caulibus simplicibus, mox sulcatis, basi vaginata excepta bene foliatis, vaginis foliorum obsessis, medio fere c. 0.5 cm diametientibus; foliis erecto-patentibus, oblongis, obtusiusculis, inaequaliter bilobulatis, glabris, 6–9 cm longis, medio fere 2–2.8 cm latis; racemis erecto-patentibus, gracilibus, late 3–7-floris, usque ad 9 cm longis; bracteis minutis deltoideis, apiculatis, ovario multoties brevioribus; floribus in sectione inter minores, erecto-patentibus, illis *D. Zippelii* J.J. Sm. similibus; sepalis late ovatis, apiculatis, glabris 0.7 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum oblongum obtusum obliquum c. 5 mm longum formantibus; petalis oblique oblongis, apiculatis, subfalcatis, margine subdenticulatis, basi paululo decurrentibus, sepalis paululo brevioribus; labello e basi breviter unguiculata trilobato, 0.8 cm longo, inter apices loborum lateralium 0.9 cm lato, lobis lateralibus falcato-ligulatis, obtusiusculis, intermedio reniformi apiculato, lateralibus paulo brevioribus, carinis dorso in appendicem brevem calcariformem liberam connatis, apice acutis, e basi labelli in basin lobi intermedii decurrentibus, lamella triangula subacuta in medio lobi intermedii ornato; columna brevi, pede apice hamato-incurvo puberulo; clinandrio serrulato, trilobulato; anthera subreniformi-cucullata, antice emarginata; ovario cum pedicello gracili, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema in the Waria District, alt. c. 800 m—R. Schlechter no. 19409, flowering in May 1909.

From all other species of the section known at present, this one differs in the lip, since here the middle lobe is not distinctly bipartite. In other respects the plant very closely resembles *D. trachyrhizum* Schltr. both externally in its habit, as well as the size of the flowers. The flowers are greenish white with red-dotted sepals.

134. *D. prosthecglossum* Schltr., sp. nov.

Epiphyticum vel terrestre, 30–90 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, dense papulis verruculosus exasperatis; caulibus simplicibus, basi vaginata excepta bene foliatis, teretibus, crassiusculis, usque ad 1.2 cm diametientibus, vaginis foliorum fere omnino obtectis; foliis erecto-patentibus, lanceolato-oblongis vel oblongis, subacutis, valde inaequaliter bilobulatis, glabris, 6–12 cm longis, medio vel infra medium 1.7–3 cm latis; racemis erecto-patentibus, subaxe 4–9-floris, usque ad 14 cm longis, pedunculo satis longo; bracteis parvulis, deltoideis, obtusis, ovario pedicellato multo brevioribus; floribus erecto-patentibus in sectione inter majores; sepalis perlate ovatis, obtusis cum apiculo, glabris, c. 1 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum conicum obtusum obliquum 1 cm longum formantibus; petalis oblique oblongis, subacutis, dimidio superiore marginibus minute serrulatis, sepalis paululo brevioribus; labello e basi breviter unguiculata late cuneato, e medio fere trilobato, 1.5 cm longo, inter apices loborum lateralium 1.6 cm lato, lobis lateralibus falcato-lanceolatis subacutis, 0.7 cm longis, intermedio late quadrato, usque supra medium bifido, antice truncato, leviter margine undulato, 7.5 mm longo, medio fere 9 mm lato; carina hippocrepiformi basi calcariformi-producta e basi labelli usque in basin lobi intermedii, cruribus parallelis, lamella humili transverse biapiculata in basi lobi intermedii; columna brevi, pede apicem versus angustato, apice incurvo; ovario cum pedicello gracili, glabro, c. 2.3 cm longo.

Kaiser-Wilhelms-Land: On open slopes of the Finisterre Range, on rocks and on the base of trees, alt. c. 1100 m—R. Schlechter no. 18174 (TYPE), flowering in Sept. 1908; at the base of tree-trunks in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19813, flowering in June 1909.

This species differs from all others in the section in its robust growth and size of flowers, furthermore the shape and structure of the lip is very characteristic and the column-foot is a little more in-curved. The flowers are yellow-green, tinged on the outside with brown; the labellum is white.

var. *obtusilobum* Schltr., var. nov.

Differt a forma typica foliis paulo latioribus, labelli lobis lateralibus latioribus, obtusis, apice subcrenatis, lamella transversa in basi lobi intermedii acutius 4 dentata, ungue brevior.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18805, flowering in Nov. 1908.

At present I would like to consider this plant as a variety, but should its differences from the Type form prove constant, it will have to be regarded as a separate species. The differences lie predominantly in the shape of the labellum; the mentum also appears relatively shorter and broader. The colour of the flowers is the same as for the Type form.

§ 19. *Distichophyllum*

On the whole, I have defined this section much as Ridley did when he established it first, except that I exclude the dry-stem forms, which are related to *D. villosulum* Wall. and *D. conostalix* Rchb. f. and which form a separate section in my division *Conostalix* of the sub-genus *Xerobium*. As I have remarked previously, this section is related closely to *Oxygenianthe* and is separated from the latter mainly by the inflorescence which, in *Distichophyllum*, is never terminal, by the mentum of the more fleshy flowers which is hardly ever as pointed, and by the different lamellar crests which occur here always as simple ridges, whereas in *Oxygenianthe* they are more-or-less deeper-toothed.

The species of the section are distributed from Ceylon and India, through the Malay Peninsula, Sunda Islands, the Philippines, Moluccas and New Guinea, to New Caledonia where *D. austro-caledonicum* Schltr., so far the most eastern species, has been found. The most western species is *D. nutans* Lindl. from Ceylon and India. The centre of distribution is probably in Borneo, where no less than ten species occur. From New Guinea, I know positively only three of the species described here and these are found in the German Territory only. In other collections, I do not remember having seen species from this section from the British or Dutch part of New Guinea, although I do not doubt that this group is represented there also. It is probable that *D. trigonellodorum* Krzl. belongs to this section. The species is reputed to come from German New Guinea, but from the description I cannot find a place for it with certainty, so I merely mention it here.

Two species, *D. pluricostatum* Schltr. and *D. xanthophaeum* Schltr., can be seen in the mist-forest zone as well as in the forests of the hill-country, while the third species, *D. melanotrichum* Schltr., has, until now, been recorded only from the mist-forest zone. It will be observed that in the last species, as well as in *D. pachyglossum* Par. et Rchb. f., the black hairy condition of the leaf sheaths occurs, and therefore the group '*Nigro-hirsuta*' cannot stand; all the more so since several species of the section *Conostalix* would then have to be accommodated here, if much importance is to be attached to this characteristic.

135. *D. pluricostatum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 50 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus carnosulis, mox longitudinaliter sulcatis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, leviter flexuosis, 3–4.5 mm medio diametientibus; foliis erecto-patentibus, lineari-lanceolatis, subacutis, apice valde inaequaliter et oblique bilobulatis, glabris, textura subcoriaceis, 6–10 cm longis, infra medium 0.5–0.8 cm latis; pedunculis unifloris, brevibus, vaginulis paucis minutis obsessis, 0.7–1 cm longis; bractea ovali, obtusiuscula, glabra, ovario pedicellato multo brevior; floribus erecto-patentibus in sectione mediocribus, illis *D. Hosei* Ridl. similibus, carnosulis, glaberrimis; sepalis ovatis, apiculatis, 0.7 cm longis, lateralibus basi margine anteriore productis, cum pede columnae mentum conicum obtusiusculum 0.4 cm longum formantibus; petalis oblique ligulato-oblongis, obtusis, glabris, sepalis paululo brevioribus; labello e basi breviter unguiculato late cuneato, e medio trilobato, 1.1 cm longo, inter apices loborum lateralium c. 1 cm lato, lobis lateralibus falcato-triangularis, acutis, brevibus, intermedio e isthmo perbrevis reniformi, apiculato, 3.5 mm longo, infra medium 6.5 mm lato, costis 15 e medio laterem versus sensim decrescentibus brevioribusque ornato, dimidio inferiore labelli medio sparsim subverruculoso; columna brevi, pede apicem versus sensim angustiore, clinandrii lobis

lateralibus rotundatis, brevibus, dorsali triangulo denticulato; ovario cum pedicello glabro, subclavato, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20239, flowering in Sept. 1909; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 450 m—R. Schlechter no. 19269 (TYPE), flowering in Apr. 1909; on trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1000 m—R. Schlechter no. 19738, flowering in June 1909.

An interesting species, closely related to *D. Hosei* Ridl., with which *D. osmophytopsis* Krzl. and *D. multicostatum* J.J. Sm. may be united, if it should not turn out that the plant from Pahang [Malaya] is specifically different from that from Borneo. Our plant is recognised easily by the labellum, furthermore it has shorter-stalked inflorescences. The flowers are pale yellow, the lip golden yellow towards the front with brown veins and crests.

136. *D. xanthophaeum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus crassiusculis, mox longitudinaliter sulcatis, dense foliatis, vaginis foliorum omnino obtectis, medio 0.5–0.7 cm diametientibus; foliis erecto-patentibus, oblongo-ligulatis, inaequaliter et obtuse bilobulatis, glabris, textura coriaceis, 2–4 cm longis, medio fere 0.7–1 cm latis; inflorescentiis lateralibus, unifloris, pedunculo perbrevis; bractea ovata, parvula, ovario pedicellato multo brevior; floribus in sectione mediocribus, illis *D. austro caledonici* Schltr. similibus, carnosulis, glabris; sepalis ovatis, apiculatis, c. 0.8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum conicum obtusum 0.4 cm longum formantibus; petalis oblique oblongis, obtusiusculis, glabris, sepalis paulo brevioribus; labello e basi breviter unguiculata late cuneato, e medio fere trilobato, 1.1 cm longo, inter apices loborum lateralium c. 1 cm lato, lobis lateralibus oblique lanceolato-triangularibus, obtusiusculis, intermedio late reniformi, apice retuso cum apiculo obtuso, margine leviter undulato, 0.6 cm longo, medio fere 8.5 mm lato, carinis 2 e basi laminae usque infra apicem parallelis decurrentibus, intermedia brevior in lobo intermedio interjecta; columna brevi, glabra, clinandrii lobis abbreviatis; anthera rotundato-cucullata, apice emarginato minute papillosa; ovario cum pedicello glabro subclavato, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19348, flowering in May 1909; on trees on the Govidjoa [Creek] (Waria District), alt. c. 1000 m—R. Schlechter no. 19787, flowering in June 1909.

The nearest relative of this species is *D. austro-caledonicum* Schltr., however, the two species differ in the labellum and the colour of the flowers. *D. xanthophaeum* Schltr. also has a larger flower than the other species, but otherwise it is very similar in habit.

As the specific name indicates, the flowers are pale yellow-brown.

137. *D. melanotrichum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, subflexuosis, bene foliatis, crassiusculis, mox sulcatis, medio fere 0.3–0.4 cm diametientibus, vaginis foliorum dense nigro-setosis omnino obtectis; foliis erecto-patentibus lanceolato-oblongis, inaequaliter et obtusiuscule bilobulatis, glabris, textura coriaceis, 1.5–3 cm longis, infra medium 0.4–0.7 cm latis; inflorescentiis lateralibus, vulgo unifloris, rarius bifloris, pedunculo brevissimo; bracteis deltoideis, minutis, ovario pedicellato multoties brevioribus; floribus nutantibus, in sectione inter mediocres, glabris; sepalis oblongis, apiculatis, basin versus paulo angustatis, 0.9 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum conicum obtusum c. 0.5 cm longum formantibus; petalis oblique oblanceolato-spathulatis, obtusis, margine irregularibus, sepalis subaequilongis; labello e basi anguste cuneata tertia parte anteriore trilobato, 1.6 cm longo, inter apices loborum lateralium 4.5 mm lato, lobulis lateralibus minutis dentiformibus, acutis, intermedio suborbiculari, obtuse apiculato, margine undulato-crenulato, 0.5 cm longo, 6.5 mm lato, basi contracta concavo, carinis 3 antice incrassatis supra basin labelli usque in basin lobi intermedii sub-parallelis decurrentibus; columna brevi, glabra,

clinandrii lobis lateralibus rotundatis, dorsali dentiformi, brevior; anthera subcordato-cucullata, apice obtusissimo minute papillosa; ovario cum pedicello glabro, sub-clavato, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20093, flowering in Sept. 1909.

In the shape of the labellum this species stands isolated entirely, not only amongst the Papuan [Papuasian] plants, but amongst all others known at present. Externally it attracts attention by the black bristles on the leaf-sheaths, furthermore the flower is narrower than usual in the section. Reduction of the lateral lobes is known also in other species of the section, but the ventricose, concave middle lobe is noteworthy. The flowers are yellowish, with pale brown veinings.

§ 20. *Amblyanthus*

We have here what appears to be a typical Papuan [Papuasian] section. Only three species were known to me when I founded the group in 1905. Since then, two more have been described by J.J. Smith from Dutch New Guinea. With the four novelties which I am about to describe, there will be, altogether, nine species from New Guinea in the section.

Every botanist who has seen and examined these peculiar plants must agree with me that the group is characterized very definitely not only in habit, but also on account of the perfect agreement in floral characters. J.J. Smith recognised this at once and very properly added his two species to *Amblyanthus*. Nevertheless, Kränzlin found occasion to criticise the actions of J.J. Smith and myself, and completely separated the species, placing them as species 174, 174a., 177 and 211 with *Pedilonum*. With *Pedilonum* these plants have only one thing in common, viz. they lack a very short mentum—otherwise they are quite different. The peculiar appendage or outgrowth, stretching backwards from the labellum, cannot be compared with anything similar in *Pedilonum*.

The characteristics of the section are found in the habit and the peculiar scaly covering on the flowers, as well as in the structure of the lip, all of which features are so constant throughout the species that it is absolutely necessary to regard them as belonging to the one section. Let us not be tempted to separate sections which are defined sharply in themselves, otherwise it will be quite impossible to comprehend such a huge genus, as *Dendrobium* Sw. has become.

With few exceptions the species of *Amblyanthus* are epiphytes of the mist-forests, where they grow close to the ground on perpendicular trunks of trees in such a way that their stems stand out or hang down obliquely. Up to the present I know of two species which occur in the valleys of the hill-country, viz. *D. Kempterianum* Schltr. and *D. gobiense* Schltr., both species growing in the same manner as those of the mist-forest zone.

Unfortunately, nothing is known of the habitat altitudes of the two species, *D. squamiferum* J.J. Sm. and *D. cavipes* J.J. Sm., from Dutch New Guinea.

The individual species do not show much variation and are very consistent also in their lesser characters. The colouring of the flowers, as well as their consistence, is very similar in all the known species.

138. *D. melanostictum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 167.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14441, flowering in Apr. 1902.

In the monograph by Kränzlin, *D. squamiferum* J.J. Sm. from Dutch New Guinea appears as a synonym of my species. The two species are well separated and the one established by J.J. Smith is, therefore, justified thoroughly.

Among the species from German New Guinea this one stands closest to *D.*

Kempterianum Schltr., but the two species are well distinguishable. To the original description of *D. melanostictum* Schltr. should be added, that the labellum is moderately long-toothed on the front of the margin, whereas this is not the case in *D. Kempterianum* Schltr.

The flowers are white, the labellum sulphur-yellow with an orange-yellow centre. As in all species of the section, they are suffused on the outside slightly with yellowish brown and beset with thin brown scales.

139. *D. Kempterianum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 80 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, carnosulis, mox sulcatis, c. 0.7 cm diametentibus, bene foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, elliptico-ligulatis, acutis vel acuminatis, glabris, 7–14 cm longis, medio fere 2.5–3.7 cm latis; inflorescentiis valde abbreviatis, capitiformibus, 5–10-floris, pedunculo perbrevis vaginis bracteiformibus obresso; bracteis late ovalibus, obtusis, amplexantibus, ovario pluries brevioribus; floribus in sectione mediocribus, illis *D. melanosticti* Schltr. similibus; sepalis ovalibus, obtusis, extus squamulosis, c. 1.1 cm longis, lateralibus obliquis, basi margine anteriore lobato-dilatata cum pede columnae mentum oblongoideum obtusum c. 0.7 cm longum formantibus; petalis oblique ellipticis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu late obovato, basi in unguem brevem sensim angustato, 1.4 cm longo, supra medium 0.9 cm lato, marginibus infra medium incurvulis, lobo apicali latere paulo prosiliente, semiobiculari, margine integro cum apiculo minuto obtuso, dense papillis subulatis oblecto, appendice supra basin refracta appressa trilobulata, lobulis truncatis pluridentatis, nervis 3 parallelis in medio labelli nunc leviter prominulis; columna brevi crassiuscula, pede excavatione oblonga donato, clinandrio trilobulato, lobulis lateralibus truncatis, dorsali dentiformi parvula; ovario sessili cylindraceo, squamulifero, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees beside the mountain creeks near Kelel, on the Minjem [River], alt. c. 300 m—R. Schlechter no. 16351, flowering in Aug. 1907; on trees on the upper Djamu [River], alt. c. 500 m—R. Schlechter no. 17312, flowering in Feb. 1908.

Unquestionably, this species is related closely to *D. melanostictum* Schltr. and *D. squamiferum* J.J. Sm., but is distinguished from them by its more robust growth, larger and broader leaves and the shape of the labellum. In *D. squamiferum* J.J. Sm., the closest to this species, the margins of the labellum are conspicuously prominent below the middle and the appendage is quite differently shaped and much smaller, whereas in *D. Kempterianum* Schltr. it occupies the whole width of the claw.

The flowers are yellowish on the outside, white inside and the labellum sulphur-yellow with an orange centre. I have dedicated this species to my faithful associate in New Guinea, A. Kempter.

140. *D. gobiense* Schltr., sp. nov.

Epiphyticum, robustum, patulum, usque ad 100 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, crassiusculis, dense foliatis, vaginis foliorum omnino obtectis, mox sulcatis, 0.6–0.8 cm diametentibus; foliis oblongo-ellipticis, acuminatis, glabris, 10–14 cm longis, medio fere 3–4.3 cm latis; inflorescentiis valde abbreviatis, subsessilibus, capitiformibus, dense 4–6-floris; bracteis ovalibus, obtusis, ovario multo brevioribus; floribus in sectione mediocribus, illis *D. melanosticti* Schltr. similibus; sepalis oblongis, obtusis, extus sparsim squamuliferis, intus glabris, c. 1.3 cm longis, lateralibus obliquis, basi margine anteriore lobato-dilatata cum pede columnae mentum oblongoideo-conicum obtusum 5.5 mm longum formantibus; petalis elliptico-spathulatis, obtusis, glabris, sepalis subaequilongis; labello circuitu obovato, basi sensim in unguem brevem angustato, medio fere margine utrinque lobulo late triangulo prosiliente sublobuliformi donato, 1.5 cm longo, supra medium 0.9 cm lato, obtuse apiculato, antice dense papillis subulatis oblecto, medio carinis 7 elevatis tenuibus donato, appendice supra basin refracta appressa bifida, segmentis laceratis, ungui aequilata; columna brevi, crassiuscula, glabra, pede angustiore excavatione ovali apice donato, clinandrio contracto, lobis lateralibus rotundatis; ovario cylindrico, squamulifero, more sectionis sessili, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees on the banks of the Waria [River] near Gobi, alt. c. 350 m—R. Schlechter no. 19851, flowering in June 1909.

Likewise a species related to *D. squamiferum* J.J. Sm., but well distinguished by the much larger and broader leaves, the spatulate petals and shape of the lip. The crests of the latter are much more prominent than in any other species known to me. The expansion of the margins of the labellum at the middle may be regarded as small lobes. The appendage occupies the entire breadth of the claw. The flowers are yellow externally, white inside, the lip with orange-red crests and brown-red pads.

Unfortunately, I found only a few serviceable flowers on this huge specimen. Accordingly, the principal flowering time can be assumed as being in May.

141. *D. xanthomeson* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 168.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14535, flowering in Apr. 1902.

Amongst all previously known species in the section this is the most robust and is distinguished easily by the flower heads which attain 4 cm in diameter. In floral structure, especially in the shape of the labellum, it stands closest to *D. bismarckense* Schltr. Unfortunately, I did not find this interesting species again on my last expedition.

The flowers are yellowish externally, white inside; the labellum pale yellow in the centre.

142. *D. bismarckense* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 167.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400–1850 m—R. Schlechter no. 14002, flowering in Jan. 1902; no. 18591, flowering in Nov. 1908.

The initial material on hand of this species, which was much damaged by water, will be well supplemented by that from my last journey. The species is related closely to the previous one, but has much narrower, longer, pointed leaves; smaller, few-flowered inflorescences, a differently shaped labellum and differences in the column. Together with *D. xanthomeson* Schltr. it is distinguished from the other species of the section by its glabrous labellum. However, now I have found a specimen in the Bismarck Range in which the labellum is furnished with wart-like, scattered excrescences in front. These are, however, rather different from the hair-like papillae or hairs of the other species. The flowers are yellowish externally, white inside; the labellum with a golden yellow spot.

143. *D. quadriferum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 65 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, laxius foliatis, carnosulis, mox sulcatis, vaginis foliorum peralte amplexantibus fere omnino obtectis, 6–9 mm diametentibus; foliis erecto-patentibus, lanceolato-ellipticis, acuminatis, glabris, basi cuneatis, 12–17 cm longis, medio fere 3.5–5.2 cm latis; inflorescentiis lateralibus, subsessilibus, abbreviatis, capituliformibus, 4–7-floris; bracteis ellipticis, acutis, ovario sessili brevioribus; floribus in sectione mediocribus, in speciminibus visis cleistogamis, extus sparsim squamuliferis, intus glabris, 1.2 cm longis, lateralibus basi margine anteriore producta cum pede columnae mentum conicum obtusum c. 0.7 cm longum formantibus; petalis oblique elliptico-oblongis, obtusis, glabris, sepalis subaequilongis; labello e ungue satis longo obovato, apiculato, ntice superne sparsim puberulo, medio quadro rhomboideo-quadrato, depresso, dorso in appendicem tridentatam cum dente intermedio minore producto, laminam latere infra medium superante ornato, labello toto 1.8 cm longo, supra medium 0.9 cm lato, quadro 0.7 cm lato, c. 0.9 cm longo; columna brevi, pede apice excavatione quadrata ornato, clinandrii lobis lateralibus rotundatis, dorsali subulato paulo longiore; anthera late rhomboideo-cucullata, glabra, facie umbonata; ovario cylindrico, sparsim squamulifero, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17143, flowering in Jan. 1908.

I have never seen an open flower of this species. The flowers would appear to be

always cleistogamous. Also they are distinguished, as is usual in such cases, by a very abundant development of the fruit. Whether cleistogamy always occurs in this species or, as I suspect, only in especially wet years when the insect fauna which is responsible for fertilization is prevented from swarming, is a question I could not settle on account of my short stay in New Guinea.

The species is distinguished well from the others by the shape and structure of the labellum. The flowers are white, and, in spite of their cleistogamy, have a very pleasant odour.

144. *D. kaniense* Schltr., sp. nov.

Epiphyticum pro sectione gracile, patulum, 30–50 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, gracilibus carnosulis, mox sulcatis, dense foliatis, vaginis foliorum omnino obtectis; foliis erecto-patentibus, lanceolatis, acutis, apice valde inaequaliter bilobulatis, glabris, textura more sectionis tenuioribus, 7.5–11.5 cm longis, infra medium 0.8–1.3 cm latis; inflorescentiis subsessilibus, abbreviatis, capitiformibus, dense 4–6-floris; bracteis ovalibus, obtusis, ovario subpedicellato pluries brevioribus; floribus in sectione inter minores, extus sparsim squamuliferis; sepalis late ovalibus, obtusis, 0.8 cm longis, extus sparsim squamuliferis, intus glabris, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum oblongoideo-conicum obtusum 0.5 cm longum formantibus; petalis oblique obovatis, obtusis, glabris, sepalis paululo brevioribus; labello e basi breviter unguiculata perlate cuneato (subflabellato), angulis acutis, antice rotundato-obtusissimo, serrulato, 1.2 cm longo, infra apicem 1.2 cm lato, supra medium superne pilis flexuosis subpulvinato-barbato, medio obscure tricostato, appendice infra medium refracta, depressa, 3–4-fida, segmentis lanceolatis acutis; columna brevi, crassiuscula, pede angustiore, apice excavatione oblonga donato, clinandrii lobis lateralibus truncatis denticulatis, dorsali subulato paulo longiore; anthera subreniformi-cucullata, antice truncata, glabra; ovario cylindraceo, basi attenuato, sparsim squamulifero, c. 1.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17485, flowering in Mar. 1908.

This species quite evidently is related closely to *D. cavipes* J.J. Sm. from Dutch New Guinea, but it differs definitely in the longer and narrower leaves, the mentum, and shape of the lip which is not tri-lobed but entire. I know this plant only from the Kani Range, where it is by no means uncommon. The flowers are yellowish externally, white internally; the labellum golden yellow in the centre.

§ 21. *Rhopalanthe*

Of all the true *Rhopalanthe* species, that is to say all those species which are related closely to *D. crumenatum* Sw., curiously enough not a single species has been reported up to the present from New Guinea, although we know related species from the Moluccas and also from the eastern south sea islands. It is with some hesitation that I deal now with these species which were included formerly in the section *Aporum*, but which are distinguished by the pseudobulbs swollen at the base or above. The more correct way perhaps, would have been to consider them as a separate section, and it will be only a question of time to decide whether these plants should not be regarded as a second section of *Rhopalobium*.

The species of *Rhopalanthe* known from New Guinea belong to that group which resembles *Aporum* in their equitant leaves, but it would be better to have them excluded. When I first began to understand that through these, *Rhopalanthe* is, to some extent, connected with *Aporum*, I endeavoured to find in the flowers a point of separation for a better division of the two sections, but without result. I came therefore to the conclusion that, even in the flowers, the differences between the two sections were so ill-defined that, in the state of our present knowledge of the two groups, only the vegetative characters could be utilised for the purposes of separation. I was obliged,

therefore, to exclude from the section *Aporum* the species referred to. It will remain for future consideration to decide whether they should not be regarded as a single section placed next to *Rhopalanthe*. I believe almost that this would be the best arrangement, and would like to establish a sub-section to be called *Aporopsis*, which would be distinguished from *Rhopalanthe* by its equitant leaves.

The four species described here are all inhabitants of the lower-lying country; not one of them reaches the higher altitudes. Most of them are found especially in the coastal zone.

In our Territory these plants are found usually in exposed places where, for part of the day at least, they receive the sunlight; such as on isolated trees on the shore or banks of rivers, or on the borders of forests.

Like the true *Rhopalanthe*, all the species have very delicate flowers which last only one day and which always all open on a certain day and then disappear as quickly, until in a few weeks or months, according to the weather conditions, new flowers again appear.

With such a very short life of the flowers, it will be understood that the fruit very seldom develops.

Up to the present only a few species have become known from regions adjacent to New Guinea. Thus *D. MacFarlanei* F.v.M. has been described from British Papua. So far as *D. Goldfinchii* F.v.M. is concerned, the habitat is a little doubtful, because it is not really known whether it is a native of the British or the German Solomons. I have, therefore, included this species here in this summation.

D. confundens Krzl. is, as far as I have been able to ascertain, the only species belonging to this section which has been recorded from Dutch New Guinea.

145. *D. MacFarlanei* F.v.M., Papuan Plants I (1876), p. 29.

Kaiser-Wilhelms-Land: On trees on the Schibruba [Creek] (Kenejia Valley), alt. c. 200 m—R. Schlechter no. 18949, flowering in Dec. 1908; on trees on the Malia [River], at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18411, flowering in Oct. 1908.

After collecting more material of this group, I have formed the opinion that this species is still different from *D. eboracense* F.v.M. et Krzl. The flowers are rather smaller and the mentum slightly longer. The labellum is more distinctly tri-lobed and the leaves narrower. It seems therefore that this species is restricted to the mainland of New Guinea. The flowers are yellowish white, the sepals and petals with red veins, the labellum yellow with a yellow-green central band.

146. *D. eboracense* Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 419.

D. podagrarica Krzl., in Notizbl. Bot. Gart. Berlin II (1898), p. 105 (nec Hook. f.).

D. MacFarlanei Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 151 (nec F.v.M.).

Neu-Pommern: On trees at the beach near Ralum—Dahl, flowering in Dec. 1896; on trees at the beach between Massawa and Cape Lambert, alt. c. 18 m—R. Schlechter no. 13718, flowering in Nov. 1901.

Neu-Lauenburg: On the main island—Micholitz.

As mentioned above I now regard this species as distinct from *D. MacFarlanei* F.v.M. with which I previously united it. The leaves are uniformly broader, the flowers larger with a shorter mentum, the petals more pointed and the labellum slightly different in shape. The species of this group are very difficult to distinguish, unless they are traced back to the right Type after an exact analysis. My specimens of *D.*

eboracense Krzl. sometimes show the quadrangular shape of the pseudobulbs, at other times the hexagonal to octagonal shape. Amongst these are specimens which were collected at the same place and on the same day. I have observed a similar variation in other related species. The flowers are pale yellow with red longitudinal veins, the labellum whitish.

147. *D. litorale* Schltr., sp. nov.

Epiphyticum, erectum, gracile, usque ad 60 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis glabris; caulibus simplicibus, gracilibus, internodiis 2–4 supra basin vulgo incrassatis, 4–6-angulatis, supra usque ad medium fere bene foliatis, paulo compressis, vaginis foliorum primum obtectis, dimidio superiore denudatis; foliis equitantibus, oblique linearibus, acutis, 4.5–6 cm longis, medio fere 0.3–0.4 cm latis, glabris, textura coriaceis; floribus in fasciculis lateralibus in dimidio superiore caulis succedaneis, tenuibus, glabris; bracteis ovatis, apiculatis, minutis, ovario graciliter pedicellato multo brevioribus; sepalis ovatis, obtusiusculis, 5.5 mm longis, lateralibus basi margine anteriore valde dilatata cum pede columnae mentum oblongoideum leviter curvatum c. 1 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusis, glabris, sepalis subaequilongis; labello e basi ligulato-cuneata supra medium late cuneato, quarta parte anteriore trilobato, lobo intermedio incluso 1.3 cm longo, inter apices loborum lateralium c. 1 cm lato, lobis lateralibus semirhombeis, obtusatis, intermedio semiquadrato alte bipartito, laterales conspicue superante, costis 3 approximatis obscuris e basi labelli usque in basin lobi intermedii decurrentibus; columna brevi, pede lineari-ligulato, concavulo, clinandrii lobis brevibus; anthera rotundato-cucullata, apice truncato papillosa; ovario cum pedicello gracillimo glabro, 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees at the beach of Morowe (Adolfhafen), alt. c. 10 m—R. Schlechter no. 19214, flowering in Apr. 1909; on trees at the mouth of the Waria [River], alt. c. 15 m—R. Schlechter no. 19958, flowering in July 1909.

This species, in many respects, stands close to *D. MacFarlanei* F.v.M., but it has larger flowers and a different labellum, the latter being distinguished especially by the very deep division of the middle lobe. The flowers are pale yellow with red veins.

148. *D. hymenocentrum* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, supra basin internodiis 1–3 incrassatis vulgo 8-costatis, deinde usque ad medium vel supra basin bene foliatis, vaginis foliorum fere omnino obtectis, dimidio superiore denudatis; foliis erectis, equitantibus, falcatis, lanceolato-ligulatis, acutis, glabris, textura coriaceis, 2.5–5.5 cm longis, supra basin 0.5–0.7 cm latis; floribus in fasciculis lateralibus in dimidio superiore caulis, succedaneis, illis *D. Goldfinchii* F.v.M. similibus, tenuibus, glabris; sepalis triangulo-ovatis, acutis vel apiculatis, 0.9 cm longis, lateralibus basi margine anteriore valde producta cum pede columnae mentum curvatum calcariforme cylindraceum obtusum c. 1.6 cm longum formantibus; petalis oblique oblongis, obtusiuscule apiculatis, antice paulo decurrentibus, sepalis paulo brevioribus; labello e ungue brevi cuneato, antice breviter trilobato, c. 2 cm longo, inter apices loborum lateralium c. 1.1 cm lato, lobis rotundatis, margine minute undulato-subcrenulatis, intermedio laterales excedente inciso cum apiculo minuto interjecto, carina lineari leviter bifoveolata e basi labelli usque infra basin lobi intermedii decurrente; columna perbrevis, pede ligulato pro genere textura tenui, clinandrii lobulis brevibus; anthera galeato-cucullata, glabra, antice truncata; ovario cum pedicello gracillimo glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees at the beach near Pro, alt. c. 15 m—R. Schlechter no. 20000, flowering in Aug. 1909.

Initially, I regarded this species as identical with *D. Goldfinchii* F.v.M., but I now see that it differs entirely from the latter. The flowers of *D. Goldfinchii* F.v.M. are narrower and the mentum is shorter and more curved at the apex, which makes it considerably broader. This is the largest-flowered species in the section. The mentum is of a rather thin texture, as is often observed in *Aporum*. The flowers are greenish white with red veins; the labellum white with a green middle crest, red veins at the base.

149. *D. Goldfinchii* F.v.M., in Wing's South. Sci. Record, Jan. 1883 (nec Krzl.).

Solomon Islands: No location details—Lieut. Goldfinch, flowering in Jan. 1883.

I am not quite certain on what grounds Kränzlin has identified this species (which

in his opinion is quite a typical *Aporum*), as a plant which is related to *D. lamprocaulon* Schltr., thus belonging to an altogether different group and which even has no equitant leaves. I would not have thought this mistake possible, had he not enumerated my *D. camptocentrum* Schltr. from New Caledonia (which is also related to *D. lamprocaulon* Schltr.) as a synonym and also illustrated a similar plant. *D. Goldfinchii* F.v.M. is related closely to *D. hymenocentrum* Schltr., but is distinguished by the characteristics given in the description of the latter. I know this species only from the one collector. The flowers seem to have been yellowish with red veins on the sepals and petals.

§ 22. *Aporum*

The species of the last sub-genus, *Xerobium*, commence with this section. The section is, in a measure, more closely connected with *Rhopalanthe* through the species of the sub-section *Aporodes*.

In the interests of the division of the huge genus *Dendrobium* Sw., I consider that a strict separation is necessary between *Aporum* and *Aporodes*, because in this way *Xerobium* will be defined more clearly against *Rhopalanthe*. It is remarkable how very few true *Aporum* species have become known from New Guinea up to the present, and it would seem that the species dwindle very quickly in going east from the western Moluccas. Apparently only three or four have been recorded from New Guinea, viz, from Dutch New Guinea *D. pseudocalceolum* J.J. Sm., and from British Papua *D. litoreum* Bail., *D. prionochilum* F.v.M. et Krzl. and *D. Ferdinandi* Krzl.

I am quite unacquainted with the last three, and I presume strongly that they do not belong here at all, but I mention them so that they may not pass unnoticed. Kränzlin also mentions *D. nycteridoglossum* Rchb. f. and *D. calceolum* Wall. as belonging to New Guinea, but this statement rests on erroneous evidence. Likewise, *D. cuspidatum* Lindl., a New Guinea plant, does not belong to this species as he asserts, but to *D. pseudocalceolum* J.J. Sm., a very different one.

I am not satisfied with the limitations of *Aporum*, as this is generally accepted (with the exclusion of *Oxystophyllum*). It will probably be necessary to make a further separation in the case of those species with ephemeral flowers, e.g. *D. pseudocalceolum* J.J. Sm. and *D. subulatum* Lindl. and those with more-fleshy flowers of long life, e.g. *D. incrassatum* Miq. and *D. aloifolium* Sw. Such a separation would be possible only after a critical examination of all *Aporum* species. I just make this as a suggestion. The only species of *Aporum* occurring in our Territory is *D. pseudocalceolum* J.J. Sm., a plant which was described originally from Dutch New Guinea and which, apparently, is distributed fairly widely. I have never found it in close proximity to the sea, but usually some kilometres inland. It is very common alongside creeks in the hill-country, always epiphytic, and ascending, as my specimens from Dscheregi prove, to an altitude of about 500 metres.

150. *D. pseudocalceolum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. V (1907), p. 34; in Icon. Bogor. III (1907), t. CCXL, p. 97.

D. cuspidatum Krzl., in Engl. Pflanzenr., IV, 50, II, B. 21 (1910), p. 208 (nec Lindl.), (p.p.).

Kaiser-Wilhelms-Land: On tall trees in the primary forests at Kelel in the Minjem Valley, alt. c. 200 m—R. Schlechter no. 16197, flowering in June 1907; on trees in the forests at Siu, on the Waria [River], alt. c. 100 m—R. Schlechter no. 19227, flowering in Apr. 1907; [Ed.—probably 1909]; on trees on the Waube Creek (Waria District) alt. c. 300 m—R. Schlechter no. 19441, flowering in May 1909; on trees in the forests of Dscheregi (Waria District), alt. c. 500 m—R. Schlechter no. 17441, flowering in Mar. 1908.

I have found this species further inland in the Kenejia Valley but neglected to collect material. It probably is related most closely to *D. teloense* J.J. Sm. but is distinguished by the more deeply cleft labellum in front, and generally shows a greater degree of branching; the leaves are also of a thinner texture. The flowers are white with red veins.

§ 23. *Oxystophyllum*

I have placed this section alongside *Aporum* because it is related in its equitant leaves, but I would also like to express a doubt as to the advisability of retaining it there, since it is not certain that its relations to *Aporum* are, in reality, very close. Moreover, on my last journey I collected some species of the section *Monanthos* which seemed to indicate that we should look in this direction for the near relationship of *Oxystophyllum*. If this should be the case, the shape and position of the leaves will have only a secondary significance. I am very much inclined to believe that the section *Aporum* is indeed quite different.

It is evident that *Oxystophyllum* has the centre of its dispersal in the Sunda Islands, and although only a few species have penetrated from there to New Guinea, a greater number are to be found in the Celebes.

From Dutch New Guinea, we know, so far, *D. atropurpureum* (Bl.) Miq., a species which is always misunderstood (because it seems to indicate an endemism of the Papuan [Papuanian] flora), and which may be distinguished by its strikingly small fleshy leaves; *D. tumoriferum* J.J. Sm. is in a similar category. From the British part of the island I know of no species, unless *D. Ferdinandi* Krzl. could be included, but this cannot be decided from the author's description.

It is very difficult to distinguish the species of the section because of their frequent striking similarity of habit, but good and consistent characteristics are found in the shape of the petals and particularly in that of the lip. This external similarity is probably the reason why species of this section have been mistaken more often than those of any other relationship. One has been satisfied generally to determine these plants as '*D. atropurpureum* (Bl.) Miq. or *D. rigidum* Miq.' frequently without paying attention to differences in habit. For example, even Kränzlin, after expressing surprise that I should compare *D. atropurpureum* Schltr. with *D. atropurpureum* Miq. (the only species of the section at that time known from New Guinea) after emphasising that the latter should have terete leaves open at the top, proceeds to enumerate in his monograph a whole list of plants as '*D. atropurpureum* Miq.', which certainly represents at least three different species, not one of which, however, approaches the true *D. atropurpureum* Miq.

151. *D. torricellianum* Krzl., in Engl. Pflanzenr. IV, 50, II. B. 21

D. atropurpureum Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 150 (nec Ridl.).

D. simile Schltr., in Fedde, Repertor. III (1906), p. 80 (nec Schltr. in K. Schum. et Laut., Nachtr. [1905], p. 175).

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14481, flowering in Apr. 1902.

When I described this species as *D. atropurpureum* Schltr. in 1905 I forgot that Ridley had published this name already. I therefore renamed the species the following year as *D. simile* Schltr., but then I overlooked again that the same name had been used previously. This last synonym was overlooked by Kränzlin.

The species may be related most closely to *D. excavatum* Miq. and *D. atropurpureum* Ridl. which have the same rarely branched long stems. Amongst the Papuan [Papuanian] species it approaches most closely *D. subsessile* Schltr., but is recognised

easily by the broader petals and the much broader labellum of a more oval shape. Furthermore the leaves are usually larger, broader and of a thicker texture than *D. subsessile* Schltr. The flowers are dark purple.

152. *D. subsessile* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 60 cm longum; rhizomate brevi, cauliformi; radicibus filiformibus, elongatis, flexuosis, minute papilloso-puberulis; caulibus simplicibus vel vulgo parum ramosis, perdense foliatis, vaginis foliorum omnino absconditis; foliis erecto-patentibus, equitantibus, subfalcato-lanceolatis, acutis, glabris, textura coriaceis, 2–3.5 cm longis, basi 4.5–6 mm latis; inflorescentiis lateralibus vel apicalibus, abbreviatis, pedunculis vulgo unifloris, nunc aggregatis, vaginis imbricantibus dense obsessis; bractea ovata, acuminata, ovario brevissimo multo longiore; sepalis oblongo-ovatis, apiculatis, 0.6 cm longis, lateralibus obliquis, subcuspidatis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve 4.5 mm longum formantibus; petalis oblique ligulatis, subcuspidato-apiculatis, basin versus paululo dilatatis, glabris, sepalis paulo brevioribus; labello oblongo, apiculato, basin versus paululo angustato, glabro, speculo mediano oblongo-ligulato apice scrobiculato-concavo, toto 0.7 cm longo, supra medium 0.4 cm lato, marginibus juxta apicem leviter incurvulis; columna brevi, crassiuscula, glabra, clinandrii lobis lateralibus rotundatis, obtusis, dorsali lineari satis longiore; anthera quadrato-cucullata, antice truncata, glabra; ovario cylindraceo-obconico glabro, vix 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 16735, flowering in Oct. 1907.

I have remarked previously that this species is the closest relative to *D. torricellianum* Krzl. and drawn attention to the differences between the two. The species is a typical inhabitant of the mist-forest formation, where it grows on the trunks of trees and branches, frequently hanging down to a length of 60 cm. The flowers are dark carmine.

153. *D. Govidjoae* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 1 m longum; rhizomate brevi; radicibus filiformibus, elongatis, flexuosis, minute papilloso-puberulis; caulibus simplicibus vel subsimplicibus, perdense foliatis; foliis equitantibus, oblique lanceolatis, acutis, glabris, textura coriaceis, 2–4 cm longis, basi c. 0.5 cm latis; inflorescentiis lateralibus vel apicalibus abbreviatis, nunc subcapitato-aggregatis, pedunculis brevibus vaginis imbricantibus acutis obtectis; bractea ovata, acuminata, ovario perbreve bene longiore; floribus in sectione inter majores, atropurpureis, illis *D. atrorubentis* Ridl. similibus; sepalis ovatis, acutis vel apiculatis, glabris, 7.5 mm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum oblongoideo conicum obtusum 0.6 cm longum formantibus; petalis oblique lanceolato-oblongis, subcuspidatis, sepalis paulo brevioribus; labello angustius oblongo-ligulato, antice subtruncato-rotundato cum apiculo, speculo lineari-ligulato lucido mediano excepto minutissime papilloso, margine leviter undulato, 0.9 cm longo, supra medium c. 0.3 cm lato; columna brevi, glabra, pede curvato, clinandrii lobis lateralibus obtusatis brevibus, dorsali lineari incurvulo longiore; ovario obconico, glabro, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees on the Govidjoa [Creek] (Dischore Range), alt. c. 1200 m—R. Schlechter no. 19726, flowering in June 1909.

The species is related closely to the two previous ones, but is distinguished well by the narrow and blunt labellum, as well as by the very long and seldom branched stems. In the shape and texture of the leaves, it resembles most *D. subsessile* Schltr. The flowers are dark purple-red.

154. *D. acianthum* Schltr. sp. nov.

Epiphyticum, decumbens vel dependens, ramosum, usque ad 50 cm longum; rhizomate cauliformi; radicibus filiformibus, elongatis, flexuosis, tenuissime pilosis; caulibus dense foliatis, ramosis, vaginis foliorum omnino absconditis; foliis equitantibus, oblique lanceolatis, acutis, glabris, textura crassius coriaceis, 1.3–2 cm longis, basi 3–4.5 mm latis; inflorescentiis semper axillaribus, abbreviatis, ut videtur vulgo unifloris, pedunculo brevi vaginis imbricantibus obtecto; bractea ovata, acuminata, vaginis pedunculi simili, ovarium sessile superante; floribus in sectione inter minores, carnosulis, illis *D. ringentis* Rehb. f. similibus; sepalis ovatis vel ovato-lanceolatis, acutis, glabris, carnosulis, 0.6 cm longis, lateralibus basi margine anteriore ampliata cum pede columnae mentum pro sectione perbreve obtusissimum formantibus; petalis oblique ligulatis, acutis, glabris, sepalis paulo brevioribus; labello

circuitu oblongo, acuto, carnosulo, integerrimo, speculo ligulato excepto superne minutissime papilloso-punctato, infra apicem incrassatione V-formi obscura donato, 5.5 mm longo, medio fere 2.5 mm lato; columna perbrevis, glabra, pede oblongo, clinandrii lobis lateralibus rotundatis, abbreviatis, dorsali subulato, paulo longiore; anthera rotundato-cucullata, antice truncata, dense papillosa; ovario cylindraceo glabro, sessili, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the primary forests of Wobbe, in the Minjem Valley, alt. c. 350 m—R. Schlechter no. 16250 (TYPE) flowering in July 1907; on trees in the forests near Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter no. 19249, flowering in Apr. 1909.

A species recognised easily in the group by the strikingly short mentum. The structure of the labellum probably is related most closely to *D. tumoriferum* J.J. Sm. I have often seen the species in the hill-country, it seems never to ascend above 500 m, also avoiding close proximity to the coast. The largest specimen which I ever found grew on a huge trunk of *Palaquium*, on which it covered an area about two metres in diameter. The species has a greater tendency to branch than the others of the section in the Territory. The flowers are green-yellow with a dark brown-red lip and anther.

§ 24. *Grastidium*

This section, including the species described below, is almost certainly the largest in the genus, since, with the added species, it unquestionably surpasses *Eugenanthe*. It corresponds precisely with the former section *Dianthe* as characterised by me in K. Schum. et Laut., Nachtr. [1905], p. 150, but now I consider it timely to remove the two sections *Eriopexis* and *Dichopus*. The huge size now attained by *Grastidium* makes it desirable to keep such well-defined forms, as mentioned above, separate, otherwise in the foreseeable future it will no longer be possible to survey the multitude of species. After all, the sectional segregation is designed to facilitate an easier overall view.

The boundaries of the area of distribution of the section are similar to those for the whole genus. From Ceylon to the Viti [Fiji] Islands we find species which belong to it, but towards the north and south the species do not seem to spread far from the Equator. Until recently the Malay Archipelago was regarded as the chief centre of dispersion, but with the evidence now to hand from New Guinea, there can be no doubt that the Papuan [Papuasian] region is by far the richest in species. It is characteristic that individual species occurring here are extremely local in their distribution; e.g. I have been able to identify only very few species found in German New Guinea with those occurring in the British and Dutch parts of the island. Where that does happen we are usually dealing with species widely distributed in the lowlands.

In this section I have considered only those species with two-flowered inflorescences which originate always laterally from flat sheaths. The group is such a remarkably natural and easily recognised one, that I do not understand why the species should have been separated forcibly by Kränzlin in his monograph. Indeed, not only has he failed to place them together, but he has mixed them up with species of the most diverse sections from the sub-genus *Xerobium*, as well as from *Eu-Dendrobium*. I will indicate merely here how I have arranged the species of this section. Those with long narrow leaves and elongated flowers come first; those with broader leaves and shorter blunt sepals (reaching their highest form of development in species related to *D. perlongum* Schltr.) follow. Some of the species related to *D. tridentiferum* Lindl. have developed on parallel lines, beginning with broader leaves and larger flowers, and then descending to plants with narrower leaves and smaller flowers. Some aberrant species may be found amongst them, but the chain indicated here seems to be pretty well unbroken. The group is concluded by a few aberrant species whose placing is uncertain, since the connecting links apparently are missing.

It may cause surprise that I enumerate almost 70 species from our Territory alone, but everyone who examines the individual forms closely will have to admit that the distinctions are really there. Only in one group am I not so sure of my boundaries, viz. the most difficult species-group associated with *D. cyrtosepalum* Schltr. and its relatives. Here too I have found such uniformity in the flower characteristics of the individual species that I deem it necessary to separate them.

Quite a considerable number of species has been recorded also from the neighbouring regions, but not nearly as many as we are now considering, this not being due to a scarcity in those areas, but rather to the poor survey of their orchid floras. The number of species described from British Papua is still small, it includes *D. tridentiferum* Lindl., *D. amblyornidis* Rehb. f., *D. cyanopterum* Krzl., *D. malacanthum* Krzl. and, with some doubt, *D. xylophyllum* Krzl., *D. tricolor* Krzl. and *D. montedeakense* Bail. To these I would like to add one more species, viz. *D. leontoglossum* (Ridl.) Schltr., which has been described erroneously by Ridley as *Trichoglottis leontoglossa*.

Thanks to the exploration of Dutch New Guinea a considerable number of *Grastidium* species has been recorded in recent years, numbering, as far as I can judge, 18 species, viz. *D. pruinatum* Teijsm. et Binnend., *D. pogonantherum* J.J. Sm., *D. dulce* J.J. Sm., *D. quinqueidentatum* J.J. Sm., *D. igneum* J.J. Sm., *D. Horstii* J.J. Sm., *D. multistriatum* J.J. Sm., *D. falcatum* J.J. Sm., *D. crassiflorum* J.J. Sm., *D. Gjellerupii* J.J. Sm., *D. Pulleanum* J.J. Sm., *D. longicaule* J.J. Sm., *D. imbricatum* J.J. Sm., *D. discreptum* J.J. Sm., *D. collinum* J.J. Sm., *D. rugulosum* J.J. Sm., *D. erectopatens* J.J. Sm. and *D. ingratum* J.J. Sm. J.J. Smith also mentions *D. acuminatissimum* Lindl. from the Aru Islands, but I think it more probable that the Aru plant will prove to be specifically distinct.

The species are found as epiphytes fairly evenly distributed at all altitudes. The most characteristic are those related to *D. perlongum* Schltr., where, from simple stems, up to three metres long, the giant racemes hang perpendicularly in a lax manner and sway in the wind.

155. *D. polyschistum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, pluricaule, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracillimis, simplicibus vel subsimplicibus, bene foliatis, vaginis foliorum arcte et alte amplexantibus omnino obtectis, c. 1.5 mm diametentibus; foliis anguste linearibus, acutis, glabris, 5–7 cm longis, infra medium 1.5–2.5 mm latis; spathis floriferis compressis, anguste oblongis; bracteis minutis; racemis bifloris, abbreviatis; floribus illis *D. acuminatissimi* Ldl. similibus, erecto-patentibus, suboppositis; sepalis anguste lanceolatis, elongato-acuminatissimis, glabris, c. 3 cm longis, lateralibus basi margine anteriore lobato-dilatata cum pede columnae mentum oblongoideum obtusum c. 0.5 cm longum formantibus; petalis oblique linearibus, elongato-acuminatissimis, sepalis paulo brevioribus; labello curvato, e basi cuneata infra medium trilobato, c. 1.1 cm longo, lobis lateralibus oblique lanceolatis acutis, c. 0.3 cm longis, intermedio e basi angustata subunguiculata latissime rhombeo, breviter acuminato, margine alte lacerato-fimbriato, fimbriis patentibus, carina mediana antice fissa e basi labelli usque in medium decurrente, cristis dentatis pluribus brevibus in dimidio inferiore hinc et inde additis, papillis subulatis in medio lobi intermedii pluribus sparsis, lobo medio c. 0.7 cm longo, medio fere c. 1 cm lato; columna brevi, glabra, pede gibbis 2 ovalibus infra apicem ornato, clinandrii lobis lateralibus oblique rhombeis serrulatis, dorsali brevi dentiformi; anthera late quadrata, antice truncata papillosa; ovario cum pedicello gracili subclavato, glabro, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20279, flowering in Sept. 1909.

This species is reminiscent of *D. biflorum* Sw. and *D. acuminatissimum* Lindl., but is recognised easily by the more slender habit, and above all by the very broad middle lobe of the labellum. It seems to be restricted to the mist-forest formation.

The flowers are white, flushed slightly red externally.

var. *graminiforme* Schltr., var. nov.

Differt a forma typica habitu gracillimo, graminiformi, floribus minoribus, labelli fimbriis subclavatis, lamella mediana alta, utrinque crista singula aucta, lobo intermedio antice magis reniformi.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16682, flowering in Oct. 1907.

It is probable that this is a separate species, but, unfortunately, I have insufficient flowering material to decide the question at present. The flowers are whitish.

156. *D. meliodorum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, pluricaule, usque ad 120 m longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, strictis, gracillimis, teretibus, bene foliatis, vaginis foliorum arcte et alte amplexantibus omnino obtectis, c. 2 mm diametentibus; foliis erecto-patentibus, angustius linearibus, apice obliquo acutissimis, 10–14 cm longis, infra medium 0.3–0.4 cm latis; spathis lateralibus compressis, oblongis, obtusis; racemis bifloris abbreviatis, pedunculo spatham excedente; bracteis parvulis hyalinis; floribus patentibus suboppositis, illis *D. acuminatissimi* Lindl. similibus, sed bene longioribus; sepalis lineari-lanceolatis, filiformi-elongatis, glabris, 4.5 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum conico-oblongum obtusum c. 3.5 mm longum formantibus; petalis oblique linearibus, filiformi-elongatis, sepalis paulo brevioribus, glabris; labello e basi cuneata infra medium trilobo, 9.5 mm longo, lobis lateralibus falcato-lanceolatis, acutis, margine interiore dentatis, lobo intermedio lanceolato, longius acuminato, margine lacerato-fimbriato, superne papillis subulatis obsesso, 0.6 cm longo, carina dentata e basi labelli usque supra basin lobi intermedii decurrente, papillis sparsis acutis hinc et inde lateraliter additis; columna brevi, pede lineari, concavulo, clinandri lobis lateralibus serrulatis, rotundatis, dorsali minuto dentiformi; ovario cum pedicello gracili, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the slopes of the Kani Range, on the upper Mudjene [River], alt. c. 600 m—R. Schlechter no. 17888, flowering in June 1908.

On superficial observation this species might be regarded as a form of *D. acuminatissimum* Lindl., but it is much more slender and taller with longer leaves and appreciably elongated sepals. Furthermore, rather marked differences are found in the shape and division of the middle lobe of the lip. The species, like many of its relatives, has a fairly strong, sweetish odour reminiscent of honey. The white flowers are flushed lightly with red on the outside, with a yellowish middle lobe to the labellum.

157. *D. laceratum* Schltr., sp. nov.

Epiphyticum, erectum vel subpatulum, 40–50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, bene foliatis, vaginis foliorum alte amplexantibus, microscopice rugulosis omnino obtectis; foliis erecto-patentibus, anguste linearibus, acutis, glabris, 7–10 cm longis, infra medium 3.5–4.5 mm latis; spathis patentibus compressis, obtusis; racemis bifloris abbreviatis, pedunculo perbrevis; bracteis hyalinis parvulis; floribus patentibus, illis *D. camaridiorum* Rchb. f. similibus, glabris; sepalis anguste lanceolatis, filiformi-elongatis, 2.5 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongoideum obtusum c. 4.5 mm longum formantibus; petalis oblique linearibus, filiformi-elongatis, glabris sepalis paulo brevioribus; labello e basi oblongo-cuneata medio fere trilobato, c. 0.9 cm longo, lobis lateralibus oblongo-lanceolatis, subacutis, margine interiore subdentatis, intermedio lateralibus duplo longiore, oblongo, breviter acuminato, margine inaequaliter lacerato, superne papillis recurvulis subulatis medio dense obsesso, carina lineari edentata e basi labelli usque in basin lobi intermedii decurrente; columna brevi, pede concavulo, clinandri lobis lateralibus rotundatis, subintegris, dorsali dentiformi; anthera quadrato-cucullata, glabra, antice truncata; ovario cum pedicello gracili, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19876, flowering in June 1909.

In habit it reminds one of *D. camaridiorum* Rchb. f. from New Caledonia. Amongst the species of the Territory, it stands nearest to *D. polyschistum* Schltr., but is distinguished well by its shorter leaves, smaller and shorter flowers, and the labellum.

The flowers are yellowish white, with the column-foot orange-yellow at the apex.

158. *D. Schwartzkopfianum* Krzl., in Notizbl. Kgl. Bot. Gart. Berlin (1898), p. 106.

Neu-Pommern: On trees on the Mangrove River near Ralum—F. Dahl s.n.

The Type in the Berlin Herbarium, like that of *D. chordiforme* Krzl., is flowerless and with the comment 'flowers in alcohol'. Since the flowers could not be found, I cannot express an opinion about their structure, but the species evidently belongs here. It is more robust than the three described above, and seems to approach more closely those which follow and which all belong to the mist-forest formation.

159. *D. leopardinum* Schltr., sp. nov.

Epiphyticum, erectum vel subpatulum, gracile, pluricaule; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, paulo compressis, bene foliatis, vaginis foliorum arcte et alte amplexentibus, minute et sparsim verruculosus omnino obtectis, 2.5–3 mm latis; foliis erecto-patentibus, linearibus, apice obliquo-acutis, glabris, 9–13 cm longis, infra medium 0.4–0.7 cm latis; spathis lateralibus, compressis, semiorbicularibus, abbreviatis, spatha oblonga obtusa bene longiore intus auctis; racemis bifloris brevibus, pedunculo c. 1.5 cm longo, bracteis caducis; floribus patentibus suboppositis, in sectione speciosis; sepalis anguste lanceolatis, filiformi-elongatis, glabris, 4.3 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum late conicum obtusum 0.4 cm longum formantibus; petalis oblique lineari-lanceolatis, filiformi-elongatis, glabris, sepalis paulo brevioribus; labello e basi oblongo-cuneata infra medium trilobo, 1.3 cm longo, medio fere 0.8 cm lato, lobis lateralibus oblongo-falcatis, obtusis, intermedio triplo longiore, ovali, longius apiculato, margine brevius pectinato-fimbriato, medio pilis recurvis flexuosis pulviniformi-villoso, carina lineari apicem versus paulo dilatata e basi labelli usque in basin lobi intermedii decurrente; columna crassiuscula, glabra, pede concavulo, clinandrii lobis lateralibus subquadratis truncatis, intermedio dentiformi parvulo; anthera cucullata antice truncata, glabra; ovario cum pedicello gracili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000–1200 m—R. Schlechter no. 18023 (TYPE) flowering in July 1908; no. 19093, flowering in Jan. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16677, flowering in Oct. 1907.

The abovementioned no. 16677 from Kani appeared to deviate from the Type of the species by the deeper division of the middle lobe of the lip, but it has now been established that this was due to the specimens from Kani having finished flowering so that a perfect reconstruction of the lip was hardly possible. The species stands nearest to *D. pantherinum* Schltr., described below, but is smaller in all its parts and has a differently shaped labellum. The bizarre flowers, with their much elongated sepals, are yellow with dark brown spots and a white lip, the tip of the lateral lobes and the margin of the middle lobe being dotted red.

160. *D. pantherinum* Schltr., sp. nov.

Epiphyticum, erectum, pluricaule, 100–120 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, paulo compressis, bene foliatis, vaginis foliorum arcte appressis, minute rugulosis, apice in lobulum obtusum productis omnino obtectis, 0.5 cm latis; foliis erecto-patentibus, linearibus, apicem versus sensim paulo angustatis, acutis, glabris, 12–15 cm longis, 1–1.4 cm latis; spathis exterioribus abbreviatis, semiorbicularibus, obtusissimis, interioribus bene longioribus, oblongis, obtusis; racemis patentibus bifloris, pedunculo c. 2 cm longo; bracteis caducis; floribus pro sectione speciosis, illis *D. leopardini* Schltr. similibus sed bene majoribus; sepalis lanceolatis, filiformi-elongatis, glabris, c. 8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve 0.3 cm longum formantibus; petalis oblique lanceolatis, filiformi-elongatis, glabris, sepalis paulo brevioribus; labello e basi oblongo-cuneata medio fere trilobato, 1.5 cm longo, medio fere 1.1 cm lato, lobis lateralibus oblique oblongis, obtusis, margine interiore minute denticulatis, intermedio fere triplo longiore, quadrato-oblongo, antice retuso cum apiculo minuto, margine undulato serrulato-inciso, per medium dense pilis flexuosis pulviniformi-villoso, carina oblanceolato-lineari e basi labelli usque in basin lobi intermedii decurrente, papillis sparsis dentiformibus in dimidio inferiore labelli; columna brevi, glabra, pede concavulo, clinandrii lobis lateralibus rotundato-truncatis serrulatis, dorsali dentiformi parvulo; anthera quadrato-cucullata, antice truncata, glabra; ovario cum pedicello gracili c. 1 cm longo.

Kaiser-Wilhelms-Land: On isolated trees on the slopes of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18012, flowering in July 1908.

A magnificent species, related to *D. leopardinum* Schltr., but appreciably larger. It differs also in the leaf-sheaths and shape of the labellum, in which the middle lobe especially is very characteristic. The flowers are pale yellow with dark red dots; the labellum white with a yellow crest. The column-foot is golden yellow in front.

161. *D. vernicosum* Schltr., sp. nov.

Epiphyticum, erectum, 100–150 cm altum, pluricaule; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, strictis, teretibus, bene foliatis, vaginis foliorum arctissime amplexantibus, minute verruculoso-rugulosis omnino vestitis, 3.5–4.5 mm diametentibus; foliis erecto-patentibus vel subpatentibus, lineari-lanceolatis, acutis, glabris, superne vernicoso-lucidis, 12–16 cm longis, infra medium 0.7–1.1 cm latis, vaginis margine apice sublobato-rotundatis; spathis oblongis, obtusis, lateralibus, compressis; racemis abbreviatis, bifloris; bracteis hyalinis, ovario bene brevioribus; floribus suboppositis, patentibus; sepalis lanceolatis, elongato-acuminatis, glabris, 4 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum breve obtusum c. 5 mm longum formantibus; petalis oblique lineari-lanceolatis, elongato-acuminatis, glabris, sepalis paulo brevioribus; labello e basi oblongo-cuneata medio trilobato, 1.5 cm longo, lobis lateralibus ovato-triangularibus, obtusis, intermedio oblongo, obtuso, margine pectinato, superne omnino dense pulvinato-piloso, carina lineari obtusa e basi labelli usque in basin lobi intermedii decurrente, dimidio inferiore labelli sparsim papilloso-puberulo; columna brevi, pede oblongo, clinandrii lobis lateralibus rotundato-truncatis, dorsali subulato bene longiore; anthera trapezoideo-cucullata, antice truncata, glabra; ovario cum pedicello glabro, c. 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17197, flowering in Jan. 1908.

Unfortunately, I have little flower-material of this species which may best be placed alongside *D. pantherinum* Schltr. The specimen before me is distinguished by the closely set leaves glistening on the upper surface as though they were coated with gum or varnish. The species is very characteristic in the shape of the labellum. The flowers are snow-white, the lip and column brownish yellow at the base.

162. *D. debile* Schltr., sp. nov.

Epiphyticum, patulum, debile, pluricaule; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, flexuosis, gracillimis, laxe foliatis, teretibus 0.1–0.2 cm diametentibus, vaginis foliorum arcte amplexantibus distanter obsessis; foliis vulgo patulis nunc erecto-patentibus, linearibus, acutis, glabris, 3.5–5 cm longis, infra medium 1.5–2.5 mm latis; spathis abbreviatis, lateralibus; racemis bifloris, pedunculo perbrevis; bracteis hyalinis; floribus suboppositis, graciliter pedicellatis, patentibus, glabris; sepalis anguste lanceolatis, elongato-acuminatis, glabris, 1.4 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum breve obtusum c. 0.3 cm longum formantibus; petalis oblique linearibus, elongato-attenuatis, sepalis paulo brevioribus; labello circuitu ovali, infra medium trilobo, 0.7 cm longo, inter apices loborum lateralium 4.5 mm lato, lobis lateralibus falcato-lanceolatis, subacutis, parvulis, intermedio obcuneato-quadrato, antice truncato, subretuso cum apiculo satis magno, marginibus leviter undulato, antice 0.4 cm lato, carina intermedia e basi labelli usque in medium lobi intermedii decurrente, carina minore e basi loborum lateralium usque in medium lobi intermedii parallela utrinque addita; columna brevi, glabra, pede lineari-ligulato, concavulo, clinandrii lobis lateralibus lanceolatis, subacutis, dorsali utrinque unidentato obtusato; anthera rotundato-cucullata, glabra; ovario cum pedicello gracillimo c. 1.2 cm longo, glabro.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 18264, flowering in Sept. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19160, flowering in Jan. 1909.

This plant appears to be an extremely characteristic species, distinguished from all others by the snake-like, lax habit. I do not know of a really close relative since it is also extremely characteristic in the structure of the lip. It is distinguished from all species of the section by the sepals being less elongated, a character which gradually disappears in the following species. The flowers are pale yellow, the labellum whitish with a dark red margin.

163. *D. glebulosum* Schltr., sp. nov.

Epiphyticum, patulum, radicans, usque ad 90 cm longum; rhizomate normaliter brevi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, leviter compressis, bene foliatis, vaginis foliorum arctissime amplectentibus, striatis fere omnino obtectis, 2–3 mm diametientibus; foliis vulgo refractis, lineari-lanceolatis, acutis, glabris, 4–7 cm longis, infra medium 0.4–0.7 cm latis; spathis semi-oblongis, obtusis, compressis; racemis bifloris, abbreviatis, pedunculo spatham subduplo exeunte; bracteis caducis, minutis; floribus suboppositis, patentibus, glabris; sepalis angustius lanceolatis, acutis, glabris, 1.7 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum breve curvatum obtusum 0.4 cm longum formantibus; petalis oblique linearibus, acutis, glabris, sepalis paulo minoribus; labello circuito oblongo, infra medium trilobato, 1.3 cm longo, inter apices loborum lateralium 0.7 cm lato, lobis lateralibus brevibus, oblique triangularibus, obtusiusculis, margine interiore apicem versus subdentatis, intermedio oblongo-quadrato, obtusissimo cum apiculo minuto, margine subcrenulato-undulato, superne appendicibus sparsis breviter stipitatis glebuliformibus obsesso, carinis 3 parallelis e basi labelli usque in medium decurrentibus, intermedia paululo longiore, dimidio inferiore labelli papillis sparsis dentiformibus donato; columna brevi, pede incurvulo, clinandrii lobis lateralibus paucidentatis, brevibus, dorsali triangulo dentiformi, parvulo; anthera obreniformi-cucullata, glabra; ovario cum pedicello gracili glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19065, flowering in Jan. 1909; on trees in the forests of the Bismarck Range, alt. c. 1200–1600 m—R. Schlechter no. 18674, no. 18734 (TYPE), flowering in Nov. 1908.

Amongst the species in this section this one is unique in the shape of the appendage of the lip, in other respects it is related most closely to *D. debile* Schltr. Very characteristic are the almost always sharply reflexed leaves. The flowers are greenish white, lightly flushed on the outside with brown. The column is yellow in front.

164. *D. holochilum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, 20–30 cm altum, pluricaule; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, densius foliatis, teretiusculis, vaginis foliorum arcte amplectentibus verruculosus omnino obtectis c. 1.5 mm diametientibus; foliis erecto-patentibus, lanceolato-ligulatis, obtusiusculis, apice inaequaliter bilobulatis, glabris, 1.8–3.5 cm longis, infra medium 0.4–0.7 cm latis; spatha compressa, parvula, obtusa; racemo bifloro bene abbreviato, pedunculo perbrevis; bracteis hyalinis; floribus in genere inter minores, patentibus, glabris; sepalis anguste lanceolatis, attenuato-productis, glabris, 1.5 cm longis, lateralibus obliquis, basi margine anteriore lobato-producta cum pede columnae mentum oblongoideum obtusum 0.5 cm longum formantibus; petalis oblique linearibus, attenuato-productis, glabris, sepalis paulo brevioribus; labello anguste lanceolato-linguiformi, acuto, dimidio superiore margine inaequaliter pectinato-inciso et papillis sparsis superne obsesso, 1.3 cm longo, infra medium 3.5 mm lato, carina mediana incrassata e basi labelli usque supra medium decurrente; columna brevi, glabra, pede lineari, concavulo, clinandrii lobis lateralibus triangularibus acutis dentiformibus, dorsali brevi, obtusato; anthera subreniformi-cucullata, glabra, antice truncata; ovario cum pedicello gracili glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19480, flowering in May 1909.

At present I do not know a species with which this may be compared closely. It is isolated by being the only one in this relationship in which the labellum is not distinctly tri-lobed. In habit, however, it reminds one of species otherwise distinguished by short, blunt flowers. The plant is evidently rare, for I have collected it only once and then as a single specimen. The flowers are whitish; the labellum reddish, sulphur-yellow towards the front.

165. *D. erectum* Schltr., sp. nov.

Epiphyticum, erectum, 20–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, paulo compressis, pro sectione dense foliatis, vaginis foliorum arcte amplectentibus omnino obtectis, 2.5–3 mm latis; foliis erecto-patentibus vel subpatentibus, lanceolatis, obtusiusculis, inaequaliter bilobulatis, 3.5–4.5 cm longis, infra medium 0.7–1.2 cm latis; spathis oblongis, obtusis, compressis; racemo abbreviato bifloro, pedunculo spatham haud excedente;

bracteis hyalinis parvulis; floribus suboppositis, patentibus, glabris; sepalis anguste lanceolatis, elongato-attenuatis, 2.7 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum incurvulum obtusum c. 0.6 cm longum formantibus; petalis oblique linearibus, elongato-attenuatis, glabris, sepalis paulo brevioribus; labello circuitu oblongo, infra medium trilobato, 1.5 cm longo, lobis lateralibus parvulis, ligulatis, subacutis, intermedio oblongo, margine pectinato, superne perdense papillis subulatis muricato-asperato, carina mediana e basi usque in medium labelli decurrente; columna brevi, glabra, clinandrii lobis lateralibus pluridentatis, dorsali brevi tridentato; anthera rhomboideo-cucullata, antice truncata, glabra; ovario cum pedicello glabro, c. 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the upper Waube Creek (Waria District), alt. c. 900 m—R. Schlechter no. 19450, flowering in May 1909.

In many respects this and the preceding species stand close to *D. quinquedentatum* J.J. Sm., but they are well distinguished by the shape of the lip. In this species there seems to be a connecting link between *D. holochilum* Schltr. and the following species, *D. exasperatum* Schltr. The flowers of *D. erectum* Schltr. are whitish, red-spotted on the outside and yellowish inside.

166. *D. exasperatum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 80 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus paululo compressis, dense foliatis, arcuatis, vaginis foliorum omnino obtectis, c. 0.4 cm latis; foliis erecto-patentibus vel patulis, anguste lanceolatis, acutis, glabris, 8–10 cm longis, infra medium 0.8–1.1 cm latis, superne lucidis; spathis oblongis, obtusis, compressis; racemis brevibus, bifloris, patentibus; bracteis mox caducis; floribus patentibus; suboppositis, graciliter pedicellatis; sepalis lanceolatis, obtusiuscule longiacuminatis, glabris, extus papillis exasperatis, c. 2.2 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique linearibus, elongato-attenuatis, sepalis paulo brevioribus; labello circuitu oblongo, c. 1.2 cm longo, e tertia parte basilari trilobo, lobis lateralibus parvulis, falcato-triangularibus, obtusiusculis, intermedio ovali, margine inaequaliter lacerato-pectinato, superne dense pulvinato-villoso, carina lineari e basi labelli usque supra basin lobi intermedii, papillis parvulis sparis in tertia parte basilari labelli; columna brevi, pede incurvulo ligulato, clinandrii lobis obtusatis, dorsali minore; anthera cucullata, glabra, antice truncata; ovario cum pedicello gracili glabro, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, above Bolobo, alt. c. 900 m—R. Schlechter no. 16527, flowering in Sept. 1907.

I have found this very interesting species only once.

From all relatives it is distinguished by the sepals covered with soft prickles on the outside and has also a very characteristic labellum. The flower stalks are fairly long for a species of this section. The flowers are pale yellow, closely red-spotted with the labellum white in front.

167. *D. collinum* J.J. Sm., in Bull. Dep. Agr. [Ind. Néerl.] XXXIX (1910), p. 8.

D. planum J.J. Sm. var. *collinum* J.J. Sm., in Nova Guinea VIII (1912), p. 556.

Kaiser-Wilhelms-Land: On trees in the primary forest at Bolobo, alt. c. 350 m—R. Schlechter no. 16520, flowering in Sept. 1907; on trees on the Wakeak [River], alt. c. 450 m—R. Schlechter no. 18119, flowering in Aug. 1908; on trees in the forests of the Finisterre Range, alt. c. 600 m—R. Schlechter no. 19186, flowering in Jan. 1909; on trees in the hill-forests near Udu, alt. c. 500 m—R. Schlechter no. 19901, flowering in June 1909; on trees on the Govidjoa [Creek], alt. c. 700 m—R. Schlechter no. 19768, flowering in June 1908.

A widely distributed plant from the forests of the plains and hills. I have found a few specimens in which the lateral lobes of the labellum were almost pointed. The Java species, *D. planum* J.J. Sm., is related closely to this, but is regarded better as a separate species. The flowers are pale yellow, with a labellum red-dotted in front.

168. *D. angraecifolium* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 169.

D. Branderhorstii J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XXXIX (1910), p. 8.

Kaiser-Wilhelms-Land: On tall trees in the primary forests of Wobbe, Minjem [River], alt. c. 200-300 m—R. Schlechter no. 16337, flowering in July 1907; no. 16478, flowering in Sept. [Ed.—possibly Aug.] 1907; on trees in the forests near the foot of the Bismarck Range, alt. c. 200-400 m—R. Schlechter no. 14089 (TYPE), flowering in Jan. 1902; no. 18665, flowering in Nov. 1905 [Ed.—probably 1908]; on trees in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18356, flowering in Oct. 1908; on trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 200 m—R. Schlechter no. 19305 [Ed.—no date cited, possibly Apr. 1909].

Neu-Mecklenburg: On trees at the beach near Karu, alt. c. 10 m—R. Schlechter no. 14623, flowering in June 1902.

Evidently, this is a widely distributed species of the forests of the plains and hill-country. As is usually observed in widely-distributed forms, it is more subject to variation than the more localised species. This variation embraces, chiefly, the breadth of the leaves and shape of the lateral lobes, but never exceeds the limits of the species. The specimens from the Waria [River] have narrower leaves than the rest. I do not doubt that *D. Branderhorstii* J.J. Sm. belongs here. The flowers are pale yellow, with an orange-yellow callus on the column-foot.

169. *D. grossum* Schltr., sp. nov.

Epiphyticum, erectum, grossum, c. 80 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, strictis, teretibus, bene foliatis, vaginis foliorum parum rugulosis omnino obtectis, c. 0.8 cm diametentibus; foliis erecto-patentibus, lanceolatis, obtusis, apice inaequaliter bilobulatis, glabris, superne lucidis, 8-12 cm longis, infra medium 1.7-3 cm latis; spathis abbreviatis, obtusis, lateralibus; racemis bifloris, pedunculo subnullo; floribus pro sectione magnis, suboppositis, erecto-patentibus patentibusve; sepalis oblongis, obtusis, glabris, 2.4 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum pro sectione perbreve c. 0.3 cm longum formantibus; petalis oblique oblongo-ellipticis, obtusiusculis, glabris, sepalis subaequilongis sed medio latioribus et textura tenuioribus, glabris; labello e basi rotundata medio trilobato, 1 cm longo, inter apices loborum lateralium 1.2 cm lato, lobis lateralibus erectis, triangulis, obtusis, intermedio multo majore subquadrato-rotundato, apiculato, carina lineari acuta e basi labelli usque in medium lobii intermedii decurrente, basi utrinque bisquamata, papillis dentiformibus acutis sparis in lamina; columna brevi, crassiuscula, pede apice excavato, clinandrii lobis lateralibus truncatis, abbreviatis, dorsali humili; anthera rotundato-cucullata, glabra; ovario cum pedicello glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19073, flowering in Jan. 1909; on trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18495, flowering in Oct. 1908.

A very robust, fairly thick, fleshy species which shows certain tendencies in the flower to *D. angraecifolium* Schltr., but otherwise is related to the species which follows. The flowers are pale yellow or pale orange-yellow, with a reddish labellum and a red central crest on the latter.

170. *D. elatum* Schltr., sp. nov.

Epiphyticum, erectum, validum, c. 100 cm altum et ultra; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, strictis vel substrictis, validis, paulo compressis, vaginis foliorum rugulosis, arcte et alte amplectentibus obtectis; foliis erecto-patentibus, oblongo-lanceolatis, inaequaliter ac obtuse bilobulatis, glabris, textura coriaceis, 12-16 cm longis, infra medium 3-4 cm latis; spathis abbreviatis, extus margine dense verrucosis; racemis bifloris, pedunculo subnullo; floribus patentibus in sectione inter majores, glabris; sepalis lanceolatis, subulato-elongatis, glabris, extus nervo medio incrassato denticulatis, 4.3 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 0.8 cm longum formantibus; petalis oblique linearibus, subulato-elongatis, sepalis paululo brevioribus; labello e basi cuneata tertia parte

antere trilobato, c. 1.5 cm longo, inter apices loborum lateralium 1.2 cm lato, lobis lateralibus oblique ovatis, obtusiusculis, intermedio multo majore, semiorbiculari, apiculato, carina lineari e basi labelli usque ad basin lobi intermedii decurrente, seriebus 3 verrucularum in lobo intermedio antepositis; columna brevi, crassiuscula, glabra, pede incurvulo apice callo bilobato tabulari ornato, clinandrii lobis lateralibus apice truncatis, dorsali minuto dentiformi minore; anthera galeato-cucullata, antice truncata, glabra; ovario cum pedicello glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20152, flowering in Sept. 1909.

Amongst the erect species of the section, this is probably the most robust. It stands close to *D. grossum* Schltr., but is distinguished well by the flowers. Very characteristic also are the closely verrucose sheaths of the inflorescence. The flowers are golden yellow, the labellum with an orange-yellow central crest, the column with an orange-yellow spot at the apex.

171. *D. asperatum* Schltr., sp. nov.

Epiphyticum, erectum, validum, c. 100 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, subteretibus, bene foliatis, vaginis foliorum rugosis arcte obtectis, 0.5–0.6 cm diametentibus; foliis erecto-patentibus, lanceolato-ligulatis, apice inaequaliter ac obtuse bilobulatis, glabris, 13–17 cm longis, infra medium 2–3 cm latis; spathis lateralibus semiorbicularibus, margine dense verruculoso-asperatis; racemis valde abbreviatis, bifloris, pedunculo perbrevi, bracteis hyalinis parvulis; floribus patentibus in sectione inter majores; sepalis lanceolatis, subacuminatis, glabris, intermedio 2.8 cm longo, lateralibus obliquis, falcatis, c. 2.2 cm longis, basi margine anteriore dilatata cum pede columnae mentum conicum obtusum c. 0.8 cm longum formantibus; petalis oblique linearibus, acutis, glabris, 2.3 cm longis; labello e basi cuneata supra medium trilobo, c. 1.7 cm longo, medio fere 1.2 cm lato, lobis lateralibus parvulis, falcato-ovatis, obtusis, intermedio suborbiculari, apiculato, carina acuta basi muricata e basi labelli usque in basin lobi intermedii decurrente, labelli dimidio inferiore sparsim muriculato-asperato, papillis subulatis pluribus in medio lobi intermedii; columna brevi, crassiuscula, pede apice disco depresso ornato, clinandrii lobis lateralibus serrulatis, dorsali dentiformi parvulo; ovario cum pedicello glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the Waube Creek (Waria District), alt. c. 700 m—R. Schlechter no. 19464, flowering in May 1909.

This species is best compared with *D. elatum* Schltr., although it does not attain the height, nor size of flowers of the latter. Very characteristic are the dense warts on the margin of the rough flower-sheaths. The flowers are cream-coloured with an orange keel on the lip and an orange-red spot on the column-foot.

172. *D. longissimum* Schltr., sp. nov.

Epiphyticum, pensile usque ad 2 m longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus, simplicibus, longissimis, dense foliatis, teretibus, vaginis foliorum arctissime amplexantibus omnino obtectis; c. 1 cm diametentibus; foliis anguste lanceolatis, acutis, glabris, 18–22 cm longis, medio fere 1.8–2.2 cm latis; spathis compressis, semiorbicularibus, obtusissimis; racemis valde abbreviatis, bifloris, pedunculo subnullo; floribus carnosissimis, patentibus, mediocribus; sepalis oblongis, obtusis, glabris, apicem versus incrassatis, incurvis, c. 1.6 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique oblongis, obtusis, sepalis bene similibus sed paulo minoribus; labello circuitu oblongo, dimidio inferiore transversim ruguloso, 0.8 cm longo, medio fere 0.5 cm lato, e medio trilobato, lobis lateralibus parvulis, ovato-triangularibus, obtusis, intermedio amplo, elliptico, subacuto, carina verrucosa e basi labelli usque in basin lobi intermedii decurrente; columna brevi crassiuscula, pede incurvulo apice incrassato, clinandrii lobis rotundatis obtusissimis; anthera quadrato-cucullata, glabra; ovario subsessili, cylindraceo, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19878, flowering in June 1909.

This, and the next following species, belong to a separate sub-group of the section, and are distinguished by the stems which are frequently two to three metres long, hanging vertically from tall trees in a lax manner and swinging to-and-fro in the wind. Furthermore, all these species have similar sepals and petals slightly incurved and

thickened towards the apex. The relationship of the group is to be looked for in *D. longicaule* J.J. Sm., *D. crassiflorum* J.J. Sm. and *D. salomonense* Schltr. The strongly scented flowers are a creamy-yellow with an orange-yellow keel on the lip and brown margins and veinings on the lateral lobes of the labellum.

173. *D. perlongum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 3 m longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, perlongis, dense foliatis, teretibus, vaginis foliorum arcte amplexantibus omnino obtectis, c. 1 cm diametro; foliis anguste lanceolato-ligulatis, obtusiusculis, obtuse ac inaequaliter bilobulatis, 13–18 cm longis, infra medium 1.6–2 cm latis; spathis lateralibus, semiobicularibus, obtusissimis, compressis; racemis subsessilibus, bifloris, pedunculo subnullo; floribus carnosius, patentibus; sepalis anguste oblongis, obtusis, apice incrassatis, incurvis, glabris, 2.2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis anguste oblongo-ligulatis, obliquis, sepalis paulo brevioribus sed bene similibus; labello circuitu ovato-elliptico, superne ruguloso, c. 1 cm longo, medio fere 0.5 cm lato, e medio trilobato, lobis lateralibus parvulis, ovato-triangularibus, obtusis, intermedio amplo, ovato, acuto, margine undulato, per medium linea verrucarum ornato, carina tenui e basi labelli in basin lobi intermedii decurrente, basi utrinque squama verrucosa aucta; columna brevi, pede incurvo, clinandri lobis lateralibus rotundatis, dorsali dentiformi minore; anthera quadrato-cucullata, antice excisa, glabra; ovario subsessili cylindrico, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17102 (TYPE), flowering in Dec. 1907; no. 19021, flowering in Dec. 1909 [Ed.—probably 1908].

This is related closely to the preceding species, but is distinguished by its larger flowers, narrower sepals and petals and by the labellum. In growth the two are very similar. The fleshy flowers are cream-coloured, the labellum yellowish with an orange-red central band and brownish lateral lobes.

174. *D. salomonense* Schltr., in sched.

Solomon Islands: On trees at Kieta Bay, Bougainville [I.], pendant, one to two metres in length—L. and K. Rechinger no. 2563, flowering in Sept. 1905.

Closely related to the two preceding species, but well distinguished by its scarcely tri-lobed labellum. A more accurate description will be published soon elsewhere. According to the collectors the flowers are yellow.

175. *D. sarcodes* Schltr., sp. nov.

Epiphyticum, pensile, 1–1.5 m longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, elongatis, dense foliatis, teretibus, c. 1 cm diametentibus, vaginis foliorum arctissime amplexantibus omnino vestitis; foliis elliptico-ligulatis, obtusiusculis, inaequaliter bilobulatis, glabris, 9–15 cm longis, medio fere 2.5–4.3 cm latis; spathis lateralibus, semiobicularibus, compressis; racemis subsessilibus, bifloris; floribus patentibus, carnosius; sepalis oblongis, obtusis, extus verruculosis, apicem versus incrassatis et incurvis, 1.8 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve formantibus; petalis spathulato-oblongis obtusis, apice incrassato incurvis, sepalis paulo brevioribus; labello e basi cuneata infra medium trilobo, superne dimidio inferiore rugoso, in lobo intermedio papilloso-muricato, 0.8 cm longo inter apices lorum lateralium 4.5 mm lato, lobis lateralibus oblique oblongis, obtusis, intermedio duplo longiore, elliptico, acuminato, margine undulato, carina subdentata e basi labelli usque in basin lobi intermedii decurrente; columna brevi, pede incurvulo, clinandri lobis rotundatis; anthera quadrato-cucullata, glabra; ovario subsessili, cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17290, flowering in Feb. 1908.

With this species begin those forms of the *Perlonga* group which are distinguished by the sepals being verrucose on the outside. *D. sarcodes* Schltr. is recognised easily from those which follow by the shape of the lip.

The flowers are white, dotted with red; the labellum yellowish, with an orange-red keel and brown transverse wrinkles.

var. *majus* Schltr., var. nov.

Differt a forma typica foliis longioribus et tenuioribus, floribus minus crassis et labelli papillis paucis et longioribus.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 500 m—R. Schlechter no. 18655, flowering in Nov. 1908.

It is probable that this plant will prove later to be a species. My material is not quite sufficient to decide the question since the flowers have suffered badly; externally it resembles the species which follows.

176. *D. pachyanthum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 1.5 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, elongatis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, teretibus, c. 0.8 cm diametentibus; foliis elliptico-ligulatis, acutiusculis, glabris, 13–17 cm longis, medio fere 2.2–3 cm latis; spathis lateralibus, obtusissimis, perbrevis; racemis valde abbreviatis, subsessilibus, bifloris; floribus carnosus, patentibus, suboppositis; sepalis oblongo-spathulatis, obtusis, apicem versus incrassatis, verruculosus, incurvulus, c. 1.5 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis sepalis simillimis, obliquis, paulo minoribus; labello e basi cuneata medio trilobato, dimidio inferiore carunculis transversis ornato, c. 0.7 cm longo, medio 3.5 mm lato, lobis lateralibus parvulis, triangulis, obtusis, intermedio oblongo, acuminato, margine undulato, superne basi papillis acutis ornato, carina lineari e basi labelli usque in basin lobi intermedii decurrente; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus apice truncatis, intermedio dentiformi vix longiore; anthera reniformi-cucullata, glabra; ovario subsessili, cylindrico, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the hill-forests close to Pema, on the Waria [River], alt. c. 400 m—R. Schlechter no. 19906, flowering in June 1909.

An interesting species, closely related to *D. sarcodes* Schltr., but with smaller flowers and a narrower labellum. The flowers are yellow, with red-brown spots on the inside, the column-foot with an orange-red spot.

177. *D. triste* Schltr., sp. nov.

Epiphyticum, pensile, 1.5–2 m longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, valde elongatis, dense foliatis, vaginis foliorum arcte appressis omnino vestitis, teretibus, c. 0.6–0.8 cm diametentibus; foliis subpatentibus, lanceolato-ellipticis, subacutis, glabris, 9–14 cm longis, medio fere 2–3.7 cm latis; vaginis lateralibus, semiorbicularibus, compressis; racemis abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis, carnosus; sepalis oblongis, obtusis, extus verruculosus, apicem versus incrassatis et incurvis, 1.5 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve formantibus; petalis spathulato-oblongis, obtusis, obliquis, glabris, sepalis paulo brevioribus; labello circuitu rhombeo, supra medium trilobato, 0.8 cm longo, inter apices loborum lateralium 0.6 cm lato, dimidio inferiore transversim rugoso, lobis lateralibus subpatentibus, triangulis, subacutis, margine interiore subdentatis, intermedio semioblongo, acuminato, bene majore, margine undulato, basi et medio carunculis vel papillis ornato, carina acuta subdentata e basi labelli usque in basin lobi intermedii; columna brevi, pede incurvulo, clinandrii lobis lateralibus oblique truncatis, dorsali dentiformi, minore; anthera quadrato-cucullata, glabra; ovario subsessili, cylindraceo, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20246, flowering in Sept. 1909.

The entire plant dries dark and, therefore, with its likewise dark flowers, makes a rather gloomy impression. The species should be placed alongside of *D. pachyanthum* Schltr., although it has a very differently shaped labellum. The flowers are dark purple with an orange-yellow crest on the labellum; the white column being flushed reddish, with an orange-yellow spot.

178. *D. multifolium* Schltr., sp. nov.

Epiphyticum, pensile, c. 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, elongatis, perdense foliatis, vaginis foliorum arcte

amplectentibus omnino obtectis, paulo compressis, c. 0.4 cm latis; foliis lanceolato-ligulatis, acutissimis, 8–11 cm longis, infra medium 1.3–1.8 cm latis; vaginis semiorbicularibus, brevibus, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis, glabris; sepalis oblongis, obtusis, apice incurvo paulo incrassatis, 1.4 cm longis, lateralibus falcato-obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique obovato-spathulatis, obtusis, sepalis paulo brevioribus; labello circuito oblongo, e medio fere trilobato, 0.7 cm longo, medio fere 4.5 mm lato, lobis lateralibus parvulis, oblique oblongis, obtusis, intermedio bene majore, subquadrato-rhomboides, antice obtusissimo, carinula leviter flexuosa e basi labelli usque in basin lobi intermedii decurrente; columna brevi, crassiuscula, pede apice callo depresso trilobulato ornato, clinandrii lobis lateralibus rotundatis, dorsali dentiformi, triangulo; anthera quadrato-cucullata, glabra; ovario subsessili, cylindrico, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20263, flowering in Sept. 1909.

An excellently characterised species, which stands rather isolated here. It is recognised easily by the labellum as well as the column-foot. The flowers are cream-yellow with an orange-yellow lip and an orange-yellow thickening at the tip of the column-foot.

179. *D. hamadryas* Schltr., sp. nov.

Epiphyticum, pensile, 80–100 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, bene foliatis, vaginis foliorum arcte amplectentibus omnino obtectis, paulo compressis, c. 0.3–0.4 cm latis; foliis anguste lanceolato-ligulatis, acutis, glabris, 9–12 cm longis, infra medium 1.2–1.7 cm latis; vaginis abbreviatis, obtusissimis, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis, carnosulis; sepalis oblongis, obtusis, extus sparsim verruculosi, apice incurvulo paulo incrassatis, c. 1 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis e basi unguiculato-angustata obovato-spathulatis, apice paulo incrassato et incurvo extus sparsim verruculosi, sepalis subaequilongis; labello e basi cuneata, supra medium trilobato, dimidio inferiore transversim ruguloso, 0.7 cm longo, inter apices lorum lateralium 0.5 cm lato, lobis lateralibus patentibus, triangulis, obtusiusculis, intermedio majore, suborbiculari, obtusiusculo, margine undulato, intus medio papillis subulatis ornato, carina lineari antice subdentata e basi labelli usque in basin lobi intermedii decurrente; columna brevi crassiuscula, pede apice incurvulo, clinandrii lobis lateralibus rotundatis, subinconspicue denticulatis, dorsali dentiformi, minore; anthera rotundato-cucullata, antice truncata, glabra; ovario subsessili, cylindraceo, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the Djamu [River], alt. c. 800 m—R. Schlechter no. 17336, flowering in Feb. 1908.

This species concludes the series of those with lax pendulous stems. The following species are arranged satisfactorily near *D. hamadryas* Schltr., but are distinguished by their more-or-less upright or overhanging stems; moreover, they frequently have an undivided lip. The flowers are closely brown-red-spotted with a yellow lip, the lateral lobes of the latter spotted brown-red.

180. *D. incurvatum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 30–40 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, subflexuosis, bene foliatis, vaginis foliorum arcte amplectentibus omnino obtectis; foliis patentibus vel subpatentibus, lanceolato-ligulatis, obtusiusculis, basi subpetiolato-contractis, 3.5–5.5 cm longis, infra medium 0.5–0.9 cm latis; spathis lateralibus, quam maxime abbreviatis, vix conspicuis, obtusissimis; racemis abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis, glabris; sepalis oblongo-ligulatis, obtusis, valde incurvatis, c. 1.5 cm longis, lateralibus falcatis, basi margine anteriore dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique lineari-spathulatis, obtusis, incurvatis, sepalis paulo brevioribus; labello circuito elliptico, e medio trilobato, dimidio inferiore carunculis transversis ornato, 0.7 cm longo, medio fere 4.5 mm lato, lobis lateralibus brevibus rotundatis, intermedio multo longiore, ovato, acuminato, basi papillis acutis recurvulis ornato, margine leviter undulato, carina lineari e basi labelli usque in basin lobi intermedii decurrente; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus subtruncato-lobulatis, dorsali subnullo; ovario subsessili, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20312, flowering in Sept. 1909.

This species indicates a relationship with *D. hamadryas* Schltr. and those following; it is the smallest among its immediate relatives and is recognised by the shape of the labellum and its narrow petals. The flowers are spotted very closely with violet-red.

181. *D. violaceo-pictum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum 30–45 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, subflexuosis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, teretibus, 2.5–3 mm diametentibus; foliis erecto-patentibus, anguste lanceolato-ligulatis, subacutis, glabris, 6–9 cm longis, infra medium 1.1–1.4 cm latis; spathis parvulis, obtusis, compressis; racemis abbreviatis, subsessilibus, bifloris; floribus patentibus suboppositis, glabris; sepalis oblongo-ligulatis, obtusis, glabris, c. 2.2 cm longis, valde incurvatis, lateralibus valde falcatis, basi margine anteriore dilatata cum pede columnae mentum breve obtusum formantibus; petalis falcato-obliquis, ligulatis, obtusis, incurvatis, sepalis paulo brevioribus; labello e basi cuneata supra medium trilobato, c. 0.6 cm longo, supra medium 0.4 cm lato, dimidio inferiore carunculis transversis ornato, lobis lateralibus falcato-oblongis, obtusis, intermedio majore late rhomboideo, obtuso, basi verruculis minutis ornato, carina apicem versus sensim attenuata e basi labelli usque supra basin lobi intermedii decurrente; columna brevi, pede incurvulo, clinandrii lobis lateralibus rotundatis, dorsali dentiformi minuto; anthera rhomboideo-cucullata, glabra, antice excisa; ovario subsessili, cylindraceo, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1200 m—R. Schlechter no. 17079 (TYPE), flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 19157, flowering in Jan. 1909.

This interesting species is related to the preceding and following ones, but is recognised easily by its labellum. Moreover, it is separated by a certain difference in habit and in the colour of the flowers. Nonetheless, it is proof how strongly these characters have developed. The flowers are white, closely spotted and dotted violet-red, with a white column.

182. *D. stictanthum* Schltr., sp. nov.

Epiphyticum, patulum, gracile, 60–80 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus flexuosis, gracilibus, laxe foliatis, vaginis foliorum alte amplexantibus omnino obtectis; foliis patentibus vel erecto-patentibus, lanceolato-ligulatis, subacutis, glabris, 5.5–10 cm longis, infra medium 1–1.7 cm latis; vaginis lateralibus, abbreviatis, obtusis, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus erecto-patentibus, suboppositis; sepalis oblongo-ligulatis, obtusis, extus verruculosus, 1.8 cm longis, incurvis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique oblanceolato-spathulatis, obtusis, extus verruculosus, sepalis paulo brevioribus; labello circuitu oblongo, e medio trilobato, 7.5 mm longo, inter apices lorum lateralium 5 mm lato, superne transversim ruguloso; lobis lateralibus triangulis, obtusis, abbreviatis, intermedio late elliptico, apiculato, margine leviter undulato, basi verruculis sparsis ornato, carina lineari acuta e basi labelli usque supra basin lobi intermedii decurrente; columna brevi, crassiuscula, pede incurvulo apice excavatione trilobulata ornato, clinandrii lobis lateralibus rotundatis, dorsali dentiformi, parvulo; anthera rotundato-cucullata, glabra, antice truncata; ovario cylindraceo, subsessili, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20185, flowering in Sept. 1909.

Undoubtedly, the species most closely related to *D. violaceo-pictum* Schltr. In habit it is distinguished by its longer, much looser growth, the warts on the outside of the sepals, the lip and finally the column. The flowers are whitish, closely dotted with violet-red, with a white column, the foot of which is marked at the apex by a violet-red spot.

183. *D. heteroglossum* Schltr., sp. nov.

Epiphyticum, patulum, 50–60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, strictis vel substrictis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis erecto-patentibus, ellipticis, acuminatis, glabris, 10–13 cm longis, medio fere 2.9–3.5 cm latis; spathis abbreviatis, obtusissimis, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus erecto-patentibus, suboppositis, glabris; sepalis erectis, lanceolato-ligulatis subacutis, 2.5 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve formantibus; petalis erectis, oblique linearibus, acutis, glabris, sepalis fere aequilongis; labello circuitu elliptico, e medio fere trilobato, 0.9 cm longo, inter apices loborum lateralium 6.5 mm lato, dimidio inferiore venulis paulo incrassatis ornato, lobis lateralibus oblique oblongis, obtusis, intermedio bene majore, ovato, subacuto, margine irregulari, superne marginibus exceptis dense papillis subulatis retrorsis oblecto, carina verrucosa lineari e basi labelli usque in basin lobi intermedii decurrente; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus rotundatis, dorsali dentiformi obtuso; anthera rotundato-galeata, glabra, antice truncata; ovario cylindrico subsessili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19866, flowering in June 1909.

I regard this species as closely related to *D. multistriatum* J.J. Sm. from Dutch New Guinea and to *D. djamuense* Schltr. It is separated well from the first by the shape of the sepals and petals, as well as by the labellum and from the latter species by the tri-lobed lip. The strongly scented flowers are dark purple, the labellum pale yellow with dark purple markings on the lateral lobes; the column is pale yellow.

184. *D. djamuense* Schltr., sp. nov.

Epiphyticum, patulum, 40–60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, dense foliatis, vaginis foliorum arcte amplexantibus dense obtectis, teretibus, 0.3–0.4 cm diametentibus; foliis erecto-patentibus, ellipticis, subacutis, glabris, 9–11 cm longis, medio fere 2.3–3.5 cm latis; spathis lateralibus, abbreviatis, obtusis, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis, illis *D. heteroglossi* Schltr. similibus; sepalis lanceolato-ligulatis, obtusiusculis, glabris, c. 2.6 cm longis, erectis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusissimum formantibus; petalis oblique linearibus, subacutis, glabris, sepalis subaequimagnis; labello subpandurato-elliptico apiculato, integro, dimidio inferiore carunculis paucis transversis ornato, linea incrassata basi usque ad medium, dimidio superiore fascia papillarum subulatarum retrorsarum donato, c. 1.1 cm longo, medio c. 0.6 cm lato; columna brevi, glabra, pede incurvulo, apice papillis ornato, clinandrii lobis lateralibus rotundatis, dorsali vix majoribus; anthera galeato-cucullata, glabra, antice truncata; ovario subsessili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 350 m—R. Schlechter no. 16822, flowering in Nov. 1907.

As already stated above, this species is very similar to *D. heteroglossum* Schltr., but differs in its undivided lip. Moreover, the papillae of the column-foot are absent, a feature very characteristic in the previous plant. The flowers are red-brown, the labellum is white in the middle.

185. *D. alticola* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, c. 40–50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, rigidulis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis erecto-patentibus, ellipticis, obtusiuscule et inaequaliter bilobulatis, glabris, rigidulis, 3–5 cm longis, medio fere 1.3–2.3 cm latis; spathis lateralibus valde abbreviatis, obtusissimis, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongis, obtusis, apicem versus extus sparsim verruculosus, 2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique spathulato-ligulatis, obtusis, extus apicem versus paulo verruculosus, sepalis paulo brevioribus; labello oblongo-pandurato, infra medium sublobato-attenuato, carina satis alta e basi usque in medium, nervis divaricantibus incrassatis in dimidio inferiore, caeterum nudo, 0.9 cm longo, medio fere 4.5 mm lato; columna brevi, pede incurvulo infra apicem gibbo parvulo donato, clinandrii lobis lateralibus oblique rhombeis subdentatis, dorsali dentiformi; anthera quadrato-cucullata, glabra; ovario subsessili cylindraceo, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18732, flowering in Nov. 1908.

This species should be placed near *D. pictum* Schltr. from the Torricelli Range and, with the latter species, is related to *D. neuroglossum* Schltr. The flowers are yellowish, red-dotted, the column-foot with a red spot and callus.

186. *D. pictum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, 30–50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, rigidulis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, teretiusculis, c. 5 mm diametentibus; foliis patentibus vel erecto-patentibus, ellipticis, inaequaliter et obtusiuscule bilobulatis, glabris, 5–9 cm longis, medio fere 2–3.2 cm latis; spathis valde abbreviatis, obtusissimis, compressis; racemis valde abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongo-subspathulatis, concavulis, extus sparsim verruculosus, 2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique obovato-spathulatis, extus sparsim verruculosus, sepalis subaequilongis; labello oblongo-subpandurato, apiculato, supra medium paulo angustato, apicem versus marginibus leviter undulato, carina lineari e basi usque in medium, nervis divaricantibus paulo incrassatis ornato, dimidio superiore verrucis sparsis medianis donato, c. 0.8 cm longo, medio fere 0.5 cm lato; columna brevi, crassiuscula, pede apice incurvulo incrassatione ovata depressa ornato, clinandrii lobis lateralibus semirhombeis obtusis, dorsali triangulo minore; anthera rotundato-cucullata, utrinque leviter retusa; ovario subsessili, cylindrico, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–700 m—R. Schlechter no. 20030; no. 20118, flowering in Sept. 1909.

Amongst all the species known at present, this one, with its variegated flowers, stands nearest to *D. neuroglossum* Schltr., although undeniably it is a close relative of *D. alticola* Schltr. All these three species differ in the colour of the flowers and shape of the labellum. The flowers in this case are brownish yellow with a dark violet lip, the column white with a violet-margined callus.

187. *D. neuroglossum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 170.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17155, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 19162, flowering in Jan. 1909; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18986, flowering in Dec. 1908; on trees in clearings in the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 13981, flowering in Jan. 1902.

It was very delightful to be able to collect, on several occasions, better material of this species, since the Type, which I first brought with me, was not well preserved. The species is distinguished easily by its completely undivided labellum and more robust growth. The flowers are yellowish, closely brown-spotted inside with a muddy violet lip and violet spot at the base of the column-foot.

188. *D. densifolium* Schltr., sp. nov.

Epiphyticum, erectum, validum, 50–60 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus validis, simplicibus, strictis, perdense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, teretibus, c. 1 cm diametentibus; foliis erecto-patentibus, ovalibus, inaequaliter ac obtuse bilobulatis, glabris tectura rigidulis, 5–8 cm longis, infra medium 2.5–3.5 cm latis; spathis abbreviatis, obtusis, compressis, lateralibus; racemis patentibus, bifloris, pedunculo spatham plus duplo excedente, c. 1 cm longo; floribus patentibus, suboppositis; sepalis oblongo-ligulatis, subacutis, glabris, 2.2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis sepalis similibus, falcato-obliquis, sepalis paulo brevioribus; labello e basi cuneata trilobato, 0.8 cm longo, inter apices loborum lateralium 0.7 cm lato, superne dimidio inferiore dense ruguloso, carina acuta serie parallela verrucularum utrinque ornata e basi usque supra basin lobi intermedii decurrente, lobis lateralibus triangulis obtusis, margine interiore subdentatis, intermedio plus duplo majore, ovato, subacuto,

marginē dense undulato-crenulato, superne papillis dentiformibus subretorsis exasperato; columna brevi, pede subrecto, concavulo, clinandrii lobis lateralibus rotundato-truncatis, dorsali triangulo sublongiore; anthera subgaleato-cucullata, antice subretusa; ovario pedicellato, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the coastal forests at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19955, flowering in July 1909.

This plant reminds me vividly of fragments of a species which J.J. Smith considered to be a form of *D. pruinatum* Teijsm. et Binnend. from Ambon., but from which I would like to see this plant separated specifically. On closer comparison it seems probable that the illustration published ('Nova Guinea' VIII, t. XXVI) under the above name by J.J. Smith is identical with the plant described here. With this species begins a new form-group of the section in which the species are very close, being very much alike, especially in habit, but differing in the labellum. The flowers are white-yellow, with a sulphur-yellow labellum, which has a brown marking and orange-red crest; the whitish column with an orange-red spot on the apex of the column-foot.

189. *D. Rechingerorum* Schltr., in sched.

Solomon Islands: On trees in the coastal forest near the native village of Djup on Bougainville [I.]—L. et K. Rechinger no. 4990, flowering in Sept. 1905.

In habit this species is about midway between *D. densifolium* Schltr. and the species following. From the first it is distinguished by the long lateral lobes and broad keel of the labellum; also the sepals and petals are narrower and sharper. There is no note regarding the colour of the flowers.

190. *D. cyrtosepalum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 169.

Neu-Mecklenburg: On trees at the beach between Malelum and Loasere, alt. c. 20 m—R. Schlechter no. 14621, flowering in June 1902.

The species is related indisputably to both the previous ones, but is distinguished by its less robust growth, the longer antennated sepals and petals and the long, tapering middle lobe of the labellum. The flowers are white, the labellum yellow with orange-red crest.

191. *D. pulvinatum* Schltr., sp. nov.

Epiphyticum, erectum, c. 50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, bene foliatis, vaginis foliorum arcte amplectentibus omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis, inaequaliter et obtuse bilobulatis, glabris, textura coriaceis, 4–9 cm longis, infra medium 1.3–2.3 cm latis; spathis lateralibus, semiorbicularibus, brevibus, compressis; racemis brevibus, bifloris, pedunculo spatham duplo superante, c. 1 cm longo; floribus patentibus, suboppositis; sepalis ligulatis, obtusis, glabris, 2.5 cm longis, lateralibus falcatis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique falcato-ligulatis, obtusiusculis, glabris, sepalis paulo brevioribus; labello e basi cuneata medio trilobato, dimidio inferiore papillis exasperato, 0.8 cm longo, inter apices loborum lateralium 0.7 cm lato, lobis lateralibus oblique oblongis, obtusis, intermedio duplo longiore ovato, acuminato, papilloso-pulvinato, carina antice acuta e basi labelli usque in basin lobi intermedi decurrente; columna brevi, crassiuscula, pede concavulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo paulo minore; anthera rotundato-cucullata, apice subretusa; ovario pedicellato cylindrico, glabro, 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19168, flowering in Jan. 1909.

A near-relative of *D. cyrtosepalum* Schltr., but distinguished from it by the blunt sepals and labellum, the flower also differing in colour. The flowers are pale yellow; the labellum with small violet tubercles, orange-red crests and violet callus; the column-foot with an orange-red spot.

192. *D. microglossum* Schltr., sp. nov.

Epiphyticum, erectum, c. 50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis,

flexuosis, glabris; caulibus paulo compressis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, 4 mm diametentibus; foliis erecto-patentibus, ellipticis, obtusis, inaequaliter bilobulatis, 5–9 cm longis, medio fere 1.7–2.8 cm latis; spathis lateralibus, bene abbreviatis, obtusis; racemis brevibus, bifloris, pedunculo spatham vix excedente; floribus patentibus, suboppositis; sepalis ligulatis, apiculatis, glabris, 2.6 cm longis, lateralibus obliquis, basi margine anteriore paulo ampliata cum pede columnae mentum breve obtusum formantibus; petalis sepalis bene similibus, apiculatis, basin versus paulo angustatis, sepalis paulo brevioribus; labello e basi cuneata medio trilobato, 0.9 cm longo, inter apices loborum lateralium 0.8 cm lato, dimidio inferiore transversim ruguloso, carina subintegra e basi usque in basin lobi intermedii, lobis lateralibus oblique oblongo-lanceolatis, obtusis, margine interiore denticulatis, lobo intermedio semioblongo, laterales vix excedente, margine crenato-undulato, superne dense papillis subulatis oblecto; columna brevi, pede concavulo, clinandrii lobis lateralibus rotundatis, parvulis, dorsali dentiformi vix minore; anthera rotundato-cucullata, antice truncata, subdenticulata; ovario pedicellato glabro, 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, (Waria District), alt. c. 1000 m—R. Schlechter no. 19519, flowering in May 1909.

Another species of the form-group of *D. cyrtosepalum* Schltr. It is characterised by its labellum, the lateral lobes of which are much lacerated being covered entirely with papillae equalling the middle lobe in length. The flowers are cream-coloured, the labellum with an orange-yellow crest, the column-foot with an orange-yellow spot.

193. *D. acutilobum* Schltr., sp. nov.

Epiphyticum, erectum 50–60 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, bene foliatis, vaginis foliorum arcte amplexantibus fere omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis, obtuse et inaequaliter bilobulatis, glabris, 5–8 cm longis, medio fere 1.2–1.8 cm latis; spathis lateralibus, valde abbreviatis, obtusissimis; racemis abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongo-lanceolatis, acutis, extus carinatis, glabris, 1.6 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique elliptico-lanceolatis, acutis, sepalis paulo brevioribus; labello e basi cuneata supra medium trilobato, 0.8 cm longo, inter apices loborum lateralium 0.8 cm lato, superne transversim ruguloso, carina antice acuta usque infra medium, lobis lateralibus falcatis, ovato-lanceolatis, acuminatis, intermedio vix aequilongo, ovato-triungulo, acuto, parum undulato, papillis sparsis recurvulis in medio labelli and in lobo intermedio; columna brevi, pede concavulo, clinandrii lobis lateralibus rotundatis, dorsali dentiformi longiore; ovario pedicellato, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 300 m—R. Schlechter no. 16874, flowering in Nov. 1907.

The species is characterised by the shape and structure of the lip. It also has much shorter sepals, pointed, and keeled on the outside. The flowers are rose-red, with an orange-yellow keel on the lip.

194. *D. falcipetalum* Schltr., sp. nov.

Epiphyticum, erectum, c. 40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis flexuosis, glabris; caulibus simplicibus, bene foliatis, vaginis foliorum arcte amplexantibus fere omnino obtectis, paulo compressis, c. 0.3–0.4 cm diametro; foliis erecto-patentibus, oblongo-ligulatis, obtuse et inaequaliter bilobulatis, glabris, 6–11 cm longis, medio fere 1.4–2.3 cm latis; spathis lateralibus, semiorbicularibus, obtusis, compressis; racemis abbreviatis, patentibus, bifloris, pedunculo perbrevis; floribus patentibus, suboppositis; sepalis oblongo-ligulatis, obtusis, glabris, c. 1.7 cm longis, lateralibus valde falcatis, basi margine anteriore paulo ampliata cum pede columnae mentum obtusum breve formantibus; petalis falcatis, sepalis similibus sed paulo angustioribus et brevioribus; labello e basi cuneata supra medium trilobato, 0.8 cm longo, inter apices loborum lateralium 0.6 cm lato, superne parvis transversim-rugulosis, carina irregulari e basi usque in basin lobi intermedii decurrente, lobis lateralibus falcato-lanceolatis, obtusiusculis, margine interiore irregularibus, intermedio late ovato, obtusiusculo, paulo brevior, margine undulato-crenulato, superne medio papillis subulatis dense pulvinato; columna brevi, crassiuscula, pede concavulo, clinandrii lobis lateralibus rotundato-auriculiformibus, dorsali subulato paulo longiore; anthera quadrato-cucullata, glabra, antice truncata; ovario pedicellato, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18529, flowering in Oct. 1908.

Amongst the species described above, this one stands nearest to *D. microglossum* Schltr., but has much shorter flowers, with conspicuously falcate lateral sepals and petals. The labellum is also somewhat aberrant. The flowers are white with an orange-red keel on the lip and orange-red tip to the column-foot.

195. *D. potamophila* Schltr., sp. nov.

Epiphyticum, erectum, 20–25 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, bene foliatis, vaginis foliorum arcte amplectentibus omnino obtectis; foliis erecto-patentibus, oblongo-ligulatis, obtuse et inaequaliter bilobulatis, 4–7 cm longis, medio fere 1–1.8 cm latis; spathis lateralibus, brevibus, obtusis, compressis; racemis abbreviatis, bifloris, pedunculo perbrevis; floribus patentibus, suboppositis; sepalis oblongo-ligulatis, subacutis, glabris, c. 1.4 cm longis, lateralibus falcatis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis subfalcato-ligulatis, obtusiusculis, apicem versus paululo dilatatis, sepalis paulo brevioribus; labello circuitu suborbiculari, 0.7 cm longo, medio 0.6 cm lato, e medio trilobato, dimidio inferiore papillis sparsis verruculiformibus ornato, linea mediana papillarum e basi labelli apicem versus conspicue aucta usque infra apicem lobi intermedii decurrente, lobis lateralibus falcato-oblongis, obtusis, margine interiore denticulatis, lobo medio late ovali, apiculato, margine inciso-dentato, laterales vix superante; columna brevi, pede concavulo, clinandrii lobis rotundatis; anthera rotundato-cucullata, antice truncata; ovario pedicellato, glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees on the Minjem [River], close to Wobbe and Kelel, alt. c. 200–300 m—R. Schlechter no. 16482, flowering in Sept. 1907.

The smallest species in the group which surrounds *D. cyrtosepalum* Schltr. It is recognised by its compact habit, the short flowers and the structure of the labellum in which the central crest is furnished with papillae. The flowers are white, with yellow papillae on the lip.

196. *D. fissum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 60–70 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, vulgo plus minusve flexuosis, bene foliatis, vaginis foliorum arcte amplectentibus omnino obtectis, paululo compressis, 0.4–0.5 cm diametro; foliis erecto-patentibus, 3.5–9 cm longis, medio fere 0.8–2.3 cm latis; spathis abbreviatis, obtusis, compressis; racemis patentibus, bifloris, valde abbreviatis, pedunculo sunbnulla; floribus patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 0.9 cm longis, lateralibus falcatis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique oblongo-ligulatis, obtusis, glabris, basin versus paulo angustatis; labello circuitu perlate rhombeo, dimidio inferiore verrucis transversis rugoso, 5.5 mm longo, inter apices loborum lateralium 6.5 mm lato, linea densa papillarum e basi usque in basin lobi intermedii, lobis lateralibus falcatis, oblongo-ligulatis, obtusiusculis, margine interiore denticulatis, lobo intermedio late rhombeo, breviter acuminato, lateribus margine alte lacerato-fisso, superne dense papillis subulatis, reversis obsesso, lobos laterales paulo excedente; columna brevi, crassiuscula, glabra, pede concavulo, clinandrii lobis lateralibus rotundatis, intermedio dentiformi minore; anthera rotundato-cucullata, glabra; ovario pedicellato, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18493, flowering in Oct. 1908.

Among the species related to *D. cyrtosepalum* Schltr., this one is related most closely to *D. potamophila* Schltr., but differs in the shape and structure of the labellum and in its sturdier growth. With this species this narrower form-group ends, although the next three species still belong to the wider relationship, but are distinguished partly by the flowers which are thickly covered with papillae on the outside. The flowers are yellowish white, the labellum has a yellow central crest, violet transverse wrinkles and yellow papillae directed backwards; the column-foot with an orange-yellow spot at the apex.

197. *D. brunnescens* Schltr., sp. nov.

Epiphyticum, erectum, c. 35–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, subteretibus, dense foliatis, vaginis foliorum arcte amplectentibus omnino obtectis, c. 0.3 cm diametro; foliis erecto-patentibus vel patentibus, elliptico-

lanceolatis, subacutis, glabris, 3–4 cm longis, infra medium 1–1.3 cm latis; spathis lateralibus, oblongis, obtusis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongis, elongato-acuminatis, glabris, 1.3 cm longis, lateralibus falcatis, basi margine anteriore dilatata cum pede columnae mentum obtusum 3.5 mm longum formantibus; petalis oblique lanceolatis, longius acuminatis, glabris, sepalis paulo brevioribus; labello circuitu oblongo-lanceolato, longius acuminato, 1.2 cm longo, medio fere 0.4 cm lato, dimidio inferiore minute puberulo, basi carina usque infra medium decurrente ornato, supra medium trilobato, lobis lateralibus parvulis, rotundatis, intermedio ovato-lanceolato, longius acuminato, margine basi pectinato-lacerato, superne dense appendicibus subulatis recurvulis obsesso; columna brevi, glabra, pede oblongo obtuso apice bicalloso, clinandrii lobis lateralibus rotundatis, dorsali trilobulato vix longiore; anthera subreniformi-cucullata, apice minute papilloso subtruncata; ovario cum pedicello gracili, glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1100 m—R. Schlechter no. 19890, flowering in June 1909.

A characteristic, but somewhat aberrant species, which in habit reminds one of species related to *D. tridentiferum* Lindl., but in the structure of the flowers evidently belongs here. Further, the brownish coloured flowers, uncommon in the genus, which are shown also by *D. verruciflorum* Schltr. and *D. phaeanthum* Schltr., seem to point to this relationship.

Unfortunately, I have found only a single specimen of this evidently rare species.

Concerning the colour of the flowers I have noted: flowers brownish, labellum with red-brown lateral lobes; column white, its foot with an orange-yellow spot on the tip.

198. *D. verruciflorum* Schltr., sp. nov.

Epiphyticum, erectum, c. 40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, compressis, bene foliatis, vaginis dense verruculosus arcte amplexentibus omnino obtectis, 0.4–0.6 cm latis; foliis erecto-patentibus, oblongo-ligulatis, obtusis, 8–9 cm longis, medio fere 1.4–2.3 cm latis; spathis oblongis, obtusis, compressis, auriculo amplo vaginalium protectis; racemis valde abbreviatis, bifloris, subsessilibus; floribus erecto-patentibus, suboppositis; sepalis lanceolatis, obtusis, extus verruculoso-papillosis, 2.5 cm longis, lateralibus valde falcatis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve formantibus; petalis lineari-falcatis, obtusiusculis, sepalis paulo brevioribus; labello oblongo, apiculato, dimidio inferiore sparsim puberulo, carina lineari e basi usque in medium donato, dimidio superiore dense papillis clavatis flexuosis barbato, toto 1 cm longo, medio 6.5 mm lato; columna brevi crassiuscula, pede concavulo, apice excavatione ovali donato, clinandrii lobis lateralibus rotundatis, dorsali minuto denticiformi; anthera cucullata, glabra; ovario breviter pedicellato, verruculoso, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 16887, flowering in Nov. 1907.

A very peculiar species which seems to be very rare, since I have found it only once. It stands near *D. phaeanthum* Schltr., described below, but is recognised easily by the shape of the lip.

The flowers are brown outside, whitish inside.

199. *D. phaeanthum* Schltr., sp. nov.

Epiphyticum, erectum vel adscendens, usque ad 40 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus conspicue compressis, bene foliatis, vaginis foliorum dense verruculosus, arcte amplexentibus omnino obtectis, 0.6–0.7 cm latis; foliis erecto-patentibus, oblongis, obtusis, inaequaliter bilobulatis, glabris, 5–7 cm longis, medio fere 1.5–2.3 cm latis; spathis semiorbicularibus, obtusis, dense verruculosus, compressis; racemis bifloris, subsessilibus, patentibus; floribus patentibus, suboppositis; sepalis lanceolatis, subacutis, extus dense verruculoso-papillosis, 2.5 cm longis, lateralibus falcatis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve formantibus; petalis falcato-linearibus, subacutis, glabris, sepalis paulo brevioribus; labello obovato, quarta parte anteriore trilobato, superne minute puberulo, carina lineari hinc et inde dentata e basi usque in basin lobi intermedii donato, 1.3 cm longo, inter apices loborum lateralium 0.8 cm lato, lobis lateralibus brevibus rotundatis, intermedio semiorbiculari, margine pectinato-crenato, superne basi et medio papillis subulatis acutis recurvulis pulvinato-obtecto; columna brevi,

pede apice excavato, clinandrii auriculis rotundatis, dorsali dentiformi; anthera rotundato-cucullata, antice truncata et minute verruculosa; ovario breviter pedicellato, verruculoso, c. 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19883, flowering in June 1909.

Undoubtedly, a near-relative of *D. verruciflorum* Schltr., but nevertheless differing in many respects, especially in the shape of the labellum, so that it must be regarded as a good species. The flowers are brownish, the labellum whitish, the column-foot red-spotted with a pale brown spot in front.

200. *D. vandoides* Schltr., sp. nov.

Epiphyticum, erectum, validum, 60–70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus dense foliatis, compressis, vaginis foliorum arcte amplexantibus omnino obtectis, 1–1.3 cm latis; foliis arcuato-patentibus, ligulato-loratis, apice inaequaliter et obtuse bilobulatis, glabris, 20–25 cm longis, medio fere 3–3.5 cm latis; spathis semiobicularibus, obtusis, compressis; racemis bifloris, pedunculo 2 cm longo; floribus patentibus, suboppositis; sepalis elliptico-ligulatis, obtusiusculis, glabris, c. 2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique ellipticis, obtusiusculis, glabris, sepalis paulo brevioribus; labello circuitu oblongo, apiculato, e tertia parte basilari trilobo, 1.3 cm longo, inter apices loborum lateralium 0.5 cm lato, basi carinula brevi ornato, dimidio inferiore papilloso, dimidio superiore transversim rugoso, lobis lateralibus parvulis, subulatis, c. 0.3 cm longis, intermedio oblongo, margine regulariter pectinato-ciliato; columna brevi, crassiuscula, pede apice 3-foveolato, clinandrii lobis lateralibus abbreviatis, dorsali dentiformi, erecto; ovario cum pedicello glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 400 m—R. Schlechter no. 16694 (TYPE), flowering in Oct. 1907; on trees in the forests of the Gati Mountain (Minjem Valley), alt. c. 400 m—R. Schlechter no. 17185, flowering in Jan. 1908.

A stately species which from the foliage aspect at first I took to be a *Vanda*, rather than a *Dendrobium*. It stands isolated entirely in the section, but in habit seems to attach itself more to the forms which follow below than any other at all and therefore is placed here. The flowers are pale yellowish, reddish dotted, and spotted inside.

201. *D. ochranthum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 171.

Neu-Mecklenburg: On trees in the forests near Punam, alt. c. 600 m—R. Schlechter no. 14656, flowering in July 1902.

This species belongs to a sub-group of the section *Grastidium*, very rich in species and evidently restricted to Papuasia, which I must designate as *Tridentifera*, since it groups itself around *D. tridentiferum* Lindl. This sub-group is distinguished by the very densely arranged leaves, usually spreading horizontally almost in one plane, but which may be variable in size and shape. The flowers are always short, yellow or whitish in colour and are characterised by a conspicuous multiformity in the shape of the labellum which is, however, very constant for each species. The flowers of *D. ochranthum* Schltr. are pale yellow, the labellum red-margined with black-red lateral lobes.

202. *D. exaltatum* Schltr., sp. nov.

Epiphyticum, erectum, validum, 90–110 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis, paulo compressis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, 1–1.3 cm latis; foliis patentibus, ellipticis vel elliptico-ligulatis, obtuse et inaequaliter bilobulatis, glabris, 15–18 cm longis, medio fere 3–4.5 cm latis; spathis in axillis foliorum rotundatis, compressis; racemis bifloris, subsessilibus; floribus erecto-patentibus; sepalis oblongis, obtusis, apicem versus extus carinatis, 1.8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique elliptico-oblongis, obtusiusculis, glabris, sepalis paulo brevioribus; labello e basi cuneata infra medium trilobato, carina mediana e basi usque in medium lobi intermedii basi utrinque dente parvulo aucta ornato, dimidio inferiore sparsim transversim ruguloso, lobis lateralibus brevibus, semiquadratis,

obtusis, intermedio permagno e isthmo brevi suborbiculari, vix apiculato, labello toto 1 cm longo, interlobos laterales 0.7 cm lato, lobo intermedio 0.6 cm lato; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus truncatis denticulatis, dorsali dentiformi; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello glabro, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17260, flowering in Jan. 1908.

This species stands near *D. ochranthum* Schltr., but its vegetative parts are appreciably more robust and it is distinguished readily in the shape of its floral parts.

On inspection of my material of the *Tridentifera* group, I see that almost all species have the peculiar character of the pseudo-axillary flower sheaths; only one species, which I shall discuss below, is aberrant in this respect. Strictly speaking the flower-sheath is not really axillary, it emerges only at the beginning of the leaf-sheath from the joint above it. The flowers of this species are cream-coloured, the lateral lobes of the labellum dark violet, the column violet in front with a yellow spot at the base.

203. *D. axillare* Schltr., sp. nov.

Epiphyticum, erecto-patens, usque ad 80 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, strictis, dense foliatis, paululo compressis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis patentibus, oblongo-ligulatis, antice paulo angustatis, inaequaliter et obtuse bilobulatis, glabris, 12–15 cm longis, medio fere 2.8–3.3 cm latis; spathis axillaribus, oblongis, obtusis, compressis; racemis brevibus, pedunculo brevi, bifloro; floribus erecto-patentibus, suboppositis, glabris; sepalis oblongis, obtusiusculis, 2.8 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique ellipticis, obtusiusculis, sepalis paulo brevioribus sed latioribus; labello e basi semioblonga medio trilobato, 1.3 cm longo, inter apices loborum lateralium et in medio lobi intermedii 0.7 cm lato, carina tenui e basi usque supra medium labelli, lobis lateralibus parvulis falcato-oblongis, obtusis, intermedio multo majore, ovali, obtuso; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus semirhombeis subacutis, dorsali parvulo dentiformi; ovario cum pedicello glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17052, flowering in Dec. 1907.

This beautiful species from the Kani Range is by no means rare and is found often in the rainy season (in the European winter months). It is distinguished from related species by the relatively simple structure of the lip. Among the related species, which I brought back with me, this one stands nearest to *D. tridentiferum* Lindl. The flowers are orange-yellow.

204. *D. extraaxillare* Schltr., sp. nov.

Epiphyticum, erecto-patens, 80–90 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretiusculis, dense foliatis, vaginis arcte amplexantibus nigro-punctatis omnino obtectis, 0.6–0.7 cm diametro; foliis patentibus, ellipticis, apice oblique bilobulatis, 10–13 cm longis, medio fere 3.5–4 cm latis; spathis supraaxillaribus, oblongis, obtusis, compressis; racemis abbreviatis, bifloris, pedunculo brevi; floribus patentibus, suboppositis; sepalis elliptico-ligulatis subacutis, glabris, 1.8 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique ellipticis, subacutis, glabris, sepalis paulo brevioribus et latioribus; labello e basi semioblonga infra medium trilobato, carina irregulariter utrinque erosula e basi usque supra medium decurrente, lobis lateralibus antice truncatis, margine subirregularibus, intermedio suborbiculari-elliptico, subacuto, supra basin utrinque dente brevi ornato, labello toto 1.5 cm longo, inter apices loborum lateralium 5.5 mm lato, in medio lobi intermedii 6.5 mm lato; columna brevi, pede incurvulo, clinandrii lobis lateralibus paucidentatis, dorsali triangulo incurvulo; anthera rotundato-galeata, glabra, antice subretusa; ovario cum pedicello glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the mountain forests near Kelel, alt. c. 300 m—R. Schlechter no. 16491, flowering in Sept. 1907.

I have chosen the specific name 'extraaxillare' in order to indicate that in the sub-group *Tridentiferae* this species is distinguished by the flower-sheaths emerging above

the joint of the leaf-sheaths. It would perhaps not be entirely out of place to remove the species on account of this character and separate the *Tridentiferae* from the bulky *Grastidium* section. However, before such a step is taken, it would be necessary to survey the entire section critically. The flowers are whitish on the outside, densely red-brown-marbled on the inside, the labellum with a white middle-lobe, the column white.

205. *D. obliquum* Schltr., sp. nov.

Epiphyticum, erecto-patens, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, dense foliatis, paulo compressis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis patentibus, ellipticis, apice obliquis, inaequaliter et obtusiuscule bilobulatis, 5–8 cm longis, medio fere 1.5–3 cm latis; spathis axillaribus, semioblongis, obtusis, brevibus; racemis bifloris, brevissime pedunculatis; floribus erecto-patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 1.7 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique elliptico-subspathulatis, apiculatis, glabris, sepalis paulo brevioribus et latoribus; labello e basi cuneata infra medium trilobato, 1 cm longo, inter apices loborum lateralium 0.6 cm lato, carina tenui subdentata e basi labelli usque supra medium ornato, lobis lateralibus parvulis, oblique quadratis, margine anteriore paucidentatis, intermedio amplo, late ovali, apiculato, 0.5 cm lato, medio verruculis paucis aggregatis ornato; columna brevi crassiuscula, glabra, pede incurvulo, clinandrii lobis lateralibus abbreviatis rotundatis, dorsali dentiformi parvulo; ovario cum pedicello gracili, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests above the Saugueti Base at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18882, flowering in Nov. 1908.

This species stands near *D. axillare* Schltr. described above, but is smaller in all its parts, has a different labellum and is fundamentally different in the colour of its flowers. Its habit somewhat resembles that of the following species. The flowers are yellowish white with an orange-red spot on the apex of the [column-] foot.

206. *D. clausum* Schltr., sp. nov.

Epiphyticum, erecto-patens, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus dense foliatis, simplicibus, paulo compressis, 0.4–0.5 cm latis; foliis patentibus, elliptico-ligulatis, apice obliquis, inaequaliter et subacute bilobulatis, glabris, 4.5–7 cm longis, medio fere 1.2–2.1 cm latis; spathis axillaribus, semioblongis, obtusis, compressis; racemis abbreviatis, bifloris, pedunculo perbrevis; floribus erecto-patentibus, vulgo clausis, cleistogamis; sepalis oblongis, obtusis, glabris, 0.9 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique oblongis, obtusis, glabris, sepalis paulo brevioribus; labello e basi oblongo-cuneata medio fere trilobato, carina angusta e basi usque infra apicem ornato, superne praesertim dimidio anteriore sparsim transversis-ruguloso, 6.5 mm longo, inter apices loborum lateralium 0.4 cm lato, lobis lateralibus oblique quadratis, antice subtruncatis, paucidentatis, parvulis, intermedio amplo, orbiculari, obtusissimo, infra apicem superne incrassatione triangula praedito, 4.25 mm lato; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus triangulis acutis, intermedio dentiformi fere aequilongo; anthera quadrato-cucullata, glabra, antice truncata; ovario cum pedicello gracili, glabro, c. 1.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18168, flowering in Sept. 1908.

I have copious material of this species at my disposal, but find the flowers nearly always cleistogamous and in those cases the flowers showed absolutely no deviation from the normal. The species is related closely to *D. obliquum* Schltr., but the flowers are appreciably smaller with aberrant shapes in the separate parts. The flowers are pale yellow, the labellum white towards the front, the column-foot with an orange-yellow spot.

207. *D. cyclolobum* Schltr., sp. nov.

Epiphyticum, erecto-patens, c. 50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, dense foliatis, paulo compressis, vaginis foliorum arcte amplexantibus omnino obtectis, c. 0.5 cm latis; foliis patentibus, oblongo-ligulatis, apicem

versus oblique acutatis, inaequaliter et subacute bilobulatis, 6–8 cm longis, medio fere 1.5–2.5 cm latis; spathis axillaribus, semioblongis, obtusis, compressis; racemis abbreviatis, bifloris, pedunculo perbrevis; floribus erecto-patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 1.4 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique oblong-ellipticis, obtusis, glabris, sepalis subaequilongis; labello e basi semioblonga medio fere trilobato, dimidio inferiore marginibus minute serrulato, carina e basi usque infra apicem ornato, dimidio inferiore sparsim transversim-ruguloso, 1.1 cm longo, inter apices loborum lateralium 6.5 mm lato, lobis lateralibus parvulis, falcato-oblongis, obtusis, intermedio e isthmo brevi suborbiculari, obtusissimo, 6.5 mm lato; columna brevi crassiuscula, pede incurvulo, clinandrii lobis lateralibus truncatulis minute serrulatis, dorsali dentiformi parvulo; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello gracili, glabro, 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the upper Djamu [River], alt. c. 500 m—R. Schlechter no. 17551, flowering in Apr. 1908.

Whereas in the last of the above-described species the size of the flowers gradually diminished, we now again observe a marked increase. In the shape of the labellum, this species resembles *D. clausum* Schltr., but it has more falcate, blunt, elongated lateral lobes and the margin in the lower half of the labellum are distinctly serrate. The flowers are a creamy yellow, the column-foot violet with an orange-red spot.

208. *D. nephrolepidis* Schltr., sp. nov.

Epiphyticum, subpatulum, usque ad 100 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracillimis, simplicibus, teretiusculis, perdense foliatis, vaginis foliorum omnino obtectis, 2.5–3 mm diametentibus; foliis patentibus, elliptico-ligulatis, apice angustioribus, obtusiusculis, 2.5–3.5 cm longis, medio fere 0.8–1.2 cm latis; spathis axillaribus, semiobicularibus, obtusis, compressis; floribus erecto-patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 1.1 cm longis, lateralibus obliquis, basi margine anteriore bene dilatata cum pede columnae mentum obtusum 0.5 cm longum formantibus; petalis oblique ellipticis, obtusiusculis, glabris, sepalis paulo brevioribus; labello circuitu obovato, supra medium trilobato, 0.8 cm longo, inter margines loborum lateralium 4.5 mm lato, carina e basi labelli usque in basin lobi intermedii ornato, lobis lateralibus oblique oblongis, obtusis, margine subirregularibus, intermedio fere duplo majore, orbiculari cum apiculo lato obtuso, margine subirregulari, superne minute papilloso, c. 3.5 mm lato; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus rotundatis, dorsali dentiformi parvulo; anthera quadrato-cucullata, glabra, antice subretusa; ovario cum pedicello gracili glabro, c. 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Peso (Eitape District), alt. c. 15 m—R. Schlechter no. 19987, flowering in Aug. 1909.

This is a solitary species in the group, which I found in a true lowland forest only a few kilometres from the coast. All species have, at the foot of the stem, a leafless part covered with sheaths, which I will not describe in detail here, except that it is alike in all and more terete and wire-like than the remaining portion. However, the foot-piece is especially noteworthy in this species, since it often reaches a length of 30–40 cm.

In this and in the immediately following species, the formation of the mentum is more marked than in those already described in this sub-group. In habit the plant reminds one of the fern genus *Nephrolepis* [sic]. The flowers are greenish white, the labellum greenish, the column-foot violet-marked and orange-yellow at the apex.

209. *D. parvilobum* Schltr., sp. nov.

Epiphyticum, patulum, 25–30 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, paulo compressis, perdense foliatis, vaginis foliorum arcte appressis omnino obtectis, c. 2.5 mm latis; foliis patentibus, oblongis vel oblongo-ligulatis, apice obliquis, inaequaliter et obtuse bilobulatis, glabris, 2.5–3.5 cm longis, medio fere 0.7–1.2 cm latis; spathis axillaribus, oblique oblongis, obtusis; racemis abbreviatis, bifloris, subsessilibus; floribus erecto-patentibus, suboppositis, glabris; sepalis oblongis, obtusis, 1.8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum c. 5 mm longum formantibus; petalis oblique oblongo-subspathulatis, obtusiusculis, sepalis paulo brevioribus; labello e basi cuneata tertia parte basali trilobato, 1.2 cm longo, inter apices loborum lateralium 0.4 cm lato, carina e basi usque infra medium ornato, lobis lateralibus lanceolato-falcatis, acutis, margine interiore dentatis, superne

sparsim papilloso-muriculatis, parvulis, intermedio fere 3–4-plo longiore, obovato-subspathulato, antice obtusissimo, subretuso cum apiculo obscuro; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus apice truncatis serrulatis, dorsali dentiformi parvulo; columna rotundato-cucullata, glabra, antice retusa; ovario cum pedicello glabro gracili, 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji, alt. c. 450 m—R. Schlechter no. 19359, flowering in May 1909.

This plant resembles in habit many of the above-described species, but stands isolated entirely in the structure of the labellum. The flowers are salmon-yellow.

210. *D. patulum* Schltr., sp. nov.

Epiphyticum, patulum, 40–60 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, dense foliatis, paulo compressis, vaginis foliorum arcte amplexantibus omnino obiectis, 2.5–3 mm latis; foliis subpatentibus, lanceolatis, apice obliquis, inaequaliter et subacutis bilobulatis, glabris, 3–4 cm longis, infra medium 0.6–1 cm latis; spathis axillaribus, abbreviatis, obtusis, compressis; racemis valde abbreviatis, bifloris, subsessilibus; floribus erectis, suboppositis; sepalis ovatis, obtusis, glabris, 1 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis oblique oblongo-ellipticis, obtusis, glabris, sepalis paulo brevioribus; labello e basi late cuneata in tertia parte basilari trilobato, 0.8 cm longo, inter apices loborum lateralium 0.5 cm lato, basi callo lineari carnosio usque in medium lobi intermedii decurrente ornato, lobis lateralibus falcato-oblongis, antice truncatis, subcrenatis, intermedio oblongo, antice obtusissimo cum apiculo lato, laterales plus duplo superante; columna brevi, pede incurvulo, clinandrio pluridentato; anthera quadrato-cucullata, antice truncata, glabra; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 17987, flowering in July 1908.

This species is very well characterised by its flowers. To a certain extent, in habit, it forms a transition between the species described above and those which immediately follow. The flowers are snow-white, the lip brownish violet in its lower half, and the column-foot marked with violet.

211. *D. njongense* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 65 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, dense foliatis, vaginis foliorum arcte amplexantibus omnino obiectis, paulo compressis, c. 2.5 mm latis; foliis erecto-patentibus, lanceolatis, acutis, 4–6 cm longis, infra medium 6.5–10 mm latis; spathis axillaribus, oblongis, obtusis, compressis; racemis bifloris, subsessilibus; floribus erecto-patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 1.2 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum 0.4 cm longum formantibus; labello e basi oblonga infra medium trilobato, 1 cm longo, inter apices loborum lateralium 0.4 cm lato, carina e basi usque supra medium ornato, lobis lateralibus minutis, dentiformibus, triangulis, acutis, intermedio subreniformi-orbiculari, 0.7 cm lato; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus triangulis, dorsali dentiformi parvulo; ovario cum pedicello glabro, c. 1.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Njonge [Creek] near Ambo (Finisterre Range), alt. c. 600 m—R. Schlechter no. 18127 (TYPE), flowering in Aug. 1908; on trees in the forests near Toliba, alt. c. 500 m—R. Schlechter no. 18965, flowering in Dec. 1908.

The multiformity that the shape of the labellum assumes in this group is peculiar. Whereas, the first species strongly resemble each other the last show all the more variation from one another, especially in the shape of the lateral lobes of the labellum which in *D. njongense* Schltr. are reduced to two diminutive teeth. The flowers are snow-white, the labellum with pale yellow lateral lobes, the column-foot with red markings and an orange-yellow spot.

212. *D. podochiloides* Schltr., sp. nov.

Epiphyticum, patulum, 40–50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, dense foliatis, vaginis foliorum omnino obiectis, subteretibus, c. 2 mm diametentibus; foliis erecto-patentibus, lanceolatis, oblique acutatis, glabris,

3.5–5 cm longis, infra medium 6.5–8 mm latis; spathis extraaxillaribus, semiorbicularibus, obtusis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis, glabris; sepalis ovatis, obtusis, 0.9 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum c. 3 mm longum formantibus; petalis elliptico-spathulatis, obtusis, subfalcatis, sepalis subaequilongis; labello e basi cuneata supra medium pandurato-trilobato, margine dimidio inferiore minutissime serrulato, carina e basi usque in medium lobi intermedii, lobis lateralibus abbreviato-obtusatis, rotundatis, intermedio obreniformi cum apiculo lato, labello toto 0.7 cm longo, inter apices loborum lateralium et in lobo medio 4.5 mm lato, nervis incrassatis divaricantibus verruculosus pluribus e basi usque in basin lobi intermedii picto; columna brevi, crassiuscula, pede incurvulo, clinandrii lobis lateralibus truncatis denticulatis, dorsali dentiformi parvulo; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello 1.2 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17738, flowering in May 1908.

With this species begins a further sub-group of the section *Grastidium*, which in the large flowers bear a strong resemblance to species of *Tridentiferae* but which differ in the flower-sheaths being always non-axillary, in the predominantly linear leaves and in the more complicated shape of the labellum. Through *D. podochiloides* Schltr., and the following species, a transition is established to the *Tridentiferae*, the habit of which they still show. The flowers of *D. podochiloides* Schltr. are white, flushed outside with red, the labellum with a yellow crest and dense violet-red tuberculations.

213. *D. odontopus* Schltr., sp. nov.

Epiphyticum patulum, usque ad 60 cm longum; rhizomate valde abbreviato; radicibus filiformibus elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, dense foliatis, vaginis arcte amplexentibus omnino obtectis, teretiusculis, c. 3 mm latis; foliis erecto-patentibus, lineari-lanceolatis, acutis, glabris, 6–9 cm longis, infra medium 0.6–1 cm latis; spathis extraaxillaribus, semioiblongis, obtusis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis, glabris; sepalis oblongis, obtusis, glabris, c. 1 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis oblique spathulato-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi cuneata medio trilobato, 0.9 cm longo, inter apices loborum lateralium 0.5 cm lato, carina tenui e basi usque supra medium ornato, lineis 3 rugulosis obliquis ad basin loborum lateralium utrinque additis, lobis lateralibus parvulis, anguste oblongis, subtruncatis, intermedio amplo suborbiculari, obtusissimo, subinconspicue apiculato, 0.4 cm lato; columna brevi, crassiuscula, pede ligulato medio dente brevi acuto ornato, clinandrii lobis lateralibus triangularibus apiculatis, dorsali dentiformi parvulo; anthera rotundato-galeata, dense verruculoso-papillosa, antice trilobulata; ovario cum pedicello glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17248, flowering in Jan. 1908.

Among all the members of this sub-group, in the formation of the labellum, this species most closely resembles the *Tridentiferae*, having the short, very small lateral lobes of the latter. The flowers are yellowish white.

214. *D. rubropictum* Schltr., sp. nov.

Epiphyticum, erectum, 40–65 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, paulo compressis, bene foliatis, vaginis foliorum arcte amplexentibus, minutissime rugulosis omnino obtectis; foliis erecto-patentibus vel subpatentibus, acutis, inaequaliter et acute bilobulatis, glabris, 10–14 cm longis, medio fere 0.9–1.3 cm latis; spathis semioiblongis, obtusis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 1.3 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 0.4 cm longum formantibus; petalis oblique elliptico-spathulatis, subacutis, glabris, sepalis subaequilongis; labello e basi cuneata medio trilobato, 0.8 cm longo, inter apices loborum lateralium 0.6 cm lato, superne transversim verruculoso-ruguloso, carina basi paucidentata e basi labelli usque in medium lobi intermedii ornato, lobis lateralibus oblique oblongis, obtusis, margine exteriori subcrenulatis, intermedio duplo longiore, late cuneato, antice truncato-obtusissimo cum apiculo minuto, basi pulvino oblongo verruculoso ornato, apice c. 5.5 mm lato; columna brevi, glabra, pede incurvulo, clinandrii lobis lateralibus rotundatis minutissime serrulatis, dorsali dentiformi; anthera rotundato-cucullata, antice retusa, glabra; ovario cum pedicello glabro, c. 1.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Peso, in the Eitape District, alt. c. 15 m—R. Schlechter no. 19981; no. 20002, flowering in Aug. 1908.

From all the other related species described up to the present, this one is distinguished by the long, narrow leaves which it has in common with those enumerated below. In the structure of the lip it stands nearest to *D. podochiloides* Schltr. The flowers are white, with red markings on the lateral lobes of the lip and a golden yellow crest; the column-foot has a golden yellow spot on the apex.

215. *D. gatiense* Schltr., sp. nov.

Epiphyticum, erectum, 40–60 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, simplicibus, bene foliatis, paulo compressis, vaginis foliorum arcte amplexantibus, minutissime rugulosis omnino obtectis, c. 3.5 mm latis; foliis erecto-patentibus vel subpatentibus, lanceolato-linearibus, acutis, glabris, 8–12 cm longis, medio fere 0.8–1.2 cm latis; spathis semioblongis, obtusis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis, glabris; sepalis ellipticis, obtusiusculis, 1.2 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis oblique ellipticis, subacutis, sepalis paulo brevioribus; labello e basi cuneata supra medium trilobato, 0.8 cm longo, inter apices loborum 0.5 cm lato, superne lobo intermedio dense verruculis transversis ornato, carina apicem versus attenuata e basi usque in medium lobi intermedii decurrente; lobis lateralibus oblique quadratis, marginibus minute et irregulariter subdentatis, intermedio e ungue brevi circuitu subreniformi, apiculato, marginibus lateralibus irregulariter dentato, 0.5 cm lato; columna brevi, pede concavulo apice callo humili trilobulato donato, clinandrii lobis lateralibus triangulis obtusis, dorsali simili; anthera rhomboideo-cucullata, glabra, antice retusa; ovario cum pedicello glabro, c. 1.4 cm longo.

Kaiser-Wilhelms-Land: On trees on the ridges of the Gati Mountain in the Minjem Valley, alt. c. 800 m—R. Schlechter no. 16991, flowering in Dec. 1907.

Undoubtedly, this species is related closely to *D. rubropictum* Schltr., although it is entirely different in the lip and column. In habit both species agree remarkably well. The flowers are white, the labellum with rose-red transverse warts and a yellow central keel; the column red at the base with a yellow callus.

216. *D. kietaense* Schltr., in sched.

Solomon Islands: On trees at the beach at Kieta Bay on Bougainville [I.]—L. et K. Rechinger no. 4824, flowering in Sept. 1905.

In habit this species closely resembles the two previous ones, but shows an entirely different lip formation, so that I am still in doubt whether it really belongs to this relationship or next to *D. angraecifolium* Schltr. According to the collectors, the flowers are yellow. This species will be described shortly in another publication together with two other new *Dendrobium* species from Rechinger's collection.

217. *D. stenophyllum* Schltr., sp. nov.

Epiphyticum, erectum, gracile, 60–70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracillimis, simplicibus, bene foliatis, vaginis foliorum arcte amplexantibus, striatis omnino obtectis, c. 2.5 mm diametro; foliis erecto-patentibus vel patentibus, anguste linearibus, acutis, glabris, 12–14 cm longis, medio fere 3.5–4.5 mm latis; spathis semioblongis, obtusis, compressis; racemis abbreviatis, subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongis, obtusiusculis, glabris, extus carinatis, 1 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 3.5 mm longum formantibus; petalis oblique spathulato-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi semioblonga infra medium trilobato, 0.8 cm longo, infra medium 0.5 cm lato, carina e basi usque infra medium lobi intermedii, lobis lateralibus falcato-lanceolatis, obtusiusculis, margine subundulatis, parvulis, intermedio multo majore, obovato-cuneato, antice truncato-obtusissimo cum apiculo lato, margine anteriore leviter undulato, superne sparsim verruculoso-papilloso, serie papillarum carinae intermediae anteposita; columna semitereti, pede incurvulo infra apicem gibbo humili donato, clinandrii lobis lateralibus denticulatis, dorsali dentiformi paulo longiore; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello gracili, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19888, flowering in June 1909.

This species concludes the sub-group. The species which follow immediately are placed as isolated forms, which are not related closely to any of those described above. *D. stenophyllum* Schltr. is distinguished easily from its relations by its very narrow leaves. The flowers are yellowish white, the labellum marked with violet; the column-foot with a red spot and an orange-yellow callus.

218. *D. incumbens* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 40–50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, compressis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis erecto-patentibus, linearibus, inaequaliter et obtuse bilobulatis, glabris, 4–8 cm longis, medio fere 0.3–0.5 cm latis; spathis semiorbicularibus, obtusis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis, glabris; sepalis ovatis, apiculatis, 0.6 cm longis, lateralibus valde obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum conicum obtusum 0.6 cm longum formantibus; petalis oblique subspathulato-ligulatis, obtusis, sepalis paulo brevioribus; labello, circuito late ligulato, apicem versus paulo dilatato, 0.9 cm longo, infra apicem 2.5 mm lato, in tertia parte apicali trilobato, lobis lateralibus horizontaliter porrectis, lobo intermedio incumbentibus, oblique oblongis, obtusis, lobo intermedio amplo, suborbiculari, antice emarginato cum apiculo lato, carina mediana e basi usque in apiculum apicalem sensim evanida; columna brevi, pede ligulato, clinandrii lobis lateralibus truncatulis apice paucidentatis, dorsali triangulo parvulo; anthera rotundato-cucullata, glabra, antice truncata; ovario cum pedicello glabro, 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests not far from Alexishafen, alt. c. 40 m—R. Schlechter no. 19200 (TYPE), flowering in Mar. 1909; on trees in the mountain forests at Jaduna on the Waria [River], alt. c. 150 m—R. Schlechter no. 19287, flowering in Apr. 1909.

As far as I can ascertain at present, this is a somewhat isolated species, which appears to suggest a certain relationship with *D. salaccense* Bl., but differs greatly in the structure of the lip.

The flowers are pale yellow.

219. *D. juniperinum* Schltr., sp. nov.

Epiphyticum, erectum, ramosissimum, 40–50 cm altum; rhizomate elongato, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus rigidis, erectis, apicem versus ramosissimis, ramis ramulisque dense foliatis, vaginis foliorum striato-verrucosis arcte amplexantibus omnino obtectis; foliis erecto-patentibus vel patentibus, linearibus, acutis, rigidulis, 2–2.5 cm longis, medio fere 2–2.5 mm latis; spathis semiorbicularibus, compressis; racemis subsessilibus, bifloris; floribus erecto-patentibus, suboppositis; sepalis oblongis, obtusis, 1 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis anguste spathulato-oblongis, obtusiusculis, glabris, sepalis paulo brevioribus, obliquis; labello e basi late cuneata supra medium trilobato, 1 cm longo, inter apices loborum lateralium 0.7 cm lato, carina e basi labelli usque in basin lobi intermedii ornato, lobis lateralibus triangulis subacutis, margine interiore serrulatis, erectis, intermedio duplo longiore, late ovato, breviter acuminato, margine crenulato, superne medio dense pilis flexuosis pulvinato-barbato; columna brevi, pede concavo, clinandrii lobis lateralibus truncatis lacerato-denticulatis, dorsali dentiformi; anthera late rhomboideo-cucullata, glabra, antice praemorsa; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1250 m—R. Schlechter no. 19075, flowering in Jan. 1909.

Even in habit this species conveys a very different impression from the remaining members of the section. They look somewhat like a small-branched Juniper shrub. In its floral structure it approaches *D. sarcophyllum* Schltr., described below, but in habit it is not very much like the latter. The flowers are pale pink, the labellum yellow-white.

220. *D. sarcophyllum* Schltr., sp. nov.

Epiphyticum, erectum, 30–45 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis vel substrictis, rigidis, simplicibus, plus minus laxe foliatis, vaginis

foliorum minute rugulosis arcte amplexantibus omnino obtectis; foliis erecto-patentibus, subulatis, apiculatis vel obtusis, 1.3–1.8 cm longis, c. 0.2 cm diametentibus; spathis semiorbicularibus, obtusissimis, parvulis, compressis; racemis subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis anguste oblongis, subacutis, glabris, 1.1 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 0.3 cm longum formantibus; petalis oblique oblongis, subacutis, glabris, sepalis aequilongis; labello e basi late cuneata medio trilobato, 0.8 cm longo, inter apices loborum lateralium 0.6 cm lato, superne sparsim papillis subulatis obsesso, carina apicem versus paulo ampliata e basi usque in medium ornato, lobis lateralibus ovato-triangularibus, obliquis, acutis, intermedio plus duplo longiore, late ovali, breviter acuminato, marginibus lateralibus irregulariter fimbriato-ciliato; columna brevi, crassiuscula, lobis lateralibus truncatis, dorsali dentiformi, parvulo; anthera rotundato-cucullata, glabra, antice truncata; ovario cum pedicello glabro 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 18013, flowering in July 1908.

From all other species in the Territory this one is recognised by its thick, fleshy, terete leaves. In the flower it shows an approach to *D. juniperinum* Schltr., but entirely differs from it in habit. The flowers are pale yellow, the labellum with an orange-red centre.

221. *D. erubescens* Schltr., sp. nov.

Epiphyticum, erectum, strictum, c. 40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus strictis, paulo compressis, dense foliatis, vaginis foliorum arcte amplexantibus, rugulosis, apice in lobum productis obtectis, 0.4 cm diametentibus; foliis erectis, lineari-ligulatis, apice inaequaliter et obtuse bilobulatis, glabris, 4.5–6 cm longis, medio fere 0.8–1 cm latis, coriaceis; spathis lobo vaginae obtectis, semiorbicularibus, obtusissimis; racemis subsessilibus, bifloris; floribus erecto-patentibus, suboppositis; sepalis oblongis, obtusis, glabris, 0.9 cm longis, lateralibus obliquis, basi margine anteriore sensim ampliata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis oblique oblongo-subspathulatis, obtusis, glabris, sepalis subaequilongis; labello circuitu late cuneato, 0.7 cm longo, inter apices loborum lateralium 8.5 mm lato, lobis lateralibus triangularibus acutis, intermedio brevissimo, bilobulata cum apiculo minuto interjecto, lobis lateralibus duplo fere brevioribus, fasci humili antice apiculato e basi usque infra basin lobi intermedii decurrente apice lateribus evanescente; columna brevi, pede concavulo, clinandrii lobis lateralibus dorsali brevioribus subdentatis; anthera subgaleato-cucullata, glabra; ovario subsessili, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18733, flowering in Nov. 1908.

This species, and the two which follow, belong to a separate sub-group distinguished by the peculiar shape of the labellum and, also in habit providing some excellent characteristics such as the leathery, erect leaves, which are narrow and blunt. The flowers are reddish.

222. *D. kenejianum* Schltr., sp. nov.

Epiphyticum, erectum, usque ad 1 m longum; rhizomate scandente, elongato, radicante; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, simplicibus, usque ad 40 cm altis, bene foliatis, vaginis arcte amplexantibus omnino obtectis; foliis erectis, linearibus, inaequaliter et obtuse bilobulatis, glabris, coriaceis, 3.5–5 cm longis, medio fere 0.6–0.9 cm latis; spathis brevissimis, subinconspicuis, obtusissimis; racemis subsessilibus, bifloris; floribus patentibus suboppositis; sepalis ovalibus, apiculatis, 0.7 cm longis, lateralibus valde obliquis, basi margine anteriore sensim dilatata cum pede columnae mentum obtusum 0.5 cm longum formantibus; petalis oblique subfalcato-ligulatis, subacutis, glabris, sepalis subaequilongis; labello circuitu late cuneato, 0.5 cm longo, inter apices loborum lateralium 0.7 cm lato, lobis lateralibus oblique ovato-triangularibus, subapiculatis, intermedio brevissimo, plus duplo brevioribus, obtuse bilobulato cum apiculo minuto interjecto, fasci lanceolato acuto e basi usque in apicem, nervis lateralibus divergentibus leviter incrassatis, verruculis pluribus minutis in disco sparsis versus apicem labelli; columna brevi, pede incurvulo, clinandrii lobis lateralibus paucidentatis, dorsali dentiformi; anthera rhomboideo-cucullata, glabra; ovario subsessili c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests in the vicinity of the Keneja [River], alt. c. 150 m—R. Schlechter no. 18467, flowering in Oct. 1908.

An extremely interesting species, which, like *D. pandaneti* Ridl., gradually climbs into the trees by means of its elongated rhizomes. It has all the peculiarities of the sub-group, but like the other two species, it also resembles a species of the section *Monanthos* rather than one of *Grastidium*. It is distinguished readily from both the others in its flowers and above all is recognised easily by its smooth, pale leaf-sheaths which, in *D. erubescens* Schltr., are wrinkled and brown and in *D. setosum* Schltr. are densely warty and hairy. The flowers are golden yellow, the broad central band of the lip yellow-brown.

223. *D. setosum* Schltr., sp. nov.

Epiphyticum, ramosum, decumbens vel scandens, usque ad 50 cm longum; rhizomate elongato, cauliformi, radicante; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus paulo compressis, simplicibus vel parum ramosis, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, c. 0.5 cm latis; foliis erectis vel erecto-patentibus lineari-ligulatis, apice inaequaliter et obtuse bilobulatis, subtus acute carinatis, crassius coriaceis, glabris, 4–7.5 cm longis, medio fere 0.8–1.3 cm latis, vaginis dense transversim verruculosi, antice alte fissis, margine setis longis subvillosis-ciliatis; spathis semiorbicularibus, obtusis, brevibus; racemis subsessilibus, bifloris; floribus patentibus, suboppositis; sepalis oblongis, obtusis, glabris, extus apicem versus leviter carinatis, 0.8 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 0.5 cm longum formantibus; petalis oblique ligulato-subspathulatis, obtusis, sepalis subaequilongis, glabris; labello circuitu late cuneato, 0.7 cm longo, inter apices loborum lateralium c. 1 cm lato, lobis lateralibus subfalcato-triangulis, obtusiusculis, intermedio distincte brevior, obtuse bilobulato cum apiculo in sinu alto interjecto, marginibus subundulato, carina lineari apicem versus subdentata e basi usque supra medium labelli, papillis sparsis in medio; columna brevi, pede concavulo, clinandrii lobis lateralibus rotundatis serrulatis, dorsali triangulo acuto; anthera rotundato-cucullata, glabra, antice leviter excisa; ovario subsessili, glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20083, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17249 (TYPE), flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19134, without flowers, in Jan. 1909.

This species is one of the most peculiar orchids which I brought back. The leaf-sheaths are so extremely uncommon for the genus, so that without flowers, I would never have considered it as a *Dendrobium*. It is interesting that both the above-described species are related closely. The flowers are greenish with the lip and column-foot orange-yellow.

§ 25. *Eriopexis*

After mature consideration I have come to the conclusion that, owing to the present bulk of the section *Grastidium*, it is advisable to separate from it every well-defined group for, otherwise, it will soon become impossible to find one's way through the huge number of species. When a genus reaches the stately number of 100 species, we feel compelled to divide it into sections, in order to maintain an effective oversight. *Grastidium*, in German New Guinea alone as we have seen, certainly contains 70 species, and it is reasonable to assume that the total number of known species exceeds 100, probably up to 120. Such a sharply defined group as I have referred to is found in *Eriopexis*. If, as was the case earlier, this group had contained a single aberrant species only, I would not have hesitated for a moment in leaving it with *Grastidium*, but here we are dealing with five species of striking uniformity of habit and all showing the same section-characters in their flowers. The peculiarities of this section, as opposed to *Grastidium*, consist of the strikingly broad, almost leaflike, flat leaf-sheaths and stem, so far as the habit is concerned; and as regards the flower the elongated column-foot (as in *Acanthephippium*), with the result that the flower acquires an appearance which is quite different from all other *Dendrobium* species.

The section is clearly a typical Papuan [Papuasian] one, because until now the only species known are those under consideration here. Curiously enough, neither from the British nor Dutch parts of the island have similar forms been recorded.

The species always grow in the mist-forest formation on thickly moss-clad tree-trunks. The Type of the section was found on a ridge of the Rössel Range in Neu-Mecklenburg, where the rain-forest formation descends to an altitude of about 600 metres, as on many exposed hills near the sea, while further inland it generally commences at about 1000 metres, in the Bismarck Range even as high as 1200 metres. It is therefore evident that all the species prefer high humidity with an appreciably low temperature at night, since in these formations the moss on the tree-trunks hardly ever dries out.

224. *D. eriopexis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 170.

Neu-Mecklenburg: On trees in the mountain forests of Punam (Rössel Range), alt. c. 600 m—R. Schlechter no. 14650, flowering in July 1902.

The Type of the section. Apparently, the plant is restricted to Neu-Mecklenburg. In habit it agrees with all other members of the section, but the leaves are a little longer, the petals somewhat narrower towards the base and it possesses a sharply defined, hairy cushion extending along the entire centre of the labellum. The shape of the labellum also differs from that of the other species. The flowers are white with a golden yellow column-foot.

225. *D. inflatum* Schltr., sp. nov.

Epiphyticum, patulum, 60–80 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde compressis, dense foliatis, vaginis foliorum ancipitibus omnino obtectis, cum vaginis c. 1.3 cm latis; foliis suberectis, ovalibus, obtusis, subtus carinatis, 10–11 cm longis, medio fere 3–3.5 cm latis, basi subpetiolato-contractis; spathis brevissimis, obtusissimis, compressis; racemis subsessilibus, bifloris; floribus magnis erecto-patentibus, suboppositis; sepalis ovalibus, obtusis, glabris, 2.2 cm longis, lateralibus obliquis, dimidio inferiore antice valde ampliata cum pede perlongo columnae mentum subgloboso-inflatum obtusissimum c. 1.5 cm diametientem formantibus; petalis oblique elliptico-spathulatis, obtusis, glabris, sepalis paulo brevioribus; labello perlate cuneato, antice trilobato, 1.1 cm longo, antice 1.3 cm lato, basi fasciculo pilorum ramosorum ornato, per medium pilis similibus sparsis oblecto, lobis lateralibus rotundatis, obtusis, margine antice serrulato-ciliatis, intermedio semiorbiculari, breviter acuminato, lobos laterales paululo tantum excedente; columnae brevi, apicem versus conspicue contracta, pede perlongo, lineari, incurvo, basi callo bilobulato donato, apice minutissime verruculoso, clinandrii lobis lateralibus parvulis obtusis, dorsali dentiformi parvulo; ovario sessili, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19885, flowering in June 1905. [Ed.—probably 1909.]

The species stands very close to the preceding one, but is distinguished by shorter leaves, larger flowers, hairiness and shape of the labellum and the column-foot which is not so deeply concave as in *D. eriopexis* Schltr. The flowers are white, tinted slightly pink inside; the mentum with small lemon-yellow warts inside, the bearded papillae at the base of the labellum orange-red; the column yellow with an orange-yellow foot.

226. *D. globiflorum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 90 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde compressis, simplicibus, dense foliatis, vaginis ancipitibus foliorum omnino obtectis, cum vaginis c. 1.3 cm latis; foliis suberectis, ellipticoguligatis vel ellipticis, obtusis, basi subpetiolato-contractis, subtus carinatis, 10–12 cm longis, medio fere 2.7–3.4 cm latis; spathis brevissimis, obtusissimis, compressis; racemis subsessilibus, bifloris; floribus erecto-patentibus, suboppositis amplis; sepalis ovalibus, obtusis, 2.4 cm longis, glabris, lateralibus falcatis, dimidio inferiore antice valde ampliata cum pede columnae perlongo mentum subgloboso-inflatum c. 1.5 cm diametientem formantibus; petalis oblique elliptico-spathulatis, obtusis, glabris, sepalis subaequilongis; labello circuitu late cuneato-obreniformi, antice trilobato, 1.1 cm longo, infra apicem 1.3 cm lato, basi

papillis subulatis barbellato, lamina marginibus lateralibus exceptis papillis subulatis plus minus dense obsessa, lobis lateralibus rotundatis, obtusissimis, intermedio paulo longiore trilobulato, lobulis obtusis, intermedio lateralibus, longiore; columna brevi, apicem verso paulo contracta, pede valde elongato, incurvo, apicem versus sensim attenuato; anthera reniformi-cucullata, glabra, ovario sessili c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17141, flowering in Jan. 1908.

In contrast to the two preceding species, this one is distinguished by the middle lobe of the lip which is distinctly tripartite, almost the whole labellum being covered above with pointed hair-like papillae and the column-foot conspicuously narrowed towards the front. Otherwise, all three species are similar in habit, only *D. eriopexis* has longer leaves, as stated above. The flowers are white, the papillae at the base of the labellum orange-red; the column yellow with a darker striped foot.

227. *D. subpetiolatum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 80 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde compressis, simplicibus, dense foliatis, vaginis foliorum ancipitibus omnino obtectis, cum vaginis c. 1 cm latis; foliis suberectis, ellipticis, obtusiusculis, basi subpetiolato-contractis, subtus carinatis, 7–10 cm longis, medio fere 2–2.7 cm latis; spathis brevissimis, obtusissimis, compressis; racemis subsessilibus, bifloris; floribus amplis, erecto-patentibus, suboppositis; sepalis ovalibus, obtusis, glabris, 2.3 cm longis, lateralibus falcatis, dimidio inferiore antice valde ampliata cum pede columnae mentum subgloboso-inflatum c. 1.4 cm diametientem formantibus; petalis oblique elliptico-spathulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi angustiore late cuneato, antice trilobato, c. 1 cm longo, supra medium 1.2 cm lato, basi papillis subulatis barbellato, superne per medium papillis sparsis recurvulis brevibus acutis ornato, lobis lateralibus rotundatis, obtusatis, margine irregularibus, intermedio longiore trilobulato, lobulis lateralibus parvulis oblongis obtusis, intermedio bene majore, semiorbiculari, acuminato; columna brevi apicem versus contracta, pede perlongo incurvo, superne apicem versus carina lineari ornato; anthera late rotundato-cucullata, apiculata, glabra; ovario sessili, cylindraceo, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20208, flowering in Sept. 1908. [Ed.—probably 1909.]

Amongst the species known at present, this is the smallest in the section, so far as the vegetative parts are concerned; its leaves are smaller and the sheaths narrower than in the other species. The labellum is very characteristic with sparse short papillae and a tri-partite middle lobe, the lateral lobes of which are small and rounded, with the middle lobe large, broad and pointed. The flowers are white, flushed with pink externally; the lip white, with brown lateral laciniae on the front lobe, the column-foot orange-yellow at the apex.

228. *D. quinquelobatum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 80 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus valde compressis, dense foliatis, vaginis foliorum ancipitibus omnino obtectis, cum vaginis 1.3–1.5 cm latis; foliis suberectis, anguste ellipticis, acutis, subtus carinatis, basi subpetiolato-contractis, 9–12 cm longis, medio fere 2.1–3.3 cm latis; spathis brevissimis, obtusissimis, compressis; racemis subsessilibus, bifloris; floribus amplis, erecto-patentibus, suboppositis; sepalis ovato-ellipticis, obtusis, glabris, 2.5 cm longis, lateralibus falcatis, dimidio inferiore antice ampliata cum pede columnae mentum subgloboso-inflatum c. 1.6 cm diametientem formantibus; petalis oblique oblongo-spathulatis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu suborbiculari, antice quinquelobato, 1.1 cm longo, supra medium 1 cm lato, superne verrucis transversis sparsis obsesso, infra apicem callis paucis irregularibus donato, lobis lateralibus valde ampliatis semioblongis, obtusis, antice subcrenatis, interioribus oblique quadratis antice truncatis, exterioribus paulo minoribus, lobo intermedio subquadrato, apiculato, exterioribus aequimagno, sed interiores paulo superante; columna brevi, apice paulo contracta, pede perlongo incurvo, apice callo oblongo rugoso ornato; anthera late quadrato-cucullata, dorso subexcisa, antice truncata, glabra; ovario sessili, cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19869, flowering in June 1909.

A well-defined species. In the structure of the labellum it varies considerably from the other species, since no small hair-like papillae appear on the upper surface, instead large, broad transverse tubercles. Moreover, the division of the middle lobe in this species is developed so much that one must now speak of three separate 'lobes', thus by including the lateral lobes, the labellum has become five-lobed. The flowers are salmon-coloured; the middle lobes of the labellum are pale cinnabar-red; the column-foot with a cinnabar-red callus at the apex.

§ 26. *Dichopus*

I quite agree with J.J. Smith in refusing to accept *Dichopus* Bl. as a genus separate from *Dendrobium* Sw., because it possesses too many of the characteristics of *Grastidium*, but I differ from him in regard to the importance of the excrescence on the lower border of the stigma. Because this characteristic is seen only in *Dendrobium* Sw. there is no justification in ignoring it as a species-character. Moreover, I have explained already that for the purpose of exercising a proper oversight of the section *Grastidium*, it is better to exclude from that section all the better-marked forms. I have done this in the case of *Eriopexis* and now proceed to deal in the same way with *Dichopus*, which I regard as a separate section.

It is apparently a monotypic section, although I am inclined to believe that the variety *subsimplex* of J.J. Smith may be worthy of full specific status. However that may be, we have in *Dichopus* a form which, in the structure of the column, differs from *Grastidium*. For instance, the stigma is placed conspicuously low down and the side lobes of the clinandrium are reduced remarkably, so that I consider it quite a distinct section.

Concerning the question as to what should be included in *Dichopus*, I believe (if I exclude the variety already mentioned) that only one species with certainty finds a place here, viz. *D. insigne* Rchb. f. I possess the Type-material of *D. lyperanthiflorum* Krzl. for which, after many years, I have to thank the author. The Type of *D. Gazellae* Krzl. I have seen in the Berlin Herbarium, and have come to the conclusion, based on plentiful and reliable material as well as on drawings of living material, that both of them should be reduced to *D. insigne* Rchb. f. Not only do these two Kränzlin species belong to this section, but furthermore, a third, *D. pentactis* Krzl., the Type of which I have seen in the Beccari Herbarium. From an examination of the drawings of *D. Gazellae* Krzl. and *D. lyperanthiflorum* Krzl., it is readily understood that the author established a 'labelli fabrica omnino inusitata'.

Thus there remains only *D. insigne* Rchb. f., a widely distributed coastal orchid which is found from the Aru Islands along the entire north and south coast of New Guinea, and across the Bismarck Archipelago to the Solomon Islands. It grows on isolated trees, very often in the most glaring sun and is able to resist long dry periods apparently without danger. With such a wide distribution, it is hardly surprising that this species tends to give rise to more variations than many other species of the genus. In the same localities, I have observed variations in spot density and in depth of colour.

The occurrence of the plant near the Kenejia [River] is of great interest, but this may be explained since other plants, which are otherwise found only near the coast, also occur, an indication that the Ramu-Markham Plain formerly was undoubtedly a sea. This follows from the coral which both Lauterbach and I found still at the Warapussa [River].

229. *D. insigne* (Bl.) Rchb. f. ex Miq., Flor. Ind. Bat. III (1855), p. 640.

Dichopus insignis Bl., Mus. Lugd.-Bat. II (1856), p. 176.

Dendrobium Gazellae Krzl., in Engl. Bot. Jahrb. VII (1886), p. 436.

D. lyperanthiflorum Krzl., in Österr. Bot. Zeitschr. (1894), p. 334.

D. obcuneatum Bail., in Queensl. Agric. Journ. XVII (1906), p. 231 (ex Krzl.). [Ed.—possibly should be (nec Krzl.)]

D. pentactis Krzl., in Engl. Pflanzenr. IV, 50, II. B., 21, (1910), p. 200.

Kaiser-Wilhelms-Land: On the beach near Paub (Eitape District)—R. Schlechter (without flowers, observed in Sept. 1909); on trees at forest borders on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18387, flowering in Dec. [Ed.—possibly Oct.] 1908; on trees at the mouth of the Waria [River], alt. c. 10 m—R. Schlechter no. 19943, flowering in July 1909.

Neu-Pommern: In the bay at Port Weber—Micholitz; on the beach between Massawa and Cape Lambert—R. Schlechter no. 13712, flowering in Nov. 1902 [Ed.—possibly 1901.]

Neu-Mecklenburg: Very frequently at the beach near Kabanut—R. Schlechter (observed in Nov. 1901).

I have purposely added a few localities where I have seen the plant often in order to show how widely it is distributed. At Kabanut in Neu-Mecklenburg, for instance, I saw it in company with *D. bifalce* Lindl. on dead trees at the beach in especially hot localities where it was exposed all day to the strongest rays of the sun.

The flowers are yellowish, spotted pale or dark brown; the labellum is white with a few yellow-brown spots, or pure white.

§ 27. *Pleianthe*

Unfortunately, I am compelled to establish a monotypic section here; it includes a *Dendrobium* species which I have collected twice and examined. In habit this plant might be regarded as a *Grastidium*, were it not for the flower, but anyone who has had the opportunity of seeing it flowering will have noticed its very peculiar inflorescence. The flowers stand four to ten or more on a small conical protuberance which arises on the side of the leaf-sheath. This protuberance is very much compressed laterally, so that the flowers appear in rows. The flowers remain fresh for a number of days, not for only a day as in the case of *Grastidium*. For these reasons the latter section does not claim consideration at this point. The shape of the inflorescence also rules out inclusion in the other sections. The only species to be considered here is *D. pleianthum* Schltr. which is an epiphyte on tall trees of the mountain forests below the mist-forest zone. It is often found as very magnificent specimens in the forks of trees and frequently associated with the fern *Dryostachyum*.

230. *D. pleianthum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, pluricaule, 90–120 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, paululo compressis, bene foliatis, vaginis foliorum nervosis, minutissime rugulosis, lucidis, arctissime amplectentibus omnino obtectis, vulgo 0.8 cm lateraliter diametro; foliis erecto-patentibus, lanceolato-linearibus, subacutis, apice inaequaliter bilobulatis, glabris, textura coriaceis, 13–20 cm longis, infra medium 0.8–1.5 cm latis; racemis lateralibus sessilibus, rhachi valde abbreviato, conico, lateraliter compresso, 0.2–0.4 cm alto; bracteis minutis, squamiformibus, vix conspicuis; floribus lateraliter patentibus, graciliter pedicellatis, 4–10; sepalo intermedio oblongo-lanceolato, subacuto, glabro, 1.1 cm longo, lateralibus paulo brevioribus, falcatis, acutis, antice basin versus ampliatis, cum pede columnae mentum obtusum 0.3 cm longum formantibus; petalis oblique lineari-ligulatis, subacutis, basin versus paululo angustatis, sepalis paulo brevioribus; labello e basi cuneata supra medium trilobato, 6.5 mm longo, medio fere 4.5 mm lato, medio longitudinaliter fasci leviter incrassato apicem versus paulo dilatato decurrente in medio lobi intermedi serie lunata verrucarum terminato ornato, lobis lateralibus oblique oblongis, obtusis, intermedio laterales plus duplo superante, late obovato, apiculato; columna brevi,

pede concavulo, clinandrii lobis lateralibus obtuse bidentatis, dorsali subulato paulo longiore; anthera rotundato-cucullata, glabra, antice subtruncata; ovario cum pedicello gracili, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Gati Mountain (Minjem Valley), alt. c. 500 m—R. Schlechter no. 16303 (TYPE), flowering in July 1907; on trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 16719, flowering in Oct. 1907.

The characteristics of this plant have been referred to above. The flowers of the specimen from the Kani Range are rather smaller than those of the Type from the Gati Mountain.

The flowers are pale yellow, the labellum faintly margined with red.

§ 28. *Conostalix*

During my preliminary investigations and studies for the grouping of the *Dendrobium* species, the idea suddenly occurred to me that *D. conostalix* Rchb. f., *D. villosulum* Wall. and a few species related to them, were placed in a very unnatural position. I was somewhat surprised to see that, in consequence of their wiry stalks, they could not remain where I had placed them in my classification. When I tried to place them in one of the already existing sections I failed and I was therefore compelled to establish a separate section, *Conostalix*. This I considered justifiable on account of the structure and texture of the flowers, as well as their very characteristic habit. The section probably comes nearest to *Monanthos*, but its flowers have a quite different structure, while the remaining sections belonging to the sub-genus must be disregarded on account of their inflorescences.

Owing to the confusion which at present prevails in the *Dendrobium* species, it is difficult to estimate the number of species which comprise this section. Four are known to me, viz. *D. conostalix* Rchb. f., *D. villosulum* Wall., *D. gramineum* Ridl. (which is missing from the Kränzlin treatise) and *D. paludicola* Schltr. Only the latter is of Papuan [Papuasian] origin. This species, which unfortunately I never found again, grew at the foot of the Bismarck Range, in a very sunny marsh together with *Nepenthes* and *Lycopodium cernuum* L., an association which I have never since seen anywhere in New Guinea. I regret that the time was then too short to inspect the locality more closely since other orchids would probably have been found in this association.

231. *D. paludicola* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 173.

Kaiser-Wilhelms-Land: In marshy locations at the foot of the Bismarck Range, alt. c. 200 m—R. Schlechter no. 13915, flowering in Jan. 1902.

The species is related most closely to *D. conostalix* Rchb. f., but easily recognised by strikingly deep bipartite leaves. The flowers are brownish with a white labellum.

§ 29. *Monanthos*

My section *Monanthos* corresponds with that of J.J. Smith's *Biloba* [see footnote p. 510], the first species of which, *D. bilobum* Lindl., was described by the author from New Guinea in 1843. Since then seven more have been described from the Papuan [Papuasian] region and one, *D. Koodersii* J.J. Sm., from the Celebes and Amboina. At present, three species are known from German New Guinea, with *D. bilobum* Lindl. probably coming from British Papua, while *D. erectifolium* J.J. Sm., *D. poneroides* Schltr. and *D. crenatilabre* J.J. Sm. are shown as endemic to Dutch New Guinea. I shall now have to add a fairly large number of new species.

There is hardly another section in which the distinguishing features of the species have presented such insuperable difficulties as this one. Without the closest analysis of

the flowers and good material in the form of stems and leaves it is almost impossible to distinguish the individual species which are, however, in the living state, all characteristically recognisable. In this regard the information relating to colour of the flowers is extremely valuable.

In the separation and determination of the species the following characters are the most important: size of the leaves and their various parts, length and shape of the mentum, width of the petals; and, above all, the shape of the lip. The main differences are found in the last character, viz. size and width of the front lobe in relation to the posterior segment, together with the shape of the latter and its margin; size and shape of the basal callus.

I know only one species in which the labellum is entirely undivided, viz. *D. integrum* Schltr., the last one described here. All the rest show a distinct contraction, whereby the front lobe is separated from the rear one. For the sake of simplicity I have merely called these 'hypochilium' [hypochile] or back part, and 'epichilium' [epichile] or front part in the descriptions following. In this way, a lengthy description of the lobed labellum is avoided. Further I may add that the smaller species are discussed first, proceeding in size until we reach those with the largest and, above all, broadest leaves.

The species of this section are to be found chiefly in the mountains, although some descend to the hill-country. I have not yet found them in the forests of the true plains or in the immediate vicinity of the coast.

232. *D. obovatum* Schltr., sp. nov.

Epiphyticum, pusillum, 15–20 cm altum, multicaule; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracillimis, simplicibus, dense foliatis, paulo compressis, vaginis arcte amplexantibus, striato-paucinerviis omnino obtectis; foliis linearibus vel lineari-ligulatis, apice obtuse et inaequaliter bilobulatis, glabris, 1.3–2.5 cm longis, medio fere 1.7–2.5 mm latis, internodia duplo vel plus duplo superantibus; floribus singulis, more sectionis inversis, in sectione inter minores, glabris; sepalis oblongis, obtusis, 0.5 cm longis, lateralibus obliquis, basi margine anteriore sensim dilatata cum pede columnae mentum obtusum 3.5 mm longum formantibus; petalis oblique linearibus, obtusissimis, glabris, sepalis paulo brevioribus; labello carnoso, circuitu obovato, 0.5 cm longo, antice 2.75 mm lato, hypochilio obovato, antice 2.5 mm lato, dimidium labelli longitudine paulo superante, angulis anterioribus paulo tantum prosilientibus, callo basali parvulo, epichilio amplo late quadrato antice subretuso; columna brevi, pede lato, concavulo, clinandrii lobis lateralibus parvulis, dorsali obsoleto; ovario cum pedicello brevi, glabro, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16656 (TYPE), flowering in Oct. 1907; on trees in the forests of the Bismark Range, alt. c. 1300 m—R. Schlechter no. 18886, flowering in Nov. 1909. [Ed.—probably 1908.]

In habit this species most closely resembles *D. poneroides* Schltr., described below, but is distinguished by its epichile, which in front, at least, attains the breadth of the front of the hypochile and is usually even broader. It is recognised most easily from other relatives by this character. The sepals and petals are yellow, the labellum brown.

233. *D. macrum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 174.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–800 m—R. Schlechter no. 14551, flowering in Apr. 1902; no. 20290, flowering in Sept. 1909.

Kränzlin has united this species with *D. isochiloides* Krzl., with which it has no connection whatever. Had the author looked more closely at the description of my species, he must have recognised that the leaves of this species are narrower, and more grass-like than in any other previously described species.

I found this species again while on my last journey and the specimens agree so

entirely with the earlier ones that they are recognised at once as *D. macrum* Schltr. The flowers are whitish, the column and lower half of the labellum densely speckled with red.

234. *D. poneroides* Schltr., in Fedde, Repertor. X (1911), p. 251.

D. isochiloides Krzl. var. *pumilum* J.J. Sm., in Nova Guinea VIII, p. 77, t. XXVI Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 300 m—R. Schlechter no. 19252, flowering in Apr. 1909.

A thoroughly characteristic species which in some forms reminds one in habit of *D. obovatum* Schltr. It is entirely different from *D. isochiloides* Krzl. which, as my Type shows, is dissimilarly taller and larger. Among the small species, *D. poneroides* is recognised by the front part of the hypochile being much widened and its tips on both sides widely projecting over the small and short epichile. The flowers are yellowish, the labellum brown with yellowish epichile.

var. *angustum* Schltr., var. nov.

Differt a forma typica foliis 3–4-plo longioribus, petalis paulo latioribus.

Kaiser-Wilhelms-Land: On trees at the waters-edge near the Djamu Gorge, alt. c. 400 m—R. Schlechter no. 16688 flowering in Oct. 1907.

At first I thought this plant must be regarded as a separate species, but I have altered my opinion since the flowers are, in general, too closely reminiscent of *D. poneroides* Schltr. I consider it possible that the plant will still have to be separated specifically later on. The colour of the flowers is the same as in the Type.

235. *D. isochiloides* Krzl., in Österr. Bot. Zeitschr. (1894), p. 334.

Neu-Mecklenburg: Near Port Praslin and Port Carteret—W. Micholitz in 1894.

I possess a Type specimen of this species, which I procured years ago from the author by exchange. According to this, the species seems to be an endemic of the island of Neu-Mecklenburg, or at least of the Bismarck Archipelago. All the specimens from New Guinea, which have been identified with it by Kränzlin and others, are specifically different. *D. isochiloides* Krzl., in point of size, occupies a middle position between the small species enumerated and the larger ones now following. Unfortunately, nothing has been mentioned about the colour of the flowers.

236. *D. procerum* Schltr., sp. nov.

Epiphyticum, erectum, procerum, c. 40 cm altum; rhizomate valde abbreviato; radicibus crassiusculis, elongatis, flexuosis, glabris; caulibus gracilibus, valde compressis, bene foliatis, vaginis foliorum lucidis, striato-nervosis omnino obtectis; foliis erectis, linearibus, obtusis, inaequaliter bilobulatis, glabris, textura pro sectione tenuioribus, 4–6.5 cm longis, medio fere 2.5–3.5 mm latis; floribus singulis, inversis; bractea minuta; sepalis oblongis, obtusis, glabris, 0.6 cm longis, lateralibus obliquis, antice basi sensim dilatata cum pede columnae mentum obtusum c. 5 mm longum formantibus; petalis oblique ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello carnoso, circuitu oblongo, 5.5 mm longo, medio fere 0.3 cm lato, hypochilio ovali, antice angulis obtusis bene distinctis, callo basali retrorso late conico obtusissimo, epichilio subreniformi, obtuso, superne plicis paucis (2–3) transversis donato, hypochilio fere 4-plo brevior, paulo angustiore; columna glabra, pede oblongo, concavulo, clinandrii lobis lateralibus rotundatis, dorsali subulato longiore; anthera rotundato-cucullata, glabra, antice truncata; ovario cum pedicello brevi, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17893, flowering in July 1908.

Amongst all the taller species of the section, this is distinguished by the narrow, relatively long lax leaves. The flowers are white, closely dotted rose-red, the labellum dotted and flecked brownish red.

237. *D. rhytidothera* Schltr., sp. nov.

Epiphyticum, erectum, 35–45 cm altum; rhizomate valde abbreviato; radicibus crassiusculis, elongatis, flexuosis, glabris; caulibus compressis, dense foliatis, vaginis dense rugulosis, arctissime amplexantibus omnino obiectis, c. 2.5 mm latis; foliis erectis, linearibus, obtusis, apice inaequaliter bidentatis, 8–12 cm longis, medio fere 3.5–4 mm latis; floribus singulis, inversis, glabris; bractea minuta; sepalis oblongis, obtusis, glabris, 0.9 cm longis, lateralibus obliquis, basi margine anteriore valde dilatata cum pede columnae mentum obtusum 0.5 cm longum formantibus; petalis oblique ligulatis, obtusiusculis, sepalis paulo brevioribus; labello circuitu oblongo, 0.9 cm longo, medio fere 0.6 cm lato, hypochilio late ovali concavo, antice angulis obtusis, sinus lateralibus satis conspicuis, callo basali retrorso, obtusissimo, lato, epichilio subreniformi, obtuso, hypochilo duplo fere brevior et conspicue angustiore, superne rugulis sparsis transversis donato; columna glabra, pede oblongo, clinandrii lobis lateralibus abbreviatis, dorsali leviter tridentato longiore; anthera quadrato-galeata, minute verruculosa, antice truncata; ovario cum pedicello glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19518, flowering in May 1909.

In habit this species most closely resembles *D. procerum* Schltr., but the flowers are much larger with a different colour and have an altogether different and very characteristic labellum, the hypochile of which seems to be somewhat concave in consequence of the incurved margins. The flowers are pale yellow, the labellum red-spotted towards the base, dark purple-brown towards the front; the column is streaked red in front, the anther dark red.

238. *D. xanthothera* Schltr., sp. nov.

Epiphyticum, erectum, gracile, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, simplicibus, dense foliatis, vaginis foliorum apicem versus rugulosis, arcte amplexantibus omnino obiectis, c. 2.5 mm latis; foliis erectis, linearibus vel lineari-ligulatis, obtusis, inaequaliter bilobulatis, glabris, 3.5–6 cm longis, medio fere 3–4 mm latis; floribus singulis, inversis, glabris; bractea minuta; sepalis ovatis, obtusis, glabris, 6.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusis, sepalis paulo brevioribus; labello circuitu oblongo, 0.6 cm longo, medio fere 0.4 cm lato, hypochilio ovali, antice angulis obtusis paulo incurvulis, basi paulo attenuato, callo basali retrorso perlate conico humillimo, epichilio transverse oblongo, obtusissimo, pliculis transversis c. 5–6 medianis donato, hypochilio fere 3-plo brevior, paulo sed distincte angustiore; columna brevi, glabra, pede ligulato, clinandrii lobis lateralibus abbreviatis irregulariter denticulatis, dorsali subulato longiore; anthera subreniformi-cucullata, glabra, dorso gibbo humili donata, antice leviter excisa; ovario cum pedicello curvato, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19070, flowering in Jan. 1909.

A species with very few characteristics, but which is striking on account of its yellow, shiny leaf-sheaths, a character which it shares with various others of the section. The labellum is similar to that of the following species, but differing, however, owing to the margins of the hypochile being turned slightly upwards in front. In habit it reminds one of *D. isochiloides* Krzl., but is taller and the flowers also are much larger. The flowers are white-yellow; the labellum and column-foot are spotted brown; the anther brown-red, white-margined in front.

239. *D. lamproglossum* Schltr., sp. nov.

Epiphyticum, erectum, 35–45 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, simplicibus, dense foliatis, vaginis foliorum arcte amplexantibus omnino obiectis, c. 0.3 cm latis; foliis erectis, linearibus, obtusis, apice inaequaliter et oblique bilobulatis, glabris; 5–8 cm longis, medio fere 0.4–0.5 cm latis; floribus singulis, inversis, glabris; bractea minuta; sepalis ovatis, obtusis, glabris, c. 1.1 cm longis, basi margine anteriore ampliata cum pede columnae mentum obtusum, pro sectione perbreve (3.5 mm longum) formantibus; petalis subspathulato-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu oblongo, 0.7 cm longo, medio fere 4.5 mm lato, lucido, hypochilio subquadrato-oblongo, antice lobis incurvis rotundatis, speculo ovato lucido donato, callo basali retrorso obtusissimo, brevissimo, antice in foveam exeunte, epichilio suborbiculari obtusissimo, superne pliculis c. 4 transversis medianis donato,

hypochilio paulo sed distincte brevior et lobis hypochilii explanatis bene angustior; columna brevi, glabra, pede lato, clinandrii lobis lateralibus rotundatis apice bidentatis, dorsali triangulo acuminato utrinque minute unidentato longiore; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18544, flowering in Oct. 1908.

In the living state this species may be recognised at once from all others by its conspicuously short mentum, by the lobes of the hypochile being incurved in front so that they lie partly on the epichile. The flowers are fairly dark red externally, white inside; the labellum glossy, thickly red-spotted.

240. *D. piestocaulon* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 173.

D. nidificum Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 (1910), p. 164.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 550 m—R. Schlechter no. 14632, flowering in July 1902.

I have not found the Type-form on the mainland of New Guinea, but it does seem to occur in Dutch New Guinea, because the Beccari specimens of *D. nidificum* Krzl. mostly agree with my Type, only a few having longer leaves. The leaves are arranged more closely than those of the variety *kauloense* Schltr. and are less robust. The flowers are white, the labellum yellowish.

var. *kauloense* Schltr., var. nov.

Differt a forma typica habitu robustiore, foliis 10–14 cm longis, medio fere 0.7–0.8 cm latis, labelli hypochilio brunneo-purpureo.

Kaiser-Wilhelms-Land: On trees in the hill-forests near the Kaulo Base, alt. c. 250 m—R. Schlechter no. 16831, flowering in Nov. 1907.

This form at first gives the impression of a separate species, but appears to have some connection with specimens from Dutch New Guinea. Perhaps later on it may prove to be a species of its own. The flowers are pale yellow, the labellum brown-red with a pale yellow middle lobe.

241. *D. roseo-flavidum* Schltr., sp. nov.

Epiphyticum, erectum, 25–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, simplicibus, dense foliatis, vaginis foliorum ancipitibus minute rugulosis arcte amplexentibus omnino obtectis; floribus singulis, inversis, glabris; bractea minuta; sepalis oblongis, obtusis, glabris, 0.8 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 0.4 cm longum formantibus; petalis oblique ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu oblongo, 0.7 cm longo, medio fere 4.5 mm lato, dimidio anteriore transversim sparsi-ruguloso, hypochilio obovato-oblongo, antice angulis obtusato-rotundatis, speculo mediano ovali, callo basali retrorso subretuso-humili, epichilio quadrato apiculato, hypochilio 3-plo brevior et conspicue angustior; columna brevi, glabra, pede concavulo oblongo, clinandrii lobis lateralibus rotundatis, dorsali subulato multo longiore; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Mimi (Waria District), alt. c. 700 m—R. Schlechter no. 19475, flowering in May 1909.

This plant is a species well characterised by the colour of the flowers and shape of the lip. Unfortunately, I have found it only once. It is the first species in which I could observe a true mucro at the apex of the epichile. The flowers are pink with a yellowish tip; the labellum is paler with pale red transverse wrinkles and small warts.

242. *D. corticicola* Schltr., sp. nov.

Epiphyticum, erectum, 25–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, dense foliatis, simplicibus, vaginis foliorum ancipitibus arcte amplexentibus omnino obtectis, 4–5 mm apicem versus latis; foliis erectis, lineari-ligulatis, obtusis, apice inaequaliter bilobulatis, basi subpetiolato-contractis, 4–5 cm longis, medio fere 0.6–0.8 cm latis;

floribus singulis, inversis, glabris; sepalis ovato-triangularibus, obtusiusculis, 0.7 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 4.5 mm longum formantibus; petalis oblique oblongo-ligulatis, subacutis, sepalis paulo brevioribus; labello circuitu oblongo, 0.7 cm longo, medio fere 0.4 cm lato, hypochilio oblongo, marginibus incurvulis concavulo, antice angulis oblique truncatis, callo basali retrorso humillimo, epichilio late ovato subacuto, margines versus superne minutissime papilloso, hypochilio subtriplo brevior et conspicue angustior; columna brevi glabra, pede oblongo, clinandrii lobis triangularibus; anthera rotundato-cucullata, glabra, gibbo humili donata; ovario cum pedicello c. 0.5 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400–1600 m—R. Schlechter no. 18839 (TYPE), no. 18549, flowering in Oct.–Nov. 1908.

The species is distinguished by its compact habit as well as the uncommon colour of the flowers and shape of the lip. It is probably most closely related to *D. roseo-flavidum* Schltr. The flowers are sulphur-yellow.

243. *D. agrostophylloides* Schltr., sp. nov.

Epiphyticum, erectum, robustum, 50–70 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, simplicibus, dense foliatis, vaginis foliorum amplectentibus ancipitibus omnino obtectis, 0.5–0.6 cm latis; foliis erectis vel suberectis, lineari-ligulatis, obtusis, inaequaliter bilobulatis, glabris, basi cuneatis, 8–10 cm longis, medio fere 1–1.4 cm latis; floribus singulis, inversis, glabris; sepalis oblongis, obtusis, 1.2 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum breve 0.3 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu oblongo, 7.5 mm longo, medio fere 3.5 mm lato, hypochilio subcuneato-oblongo, antice lobis parvulis obtusis anguliformibus subtruncatis, gibbo basali retrorso conico obtuso parvulo, epichilio perlate ovato, obtuso, margine superne verruculoso, hypochilio subduplo brevior sed basi subaequilato; columna brevi, pede oblongo-ligulato; anthera quadrato-cucullata, glabra, antice truncata; ovario cum pedicello glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 1696 [Ed.—no. is incomplete] flowering in Dec. 1907.

The most robust of all the species known at present. In appearance it is quite a typical species of the section, but well distinguished by the shape and structure of the labellum. It is reminiscent of some *Agrostophyllum* species. The flowers are brown-red to dark cherry-red and glistening.

244. *D. subserratum* Schltr., sp. nov.

Epiphyticum, erectum, 30–40 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus compressis, simplicibus, dense foliatis, vaginis foliorum ancipitibus apicem versus striato-nervosis arcte amplectentibus omnino obtectis; foliis erectis, linearibus vel lineari-ligulatis, obtusis, inaequaliter bilobulatis, 4–7 cm longis, medio fere, 0.5–1.2 cm latis; floribus singulis inversis, glabris; sepalis ovato-oblongis, subacutis, glabris, c. 1.1 cm longis, lateralibus obliquis, basi margine anteriore dilatata, cum pede columnae mentum obtusum 0.5 cm longum formantibus; petalis sublineari-ligulatis, obtusiusculis, glabris, sepalis paulo brevioribus; labello circuitu oblongo, 1 cm longo, medio fere 0.5 cm lato, hypochilio oblongo, margine minutissime subserrato, antice angulis vix conspicuis parvulis, callo basali retrorso humili conico, obtuso, epichilio triangulo-semiovali obtusiusculo, integro, superne pliculis 4 transversis medianis donato, hypochilio plus triplo brevior; columna brevi, glabra, pede oblongo, clinandrii lobis lateralibus rotundatis, dorsali dentiformi vix longiore; anthera late rhombeo-cucullata, glabra, antice excisa, dorso gibbo minuto donata; ovario cum pedicello glabro, 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19061, flowering in Jan. 1909.

This interesting species probably is related most closely to *D. crenatilabre* J.J. Sm., but is well distinguished because the hypochile and epichile are contrasted distinctly with each other, which is not the case with *D. crenatilabre* J.J. Sm. The flowers are yellowish pink, the labellum brown-red towards the margin, the centre and apex yellow.

245. *D. integrum* Schltr., sp. nov.

Epiphyticum, erectum, rigidum, 30–50 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus paulo compressis, simplicibus, bene foliatis; vaginis foliorum arctissime amplexantibus omnino obtectis, c. 0.2 cm latis; foliis erectis, linearibus vel lanceolato-linearibus, acutis, marginibus apicem versus paulo involutis, rigidis, 3.5–5.5 cm longis, medio vel infra medium 0.3–0.4 cm latis; floribus singulis, inversis, glabris; sepalis oblongis, obtusis, 0.8 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 4.5 mm longum formantibus; petalis oblique lineari-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello oblongo, obtusissimo, integerrimo, 0.7 cm longo, medio 2.5 mm lato, callo basali retrorso humillimo in lamina, antice mox evanescente; columna brevi glabra, pede oblongo, clinandrii lobis lateralibus triangulis obtuse apiculatis, dorsali triangulo aequilongo; anthera reniformi-cucullata, glabra, dorso obscure umbonata; ovario cum pedicello brevi glabro, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18711, flowering in Nov. 1908.

The most interesting species of the section, showing so clearly the character of a typical New Guinea high-mountain orchid. It is distinguished easily from all the others by the stiff, pointed, almost dagger-like leaves and the entirely undivided lip which is very blunt and has entire margins. *D. crenatilabre* J.J. Sm., described from Dutch New Guinea, in the shape of the lip is about midway between *D. integrum* Schltr. and *D. subserratum* Schltr. The flowers are golden yellow, the column dark red.

§ 30. *Herpethophytum*

In 1905 when I was working on the *Orchidaceae* from my first expedition to New Guinea, I described two small plants which I placed temporarily under *Monanthos*, because so little material was available. Even then, I was impressed by the structure of the flower and habit of the plant as being different from members of that section, although at the time it seemed more suitable to place them there than in any other existing section. During my last expedition I was fortunate in finding very copious material of the same and similar species, and was able there-and-then to test the question of the relationship of these plants to *Monanthos*. After a short investigation I came to the conclusion that they were representatives of a distinct section, which I propose to call *Herpethophytum* after the first species discovered by me. The species all have a very characteristic habit and flower structure, being more-or-less long-creeping plants with a very elongated rhizome and small, considerably branched stems, which bear small, fairly close leaves. The flowers, which are usually lateral, appear singly and are the smallest in the genus, being always inverted so that the labellum is uppermost. The lateral sepals are joined by their outer margins and are more-or-less connate nearly to the tip to form a spur or helmet which surrounds the labellum. The latter generally is narrowed distinctly into a claw at the base, and widened in front into a broad, mostly tri-lobed, lamina, which is hairy on its upper surface and generally bears two parallel lamellae, or a horse-shoe-shaped callus. The clinandrium is reduced greatly [in size]. The species, with one exception, are all epiphytes of the mist-forest formation and grow always deeply embedded in moss on thick branches of tall trees.

The two species known up to the present are: *D. glossorhynchoides* Schltr. and *D. herpethophytum* Schltr., both from German New Guinea to which a third species from Dutch New Guinea, *D. Vanroemeri* J.J. Sm., has been added recently. J.J. Smith places this latter species doubtfully in *Grastidium*, but it has less affinity with that section than to *Monanthos*, having in common with the latter a single-flowered inflorescence and inverted flowers which last for several days. J.J. Smith also appears to have thought it worthy of a separate section.

246. *D. oxychilum* Schltr., sp. nov.

Epiphyticum, decumbens vel patulum, usque ad 30 cm longum; rhizomate cauliformi, radicante;

radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, gracillimis, bene foliatis, teretiusculis, vaginis foliorum rugulosis nervoso-striatis arcte amplexantibus omnino obtectis, 1–1.3 mm diametientibus; foliis erecto-patentibus, lanceolato-ligulatis, acutis, dorso carinatis, superne lucidis, carnosius, 1.2–2.3 cm longis, infra medium 0.3–0.4 cm latis; floribus singulis, lateralibus, in genere inter minimos, inversis; bractea minuta; sepalis intermedio ovato, acuminato, glabro, 4.5 mm longo, lateralibus oblique lanceolatis, acuminatis, intermedio aequilongis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongoideum obtusum 0.3 cm longum formantibus, margine anteriore cohaerentibus; petalis oblique lanceolato-ligulatis, acutis, glabris, sepalis subaequilongis; labello e basi subunguiculato-cuneata late rhombeo, longius acuminato, superne bilamellato, lamellis medio paulo ampliatis, usque infra apicem parallelis decurrentibus, margine dimidio anteriore subdenticulato, glabro, toto 0.6 cm longo, medio fere 0.3 cm lato; columna brevi, glabra, pede oblongo, concavulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo paulo longiore; ovario cum pedicello glabro gracili, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji (Goromia) on the Waria [River], alt. c. 350–450 m—R. Schlechter no. 17475, flowering in Mar. 1908; no. 19921, flowering in June 1909.

From all other species of the section, this can be distinguished by the glabrous, entirely undivided labellum elongated in front; the mentum is also shorter than in any other species. The flowers are white with red markings on the lip.

247. *D. herpethophytum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 172.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1500–1800 m—R. Schlechter no. 14059, flowering in Jan. 1902; no. 18702, flowering in Nov. 1908.

The appreciably better material now in my possession enables me to give a better description of the labellum. This is furnished on each side with a round auricle above the base and the margins are bent inwards on both sides at the apex, so that it appears slightly lobed. The former description of this part may be replaced by: 'labello e ungue brevi margine basi utrinque obtuse auriculato, lamina obovato-elliptica, obtusa, marginibus juxta apicem incurvis, lamellis 2 semilunatis leviter crenulatis basi apiceque confluentibus dimidio anteriore ornato'.

The species is nearest *D. oxychilum* Schltr. in so far as the labellum is not tri-lobed in front as in the other species and also is glabrous.

The flowers are white with a rose-red-marked lip.

248. *D. decumbens* Schltr., sp. nov.

Epiphyticum, decumbens, pusillum, usque ad 20 cm altum; rhizomate decumbente, elongato, cauliformi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus erectis vel adscendentibus basi radicantibus, valde ramosis, ramisque gracilibus dense foliatis, vaginis foliorum omnino obtectis, 1–1.5 mm diametientibus; foliis erecto-patentibus, linearibus, obtusis, apice minute et inaequaliter bilobulatis, glabris, carnosulis, 1–1.8 cm longis, 2–2.5 mm latis; floribus singulis, lateralibus, in genere minutis, inversis; bractea parvula, ovario multo brevior; sepalis oblongis, obtusiusculis, glabris, 0.5 cm longis, lateralibus obliquis, usque ad apicem cohaerentibus, margine anteriore basi lobato-ampliata cum pede columnae mentum vel saccum oblongoideum obtusum 2.5 mm longum formantibus; petalis oblique elliptico-ligulatis, obtusiusculis, sepalis paulo brevioribus; labello e ungue ligulato sensim dilatato, antice trilobato, 0.5 cm longo, inter apices loborum lateralium 0.2 cm lato, superne puberulo, lamellis 2 medio ampliatis dimidio anteriore ornato, lobis lateralibus divergentibus, ovato-triangularibus, subacutis, intermedio paulo longiore, late triangulo, apiculato; columna brevi, glabra, pede satis longo, incurvulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo vix longiore; anthera quadrato-cucullata, glabra, antice truncata; ovario cum pedicello glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16652, flowering in Oct. 1907; no. 17296, flowering in Feb. 1908.

In habit the species is distinguished easily from the two preceding ones but closely approaches *D. glossorhynchoides* Schltr. From this it is distinguished by the relatively

short middle lobe of the labellum and the shorter lamellae on the latter. The flowers are white with the front of the labellum red.

var. *stenophyllum* Schltr., var. nov.

Differt a forma typica foliis longioribus et angustioribus, subacutis.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17292, flowering in Feb. 1902. [Ed.—probably 1908.]

Unfortunately, the flower material of my specimens is not sufficient to decide whether this plant should be regarded better as a separate species. In collecting it I regarded it as a variety of *D. decumbens* Schltr. and therefore neglected to sketch an accurate analysis of the flowers.

249. *D. nigricans* Schltr., sp. nov.

Epiphyticum, pusillum, c. 20 cm altum, exsiccatione nigricans; rhizomate decumbente, cauliformi, plusminusve elongato; caulibus erectis, ramosis, ramisque dense foliatis, teretibus, vaginis foliorum arcte amplexantibus omnino obtectis, c. 0.1 cm diametentibus; foliis erecto-patentibus, linearibus vel lineari-ligulatis, apice inaequaliter et obtuse bilobulatis, glabris, textura coriaceis, 1.2–2 cm longis, medio fere 2–2.5 mm latis; floribus singulis, lateralibus, in genere minutis, inversis, bractea parvula, ovario multo brevior; sepalis oblongis, obtusis, glabris, 0.5 cm longis, lateralibus falcatis, apiculatis, margine anteriore usque infra apicem cohaerentibus, basi margine anteriore lobato ampliata cum pede columnae mentum vel saccum oblongoideum obtusum 2.5 mm longum formantibus; petalis oblique elliptico-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e ungue oblongo-ligulato concavo pilosulo dimidio anteriore conspicue dilatato, antice trilobato, 0.4 cm longo, inter apices loborum lateralium 0.3 cm lato, lamellis 2 parallelis e basi usque infra apicem decurrentibus, antice ampliatis, basi in processum linearem conjunctis, lobis lateralibus falcato-divergentibus, ovato-triangularis, obtusiusculis, margine anteriore paulo undulatis, intermedio vix longiore, perlate triangulo, obtuso; columna brevi glabra, pede lineari-ligulato apice incurvulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo vix longiore; ovario cum pedicello glabro, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19613, flowering in May 1909.

In habit it resembles the previous one, but is recognised easily by drying to a black colour. The flowers are distinguished chiefly by the labellum, the broader claw which is concave and covered with longer hairs, and by the lamellae extending to the base. The flowers are yellowish white, the labellum has a yellow claw with two red spots in front.

250. *D. glossorhynchoides* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 172.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900–1000 m—R. Schlechter no. 14473, flowering in Apr. 1902; no. 20296, flowering in Sept. 1909.

Amongst all the species enumerated here this one has the smallest leaves and therefore is recognised easily. The labellum has a much longer, more quadrate front lobe, the margins of which are often bent inwards. The flowers, as in almost all species, are white with a red-marked lip.

251. *D. appendicula* Schltr., sp. nov.

Epiphyticum, pusillum, 10–25 cm altum; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, erectis vel adscendentibus, dense foliatis, vaginis foliorum arcte amplexantibus omnino vestitis, c. 1.5 mm diametentibus; foliis patentibus vel erecto-patentibus, linearibus, inaequaliter ac obtuse bilobulatis, glabris, subcarunculatis, lucidis, 1.2–2.3 cm longis, 1.75–2.75 mm latis; floribus lateralibus, singulis, in genere inter minimos, inversis; sepalis oblongo-ligulatis, subacutis, glabris, 0.5 cm longis, lateralibus falcatis, margine anteriore cohaerentibus, basi lobato-producta cum pede columnae mentum vel saccum oblongum obtusum 0.2 cm longum formantibus; petalis subfalcato-ligulatis, subacutis, dimidio superiore paululo dilatatis, glabris; labello e ungue ligulato sensim dilatato, antice trilobato, 0.5 cm longo, inter apices loborum lateralium 2.5 mm lato, lamellis 2 bene latis e tertia parte basali usque supra basin lobi intermedii ornato, ungue et medio pilosulo, lobis lateralibus oblique triangularis, obtusiusculis, intermedio distincte majore, ovato, obtusiuscule subapiculato; columna brevi, glabra, pede ligulato

apice incurvulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo vix longiore; ovario cum pedicello glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 18137, flowering in Sept. 1908.

On superficial examination this species has an astonishing resemblance to *Appendicula carnososa* Bl. It is nearest to the above-described species, but is distinguished by its general appearance and cuneate labellum with high crests. The flowers are white with a red-marked lip.

252. *D. lucidum* Schltr., sp. nov.

Epiphyticum, pusillum, 10–15 cm altum; rhizomate decumbente, brevi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus erectis vel erecto-patentibus, plus-minusve ramosis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, c. 1.5 mm diametentibus; foliis erecto-patentibus, ligulatis, obtusiusculis, lucidis, carnosulis, 1.4–2.3 cm longis, medio fere 3–4 mm latis; floribus singulis, lateralibus, in genere inter minimos, inversis; bractea parvula ovario multo brevior; sepalis oblongo-ligulatis, subacutis, glabris, 3.5 mm longis, lateralibus falcatis, margine anteriore usque ad apicem cohaerentibus, basi lobato-ampliata cum pede columnae mentum vel saccum oblongoideum obtusum 0.2 cm longum formantibus; petalis falcato-ligulatis, obtusis, glabris, apicem versus paululo dilatatis, sepalis subaequilongis; labello e ungue ligulato sensim cuneato-dilatato, antice trilobato, medio pilosulo, lamella duplici hippocrepiformi e medio usque in basin lobi intermedii ornato, 3.5 mm longo, inter apices loborum lateralium 2 mm lato, lobis lateralibus divergentibus, oblique ovato-triangularis obtusiusculis, intermedio bene longiore subquadrato cum apiculo obtuso; columna glabra, brevi, pede ligulato, apice incurvulo, clinandrii lobis lateralibus obtusatis, dorsali triangulo vix longiore; ovario cum pedicello glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19712, flowering in June 1909.

This has the smallest flowers of any species known to me. It is distinguished by its broader, shiny leaves and the short crests of the labellum are arranged like a horse-shoe. The shape of the middle lobe somewhat reminds one of *D. glossorhynchoides* Schltr. The flowers are white, with the labellum red in front.

253. *D. scopula* Schltr., sp. nov.

Epiphyticum, debile, erectum vel adscendens, usque ad 60 cm longum; rhizomate elongato, decumbente, cauliformi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus gracilibus, dimidio superiore valde ramosis, ramulisque bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, 1.5–2 mm diametentibus, caule basi c. 3 mm diametro, vaginato; foliis erecto-patentibus, linearibus, inaequaliter ac obtuse bilobulatis, glabris, 1–2.5 cm longis, medio fere 1.5–2.5 mm latis; floribus singulis, lateralibus, in genere inter minimos, inversis; sepalis oblongo-ligulatis, obtusiusculis, glabris, 0.5 cm longis, lateralibus falcatis, margine anteriore cohaerentibus, basi lobato-producta cum pede columnae mentum vel saccum oblongoideum obtusum 2.5 mm longum formantibus; petalis subfalcato-ligulatis, subacutis, basin versus paulo angustatis, glabris, sepalis subaequilongis; labello e ungue lineari infra medium conspicue cuneato-dilatato, antice trilobato, 0.4 cm longo, inter apices loborum lateralium 2 mm lato, intus medio pilosulo, lamella duplici basi connata medio ampliata e medio labelli usque in basin lobi intermedii decurrente, lobis lateralibus oblique ovatis, obtusiusculis, intermedio bene longiore, semiorbiculari-quadrato, obtuso, marginibus apice incurvulis; columna brevi, glabra, pede ligulato, apice incurvulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo altiore; anthera rotundato-cucullata, dorso gibbo donata, antice truncata, glabra; ovario cum pedicello glabro c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19146, flowering in Jan. 1909.

This species is distinguished by the peculiar broom-like growth habit. The lower part of the stem is glabrous or only densely covered with involucre leaves, while the upper part is branched markedly and covered densely with leaves. The species reminds one of *Appendicula buxifolia* Bl. The flowers are distinguished by their narrow petals and the long-clawed labellum, with fairly short crests. The flowers are white with a red-marked lip.

254. *D. disoides* Schltr., sp. nov.

Epiphyticum, flaccidum, erectum vel patulum, usque ad 35 cm longum; rhizomate decumbente, cauliformi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus vel parum ramosis, nunc radicanibus, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, 1.25–1.75 mm diametentibus; foliis erecto-patentibus, ligulatis vel oblongo-ligulatis, inaequaliter ac obtuse bilobulatis, glabris, lucidis, carnosulis, 1–1.8 cm longis, 2.75–3.5 mm medio latis; floribus singulis, lateralibus, in genere inter minimos, inversis; sepalis oblongis, obtusis, glabris, 0.5 cm longis, lateralibus falcatis, apiculatis, margine anteriore usque infra apicem cohaerentibus, basi lobato-producta cum pede columnae mentum oblongoideo-cylindricum obtusum calcariforme 2.5 mm longum formentibus; petalis oblique elliptico-spathulatis, obtusis, glabris, sepalis paulo brevioribus; labello e ungue ligulato dimidio superiore valde dilatato antice trilobato, 4.5 mm longo, inter apices loborum lateralium 3 mm lato, medio pilosulo, lamella duplici satis alta e medio labelli usque infra apicem decurrente, lobis lateralibus divaricantibus, oblique ovatis, subfalcatis, breviter acuminatis, intermedio semi-oblongo, obtuso, antice angustato, laterales superante; columna glabra, pede ligulato, clinandrii lobis lateralibus rotundatis, dorsali obtuso longiore; anthera subquadrato-cucullata, obscure umbonata, antice subretusa, glabra; ovario cum pedicello glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17118, flowering in Jan. 1908.

The flowers of this species externally remind one of certain species of *Disa*, since the lateral lobes form a spur-like mentum which strikingly resembles the helmet of some species of that genus of the *Ophrydinae*. In habit it resembles the following species, but is distinguished easily by the lip. The flowers are white with the lip red-dotted in front.

255. *D. dischorensis* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, 20–30 cm altum; rhizomate decumbente brevi; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus paulo compressis, simplicibus vel subsimplicibus, bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, c. 0.2 cm latis; foliis erectis vel suberectis, lanceolatis vel elliptico-lanceolatis, subacutis, glabris, carnosulis, lucidis, basi subpetiolato-contractis, 1.5–2.5 cm longis; floribus lateralibus, singulis, in genere inter minimos, inversis; bractea parvula, ovario multo brevior; sepalis oblongis, obtusis, glabris, 5.5 cm longis, lateralibus obliquis, margine anteriore cohaerentibus, basi lobato-producta cum pede columnae mentum sacciforme obtusum c. 2.5 mm longum formentibus; petalis oblique oblongo-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi ligulato-unguiculata dimidio superiore late cuneato, antice trilobulato, superne pilosulo, 0.5 cm longo, inter apices loborum lateralium 3.5 mm lato, per medium bilamellato, lamellis infra medium paulo constrictis, dimidio superiore labelli satis altis, antice truncatis, in ungue natis, usque infra apicem decurrentibus, lobis lateralibus antice truncatis, leviter undulatis, obtusis, intermedio paulo longiore, semiquadrato, antice obtuse trilobulato cum lobulo intermedio paulo longiore; columna semitereti, glabra, pede foveolato, clinandrii lobis lateralibus rotundatis, dorsali triangulo paulo longiore; anthera rotundato-cucullata, glabra, antice subretusa; ovario cum pedicello glabro, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19682, flowering in June 1909.

A very well characterised species, which in habit resembles *D. oxychilum* Schltr. and, above all, is somewhat similar to *D. hippocrepiferum* Schltr. It is distinguished easily by the peculiar leaves. The plant also reminds me, in its foliage, of some South African *Rutaceae* of the genus *Adenandra*. In floral characters the species is distinguished by the slightly trifid middle lobe of the labellum and the shape of the crests. The flowers are white, the labellum marked with red.

256. *D. hippocrepiferum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 50 cm longum; rhizomate cauliformi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, interdum radicanibus, teretiusculis, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, 1.5–1.75 mm diametentibus; foliis erectis, lanceolatis, obtusiusculis, inaequaliter bilobulatis, basi subpetiolato-contractis, glabris, coriaceis, 1.7–3 cm longis; infra medium 0.3–0.4 cm latis; floribus singulis, lateralibus, in genere inter minimos, inversis; sepalis oblongis, obtusis, glabris, 0.7 cm longis, margine

antere cohaerentibus, basi lobato-producta cum pede columnae mentum sacciforme obtusum 3.5 mm longum formantibus; petalis obliquis, angustius elliptico-spathulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi breviter unguiculato-attenuato late cuneato, antice trilobato, dimidio inferiore minute puberulo, medio callo hippocrepiformi cruribus parallelis usque in basin lobi intermedii decurrente ornato, 6.5 mm longo, inter apices loborum lateralium 5.5 mm lato, lobis lateralibus leviter divergentibus, oblique triangulis, obtusis, intermedio quadrato, obtuse apiculato, marginibus juxta apicem incurvis, laterales distincte superante; columna glabra, pede ligulato, curvatulo, clinandri lobis lateralibus rotundatis, dorsali paulo longiore obtuso; anthera perlate cordato-cucullata, glabra, antice truncata; ovario cum pedicello glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18736, flowering in Nov. 1908.

As mentioned above, this species has a certain resemblance in habit to *D. dischorens* Schltr. Its flowers are larger than those of any other species of the section. The labellum is very characteristic with a horse-shoe-shaped callus in the middle. As in the case of nearly all species, the flowers are white with a red-marked lip.

72. *Pseuderia* Schltr.

In the course of work on the Papuan [Papuasian] species of *Dendrobium*, I have lately come to the conclusion that the group, which was named formerly by me *Pseudo-Eria*, must be excluded from the genus; I have therefore treated it here as a separate genus—*Pseuderia* Schltr. Since I have formed this opinion only recently it is not contained in the synopsis of the genera of the *Dendrobiinae* (p. 496) and must now be inserted after *Dendrobium* Sw. [Ed.—inserted by the translators.] All the species belonging to this genus are distinguished quite readily from all *Dendrobiinae*, by their long-creeping habit, either as undershrubs on the ground or scandent on trunks of tall growing trees. They often reach very considerable size since I have seen them completely cover tree-trunks up to a height of several metres. The leaves are different in texture from those of *Dendrobium* Sw. and the inflorescences are noteworthy for their shortened side shoots, as I have already explained. The chief characteristics, however, are undoubtedly found in the flowers, which always have a small, undivided labellum and a slender, bent column from which the foot is absent. These are characters which militate against its insertion in the genus *Dendrobium* Sw. Finally, the anther differs considerably from that of *Dendrobium*, and the fruits are more reminiscent of *Eria* than *Dendrobium*.

Pseuderia Schltr., nov. gen.

Sepala ligulata, ringentia, lateralia plus minus falcata, saepe quam intermedium breviora. Petala sepalis plus minus similia, subfalcata, labellum integrum rhomboideum vel lanceolatum, superne plus minus puberulum, sepalis vulgo brevius, carinis 2 e basi antice confluentibus. Columna gracilis, leviter arcuata, semiteres, apoda, glabra; clinandrio haud bene evoluto, vulgo plus minus dentato. Anthera ovato-cucullata, basi plus minus cordata, medio callo cariniformi obtuso satis alto ornata. Pollinia 4 inaequalia, 2-nis coalita. Capsula cylindrica, perigonio viridescens coronata.

Suffrutescentes vagantes vel alte scandentes ramosae, bene foliatae, radicales; foliis erecto-patentibus ovalibus vel lanceolatis vulgo acuminatis, glabris, textura coriaceo-papyraceis, vulgo lucidis; inflorescentiis pseudo-lateralibus racemosis, post anthesin vulgo mox basi lignescentibus, persistentibus, bracteis plus minus foliaceis obsessis, species 7 adhuc notae insularum Moluccarum et Novae Guineae incolae.

In addition to the species listed here, *P. foliosa* (Brogn.) Schltr. (*Dendrobium foliosum* Brogn.) from the Moluccas, belongs to this group.

Since I already have detailed the reasons which influenced me to keep the genus separate from *Dendrobium* Sw., I will confine my comments to the habit and distribution of *Pseuderia* Schltr.

They are found nearly always in constant damp locations in the primary forest where they climb on thick tree-trunks, reaching a height of several metres, however,

never losing contact with the ground since these species are terrestrial and never epiphytic. They particularly favour damp places in the forests of the hill-country and usually do not occur at higher altitudes. Only two species, *P. similis* Schltr. and *P. frutex* Schltr., have I found growing in the rain-forest formations.

In the structure of the flowers these species are related closely and without a detailed examination it is not always easy to separate them. The leaves, however, offer good distinguishing characteristics which, in their shape and structure, are subject to little variation. Some species dry to a black colour, while others to a pale brown.

1. *P. similis* Schltr. [Ed.—comb. nov.]

Dendrobium simile Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 175.

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 14491, flowering in Apr. 1902.

This species dries to a pale brown colour. Together with *P. frutex* Schltr., it is distinguished from all the rest by its narrow leaves.

The flowers are white with red-dotted sepals.

2. *P. frutex* Schltr. [Ed.—comb. nov.]

Dendrobium frutex Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 175.

Dendrobium foliosum Krzl., in Engl. Pflanzenr. IV, 50, II. B. 21 (1910), p. 197 (p.p.).

Kaiser-Wilhelms-Land: In humus in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 14424, flowering in Apr. 1902.

Kränzlin has united this species with *Dendrobium foliosum* Brogn. and, as it appears to me, has made his description of the latter from my description of *Dendrobium frutex* Schltr. However, this plant is altogether different from the latter and is recognised easily on superficial observation by its narrow leaves.

P. foliosa (Brogn.) Schltr. seems to have its habitat in the Moluccas, for none of the specimens I have seen from New Guinea belong to this species. For instance, *Eria foliosa* (Brogn.) Ridl. is certainly not identical with *Dendrobium foliosum* Brogn., which dries to a dark brown colour and is a much more robust plant. *P. frutex* Schltr. dries to a dark greyish brown. The flowers are yellowish, flecked with brown.

3. *P. pauciflora* Schltr., sp. nov.

Terrestris, in truncos arborum scandens, usque ad 2 m alta, ramosa, sicca nigricans; caulibus ramisque teretibus, glabris, bene foliatis, vaginis foliorum alte et arcte amplexentibus omnino obtectis, ramis florentibus c. 0.3 cm diametentibus; foliis erecto-patentibus, anguste ellipticis, acuminatis, obliquis, 6–9.5 cm longis, medio fere 1.5–2.5 cm latis; racemis lateralibus, pauci-(1–3)-floris, brevibus; bracteis ellipticis, patentibus, ovario multo brevioribus; floribus erecto-patentibus, in genere inter majores; sepalis oblongo-ligulatis, apiculatis, glabris, intermedio 1.3 cm longo, lateralibus falcatis, intermedio paulo brevioribus; petalis lineari-falcatis, obtusis, glabris, sepalis bene brevioribus, c. 1 cm longis; labello elliptico, obtusiusculo, c. 0.8 cm longo, 0.4 cm medio lato, superne minute puberulo, carina duplici e basi infra medium confluyente; columna semitereti, glabra, apoda, labello paulo tantum brevior; clinandrio dorso denticulato; ovario cylindrico, glabro, in speciminibus jam defloratis 2.5 cm longo, verosimiliter sub anthesi c. 1.5 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests near the Djamu Gorge (Minjem District), alt. c. 400 m—R. Schlechter no. 16810, flowering in Nov. 1907.

From the above-mentioned species, this one is distinguished by the shorter, but broader, black-drying leaves. The flowers are also larger and are arranged in shorter, few-flowered racemes. The petals are narrower than in the other species. The flowers are yellowish, very finely red-dotted and with the progressive development of the fruit, gradually turn green, in a somewhat similar manner to *Phalaenopsis Lueddemanniana* Rchb. f. thus forming a green crown on the fruit, the lip alone soon withers and shrivels up.

4. *P. floribunda* Schltr., sp. nov.

Terrestris, in truncos arborum scandens, ramosa, usque ad 3 m alta et ultra, sicca nigricans; ramis florentibus bene foliatis, vaginis foliorum arcte amplexantibus omnino obtectis, 0.3–0.4 cm diametentibus; foliis erecto-patentibus, ellipticis, acuminatis, obliquis, 7–10 cm longis, medio fere 2–3 cm latis, basi cuneatis; racemis lateralibus brevibus, subdense 3–5-floris, basi mox lignescentibus; bracteis ellipticis, obtusiusculis, glabris, ovario multo brevioribus; floribus erecto-patentibus in genere mediocribus; sepalis ligulatis, apiculatis, glabris, intermedio 1.6 cm longo, lateralibus falcatis, distincte brevioribus; petalis lineari-ligulatis, obtusis, falcatis, c. 1 cm longis; labello curvato late ovali, obtuso, superne dense puberulo, 0.8 cm longo, medio 4.5 mm lato, carinis 2 e basi antice confluentibus usque supra medium decurrentibus; columna arcuata, gracili, 0.8 cm longa, glabra, clinandrio dorso leviter dentato; anthera ovato-cordata, umbone alto obtuso carinata, glabra; ovario cylindrico, glabro, gracili, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In the forests near the Kaulo Base in damp, moist places, on trees, climbing to three metres and higher, alt. c. 150 m—R. Schlechter no. 17830, flowering in June 1908.

This species is distinguished by the profusion of flowers. It dries to a black colour, as in *P. pauciflora* Schltr., but with much broader leaves and has larger, several-flowered inflorescences. The hairiness on the upper side of the lip is fairly dense. The petals are remarkably short; likewise the lateral sepals, the latter considerably exceeding the petals in length. The flowers are pale yellow and dotted with red. It is possible that the plant collected by H.O. Forbes during his Sogeri Expedition under no. 867 belongs here. In that case *Eria foliosa* Ridl. would be placed here as a synonym.

5. *P. wariana* Schltr., sp. nov.

Terrestris, in truncos arborum scandens, ramosa, 3 m alta et ultra; ramis florentibus bene foliatis, teretiusculis, vaginis foliorum omnino obtectis, c. 3 mm diametentibus; foliis erecto-patentibus, lanceolato-ellipticis, acuminatis, glabris, obliquis, basi cuneatis, 9–13 cm longis, medio fere 1–1.5 cm latis; racemis lateralibus, sublaxe 2–4-floris; bracteis ovalibus recurvulis, ovario multo brevioribus; floribus erecto-patentibus, in genere inter majores; sepalis ligulatis, obtusiusculis, glabris, 1.4 cm longis, lateralibus falcatis, apiculatis, subaequilongis; petalis lineari-falcatis, obtusis, c. 1.1 cm longis, glabris; labello e basi cuneata elliptico, obtuso, superne dense papilloso-puberulo, 0.8 cm longo, supra medium vel medio 0.4 cm lato, carinis 2 e basi antice conjunctis, usque in medium decurrentibus; columna semitereti, arcuata, glabra, apoda, labello paulo brevior, clinandrio irregulariter paucidentato; ovario gracili, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: In humus in the forests of the mountain slopes near Jaduna, on the Waria [River], alt. c. 300 m—R. Schlechter no. 19272, flowering in Apr. 1909.

This plant dries to a dark greyish brown. Probably it is related most closely to *P. trachychila* (Krzl.) Schltr. amongst the Papuan [Papuan] species, but has considerably thinner branches and much smaller leaves. *P. foliosa* (Bogn.) Schltr. might still be closer, but it has appreciably broader leaves. The flowers are yellowish, red-dotted on the outside.

6. *P. trachychila* (Krzl.) Schltr. [Ed.—comb. nov.]

Dendrobium trachychilum Krzl., in K. Schum. et Laut., Nachtr. (1905), p. 179.

Kaiser-Wilhelms-Land: Bismarck Range—Rodatz et Kling (Ramu Expedition), no. 203.

The statement of locality 'Bismarck Range' does not appear to be quite correct here since neither Rodatz nor Kling penetrated into the Bismarck Range on that expedition, and neither could they have climbed to any appreciable height in the foothills they visited. We can thus regard the species with certainty as an inhabitant of the forests of the hill-country. In 1902, I observed a *Pseuderia*, though unfortunately not in flower, at the foot of the Bismarck Range on the borders of the forests and I presume that this is the same species. Kränzlin, who has forgotten this, his own species,

in his monograph, so far as I can see from the index, unfortunately compares it with *D. scabrilingue* Lindl., *D. involutum* Lindl. and *D. Gazellae* Krzl., three species of *Dendrobium* with which *P. trachychila* Schltr. has nothing in common. Had I not seen the Type in the Berlin Herbarium, naturally I would not have thought that this species could be a *Pseuderia*.

From all other species, this one is distinguished by the large leaves.

73. *Eria* Lindl.

As for *Dendrobium* Sw., so here for the genus *Eria* Lindl., Kränzlin has written a treatise and with the same results. I have explained already in my introduction to the group of the *Dendrobiinae* [on page 496] how I proposed to circumscribe the genus *Eria*; in short I practically agree with the Lindleyan stand point. It only remains to establish the manner in which we can best separate the species of the Papuan [Papuanian] flora into sections.

The genus now numbers approximately 300 species and it has, therefore, like *Dendrobium*, increased during recent years to unexpected proportions. It would lead us too far to give a minute division of this genus, since already we have circumscribed the group fairly well which has repeatedly been discussed by botanists like J.J. Smith and R.G. Leavitt and myself. Therefore, I shall deal only with those sections which, as far as we know at present, should receive consideration for New Guinea. For this purpose it will, unfortunately, become necessary to add a few remarks for the better understanding of the introduction. The genus may be divided best into three sub-genera, of which the first is founded on the convoluted condition of the [leaf-] buds, and the two others on distinctive vegetative characters.

I therefore divide it as follows:—

The sub-genus *Eneileria* is distinguished from all other *Eria*-species by the convoluted buds. It was for this reason that Pfitzer removed from the genus all species belonging to *Eneileria* and placed them under *Tainia* Bl. I do not approve of such a transfer, on account of the obvious relationship which these plants bear to the rest of the *Eria*-species. It seems to me merely proof that we should not attach undue importance to the bud condition here or in the *Liparidinae*.

The second sub-genus, *Eu-Eria*, comprises by far the largest part of the section. It is more polymorphic than the other two sub-genera and includes all such forms with duplicative buds and which have more-or-less thick, short stems, usually transformed into distinct pseudobulbs. In some of these species the stems may reach a considerable length, but they are always fleshy (though only in the upper part), and crowned with a tuft of leaves.

In the third sub-genus, *Cauleria*, I have included all those forms which have elongated, uniformly leaved stems. This concept does not, however, correspond with what Kränzlin understands by the genus *Trichotosia*, because a whole series of other forms is included, to which I shall refer later on.

I have combined the above information into the following key:—

- | | | |
|----|--|--------------------|
| A. | Bud condition of leaves convolute | — <i>Eneileria</i> |
| B. | Bud condition of leaves duplicate | |
| 1. | Stems shortened, more-or-less changed into fleshy pseudobulbs, with a few leaves or only leafy in the upper part | — <i>Eu-Eria</i> |
| 2. | Stems elongated, not fleshy, uniformly leaved | — <i>Cauleria</i> |

We now move to the division into sections and obtain the following ones for the Papuan [Papuanian] flora:

The first sub-genus *Eneileria* contains only one section, which I have named *Goniorhabdos*, avoiding an adjectival term for a section.

§ 1. *Goniorhabdos*. This section corresponds perfectly with the group *Convolutae* of J.J. Smith. The name chosen by me expresses the character of the species of the section, viz. the tendency to develop a sharp, two or more-edged pedicel. The Type of this section is *Eria javanica* Bl. (*E. stellata* Lindl.).

The second sub-genus, *Eu-Eria*, contains a whole series of sections, of which only three need consideration for our Territory. I would like to mention that—in recent years—the sections of Lindley and Blume have been misunderstood often, especially by Hooker f. followed by Ridley and Kränzlin, although J.J. Smith has done much to present a clear summary. The concept of the section *Urostachya* in particular has often been interpreted wrongly. Not much better, indeed, has been the fate of *Aeridostachya* while *Hymeneria* has been expanded unnecessarily. The sections represented in our Territory are:—

§ 2. *Aeridostachya*, which only includes the species which are related to *E. aeridostachya* Lindl., i.e. which possess its habit and characteristic flower-structure, in which a small and usually undivided labellum is very typical. The flowers always are covered densely with stellate hairs.

§ 3. *Polyura* is a section which I have characterised previously.* It is distinguished by a small labellum, usually entire, or obscurely divided into segments, the lamina furnished with two or three short, longitudinal crests. The Type of the section is *E. polyura* Lindl. The flowers are usually glabrous; occasionally the ovary is covered with a few scattered, stellate hairs.

§ 4. *Hymeneria* may prove the largest section of the genus and will be discussed more fully later on. Here the labellum is usually tripartite and is provided with various crests, ridges or other excrescences on the lamina. The flowers are always of a very delicate texture, often glabrous, at other times beset with scattered stellate hairs on the outside. In our Territory a series of different forms occurs, to which I will refer later.

The third sub-genus, *Cauleria*, is represented in New Guinea by four sections of which only three have been recorded so far from German New Guinea. I mention the four here which, apart from *Dilochiopsis*, are all sections into which the sub-genus is divided.

§ 5. *Mycaranthes*. It is more correct to designate this section as *Mycaranthes* rather than *Eriura*, since Lindley intended to retain the Blumean name, but having interpreted *Mycaranthes* wrongly, he applied this name to other plants. It is characterised by the labellum which is always small, and by the flowers which are beset densely with stellate hairs on the outside. This section is quite a natural one containing species with well-leaved stems of which some undoubtedly have terminal flower-stalks. This fact is further proof of the assertion which I made on p. 497, to the effect that the *Dendrobiinae* are normally acanthous and not pleuranthous orchids.

[Ed.—*Acranthae*—Inflorescence terminal on a single sympodial shoot.

Pleuranthae—Inflorescence on special lateral shoots and not terminal segments of a sympodium.]

In this way the *Trichosma* question is explained fully and the genus correctly placed in *Dendrobiinae*.

*cf. Fedde, Repertor. IX (1910), p. 106, X (1911), p. 90.

§ 6. *Aporodes* is a small section of probably about four species, the inflorescences being strongly reminiscent of *Cylindrolobus*, but having long-creeping rhizomes and erect stems with equitant leaves. In the structure of the flower, the labellum differs somewhat from that of *Cylindrolobus*.

At present only one species is known from Papuasia, occurring in Dutch New Guinea. The plants are always glabrous.

§ 7. *Cylindrolobus* may perhaps have to be divided later on into two sections. In New Guinea only representatives of the first *Cylindrolobus*-forms occur, while those species related to *Eria leptocarpa* Hook. f., which vary a great deal in their flowers, appear to be of western Malayan origin.

The flowers, as well as the whole plant, of genuine *Cylindrolobus*-species, are always glabrous.

§ 8. *Trichotosia* is a section which, in New Guinea, occurs in a considerable number of forms. In habit it is similar to the last section, but has more-or-less markedly hairy leaves and the flowers are densely hairy on the outside. A conspicuous characteristic of all the species is the shortened ovary. In this section only simple, and never stellate, hairs occur.

In considering the separate sections I will discuss their geographical distribution and more particularly the occurrence of the individual species in New Guinea.

New Guinea is relatively poor in species of the genus *Eria*. The centre of dispersal is to be looked for more to the west, perhaps in the Malay Peninsula, although various forms have penetrated towards the east as far as the Viti [Fiji] and Samoan Islands. So far as I can ascertain, barely 30 species are known from New Guinea, which seems strange when we take into account the really astonishing development of the related genus *Dendrobium*. Of course, a not inconsiderable number of new species will be described here, yet the percentage of the total species (300) contained in the entire genus still remains small.

§ 1. *Goniorhabdos*

This small section, of which about half a dozen species are known at present, has produced in New Guinea some striking forms, three endemic species having already been described from there, and I shall have a few more to add.

The species are all epiphytic and are inhabitants chiefly of the plains and hill-forests. One species, *E. Micholitzii* Krzl., is found occasionally on the coast; *E. ramuana* Schltr. ascends from the hills to high up in the mountains, while the less common *E. kaniensis* Schltr. occurs only in mist-forest formations.

Characteristic for most species is the almost glabrous, sharp-edged flower-stalk. The flowers are generally white or pale yellow in colour, but brown or yellow specks are found on the labellum of *E. ramuana* Schltr. and *E. imitans* Schltr., which give the somewhat translucent flower a brighter appearance.

The distribution of the section reaches from the Himalayas across India, the Malay Archipelago, the Philippines, northwards to Formosa and to New Guinea in an eastern direction.

1. *E. kaniensis* Schltr., sp. nov.

Epiphytica, erecta, 20–30 cm alta; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, villosulis; pseudobulbis ovoideis vel ellipsoideis, 4-angulatis, apice 2–3-foliatis, 3–4 cm altis, medio vel infra medium 1.3–2 cm diametro; foliis erecto-patentibus vel suberectis, oblanceolato-ellipticis, acutis vel breviter acuminatis, basi in petiolum satis longum sensim attenuatis, glabris, petiolo incluso 18–25 cm longis, supra medium 1.7–2.3 cm latis; scapis in axillis foliorum natis, gracilibus, folia aequantibus vel brevioribus, laxe pauci-(3–6)-floris; pedunculo vaginulis paucis

amplectentibus obsessis, ancipitibus, glabris; bracteis ovalibus, breviter acuminatis, ovario sessili aequilongis vel paulo longioribus; floribus mediocribus, erecto-patentibus, glabris; sepalis lanceolatis, subacutis, 1.8 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum conicum obtusum 3 mm longum formantibus; petalis oblique lanceolatis, acutis, sepalis paulo brevioribus; labello elliptico, subacuto, integerrimo, 1.8 cm longo, medio fere 0.6 cm lato, nervis 5 supra medium incrassatulis ornato, caeterum nudo; columna semitereti, glabra, labello fere duplo brevior, pede leviter incurvulo, clinandrii lobis lateralibus brevibus bidentatis, dorsali rotundato minute serrulato cum apiculo; anthera conico-cucullata, obtusissima, antice alte excisa et umbone bicurvi ornata; ovario triquetro, 0.6 cm longo, glabro.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17642, flowering in May 1908.

One of the most characteristic species one could imagine. Doubtless it belongs to the section *Goniorhabdos*, but is recognised easily by the completely undivided lip and the loose inflorescences with two-edged stalks. Of other species in the section only *E. Goldschmidtiana* Schltr. from Formosa bears any resemblance in habit. The flowers are pale yellow.

2. *E. ramuana* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 183.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16483, flowering in Sept. 1907; on trees in the forests near Toliba, alt. c. 300 m—R. Schlechter no. 18951, flowering in Dec. 1908; on trees in the forests on the upper Ramu [River], alt. c. 100 m—R. Schlechter no. 13912, flowering in Jan. 1902.

All the numbers enumerated belong undoubtedly to this somewhat variable plant. The specimens which I have now brought back agree very well with the Type from the Ramu and differ hardly at all in the breadth of the middle lobe. The flowers are yellowish white; the labellum with a dark brown spot in the middle.

var. *wariana* Schltr., var. nov.

Differt a forma typica labello paulo minore, lobo intermedio minore, apiculato.

Kaiser-Wilhelms-Land: On trees in the mountain forests at Pema, on the Waria [River], alt. c. 250 m—R. Schlechter no. 19400, flowering in May 1909; on trees in the forests on the Govidjoa [Creek] (Waria District), alt. c. 800 m—R. Schlechter no. 19817. [Ed.—no date cited, possibly June 1909.]

This variety occupies a place intermediate between *E. ramuana* Schltr. and *E. imbricata* J.J. Sm., which makes it very doubtful whether the latter should be retained. Likewise, in the shape of the pseudobulbs, there appears to be marked variability, for the specimens from the Govidjoa have short, almost ovate pseudobulbs, while those from other localities have much taller or longer pseudobulbs.

3. *E. imitans* Schltr., sp. nov.

Epiphytica, valida; pseudobulbis ovoideo-cylindraceis, c. 3-foliatis, 4-angulatis, apice vel infra apicem 1.5 cm latis; foliis elliptico-lanceolatis, acuminatis, basi sensim angustatis, glabris, usque ad 55 cm longis, medio fere usque ad 6 cm latis; scapis versus apicem pseudobulborum natis, illis *E. ramuanae* Schltr. similis, angulatis, pedunculo c. 30 cm longo, vaginulis pluribus subfalcatis obsessis; bracteis erecto-patentibus ovato-ellipticis, acuminatis, subimbricantibus, ovarium superantibus; floribus erecto-patentibus, illis *E. ramuanae* Schltr. similibus; sepalis ellipticis acuminatis, extus basi sparsim squamulosi, caeterum glabris, 1.7 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 0.5 cm longum formantibus; petalis subfalcatis, oblique elliptico-lanceolatis, acutis, glabris, sepalis paulo brevioribus; labello e basi unguiculato-cuneata supra medium trilobo, 1.1 cm longo, inter apices loborum lateralium 0.9 cm lato, callo oblanceolato e basi usque in medium ornato, lobis lateralibus falcato-oblongis, obtusis, glabris, intermedio e isthmo brevi suborbiculari, apiculato, 4.5 mm lato; columna semitereti, glabra, labello paulo brevior, pede subrecto; clinandrio subintegro, dorso breviter acuminato; ovario sessili cylindraceo, minute et sparsim squamuloso, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Damum, alt. c. 300 m—R. Schlechter no. 16134, flowering in May 1907.

This species bears a close resemblance externally to *E. ramuana* Schltr., but specifically is well separated by the entirely different labellum. My specimen, which was brought to me by a native, is, unfortunately, not quite complete, since the root-stock and lower part of the pseudobulb are missing. There is, however, no doubt that this is a separate species in which differences in the labellum are two important for it to be united with *E. ramuana* Schltr. The flowers are yellowish, the labellum with a brown spot.

4. *E. Micholitzii* Krzl., in Österr. Bot. Zeitschr. (1894), p. 459.

E. pseudo-stellata Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 182.

E. papuana Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 II (1911), p. 25 (nec J.J.Sm.).

E. javanica Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 II (1911), p. 26 (nec Bl.) p.p.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], alt. c. 500 m—R. Schlechter no. 20016, flowering in Sept. 1909; frequently on trees in the beach swamps near Friedrich-Wilhelmshafen—W. Micholitz, flowering in Sept. 1893; on trees in the forests at the Minjem Gorge, alt. c. 75 m—R. Schlechter no. 16571, flowering in Sept. 1907; on trees near the Saugueti Base, at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18878, flowering in Nov. 1908.

Neu-Mecklenburg: On trees at the beach near Karu—R. Schlechter no. 14625, flowering in June 1902.

I cannot quite understand why Kränzlin has again renamed this plant, since, in the first place, he described it (1894) as *E. Micholitziana* Krzl., which appeared only in 1900. Therefore, the species before us is not *E. Micholitziana* Krzl., as he himself writes, but *E. Micholitzii* Krzl., which, under the circumstances, could stand next to the second species.

I do not doubt now that my *E. pseudo-stellata* Schltr. is identical with Kränzlin's species, but who could have expected that a plant which is regarded as a close relative of *E. andamanica* Hook. f., is, in fact, related very closely to the not entirely unknown *E. javanica* Bl. (*E. stellata* Lindl.). I infer its identity, not only from the description, but also from its locality, since *E. pseudo-stellata* Schltr. is a common species on the coast near Friedrich-Wilhelmshafen. The flowers are white with a yellow central crest on the labellum. Sometimes the column has an orange-yellow spot at the base.

§ 2. *Aeridostachya*

Only recently has this section been examined more thoroughly to arrive at the surprising result, that a whole series of plants, like *E. aeridostachya* Lindl., has been described, which represented in fact widely separated species, having a fairly local distribution. The section often is interpreted incorrectly. Kränzlin, for instance, in his monograph has included in it various species which do not belong there. This may be seen by examining the illustrations of *E. verticillaris* Krzl. and *E. validissima* Krzl., both of which cannot possibly belong to *Aeridostachya*.

The distribution of this section, in the light of our present knowledge, extends from the Malay Peninsula and Sumatra, across Java, Borneo and the Philippines to the Celebes. There are now two species from German New Guinea, whereby the range is extended considerably further to the east.

As in other countries, the *Aeridostachya*-species in New Guinea are epiphytes of the mist-forests. They grow mostly as solitary scattered specimens on tall trees and this is probably the reason why many species have been found only in recent years.

5. *E. Feddeana* Schltr., sp. nov.

Epiphytica, valida, 30–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis crassis ellipsoideo cylindraceis, paululo compressis, 7–8 cm altis, medio fere 2.5 cm latis, apice 3-foliatis, primum vaginis foliaceis mox decadentibus obtectis; foliis erectis vel erecto-patentibus, elliptico-ligulatis, acutis, basi sensim in petiolum satis longum angustatis, glabris, textura coriaceis, 28–34 cm longis, supra medium 3.5–4.2 cm latis; racemis lateralibus in dimidio superiore pseudobulborum natis, longius pedunculatis, dense multifloris, cylindraceis, folia aequantibus, pedunculo teretiusculo, densius et brevissime stellato-puberulo, 15–18 cm longo, racemo ipso c. 15 cm longo, c. 2.5 cm diametiente; bracteis minutis ovalibus, obtusis, stellato-puberulis; floribus illis *E. aeridostachyae* Ldl. similibus et fere aequimagnis, extus dense stellato-tomentosulis, intus glabris; sepalis intermedio oblongo, obtusiusculo, 0.4 cm longo, lateralibus falcato-obliquis, apiculatis, 0.3 cm longis, basi margine anteriore valde lobato-ampliata cum pede columnae mentum oblongoideum obtusum 4.5 mm longum formantibus; petalis subfalcato-linearibus, obtusis, glabris, sepalis intermedio paulo brevioribus; labello circuitu angustius oblongo, concavulo, minute apiculato, quarta parte basali leviter subcucullato-contracto, supra basin intus callo humillimo semiorbiculari donato, superne minutissime papilloso, marginibus leviter undulato, 3.75 mm longo, medio 1.25 mm lato; columna brevi, pede ligulato, nudo, clinandrii lobis lateralibus obliquis humillimis truncatis, dorsali parvulo; anthera reniformicucullata, glabra, antice trilobata; ovario cum pedicello brevi subclavato, dense stellato-tomentosulo, c. 1 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17509, flowering in Mar. 1908.

This species is related to *E. falcata* J.J. Sm. from Java, but is distinguished by its longer, pointed leaves, the more slender-stemmed inflorescence, the elongated dorsal sepal and the finely papillose labellum slightly exceeding the rostellum in length and more contracted at the base. The related species can be distinguished only after a careful analysis.

The flowers are pale yellow inside and thickly covered with brown stellate hairs on the outside. The labellum is red-yellow.

6. *E. gobiensis* Schltr., sp. nov.

Epiphytica, erecta, valida, c. 40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis oblongoideis, paulo compressis, c. 7 cm longis, medio fere 2.7 cm latis, trifoliatis, vaginis foliaceis primum obtectis; foliis erectis vel erecto-patentibus, elliptico-ligulatis, acutis, basi sensim in petiolum angustatis, glabris, textura coriaceis, 25–33 cm longis, supra medium 4–4.5 cm latis; racemis lateralibus in dimidio superiore pseudobulborum, breviter pedunculatis, quam folia subduplo brevioribus, pedunculo dense et brevissime stellato-tomentosulo c. 10 cm longo, racemo ipso cylindrico, dense multifloro c. 2.2 cm diametiente; bracteis minutis, ovalibus, obtusis, dense stellato-tomentosulis; floribus patentibus, in sectione inter minores, extus dense stellato-tomentosulis; sepalis intermedio oblongo, obtuso, 3.5 mm longo, lateralibus falcato-obliquis, apiculatis, 2.5 mm longis, margine anteriore valde lobato-ampliata cum pede columnae mentum oblongoideum obtusum 0.4 cm longum formantibus; petalis falcatis, oblongo-ligulatis, obtusis, glabris, sepalis intermedio paulo brevioribus; labello circuitu oblongo-ligulato, obtusiusculo, glabro, rostellum superante 0.5 cm longo, medio fere 0.2 cm lato, basi concavo, supra basin callo obtusissimo ornato, in tertia parte anteriore trilobato, lobis lateralibus parvulis obtusis, intermedio amplo margine utrinque 2-plicato, parte inferiore labelli paululo tantum angustiore; columna brevi, pede ligulato medio serie lunata verrucarum ornato, clinandrii lobis lateralibus parvulis, dorsali subquadrato trilobulato amplo; stigmatibus margine inferiore calloso-marginato; anthera subreniformi-cucullata, antice trilobulata, glabra; ovario cum pedicello clavato, dense stellato-tomentosulo, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the Waria [River], near Gobi, alt. c. 800 m—R. Schlechter no. 19556, flowering in May 1909.

This species is characterised exceedingly well both in the shape of the lip and by the column. The column-foot exhibits similar excrescences to those which I have observed previously in *E. trichotaenia* Schltr. from Sumatra, with which *E. gobiensis* Schltr. is related, but in that species a simple, thickened and hairy transverse stripe is present, whereas here we have a series of warts linked together like a 'string-of-pearls'. Very noticeable also is a similar thickening on the lower stigmatic margin and behind,

the strikingly large clinandrium. The flowers are pale yellow, thickly studded with brown stellate hairs on the outside. The row of warts on the column-foot and lower stigmatic margin is red and the anther has a dark red spot.

§ 3. *Polyura*

The centre of dispersal for this section is evidently in the Philippines from which R.G. Leavitt (Philipp. Jour. Sci. IV (1910), p. 203 p.p.) has recorded no less than ten species belonging to it. He places these plants, however, in *Urostachya*, but this concept of the Lindleyan section is incorrect, since the species belonging to *Urostachya* are related to *E. floribunda* Lindl., the labellum of which has been illustrated accurately by Leavitt (Philipp. Jour. Sci. IV (1909), p. 231, fig. 10.) and has a totally different structure.

It appears that from the Philippines towards the south-west only a small dispersal of the section has taken place, as in the case of *E. tenuiflora* Ridl. on the Malay Peninsula. Towards the south-east, however, we find representatives in the Celebes, New Guinea, New Caledonia and as far as Samoa and the Viti [Fiji] Islands, which as in many other cases, form the eastern limits of distribution.

The section is not very rich in species and at present probably does not exceed 25 known species, but it is expected that with the exploration of the Moluccas quite a number will become known, the same applies to New Guinea.

Up to the present I know of six species occurring in our Territory, these are found mainly as epiphytes in the mist-forest formations. However, there are two, *E. microglossa* Schltr. and *E. cycloglossa* Schltr., which occur at a lower altitude in the upper forests of the hill-country. The species are all distinguished by their very thin, delicate roots. *E. Baeuerleniana* Krzl. from British Papua, probably also belongs to this section.

7. *E. microglossa* Schltr., sp. nov.

Epiphytica, erecta, c. 20 cm alta; rhizomate brevi, decumbente, carnosio; radibus tenuissimis, filiformibus, elongatis, flexuosis, minute puberulis; pseudobulbis 1–1.5 cm distantibus, cylindraceis, carnosio, vaginis paucis arcte amplexantibus mox desiccantibus omnino obtectis, apice 2–3-foliatis, 8–12 cm longis, supra medium 3–5 mm diametentibus; foliis erecto-patentibus, lineari-ligulatis, obtusiusculis, basi sensim paulo angustatis, glabris, 8–13 cm longis, medio fere 0.8–1.3 cm latis; racemis versus apices pseudobulborum lateralibus, laxe plurifloris, foliis duplo vel subduplo brevioribus, erecto-patentibus, pedunculo brevi; bracteis recurvis, ovalibus, acutis, ovario paulo brevioribus; floribus erecto-patentibus, glabris, illis *E. graciliscapae* Rolfe similibus; sepalis oblongo-lanceolatis, subacutis, glabris, 0.7 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum obtusum breve 0.1 cm longum formantibus; petalis oblique lanceolatis, acutis, glabris, 0.5 cm longis; labello circuitu ovato-lanceolato, subacuto, dimidio anteriore paulo angustato, basi cuneato, infra medium lamellis 2 parallelis rotundatis, brevibus ornato, 0.4 cm longo, tertia parte basilari 0.2 cm lato; columna semitereti, glabra, 1.25 mm alta, pede brevi, clinandrio humili, lobis truncatis; anthera rotundato-cucullata, glabra, antice obtusissima bidentata; ovario subsessili, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near the Kaulo Base, in the Minjem Valley, alt. c. 500 m—R. Schlechter no. 16711, flowering in Oct. 1907.

This species reminds one of *E. graciliscapa* Rolfe and might best be placed beside it. It is related closely to the following two species, yet it might better be separated specifically on account of the more lanceolate petals, the shorter labellum, the lamellae of which are better developed and run parallel, and by the very short column.

8. *E. lancilabris* Schltr., sp. nov.

Epiphytica, erecta, 20–25 cm alta; rhizomate abbreviato; radicibus tenuibus, filiformibus, elongatis, flexuosis, minute puberulis; pseudobulbis bene approximatis, cylindraceis, vaginis arcte amplexantibus primum obtectis, apice 2–3-foliatis, 7–13 cm longis, medio vel supra 0.4–0.6 cm

diametientibus; foliis erecto-patentibus linearibus, acutis, basin versus sensim paulo angustatis, glabris, 12–17 cm longis, medio fere 0.5–0.9 cm latis; racemis lateralibus, ad apices pseudobulborum natis, erecto-patentibus, laxe 10–15-floris, quam folia duplo fere brevioribus, pedunculo brevi; bracteis lanceolatis, acuminatis, ovario duplo vel subduplo brevioribus, recurvis; floribus erecto-patentibus, in sectione mediocribus, glabris; sepalis oblongo-lanceolatis, acutis, 0.9 cm longis, lateralibus obliquis, basi margine anteriore paululo dilatata cum pede columnae mentum obtusum pro genere perbreve formantibus; petalis oblique lineari-lanceolatis, acutis, 7.5 mm longis, glabris; labello circuitu lanceolato, acuto, tertia parte basilari sublobulato-dilatato, basi cuneato, 0.4 cm longo, tertia parte basali 0.2 cm lato, lamellis 2 humilibus brevibus subparallelis versus margines in tertia parte basali ornato; columna brevi, glabra, semitereti, c. 2 cm alta, pede brevi, clinandrii lobis lateralibus rotundatis, dorsali minuto, dentiformi; anthera subgaleato-cucullata, glabra, antice obtusa; ovario subpedicellato, gracili, 0.7 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20177, flowering in Sept. 1909.

A close relative of *E. microglossa* Schltr. from which it may be distinguished by the shorter rhizome, narrower leaves, rather larger flowers of a different colour, narrower petals and the shape of both the labellum and anther. The flowers are white, violet-red at the base, the labellum dark cherry-red in the lower half and the ovary violet-red.

9. *E. maboroensis* Schltr., sp. nov.

Epiphytica, erecta, 25–30 cm alta; rhizomate valde abbreviato; radicibus tenuibus, filiformibus, elongatis, flexuosis, minute puberulis; pseudobulbis approximatis, cylindricis, vaginis arcte amplexantibus mox desiccantibus obtectis, apice 2–4-foliatis, 9–16 cm altis, supra medium 0.4–0.7 cm diametientibus; foliis erecto-patentibus, ligulatis vel lineari-ligulatis, obtusiusculis, basi sensim subpetiolato-angustatis, glabris, 11–14 cm longis, medio fere 0.9–1.7 cm latis; racemis lateralibus juxta apicem pseudobulborum, erecto-patentibus, perlaxe 10–18-floris, quam folia subduplo brevioribus, pedunculo brevi; bracteis recurvulis, ovalibus, apiculatis, ovario duplo vel subduplo brevioribus; floribus erecto-patentibus, illis *E. microglossae* Schltr. similibus, sed paulo majoribus, glabris; sepalis lanceolatis, acutis, 9.5 mm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum perbreve obtusum formantibus; petalis oblique lanceolato-ligulatis, acutis, 0.7 cm longis; labello lanceolato, subacuto, glabro, basi late cuneato, 0.4 cm longo, infra medium 0.2 cm lato, lamellis 2 margini parallelis humilibus obtusis infra medium ornato; columna semitereti, glabra, c. 2 mm alta, pede brevi, clinandrii lobis lateralibus rotundato-truncatis, dorsali parvulo; anthera subreniformi-cucullata, antice excisa; ovario subpedicellato, glabro, pergracili, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19543, flowering in May 1909.

Undoubtedly, this species is related to the two preceding ones, but I thought it better to keep them separate, since the leaves are broader and blunter; the labellum has a different shape, the two crests being closer to, and parallel with the margin, i.e. slightly diverging from one another, and the anther is distinctly different. The flowers are white with yellow tips; the labellum dark cherry-red in the lower half and pale yellow towards the front.

10. *E. pandurata* Schltr., sp. nov.

Epiphytica, erecta, 25–30 cm alta; rhizomate valde abbreviato; radicibus tenuibus, filiformibus, elongatis, flexuosis, minute puberulis; pseudobulbis cylindraceutis, vaginis amplexantibus mox desiccantibus primum obtectis, apice 4–6-foliatis, 9–16 cm altis, supra medium 0.8–1.2 cm diametientibus; foliis erecto-patentibus, ligulatis vel elliptico-ligulatis, acutis vel subacutis, basi sensim subpetiolato-dilatatis, glabris, 9–16 cm longis, medio fere 1.1–2.8 cm latis; racemis lateralibus, erecto-patentibus, quam folia duplo vel subduplo brevioribus, juxta apicem pseudobulborum vel infra natis, subdense multifloris, pedunculo brevi; bracteis recurvulis, ellipticis, acutis, ovario duplo vel subduplo brevioribus; floribus erecto-patentibus vel patentibus, glabris; sepalis oblongis, apiculatis, 0.7 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatata cum pede columnae mentum perbreve obtusum formantibus; petalis oblique oblongo-lanceolatis, apiculatis, 0.6 cm longis; labello circuitu subpandurato, 3.5 mm longo, infra medium 2 mm lato, supra medium 1.5 mm lato, medio paulo constricto, infra medium lamellis 2 leviter divergentibus, humilibus, brevibus ornato; columna semitereti, glabra, 1.5 mm alta, pede brevi, clinandrii lobis lateralibus truncatis, dorsali rotundato, humili; anthera subreniformi-cucullata, apiculata, glabra; ovario cum pedicello brevi gracili, glabro, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19520, flowering in May 1909.

This species is distinguished from the three previous ones by its thick pseudobulbs, broader leaves, denser inflorescences and the labellum contracted laterally in the middle. The flowers are pale yellow, the labellum dark purple with a yellow apex, the column-foot reddish.

11. *E. cycloglossa* Schltr., sp. nov.

Epiphytica, vagans, usque ad 40 cm longa; rhizomate elongato, flexuoso, crassiusculo, vaginis amplexantibus omnino oblecto; radicibus tenuibus, filiformibus, elongatis, flexuosis, minute puberulis; pseudobulbis c. 5–8 cm distantibus, cylindraceis, vaginis amplexantibus mox desiccantibus primum oblectis, apice 5–6-foliatis, 5–8 cm altis, medio fere 0.7–1 cm diametentibus; foliis erecto-patentibus, elliptico-ligulatis, acutis, basi sensim subpetiolato-angustatis, glabris, 7–12 cm longis, medio fere 1.2–2.1 cm latis; racemis lateralibus in dimidio superiore pseudobulborum, erecto-patentibus, subdense multifloris, quam folia aequilongis vel subaequilongis, pedunculo brevi; bracteis elliptico-lanceolatis, acuminatis, ovario paulo brevioribus; floribus erecto-patentibus, in sectione inter minores, glabris; sepalis lanceolatis, acutis, 0.5 cm longis, lateralibus subfalcatis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve formantibus; petalis oblique lanceolato-ligulatis, acutis, vix 0.4 cm longitudine excedentibus; labello orbiculari, apiculato, vix 0.2 cm longo, integro, dimidio inferiore lamellis 2 semilunatis, leviter divergentibus ornato; columna semitereti, glabra, 1.25 mm alta, pede adscendente, clinandrii lobis lateralibus subobsoletis, dorsali humili; anthera rotundato-cucullata, crassius umbonata, glabra; ovario gracili, sparsim stellato-puberulo, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19912, flowering in June 1909.

This and the following species are members of a group of *Polyura* which are distinguished by their long creeping rhizomes. As an example, *E. vagans* Schltr. from the Celebes also belongs here and may be its closest relative. *E. cycloglossa* Schltr. however, is well distinguished from the latter by the almost circular lip. The flowers are white, the labellum dark carmine with a yellow apex and white base.

[11a.] *E. truncicola* Schltr., sp. nov.

Epiphytica, vagans, usque ad 40 cm longa; rhizomate elongato, flexuoso, vaginis amplexantibus oblecto, crassiusculo; radicibus filiformibus, tenuissimis, elongatis, flexuosis, minutissime puberulis; pseudobulbis subfusiformi-cylindraceis, 3–7 cm distantibus, 5–20 cm longis, medio fere 0.6–1.7 cm diametentibus, vaginis mox siccis primum oblectis, apice 5–8-foliatis; foliis erecto-patentibus, elliptico-ligulatis, acutis, basin versus sensim angustatis, glabris, 10–20 cm longis, medio fere, 1.2–2.5 cm latis; racemis in dimidio superiore pseudobulborum lateralibus, erectis vel erecto-patentibus, plus minus dense multifloris, 6–12 cm longis, pedunculo perbrevis; bracteis recurvis, ovalibus, breviter acuminatis, ovario gracili duplo fere brevioribus; floribus erecto-patentibus, in sectione inter minores, glabris; sepalis oblongo-lanceolatis, subacutis, 4.5 mm longis, lateralibus subfalcatis, paulo brevioribus, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum formantibus; petalis oblique lineari-lanceolatis, obtusiusculis, quam sepala paulo brevioribus; labello circuitu late rhombeo, e basi semiorbiculari infra medium leviter trilobato, lamellis 2 brevibus obtusis in tertia parte basali, 0.2 cm longo, inter apices loborum lateralium 0.2 cm lato, lobis lateralibus patentibus, falcato-triangulis, obtusis, parvulis, intermedio amplo triangulo obtusiusculo medio untrinque sublobulato-dilatato; columna perbrevis, glabra, vix 0.1 cm alta, pede brevi, clinandrii lobis lateralibus truncatis, dorsali subobsoletis; anthera subreniformi-cucullata, late umbonata, glabra, ovario gracili, sparsim stellato-puberulo, 4.5 mm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17633 (TYPE), flowering in Apr. 1908; on trees in the forests of the Ibo Range, alt. c. 900 m—R. Schlechter no. 19033, flowering in Dec. 1908; on trees in the forests on the Schibruba [Creek], alt. c. 450 m—R. Schlechter no. 18946, flowering in Dec. 1908.

On superficial observation this species resembles *E. cycloglossa* Schltr. strikingly, but it hardly can be united with it since the labellum differs considerably in the two

species. There are also differences in the shape and size of the remaining floral parts. The flowers are white, the labellum with a red spot in the middle.

§ 4. *Hymeneria*

Hymeneria, in its present concept is the most polymorphic section of the genus, so that it would appear desirable to sub-divide it further. In order to do this, however, a study of all the species would be necessary. Unfortunately, Kränzlin has not understood the necessity to define the group sharply enough; on the contrary he has united *Urostachya*, an entirely different section, with it and has admitted some other species as well. Also he has placed true *Hymeneria* species in other sections, thus confusing the true boundaries of the section still further. I have accepted and defined *Hymeneria* in the same way as J.J. Smith has done in 'Orchideen von Java', because this concept seems to me the most natural in the light of our present knowledge of the genus. We must leave further separation until later.

The section is represented in New Guinea by a relatively large number of species, some of which, of course, call for explanation. Besides the species enumerated here, we also know from Dutch New Guinea, *E. Hollandiae* J.J. Sm., *E. Lorentziana* J.J. Sm. et Krzl. and a very doubtful *E. anonoensis* Krzl., which perhaps does not belong here. British Papua has supplied a greater number, viz. *E. umbonata* F.v.M. et Krzl., *E. parviflora* Bail., *E. ambasiensis* Bail., *E. puberula* Ridl. and *E. Mooreana* F.v.M.

The 11 species known from German New Guinea are found under very different conditions although they appear to avoid the true low-lying forests. All these species are epiphytic and grow on the branches of rather tall trees. In the forests of the hill-country, I found *E. indivisa* Schltr. and *E. diphylla* Schltr. The other species are to be found in the mountains, especially in the mist-forest.

E. oligotricha Schltr. seems to possess a surprisingly wide distribution, for not only does it occur in its different varieties on all the ranges in our Territory, but it has been recorded also from Dutch New Guinea.

12. *E. indivisa* Schltr., sp. nov.

Epiphytica, valida, 45–60 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceis, lateraliter paulo compressis, apice 2–4-foliatis, vaginis mox desiccantibus, amplexantibus primum obtectis, 10–17 cm altis, medio fere 1.6–2.3 cm diametientibus; foliis erecto-patentibus vel suberectis, anguste elliptico-ligulatis, obtusiusculis, 25–40 cm longis, medio fere 2.3–3.7 cm latis, basin versus sensim angustatis; racemis versus apices pseudobulborum erecto-patentibus, dense multifloris, usque ad 18 cm longis, pedunculo brevi vaginis obsesso; bracteis reflexis ellipticis, obtusiusculis, ovario pedicellato duplo vel plus duplo brevioribus; floribus erecto-patentibus vel patentibus, in sectione vix inter mediocres; sepalis oblongis, apiculatis, extus sparsim stellato-pilosis, 0.6 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 2.5 mm longum formantibus; petalis oblique oblongis, valde obtusis, margine anteriore paulo decurrentibus, glabris, sepalis paulo brevioribus; labello indiviso, obovato-cuneato, antice truncato, retuso, medio longitudinaliter foveolato-concavo, carinis 3 parallelis, supra basin natis usque infra apicem decurrentibus, glabro, 6.5 mm longo, infra apicem 4.5 mm lato; columna brevi, glabra, pede ligulato, clinandrii lobis lateralibus truncato-rotundatis, dorsali parvulo; anthera rotundato-cucullata, glabra, antice truncata; ovario pedicellato gracili, sparsim stellato-puberulo, c. 1.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near the Djamu Gorge, alt. c. 400 m—R. Schlechter no. 16686, flowering in Oct. 1907; on trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 18086, flowering in Aug. 1908.

This is related evidently to *E. Hollandiae* J.J. Sm. but is distinguished by its broader leaves, the entire labellum and the shape of the petals. The flowers are white, the labellum pale yellow.

13. *E. torricellensis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 183.

E. parviflora Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21, II (1911), p. 41 (nec Bail.), p.p.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 14371, flowering in Apr. 1902.

This species is related closely to *E. diphylla* Schltr. and to *E. Lorentziana* J.J. Sm. et Krzl., but differs altogether from *E. parviflora* Bail. with which Kränzlin has united it. The flowers are flesh-coloured, the lower half of the lip is red.

14. *E. diphylla* Schltr., sp. nov.

Epiphytica, erecta, c. 30 cm alta; rhizomate decumbente, brevi, crassiusculo, dense vaginis amplexantibus oblecto; radicibus tenuibus, filiformibus, elongatis, flexuosis, subinconspicue papillosis; pseudobulbis 1–2 cm distantibus, cylindraceis, vaginis magnis amplexantibus, oblectis, apice bifoliatis, 5–7 cm altis, medio fere 0.7–1 cm diametientibus; foliis erectis vel suberectis, angustius elliptico-lanceolatis, acutis vel subacutis, basi sensim in petiolum 4–6 cm longum attenuatis, petiolo incluso 13–24 cm longis, lamina medio 2–2.7 cm latis; racemis juxta apicem pseudobulborum lateralibus, erectis vel suberectis, sublaxe 10–20-floris, 4–7 cm longis, pedunculo brevi et rhachi stellato-tomentosulis; bracteis erecto-patentibus, ovalibus, obtusis, ovario aequilongis vel paulo brevioribus; floribus erecto-patentibus, in sectione inter minores, vulgo cleistogamis, clausis; sepalis ovato-ellipticis, obtusis, extus sparsim stellato-puberulis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 1.7 mm longum formantibus; petalis oblique elliptico-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi late cuneata, tertia parte anteriore trilobato, 3 mm longo, inter apices loborum lateralium 3 mm lato, carina intermedia usque in basin lobi intermedii, carinis 2 lateralibus obliquis crassioribus aequilongis additis, lobis lateralibus divergentibus semioblongis obtusis, intermedio paulo longiore, triangulo-semioblongo, obtuso; columna brevi, glabra, pede brevi; clinandrii lobis humillimis; anthera reniformi-cucullata, antice retusa, dorso gibbo donata, glabra; ovario sessili, cylindraceo, minute stellato-tomentosulo, 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Mudjene [River] (Minjem District), alt. c. 200 m—R. Schlechter no. 16582, flowering in Sept. 1907.

Externally, this species has a close resemblance to the previous one, but I regard them as different. The rhizome is longer and thicker and the pseudobulbs are further apart, being thicker and with blunter sheaths. The flowers are somewhat larger; the labellum with blunt lobes is broader and has a shorter, blunt middle lobe. The hair on the ovary is shorter and less dense than in *E. torricellensis* Schltr. *E. Lorentziana* J.J. Sm. et Krzl. must also be very similar, but has a callus on the front lobe. The flowers are reddish with yellowish white apices, the labellum dark red with a whitish front lobe.

15. *E. subclausa* Schltr., sp. nov.

Epiphytica, erecta, 25–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceis, vaginis magnis amplexantibus oblectis, 8–15 cm altis, medio fere 0.7–1.5 cm diametientibus, apice 3–4-foliatis; foliis erecto-patentibus, lanceolato-ligulatis, obtusiusculis, basin versus sensim subpetiolato-angustatis, glabris, 16–28 cm longis, medio fere 1.7–1.8 cm latis; racemis erectis, versus apicem pseudobulborum lateralibus, breviter pedunculatis, laxe 10–15-floris; bracteis ovatis, obtusiusculis, ovario pluries brevioribus; floribus erecto-patentibus, in genere inter minores, haud bene apertis; sepalis ovalibus, obtusis, 0.6 cm longis, extus sparsim stellato-puberulis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 0.3 cm longum formantibus; petalis oblique ovalibus, obtusis, glabris, sepalis paulo brevioribus; labello e basi late cuneata tertia parte anteriore trilobato, 0.6 cm longo, inter apices loborum lateralium 0.5 cm lato, carinis 2 subparallelis minute papillosis e basi labelli usque infra basin lobi intermedii ornato, lobis lateralibus divergentibus triangulis, obtusis, intermedio semioblongo apiculato, marginibus incurvulo, laterales superante, incrassatione late cordata vel subreniformi oblecto; columna brevi, glabra, pede leviter incurvulo, clinandrii lobis lateralibus rotundatis, dorsali triangulo obtuso paulo longiore; anthera subreniformi cucullata, antice truncata, dorso excisa, crassius umbonata; ovario sessili cylindraceo, minute stellato-tomentosulo, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 950 m—R. Schlechter no. 18143 (TYPE), flowering in Sept. 1908; on trees in the

forests above the Djamu Gorge, alt. c. 600 m—R. Schlechter no. 16690, flowering in Oct. 1907.

Also a relative of *E. torricellensis* Schltr., but distinguished from *E. diphylla* Schltr. and *E. Lorentziana* J.J. Sm. et Krzl. by the robust growth and the finely papillose crests of the lip.

The only partially open flowers are snow-white.

16. *E. cordifera* Schltr., sp. nov.

Epiphytica, erecta, 20–30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, puberulis; pseudobulbis cylindraceis, bifoliatis, vaginis alte amplexantibus magnis obtectis, 2.5–5 cm altis, 0.4–0.7 cm diametentibus; foliis erecto-patentibus vel erectis, linearibus, acutis, basin versus sensim petioliformi-angustatis, 17–25 cm longis, medio fere 0.5–0.8 cm latis; racemis brevibus, subdense 4–7-floris, versus apices pseudobulborum lateralibus, erecto-patentibus, breviter pedunculatis; bracteis ovalibus, obtusis, erecto-patentibus, ovario sessili vulgo paulo longioribus; floribus erecto-patentibus, mediocribus; sepalis oblongis, obtusis, extus stellato-puberulis, 6.5 mm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 2.75 mm longum formantibus; petalis oblique elliptico-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello e basi late cuneata supra medium trilobato, 6.5 mm longo, inter apices loborum lateralium 6.5 mm lato, carina intermedia tenui e basi usque in basin calli apicalis decurrente, lamellis 2 parallelis lateralis nunc antice unidentatis e basi usque in basin lobi intermedi aucto, lobis lateralibus divergentibus triangulis obtusis, intermedio late ovato obtuso, apice marginibus incurvo, laterales superante, callo amplo cordiformi ornato; columna brevi, glabra, pede ligulato, clinandrii lobis lateralibus triangulis subacutis, dorsali dentiformi, minore; anthera quadrato-cucullata, glabra; ovario sessili cylindrico, stellato-tomentosulo, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on Mount Gati (Minjem District), alt. c. 800 m—R. Schlechter no. 16863, flowering in Nov. 1907; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17687 (TYPE), flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18231, flowering in Sept. 1908.

In floral structure this species is related to *E. subclausa* Schltr., but is quite different in habit, the flowers being much larger. The next species, *E. atrorubens* Schltr. described below, likewise has much broader leaves and a different habit. The flowers are reddish, with dark streaks inside or tinged with whitish red.

17. *E. atrorubens* Schltr., sp. nov.

Epiphytica, decumbens, usque ad 35 cm longa; rhizomate decumbente, crassiusculo, vaginis imbricantibus obtecto; radicibus filiformibus elongatis, flexuosis, minute papillosis; pseudobulbis 3–4.5 cm distantibus, cylindraceis, vaginis amplis, alte amplexantibus obtectis, apice vulgo 3-foliatis, 5–7 cm altis, medio fere 0.6–1 cm diametentibus; foliis erecto-patentibus vel suberectis, linearibus vel lineari-ligulatis, acutis, basin versus sensim petioliformi-angustatis, 16–22 cm longis, medio fere 0.9–1.5 cm latis; racemis brevibus versus apices pseudobulborum lateralibus, breviter pedunculatis, subdense 4–8-floris; bracteis late ovalibus obtusis, ovario fere aequilongis; floribus in sectione mediocribus, erecto-patentibus; sepalis oblongis, obtusis, extus sparsim stellato-puberulis, 0.8 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 0.3 cm longum formantibus; petalis oblique ellipticis, obtusis, glabris, sepalis paulo brevioribus; labello e basi oblongo-cuneata, tertia parte apicali trilobato, 0.7 cm longo, inter apices loborum lateralium 5.5 mm lato, carina angusta minute papillosa e basi labelli usque in basin lobi intermedi, lamellis 2 lateralibus apicem versus paulo ampliatis, minute granuloso-papillosis apiculatis aucta, lobis lateralibus triangulis obtusis, leviter divergentibus, intermedio semiorbiculari obtuso, lateralibus majore, callo reniformi-cordato dense granuloso-papilloso amplo obtecto; columna brevi, glabra, pede concavulo, clinandrii lobis humilibus; anthera trapezoideo-cucullata, antice truncata, dorso excisa, crasse umbonata; ovario sessili, stellato-subtomentosulo, c. 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20094, flowering in Sept. 1909.

This species is distinguished from *E. cordifera* Schltr., the nearest related species, by the broader leaves, the shape of the lip and the granular papillose lamellae and calli. The flowers are dark purple.

18. *E. oligotricha* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 181.
E. papuana J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 22.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 14353, flowering in Apr. 1902; no. 20048, no. 20145, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 900–1000 m—R. Schlechter no. 16680, flowering in Oct. 1907; no. 17301, flowering in Feb. 1908; on trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 17105, flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18233, flowering in Sept. 1908, no. 19158, flowering in Jan. 1909; on trees in the mountain forests on the Waube [Creek] (Waria District), alt. c. 600 m—R. Schlechter no. 19462, flowering in May 1909; on trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19504, flowering in May 1909.

A widely distributed and therefore a somewhat variable species. The three crests on the labellum are sometimes more and sometimes less conspicuous. I do not doubt for a moment that *E. papuana* J.J. Sm. belongs here. The plant is in flower all the year round. The flowers are yellow with red veins or streaks; the labellum with yellow front and red lateral lobes.

var. *acutiloba* Schltr., var. nov.

Differt a forma typica labelli lobis lateralibus minoribus, lanceolatis, acutis.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19031, flowering in Dec. 1908.

The small, pointed lateral lobes are very striking, otherwise the plant agrees so well with *E. oligotricha* Schltr., that I regard it only as a variety.

19. *E. dischorensis* Schltr., sp. nov.

Epiphytica, decumbens, usque ad 15 cm alta; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, minute puberulis; pseudobulbis 0.5–1 cm distantibus, compressis, oblongoideis, unifoliatis, 2–3 cm altis, medio fere 0.8–1 cm latis; folio erecto, elliptico-ligulato, obtuso, inaequaliter bilobulato, basin versus sensim paulo angustato, 10–13 cm longo, medio fere 2.2–2.7 cm lato; racemis erectis, juxta apicem pseudobulborum singulis, laxe 3–5-floris, folio brevioribus, pedunculo gracili, paucisquamato, minute stellato-puberulo, c. 4–6 cm longo; bracteis ellipticis, obtusiusculis, ovario multo brevioribus; floribus erecto-patentibus, in sectione mediocribus; sepalis oblongis, obtusis, basin versus sparsim stellato-puberulis, 0.8 cm longis, lateralibus margine anteriore lobato-dilatata cum pede columnae mentum obtusum, 0.3 cm longum formantibus; petalis subfalcatis, lineari-ligulatis, subacutis, glabris, sepalis paulo brevioribus; labello cuneato, antice 5-lobulato, lamellis 2 parallelis antice ampliatis e basi usque infra basin loborum apicalium ornato, 0.7 cm longo, antice 0.5 cm lato, lobis lateralibus exterioribus parvulis oblique rhombeis, subfalcatis, obtusis, lobis lateralibus interioribus semiorbicularibus perbrevis obtusissimis, basi callo transverso angusto ornatis, intermedio paulo longiore semiorbiculari apiculato, callo V-formiter bicurvi donato; columna brevi, glabra, pede oblongo, clinandrio crenulato; anthera reniformi cucullata, umbone oblongo apiculato ornata glabra; ovario breviter pedicellato, cylindrico, minute stellato-puberulo, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19697, flowering in June 1909.

This and the following species belong to a somewhat aberrant form of *Hymeneria*, which later may have to be separated as a section. Both are related to *E. rhizophoreti* Schltr. from the Celebes. I will refer below to the difference between the two Papuan [Papuasian] species.

The flowers are white, lightly dotted red.

20. *E. oreogena* Schltr., sp. nov.

Epiphytica, decumbens, 20–25 cm alta; rhizomate brevi; radicibus filiformibus, elongatis, flexuosis, minute papilloso-puberulis; pseudobulbis paulo compressis, anguste oblongoideis, approximatis,

unifoliatis, 3–5.5 cm longis, medio fere 0.7–1.3 cm latis; folio erecto vel suberecto, lanceolato-ligulato, obtusiusculo, inaequaliter bilobulato, basi sensim subpetiolato-angustato, 12–17 cm longo, medio fere 1.5–2.5 cm lato; racemis juxta apicem pseudobulborum natis, erectis, laxe 8–15-floris, usque ad 15 cm longis, pedunculo paucivaginato, minute stellato-puberulo, 5–6 cm longo; bracteis ovalibus, obtusis, ovario multo brevioribus; floribus erecto-patentibus, in sectione mediocribus; sepalis oblongis, obtusis, extus dimidio inferiore sparsim stellato-puberulis, 6.5 mm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum 3.5 mm longum formantibus; petalis oblique linearibus, subacutis, glabris, sepalis paulo brevioribus; labello cuneato, quarta parte anteriore trilobato, lamellis 2 antice suborbiculari-dilatatis, leviter divergentibus e basi usque ad tertiam partem apicalem ornato, 5.5 mm longo, inter apices loborum lateralium 0.4 cm lato, lobis lateralibus perparvulis, semioblongis, obtusis, intermedio multo majore semiobiculari, obtuse acuminato, callo bicruri cruribus V-formiter divergentibus margini subparallelis donato; columna brevi, glabra, pede ligulato, clinandrio irregulariter crenulato; anthera quadrato-cucullata, umbonata, glabra; ovario cum pedicello brevi cylindrico, minute stellato-puberulo, 2.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20170, flowering in Sept. 1909.

As mentioned already the species is related closely to *E. dischorensis* Schltr. It is distinguished by the narrower pseudobulbs and leaves and the tri-lobed (not five-lobed) labellum and its crests. The flowers are white, pink-spotted.

Doubtful Species

21. *E. Kingii* F.v.M., in Wing's South. Sci. Record (1882), p. 71.

Solomon Islands: Boneta—Lt. Goldfinch.

This species is unknown to me and is enumerated here since it probably occurs also on the German Solomon Islands.

22. *E. lactea* Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21 II (1911), p. 91.

Kaiser-Wilhelms-Land: Friedrich-Wilhelmshafen?—W. Micholitz.

This species, likewise, is unknown to me. I cannot place it very well from the description, so that possibly it does not belong here at all.

§ 5. *Mycaranthes*

This section generally has been designated as *Eriura* by many authors, including Lindley, Hooker f. and Ridley. Lindley, who was not acquainted with the Blumean *Mycaranthes*-species, assumed that these belonged to another group; in fact the section *Eriura* Lindl. corresponds so exactly with the section *Mycaranthes* Bl., that it is best to use the older name here. This section has been augmented greatly in recent years through the exploration of the Malayan floral-zones. New Guinea constitutes the eastern boundary of its distribution and this explains why only comparatively few species occur there, since, apart from the ones mentioned, no material has been collected from either Dutch New Guinea or British Papua.

The species in our Territory inhabit the mist-forest formation, whilst in the Malayan territory some terrestrial species occur and also some growing on rocks. Those indigenous to New Guinea are all epiphytes and grow mostly on tall, fairly exposed trees.

The frequent formation of pelorial flowers is very conspicuous in this section. Such flowers do not develop separately among the normal ones, but, as in the case of many other orchids, the individual stems are either entirely pelorial or not at all. Such a pelory of a Javanese species has been described and illustrated by Kränzlin as *E. isochila* Krzl.

23. *E. stenophylla* Schltr., sp. nov.

Epiphytica, erecta, 25–40 cm alta; rhizomate valde abbreviato; radicibus tenuissimis, filiformibus,

elongatis, flexuosis, glabris; caulibus simplicibus, strictis vel substrictis, teretibus, bene foliatis, vaginis foliorum arctissime amplexantibus omnino obtectis, 0.5–0.7 cm diametientibus; foliis erecto-patentibus, linearibus, acutis, textura crassius coriaceis, marginibus vulgo incurvulis, 7–15 cm longis, medio fere 0.3–0.6 cm latis; racemis apicalibus singulis vel (vulgo) geminis, erectis, sublaxe 10–20-floris, folia superiora haud excedentibus, pedunculo vaginis paucis bracteis conformibus obsesso, racemo ipso fere aequilongo, pilis niveis stellato-tomentosulis; bracteis lanceolatis, acuminatis, quam flores vulgo brevioribus, apicem versus sensim decrescentibus; floribus erecto-patentibus, in sectione inter minores, extus pilis niveis stellato-tomentosulis; sepalis ovato-oblongis, obtusis, intus glabris, 0.4 cm longis, lateralibus obliquis, basi margine anteriore dilatata cum pede columnae mentum obtusum breve c. 0.2 cm longum formantibus; petalis oblique oblongis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu e basi late cuneata quadrato, margine leviter subcrenato, antice obtuse apiculato, 3.5 mm longo, medio 3 mm lato, simplici, callo semigloboso farinoso in basi callis 2 parvulis in ima basi additis, callo altero majore infra apicem farinoso carina lineari antice dilatata farinosa cum callo basali conjuncto, carina laterali apice libera subacuta glabra utrinque cum carina mediana subparallela e basi usque supra mediam decurrente; columna brevi, glabra, clinandrii lobis truncatis, dorsali altiore; anthera obreniformi-cucullata, umbonata, glabra; ovario breviter pedicellato subclavato, stellato-tomentosulo, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19624, flowering in May 1909.

This species is distinguished easily from the other two in our Territory by the labellum possessing no distinct lateral lobes. The two small, mealy-haired calli at the base, near the basal callus, are absent in the other two species. The flowers are white with a red-spotted lip.

var. *homoglossa* Schltr., var. nov.

Differt a forma typica labello petalis bene simili, integro, ecalloso, columna antice infra stigma gibbo donata, apoda.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19644 flowering in May 1909.

A pelorial variety of the above species. It is distinguished externally by the absence of the column-foot and therefore the mentum is not developed. Evidently, this pelorial variety is more frequent than the Type-form.

24. *E. leucotricha* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 180.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 14348, flowering in Apr. 1902; no. 20247, flowering in Sept. 1909.

On account of the tri-lobed lip, this species is nearer *E. bifalcis* Schltr. than *E. stenophylla* Schltr. It is distinguished from the latter by the shape of the lip and its calli and keels. The flowers are white with a red-spotted labellum.

25. *E. bifalcis* Schltr., sp. nov.

Epiphytica, erecta vel patula 35–70 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris, tenuissimis; caulibus simplicibus, vulgo curvatis, vaginis foliorum arcte amplexantibus omnino obtectis, teretibus, 0.5–0.9 cm diametientibus; foliis linearibus vel lanceolato-linearibus, acutis, textura coriaceis, glabris, 10–20 cm longis, 0.5–1.5 cm medio latis; racemis apicalibus, 2–5-nis, quam folia superiora vulgo fere aequilongis, subdense multifloris, pedunculo pilis niveis stellato-tomentosulis, vaginis paucis bracteis conformibus obsesso; bracteis lanceolatis, acuminatis, flores vulgo superantibus; floribus in sectione inter minores, erecto-patentibus; sepalis ovatis, obtusis, extus stellato-tomentosulis, 0.4 cm longis, lateralibus basi margine anteriore dilatata cum pede columnae mentum obtusum breve 0.2 cm longum formantibus; petalis oblique ellipticis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu suborbiculari-quadrato, 3.5 mm longo et medio lato, basi callo ovato farinoso-puberulo ornato, callo oblanceolato usque ad apicem decurrente anteposito, medio utrinque lamella lanceolato-falcata obtusiuscula instructo, lobis lateralibus ovato-falcatis, obtusiusculis, intermedio perlate rhomboideo, breviter bilobulato, lobulis antice truncatis, subcrenulatis, apiculo parvulo interjecto; columna brevi, glabra, clinandrii lobo dorsali rotundato altiore; anthera obreniformi-cucullata, umbone crasso minutissime papilloso ornata; ovario cum pedicello subclavato, minute stellato-tomentosulo, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17853 (TYPE), flowering in June 1908; on trees in the forests on the Ngoye [Creek] near Ambo, at the foot of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 18128, flowering in Aug. 1908.

A near relative of *E. leucotricha* Schltr., but specifically different in the rounder labellum, the shape of the calli and the two falcate lamellae near the middle. The flowers are white with a pink-spotted lip and a brown-red anther hump.

var. *subnormalis* Schltr., var. nov.

Differt a forma typica labello petalis persimili, ecalloso, integerrimo, columna erostri, pede omnino obsoleto.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17887, flowering in June 1908.

Also a pelorial form which corresponds to var. *homoglossa* of *E. stenophylla* Schltr.

§ 6. *Aporodes*

No species of this section has, up to the present time, been collected in German New Guinea, but since it is represented in the neighbouring part of Dutch New Guinea by *E. soronensis* Schltr., one can expect to find it in our Territory in the near future. For this reason I have included it here.

So far only a few species of this section are known. They occur in the vicinity of the coast, on trees of the mangrove-formation and from such places we may expect to obtain related species.

§ 7. *Cylindrolobus*

I have made a few remarks already about this section and have expressed the opinion that it would be better to distinguish two different sections here, viz. the true *Cylindrolobus* of which *E. compressa* Bl. and *E. rigida* Bl. may be regarded as the Types, and on the other hand the species which group themselves around *E. leptocarpa* Hook. f., *E. pilifera* Ridl. (*Trichotosia bracteolata* Krzl.) and *E. cyrtosepala* Schltr. The species occurring in our own Territory are all related to *E. rigida* Bl. and belong, therefore, to the true *Cylindrolobus*. It is difficult to establish whether any species of this section have been recorded yet from the Papuan region. Two species which perhaps belong here have been published by Kränzlin as *Trichotosia d'Entrecasteauxii* Krzl. and *Trichotosia microbambusa* Krzl., but the descriptions are so defective in certain important aspects that a conclusion regarding the relationship of the species cannot be drawn. The three species treated here are natives of the hill-country forests. They are found always as epiphytes on the banks of creeks and rivers.

26. *E. rhodoleuca* Schltr., sp. nov.

Epiphytica, erecta vel saepius patula, usque ad 60 cm longa; rhizomate valde abbreviato; radicibus tenuibus, filiformibus, elongatis, flexuosis, minutissime puberulis; caulibus simplicibus, leviter curvatis, bene foliatis, vaginis foliorum arcte amplectentibus omnino obtectis, 0.5–0.6 cm diametentibus; foliis erecto-patentibus, oblique linearibus, subacutis, glabris, 6–11 cm longis, medio fere 6–12 mm latis, textura carnosulis; inflorescentiis unifloris, abbreviatis; bracteis vaginisque lanceolatis, acutis, ovario subduplo brevioribus; floribus in sectione mediocribus, glabris; sepalis oblongis, obtusis, 1.3 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum inflatum obtusissimum 0.7 cm longum formantibus; petalis oblique falcato-oblongis, obtusissimis, basin versus paululo angustatis, sepalis paulo brevioribus; labello e basi perlate cuneata antice trilobato, c. 1 cm longo, arte explanato infra apicem 1.1 cm lato, fasci longitudinali incrassato apice libero tridentato cum dente intermedio subulato, e basi labelli usque in basin lobi intermedii decurrente, antice lateraliter evanescente, lobis lateralibus semioblongis, obtusis, sensim in

intermedium abenutibus, intermedio subreniformi-semiquadrato, breviter ac obtuse bilobulato, quam laterales subaequilongo; columna brevi, pede apice callo trilobulato ornato, clinandrii lobis lateralibus rotundatis, dorsali obtusato brevior; anthera reniformi-cucullata, glabra, obtusissima; ovario sessili, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the primary forests of Kelel on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16210, flowering in June 1907.

The species closely resembles *E. rigida* Bl. in habit, but is well distinguished by the labellum, which is so strongly bent that it is impossible to flatten out, which makes the lateral lobes look much longer than they actually are. Furthermore, the depression between the lateral and middle lobes is fairly obtuse, the bracts and sheaths at the base of the flowers are not very large. The flowers are white, the labellum with red lateral lobes and the apex of the column-foot with a yellow callus.

27. *E. kenejiana* Schltr., sp. nov.

Epiphytica, patula, c. 60 cm longa; rhizomate abbreviato; radicibus tenuibus, filiformibus, elongatis, flexuosis, minutissime puberulis; caulibus simplicibus, strictis vel substrictis, dense foliatis, vaginis foliorum arctissime amplexantibus omnino obtectis, c. 0.7 cm diametentibus; foliis erecto-patentibus, oblique linearibus, subacutis, glabris, textura carnosulis, 7–13 cm longis, medio fere 0.5–1 cm latis; inflorescentiis lateralibus, unifloris; bracteis vaginisque patulis, lanceolatis, subacutis, glabris, ovario aequilongis; floribus erecto-patentibus, in sectione inter majores, glabris; sepalis oblongis, obtusiusculis, intermedio 1.8 cm longo, lateralibus falcatis, brevioribus, margine anteriore valde ampliata cum pede columnae mentum inflatum obtusissimum c. 0.7 cm longum formantibus; petalis oblique oblongo-ligulatis, subfalcatis, obtusissimis, basin versus paulo angustatis, sepalo intermedio paulo brevioribus; labello circuitu semiorbiculari, supra medium trilobato, 0.9 cm longo, antice 1.3 cm lato, linea mediana incrassata antice in squamam transversam tridentatam exeunte usque ad basin lobi intermedii, carinis 2 lateralibus e basi brevibus, callis 2 parvulis oblique quadratis in medio laminae antepositis, lobis lateralibus falcato-oblongis obtusis, intermedio subquadrato antice breviter trilobulato, lateralibus fere aequilongo; columna brevi, pede apice callo quadrato ornato verrucis minutis circumdati, clinandrii lobis rotundatis, brevibus; anthera transversa, oblongoideo-cucullata, glabra; ovario sessili, cylindrico, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Saugueti Base, in the vicinity of the Kenejia [River], alt. c. 200 m—R. Schlechter no. 18857, flowering in Nov. 1908.

On superficial observation one would be inclined to regard this species as *E. rhodoleuca* Schltr., but it cannot be united with the latter, since the differences in the shape and structure of the lip are too great. All the species related to *E. rigida* Bl. have this striking habit in common. The bracts of this species are also much longer than in *E. rhodoleuca* Schltr. The flowers are white, the lateral lobes of the labellum pink, the column-foot with a yellow callus at the base, and brown warts.

28. *E. wariana* Schltr., sp. nov.

Epiphytica, patula, 120–140 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, minute puberulis; caulibus simplicibus, dense foliatis, vaginis foliorum arcte amplexantibus omnino obtectis; foliis erecto-patentibus, lanceolato-linearibus, apice oblique subacutis, glabris, 12–18 cm longis, medio fere 1.3–1.5 cm latis; inflorescentiis lateralibus, unifloris, abbreviatis; bracteis vaginisque lanceolatis, acutis, glabris, ovario subaequilongis vel paulo brevioribus; floribus in sectione mediocribus, glabris; sepalis oblongis, obtusiusculis, intermedio 1.5 cm longo, lateralibus paulo brevioribus, falcatis, apiculatis, margine anteriore lobato-ampliata cum pede columnae mentum inflatum obtusissimum 0.5 cm longum formantibus; petalis oblique oblongo-ligulatis, obtusissimis, glabris, sepalo intermedio paulo brevioribus; labello e basi semiorbiculari-cuneata supra medium trilobato, 7.5 mm longo, infra apicem 1.1 cm lato, linea vel carina incrassata e quarta parte basali usque in squamam transversam subulato-apiculatam in basi lobi intermedii decurrente, callis 2 lateralibus conicis parvulis in tertia parte basali, costa humili ad basin decurrentibus, lobis lateralibus oblique semioblongis, obtusis, leviter crenulatis, intermedio distincte longiore obreniformi-subquadrato, transversim leviter ruguloso, antice 3-lobulato, lobulis rotundatis, obtusissimis, intermedio lateralibus brevior; columna brevi glabra, pede apice callo 3-lobulato ornato, verruculis numerosis circumdati, clinandrii lobis lateralibus breviter bidentatis, dorsali obtuso vix longiore; anthera reniformi-cucullata, obtusissima, glabra; ovario sessili, glabro, 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 200 m—R. Schlechter no. 19952, flowering in June [Ed.—possibly July] 1909.

Amongst the *Cylindrolobus*-species in our Territory, this is by far the largest in its vegetative parts. The structure of the flowers, particularly the labellum, brings it nearest to *E. kenejiana* Schltr., but it is well distinguished in floral colouring and its shorter, slightly indented lateral lobes of the labellum. The flowers are reddish white, red-flushed on the outside at the base; the lateral sepals yellow inside of the front half; the labellum with red lateral lobes.

§ 8. *Trichotosia*

Next to *Hymeneria*, the section *Trichotosia* is probably the richest in species in the entire genus. The number of species described already amounts to over forty. These distribute themselves over an area which begins in the Sikkim Himalayas and stretches across the Malayan Peninsula, the Sunda Islands, Philippines and Moluccas to New Guinea. This section has been treated by Kränzlin as a separate genus, but it is evident that he was not acquainted with its true limits, because he mixed it up with *Cylindrolobus* species and even with *E. leiophylla* Lindl. For anyone who has examined it closely, the section is distinguished easily by its habit and the hairiness of its flowers, which in contrast to all other *Eria*-sections, never possess stellate hairs. The inflorescences are generally racemes and spikes, but solitary flowers occur in a few species which must, however, be regarded always as an indication of a one-flowered raceme.

Although New Guinea limits the eastern distribution of the section, the number of species occurring in the Territory is, nevertheless, considerable. Besides the species enumerated here, we know also *E. breviflora* Schltr. from British Papua, and *E. paludosa* J.J. Sm. and *E. integra* J.J. Sm. from Dutch New Guinea. Accordingly the New Guinea species constitute about a quarter of the total species known.

With few exceptions the species are epiphytes of the mist-forest formation, only three species, viz. *E. xanthotricha* Schltr., *E. collina* Schltr. and *E. bracteata* Schltr. occur below this region and extend down to about 300 metres altitude, indicating that they prefer more warmth than the other species.

29. *E. iodantha* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 70 cm longum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, bene foliatis, vaginis foliorum arcte amplexantibus densissime villosis-hispidis omnino obtectis, 0.6–0.7 cm diametentibus; foliis erecto-patentibus, oblique elliptico-lanceolatis, obtusiuscule acuminatis, basin versus sensim paulo angustatis, utrinque molliter puberulis, superne demum subglabratis, 10–18 cm longis, medio fere 1.8–3.3 cm latis; spicis lateralibus, erecto-patentibus, pilis ferrugineis dense villosis, breviter pedunculatis, laxe 8–10-floris, usque ad 9 cm longis; bracteis ellipticis, obtusiusculis, ovarium paulo superantibus, ferrugineo-villosis; floribus in sectione mediocribus, extus dense ferrugineo-villosis; sepalis oblongis, obtusiusculis, intus glabris, 1.2 cm longis, lateralibus subfalcato-obliquis, basi margine anteriore lobato-producta cum pede columnae mentum oblongoideum obtusum leviter incurvulum 0.8 cm longum formantibus; petalis oblique lineari-ligulatis, obtusis, glabris, sepalis paulo brevioribus; labello circuitu oblanceolato-ligulato, 1.4 cm longo, supra medium 4.75 mm lato, glabro, e basi ligulata concavula medium versus sensim paululo dilatato, in quarta parte apicali paululo constricto et apicem versus sursum paulo dilatato, antice truncato-obtusissimo, leviter retuso cum apiculo minuto interjecto, callis 3 oblanceolatis in tertia parte apicali labelli, intermedio paulo anteposito; columna brevi, glabra, pede antice paulo incurvulo ligulato, clinandrii lobis humilibus; anthera subreniformi-cucullata, dorso gibbo donata, glabra, antice truncata; ovario sessili densissime hispido, 0.7 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17682 (TYPE), flowering in May 1908; no. 16650, past

flowering in Oct. 1907; on trees in the forests of the Ibo Range, alt. c. 1200 m—R. Schlechter no. 17089, in early bud in Dec. 1907.

Of all the species occurring in German New Guinea, this is distinguished by the labellum not being distinctly three-lobed, but entire. The rusty-coloured hair is strikingly dense on the flowers. The flowers are yellowish inside with red-brown stripes and a violet-brown anther.

30. *E. atroferruginea* Schltr., sp. nov.

Epiphytica, patula, usque ad 100 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, minute puberulis; caulibus simplicibus, elongatis, teretibus, bene foliatis, vaginis foliorum basi tantum ferrugineo-villosis, caeterum glabris, arcte amplexantibus omnino obtectis, 0.7–1 cm diametientibus; foliis erecto-patentibus, ligulatis, inaequaliter et obtuse bilobulatis, glabris, 15–22 cm longis, medio fere 2–3.3 cm latis, glabris, textura coriaceis; spicis lateralibus arcuato-patulis, subaxe 10–15-floris, pilis atroferrugineis perdense villosis, usque superbasin floriferis, usque ad 13 cm longis; bracteis recurvis, ovalibus, obtusis, flores subaequantibus vel paulo brevioribus; floribus in sectione inter mediocres, extus dense atroferrugineo-villosis; sepalis ovato-oblongis, apiculatis, intus glabris, 1 cm longis, lateralibus obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongoideum obtusum c. 0.5 cm longum formantibus; petalis oblique lineari-ligulatis, obtusis, margine sparsim ciliatis, caeterum glabris; labello circuitu longe cuneato, 1.1 cm longo, infra apicem 0.6 cm lato, e basi oblongo-ligulata medio trilobato, superne infra medium callis 2 lineari-lanceolatis minute papilloso-puberulis, e medio usque infra apicem callo mediano lineari minute papilloso-puberulo ornato, lobis lateralibus minutis, dentiformibus, intermedio subreniformi, exciso cum apiculo obtuso; columna brevi, pede ligulato, clinandrii lobis subcrenatis, brevibus, dorsali triangulo paulo longiore; anthera reniformi-cucullata, apiculata, glabra; ovario sessili, pilis atroferrugineis villosis, 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19604, flowering in May 1909.

In its vegetative parts, this plant is the largest of the Papuan [Papuasian] species of this section so far described. In its floral structure it is nearest to *E. iodantha* Schltr. It is characterised strikingly by the glabrous leaves and the dense, very dark brown hairs on the inflorescence and flowers. The shape of the lip distinguishes the species at once. The flowers are brown-red with brownish white petals and lip.

31. *E. rufa* Schltr., sp. nov.

Epiphytica, patula, usque ad 130 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, bene foliatis, vaginis foliorum arcte amplexantibus, rufo-villosis omnino obtectis, 0.5–0.6 cm diametientibus; foliis erecto-patentibus, lanceolato-ligulatis, obtusiuscule acuminatis, utrinque molliter et breviter villosulis, 8–13 cm longis, medio fere 1.3–2.5 cm latis; racemis dense rufo-villosis, laxae 4–8-floris, foliis fere duplo brevioribus, perbreve pedunculatis; bracteis suborbicularibus, obtusis, floribus subaequilongis; floribus in sectione mediocribus, extus dense rufo-villosis; sepalis oblongis, obtusiusculis, 1.3 cm longis, lateralibus falcato-obliquis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongoideum obtusum incurvulum c. 0.6 cm longum formantibus; petalis oblique lineari-ligulatis, obtusis, basin versus paulo angustatis, sparsim pilosis et ciliatis, sepalis paulo brevioribus; labello e basi cuneata tertia parte anteriore trilobato, 1.4 cm longo, medio fere 0.8 cm lato, callis 2 oblique oblanceolatis in dimidio inferiore ornato, carinula brevi minute puberula mediana e medio usque in basin lobi intermedii anteposita, apice gibbo parvulo obtuso terminata, lobis lateralibus perparvulis falcato-triangularibus subacutis, intermedio multo majore, subquadrato, obtusissimo; columna brevi, dorso sparsim puberula, pede incurvulo, clinandrii lobis lateralibus rotundatis, dorsali obtuso paulo altiore; anthera rotundato-cucullata, obtusa, umbone reniformi ornata, glabra; ovario dense villosis, sessili, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20219, flowering in Sept. 1909.

Externally, this species bears some similarity to *E. paludosa* J.J. Sm. from Dutch New Guinea, but differs considerably in the shape and structure of the lip. The latter

reminds one more of *E. bracteata* Schltr. which, however, is very different in habit. The flowers are pale yellow, with red-brown hairs.

32. *E. bracteata* Schltr., sp. nov.

Epiphytica, patula, usque ad 80 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, minute papilloso-puberulis; caulibus simplicibus, teretibus, bene foliatis, vaginis foliorum flavido-villosis, arcte amplexantibus omnino obtectis, c. 1 cm diametentibus; foliis erecto-patentibus, ellipticis, oblique acuminatis, utrinque pilis brevibus subvillosis-puberulis, superne demum subglabris, 8–16 cm longis, medio fere 2.8–4.5 cm latis; spicis pendulis foliorum longitudine, laxe 8–14-floris usque supra basin floriferis, fulvo-villosis; bracteis patentibus, ovato-lanceolatis, acuminatis, inferioribus flores superantibus, superioribus flores aequantibus; floribus in sectione inter majores, extus fulvo-villosis; sepalis oblongis, obtusiusculis, intus glabris, 1.3 cm longis, lateralibus falcatis, basi margine anteriore lobato-ampliata cum pede columnae mentum oblongoideum obtusum incurvum 0.7 cm longum formantibus; petalis falcato-ligulatis, obtusis, dimidio inferiore sparsim pilosis, sepalis paulo brevioribus; labello e basi cuneata supra medium trilobato, c. 1 cm longo, inter apices loborum lateralium 0.8 cm lato, basi carina verruculosa acuta usque ad basin lobi intermedii donato, lobis lateralibus parvulis, oblique triangulis, obtusiusculis, antice truncatis, intermedio multo majore quadrato, antice exciso, leviter undulato, carina tenui infra apicem superne donato; columna semitereti, dorso sparsim pilosa, pede ligulato leviter incurvo; clinandrii lobis lateralibus rotundatis, dorsali brevi, dentiformi; anthera reniformi-cucullata, umbonata, glabra, antice excisa; ovario sessili, villosulo, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees of the mountain forests near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19285, flowering in Apr. 1909.

At first I thought that I was dealing with my earlier-described species *E. xanthotricha* Schltr., until examination of the flowers showed the lip of the two species to be entirely different, for the lateral lobes, which in *E. xanthotricha* Schltr. are well developed, are here much more reduced and very small. The middle lobe is also quite different. The flowers are yellowish, suffused with red, the labellum darker.

33. *E. xanthotricha* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 184.

Trichotosia xanthotricha Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21, II (1911), p. 149.

Kaiser-Wilhelms-Land: On tree-trunks in the forests on the upper Nuru [River], alt. c. 500 m—R. Schlechter no. 14210, past flowering in Feb. 1902.

Already I have made some remarks regarding the differences between this species and *E. bracteata* Schltr. I should perhaps add further that in *E. xanthotricha* Schltr. the leaves are longer and narrower. *E. Teijsmannii* J.J. Sm. from Borneo is related closely to both species and is strikingly similar in habit, though very different in the structure of the labellum.

34. *E. phaeotricha* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 181.

Trichotosia phaeotricha Krzl., in Engl. Pflanzenr. IV, 50, II, B. 21, II (1911), p. 144.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14473, flowering in Apr. 1902.

This very characteristic species differs from the following one, to which it is related closely, in its dense flower-spikes with very large bracts and the conspicuously wide middle lobe of the labellum which is wider than the remaining portion of the lip. It stands closest to *E. paludosa* J.J. Sm. from Dutch New Guinea. The flowers are whitish on the inside.

35. *E. collina* Schltr., sp. nov.

Epiphytica, patula, 30–45 cm longa; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, minute puberulis; caulibus simplicibus, teretibus, bene foliatis, vaginis foliorum striatis, pilis rufis strigoso-puberulis, arcte amplexantibus omnino obtectis, 0.3–0.4 cm diametentibus; foliis

erecto-patentibus, lanceolatis vel lanceolato-ligulatis, acuminatis, basi cuneatis, subtus strigoso-puberulis, superne mox glabratis, 7–11 cm longis, medio vel infra medium 0.9–1.8 cm latis; spicis lateralibus erecto-patentibus, subaxe 4–8-floris, dense rufo-villosis, vulgo foliis brevioribus, nunc aequilongis, pedunculo racemo ipso fere aequilongo; bracteis recurvis, ovatis, obtusiusculis, ovarium duplo fere superantibus; floribus in sectione inter mediocres, extus dense rufo-villosis; sepalis oblongis, apiculatis, intus glabris, 1.2 cm longis, lateralibus falcatis, basi margine anteriore lobato-dilatata cum pede columnae mentum oblongoideo-conicum obtusum 0.6 cm longum formantibus; petalis subfalcatis, lineari-ligulatis, obtusis, sparsim pilosis, sepalis paulo brevioribus; labello e basi subungiculato-cuneata, tertia parte apicali trilobato, 1.5 cm longo, inter apices loborum lateralium 1 cm lato, lamellis 2 e basi labelli usque in basin lobi intermedii decurrentibus, carina puberula e medio usque infra apicem labelli interjecta, lobis lateralibus satis magnis subfalcato-triangularibus obtusis, margine anteriore subrenulatis, sparsim ciliatis, intermedio majore perlate rhomboideo, subcrenulato, sparsim ciliato, antice exciso cum apiculo; columna semitereti, satis gracili, pede incurvulo, clinandrii lobis rotundatis, humilibus; anthera late umbonata, reniformi-cucullata, glabra, obtusissima; ovario sessili, longe rufo-villoso, 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the hill-forests near Jaduna on the Waria [River], alt. c. 300–500 m—R. Schlechter no. 19294, flowering in Apr. 1909.

This species appears to be related closely to *E. paludosa* J.J. Sm. from Dutch New Guinea. From the latter, *E. collina* Schltr. differs in the distinctly larger lateral lobes of the lip and the glabrous lateral lamellae of the labellum. Externally, both species show great similarity. The flowers are whitish, inside streaked red with white tips; the labellum white with red-margined lateral lobes.

var. *Govidjoae* Schltr., var. nov.

Differt a forma typica floribus minoribus, labelli lobis lateralibus magis falcatis, intermedio minus exciso, carina intermedia longiore.

Kaiser-Wilhelms-Land: On trees in the forests on the Govidjoa [Creek] (Waria District), alt. c. 800 m—R. Schlechter no. 19730, flowering in June 1909.

When I found this plant I thought initially that I had a new species, but I soon convinced myself that it should be treated only as a variety of *E. collina* Schltr. The flower colouring is the same as in the Type-form.

36. *E. oreodoxa* Schltr., sp. nov.

Epiphytica, erecta, pro sectione parvula, 7–20 cm alta; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; caulibus simplicibus, teretibus, bene foliatis, vaginis foliorum rufo-villosis arcte amplexentibus omnino obtectis, 2.5–3.5 mm diametentibus; foliis erecto-patentibus, linearibus, subacutis, sparsim rufo-hispidulis, demum subglabris, 2–5 cm longis, medio fere 3–5 mm latis; spicis lateralibus gracilibus, arcuatis, foliorum longitudine vel paulo longioribus, laxe 3–7-floris, rufo-villosis, pedunculo et rhachi gracilibus, flexuosis; bracteis suborbicularibus, obtusis, rufo-villosis, ovario aequilongis; floribus in sectione inter minimos, extus rufo-villosis, erecto-patentibus; sepalis oblongis, obtusis, 3.5 mm longis, intus glabris, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum c. 1.5 mm longum formantibus; petalis subfalcato-ligulatis, obtusis, margine sparsim longeciliatis, sepalis paulo brevioribus; labello e basi obovato-cuneata tertia parte anteriore trilobato, supra basin gibbo obtuso donato, 3.25 mm longo, inter apices loborum lateralium 2.5 mm lato, lobis lateralibus oblique semioblongis, obtusis, margine interiore ciliatis, intermedio bene majore semiquadrato, antice exciso cum apiculo lato; columna brevi, facie sparsim farinoso-papillosa, clinandrii lobis lateralibus humilibus, dorsali truncato haud altiore; anthera reniformi-cucullata, obtusa, dorso granulosa; ovario sessili, cylindraceo, rufo-villoso, 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19582, flowering in May 1909.

A charming little species which is isolated entirely from the rest of the section in the Territory. However, it approaches certain Malayan species rather closely, such as *E. mollis* Schltr. and *E. hispidissima* Ridl. The flowers are red-brown with gold-brown hairs; the anther is red, edged with white.

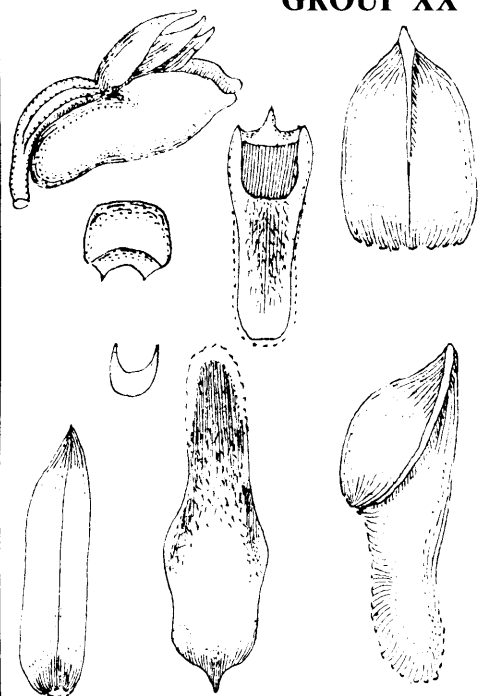
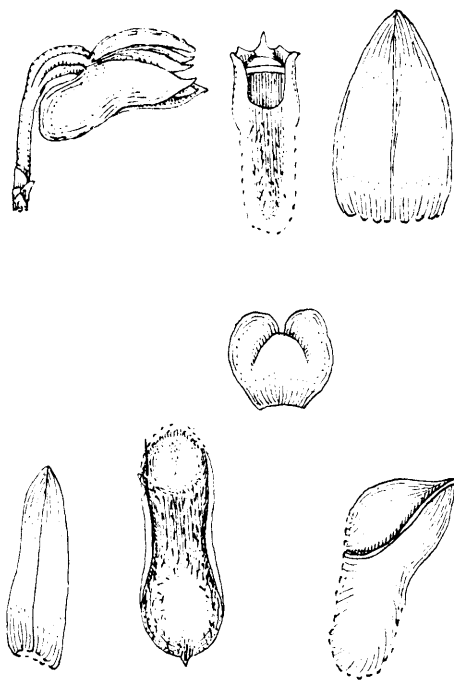
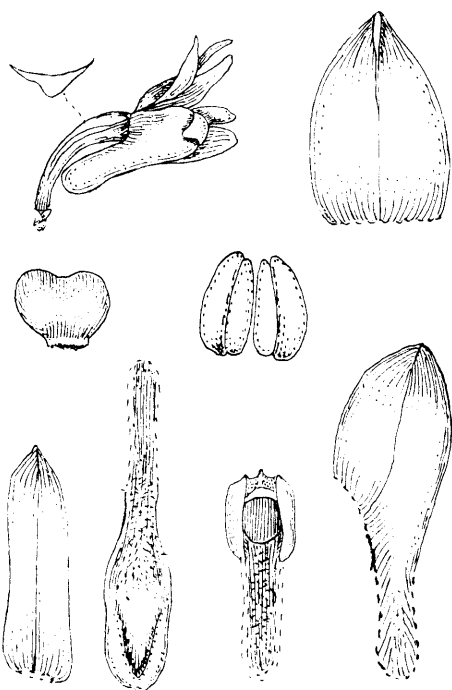
Species of Quite Uncertain Position

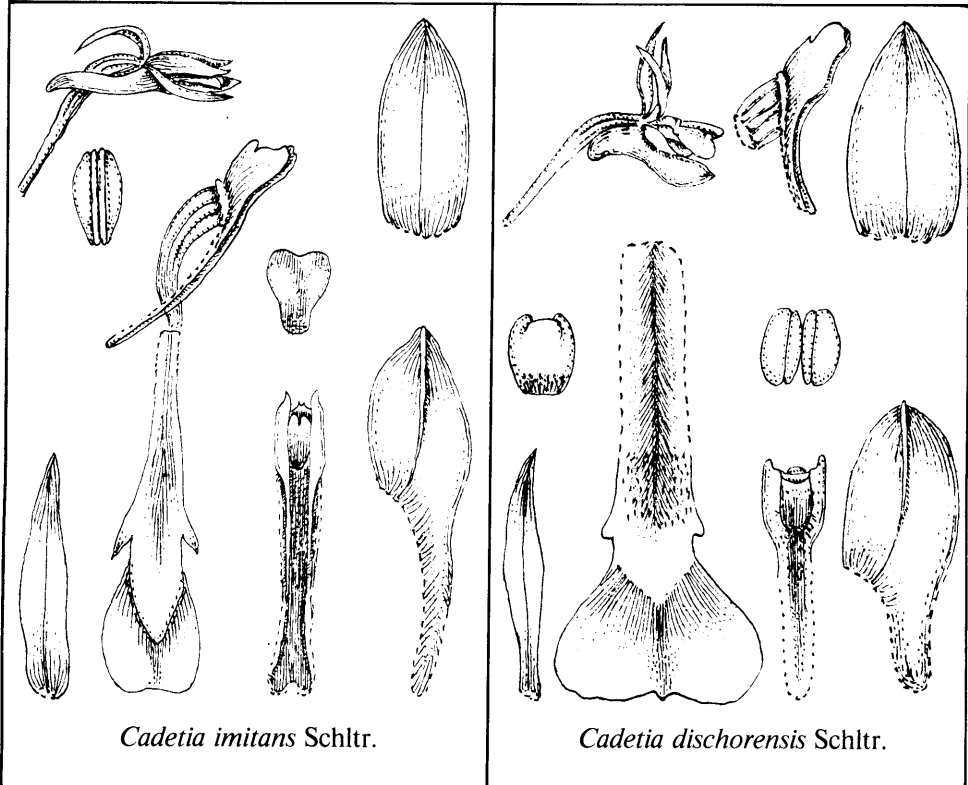
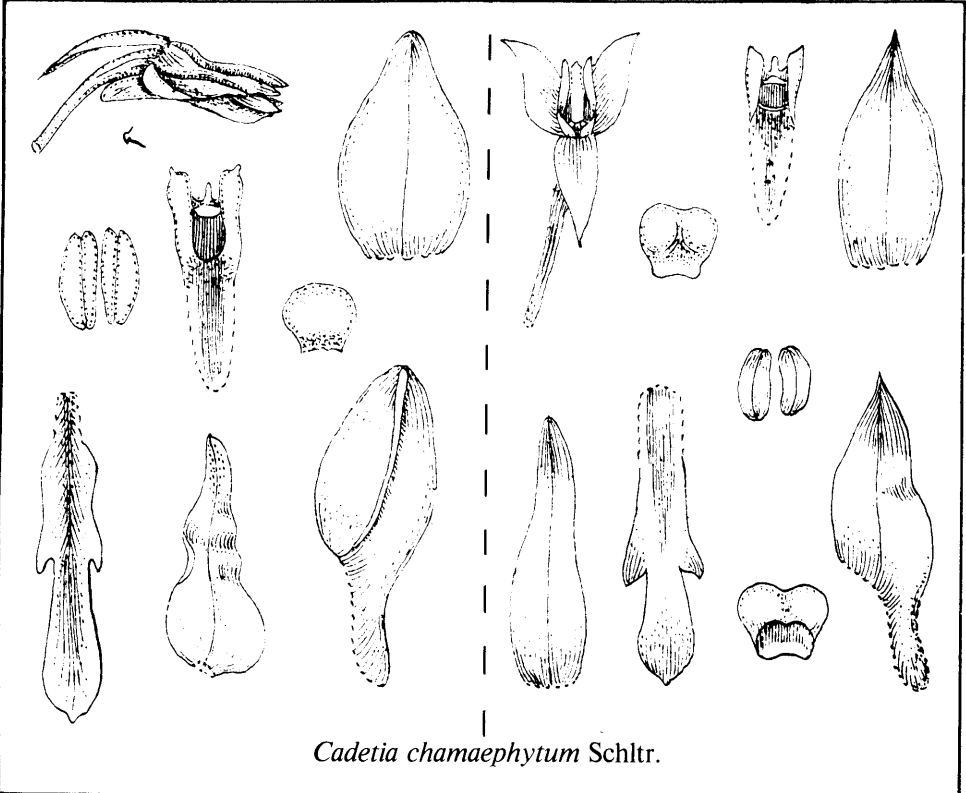
37. *E. Micholitziana* Krzl., in Notizbl. Kgl. Bot. Gart. Berlin III (1900), p. 21.

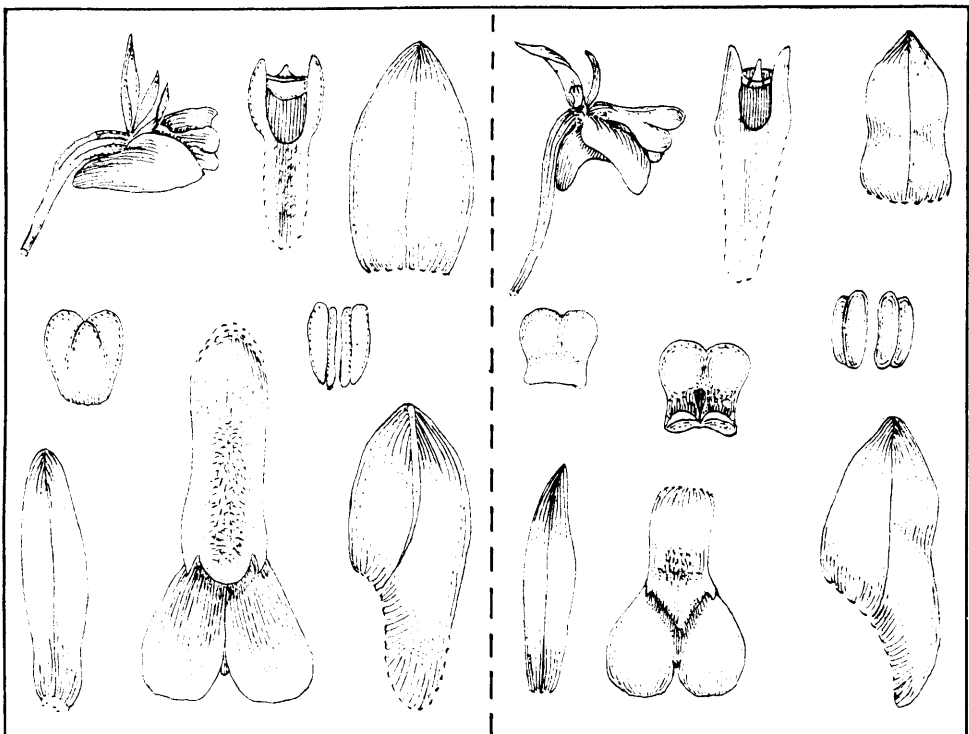
Kaiser-Wilhelms-Land: Without location details—W. Micholitz, imported into England in 1895.

From the description, it is not possible for me to place the plant anywhere, for, it might accordingly just as well be treated as an *Hymeneria* or as a *Trichotosia*. According to the rules of nomenclature as I have shown above [p. 647] the name can quite well be retained near *E. Micholitzii* Krzl. According to the statement of the author, the flowers are green-brown on the outside, the petals white with a red line in the middle. The labellum is white suffused with violet.

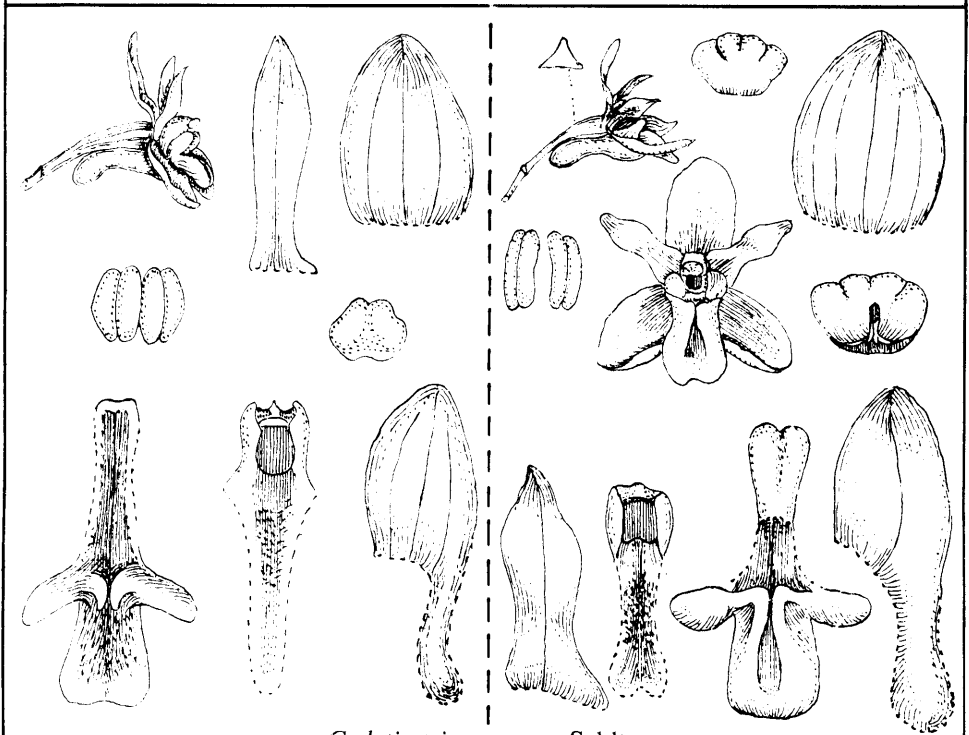
GROUP XX

Dendrobiinae*Cadetia parvula* Schltr.*Cadetia crassula* Schltr.*Cadetia wariana* Schltr.

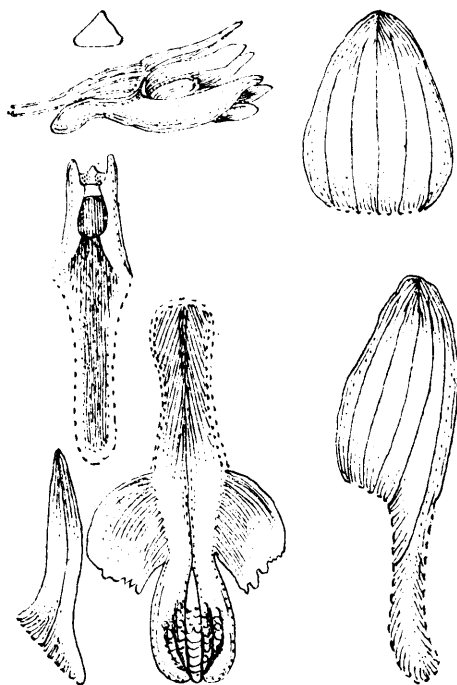




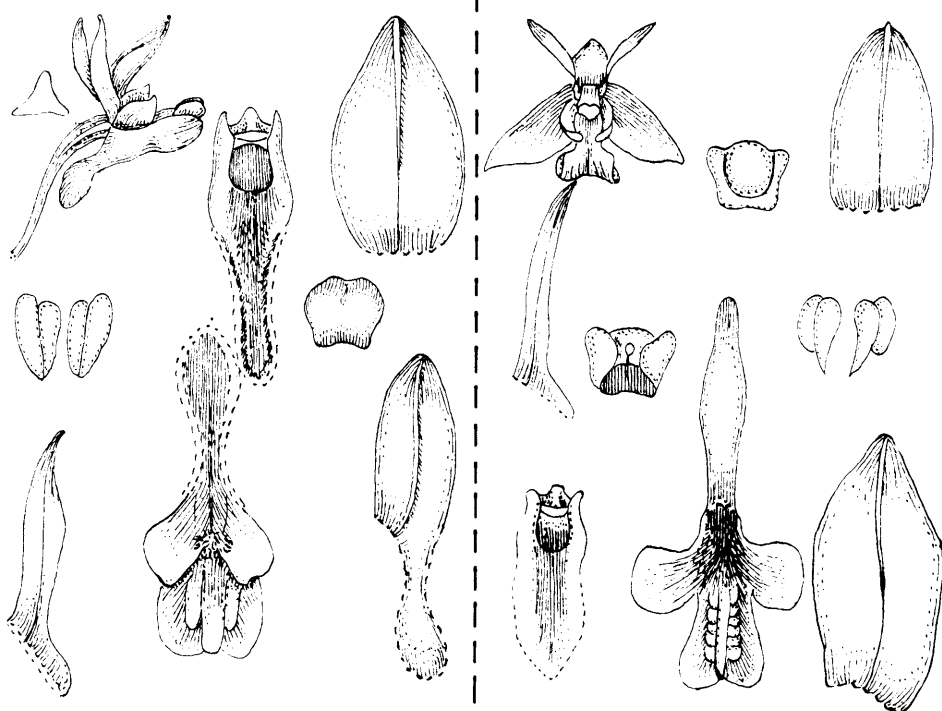
Cadetia chionantha Schltr.



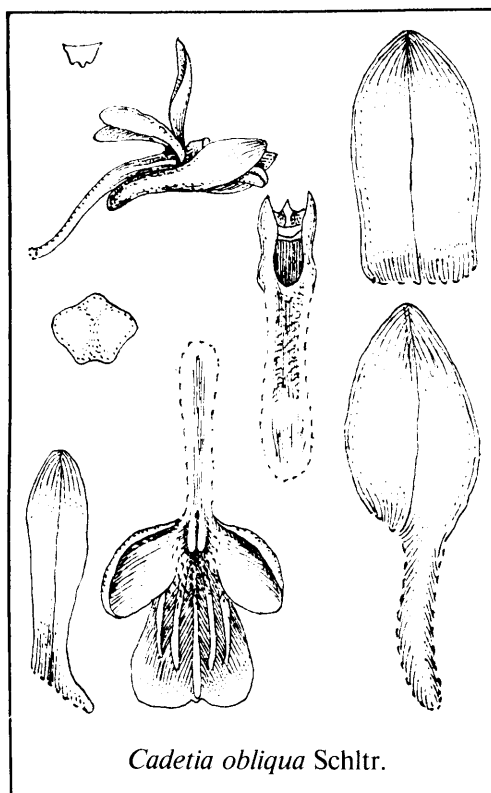
Cadetia trigonocarpa Schltr.



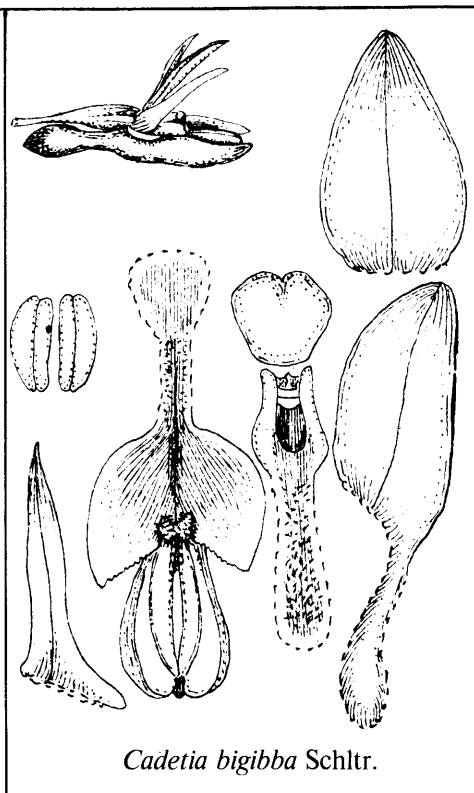
Cadetia crenulata Schltr.



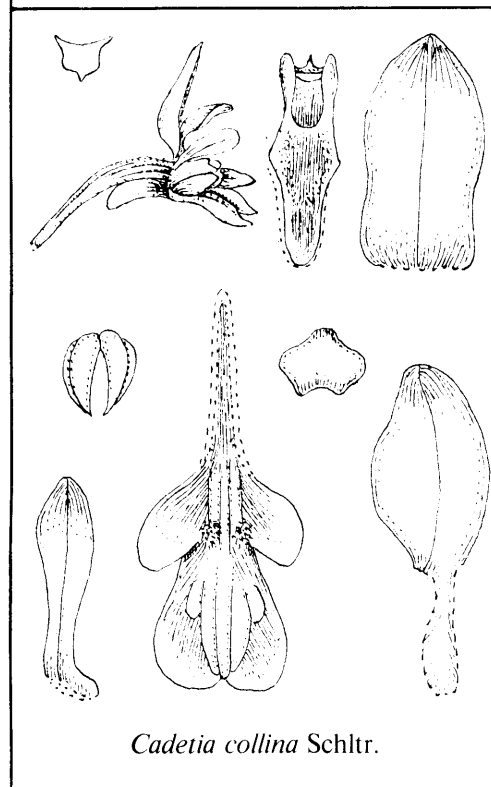
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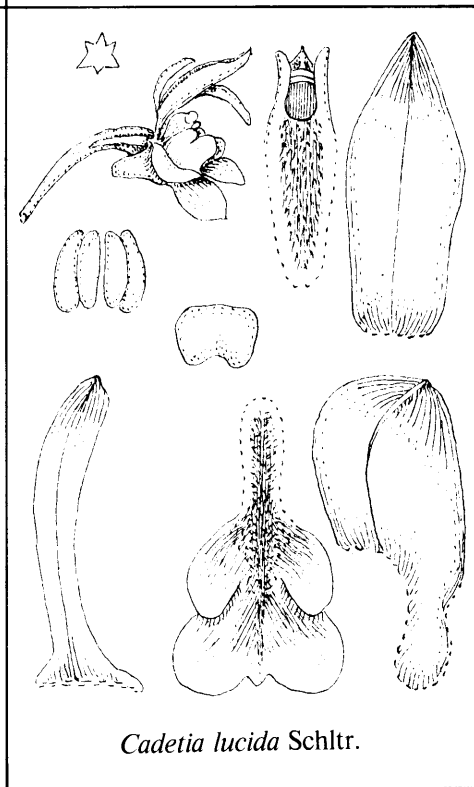
Cadetia obliqua Schltr.



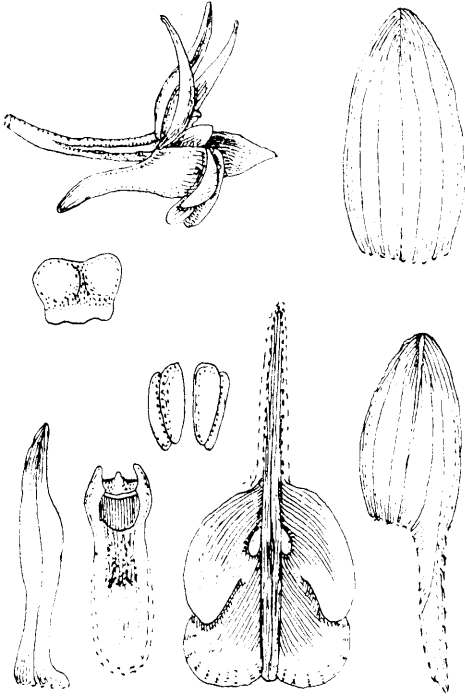
Cadetia bigibba Schltr.



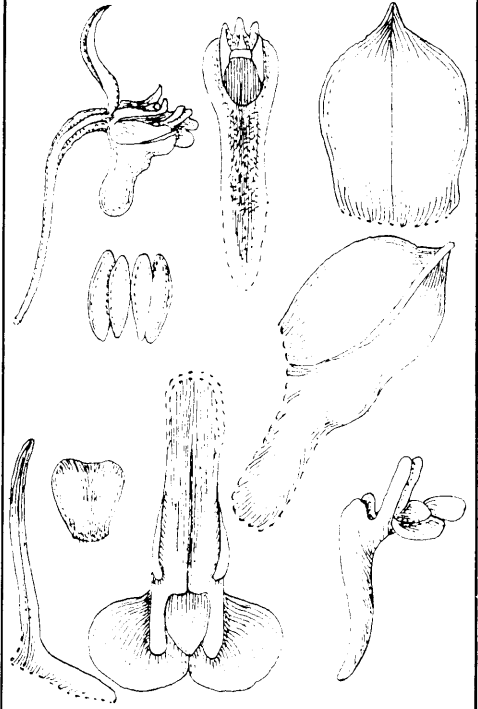
Cadetia collina Schltr.



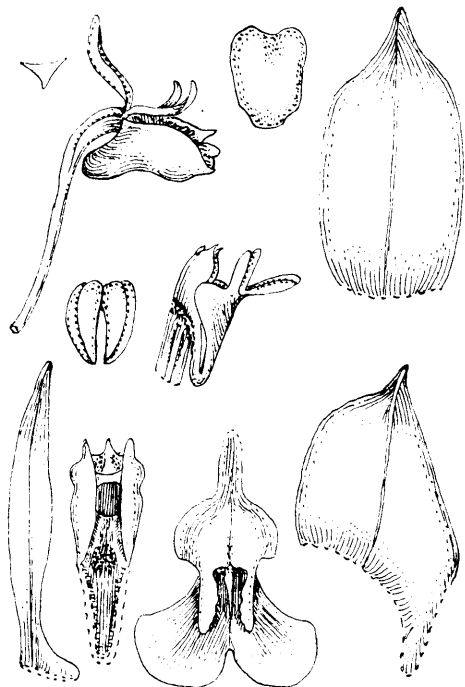
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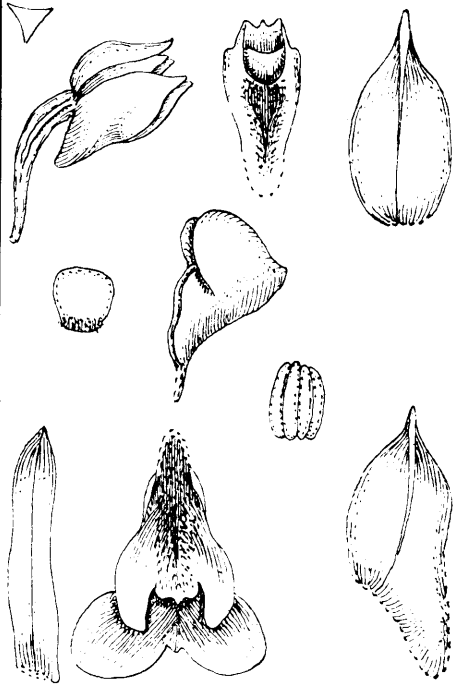
Cadetia takadui Schltr.



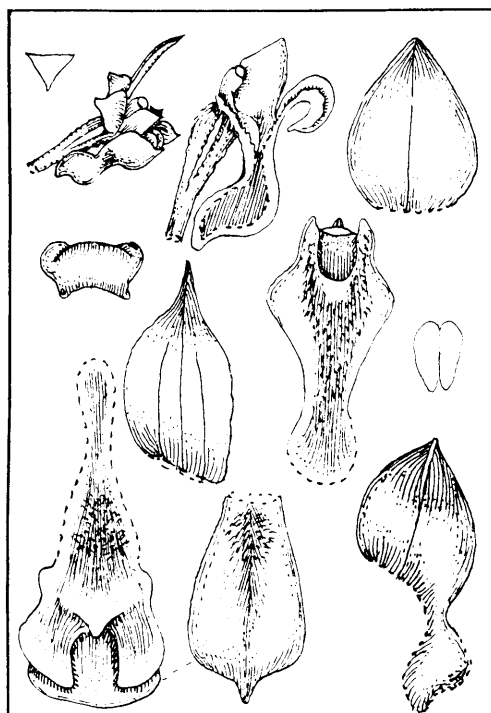
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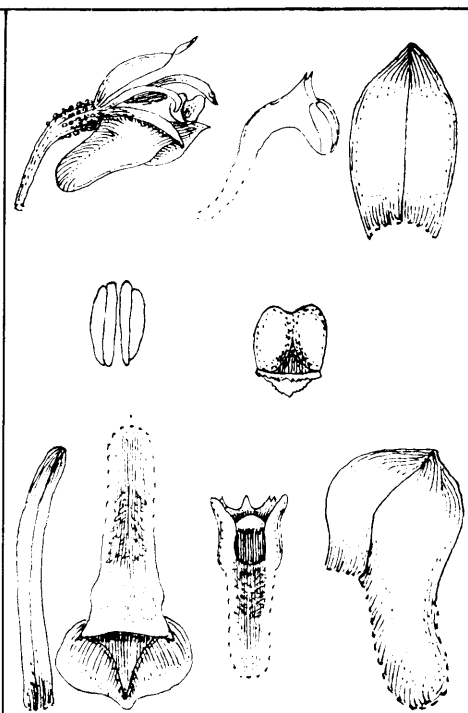
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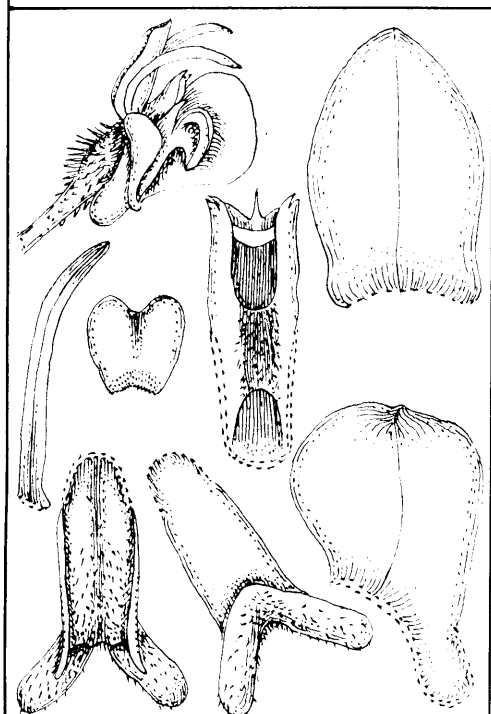
Cadetia Finisterrae Schltr.



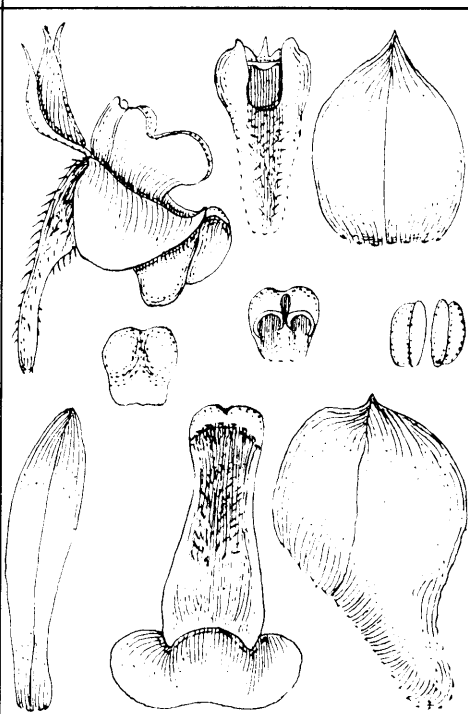
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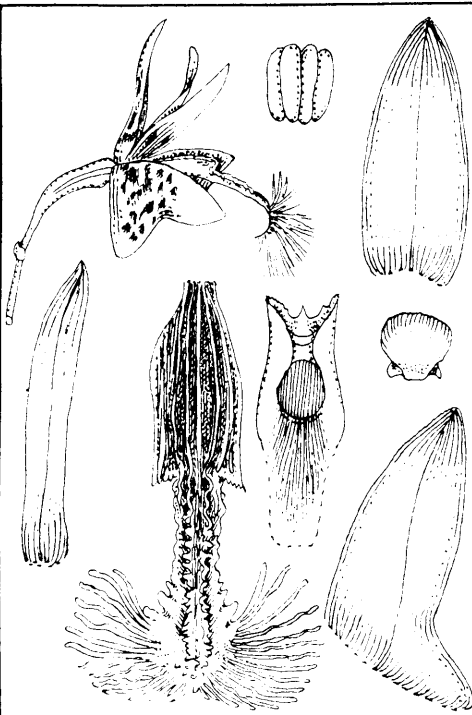
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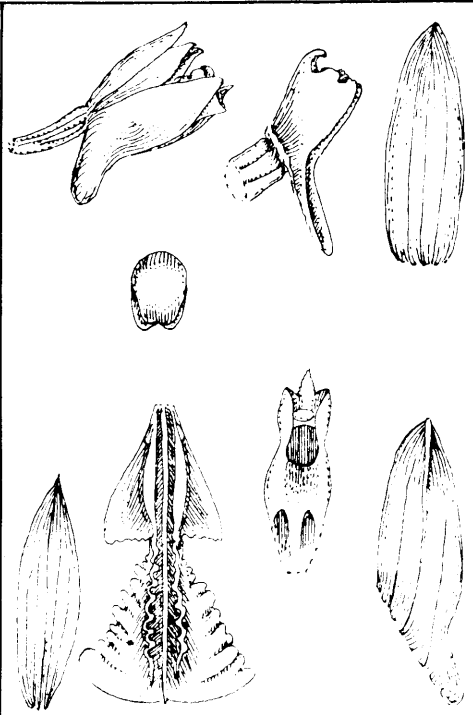
Cadetia echinocarpa Schltr.



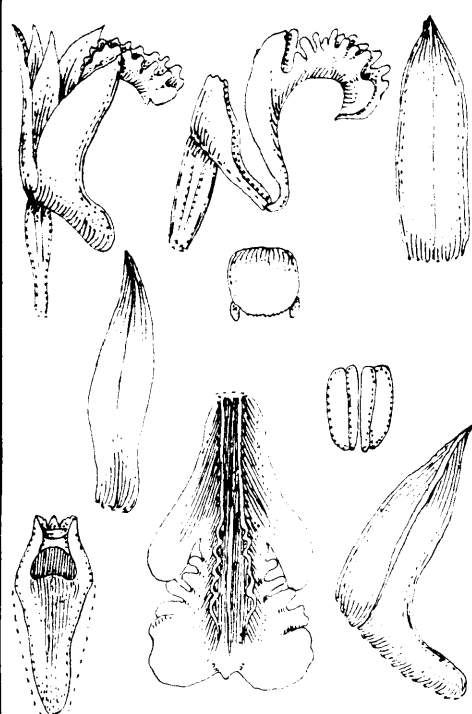
Cadetia karoensis Schltr.



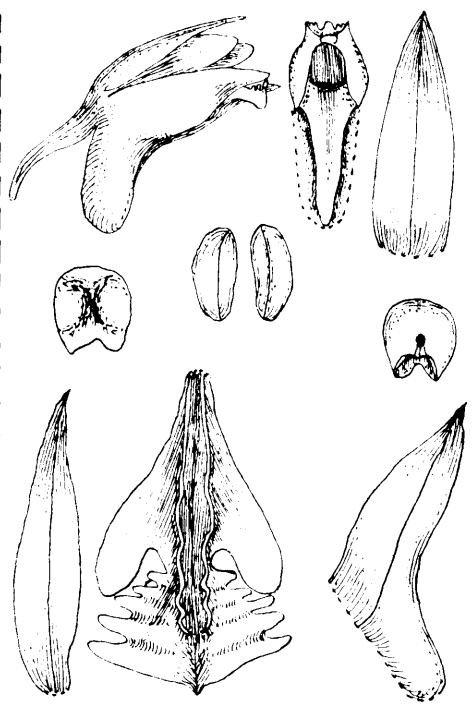
Dendrobium thysanochilum Schltr.

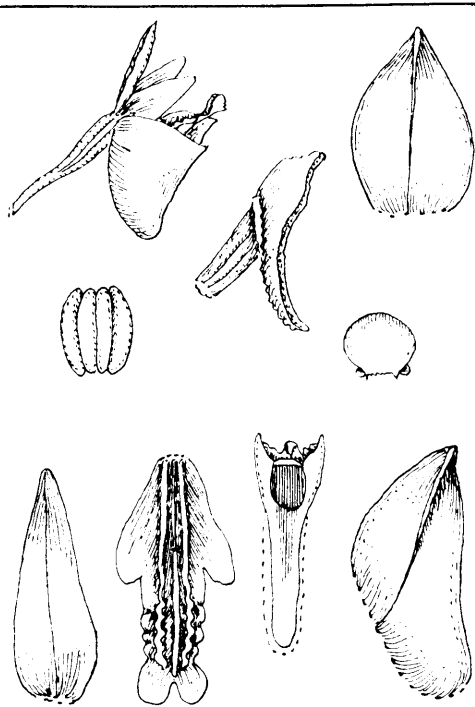


Dendrobium flabelliforme Schltr.

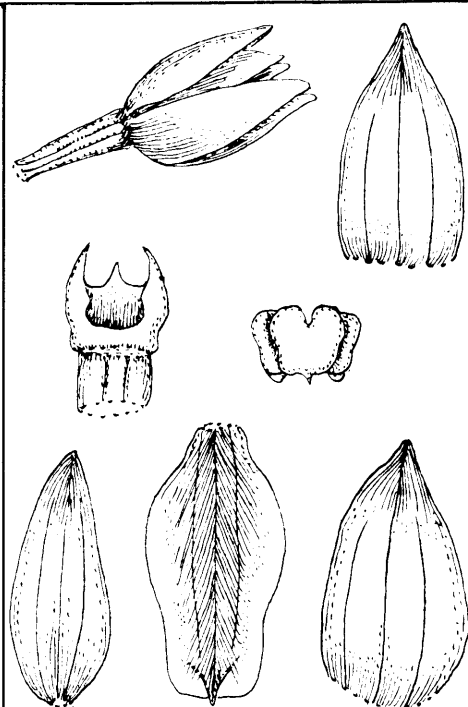


Dendrobium rhipidolobum Schltr.

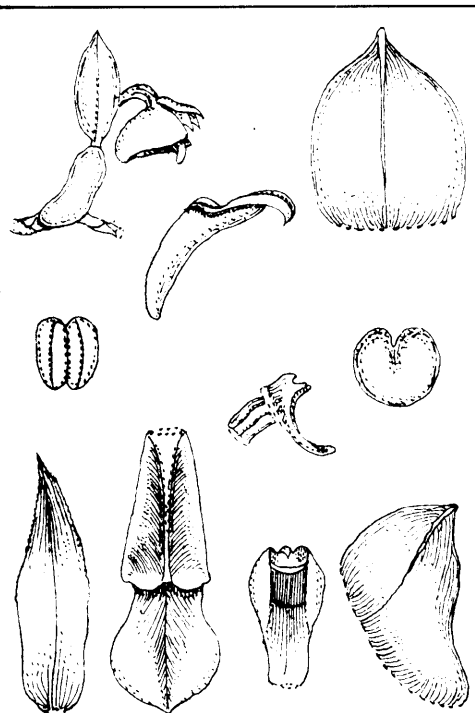




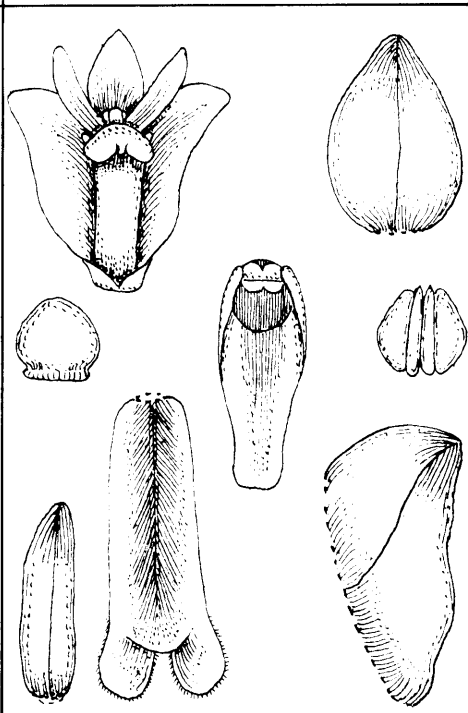
Dendrobium Pema Schltr.



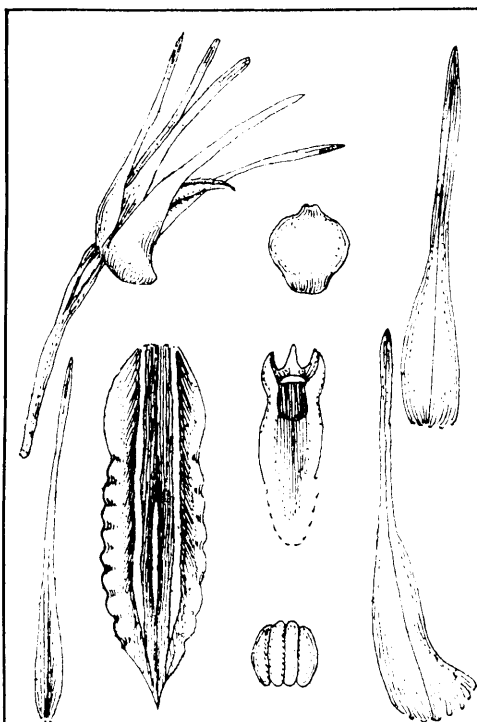
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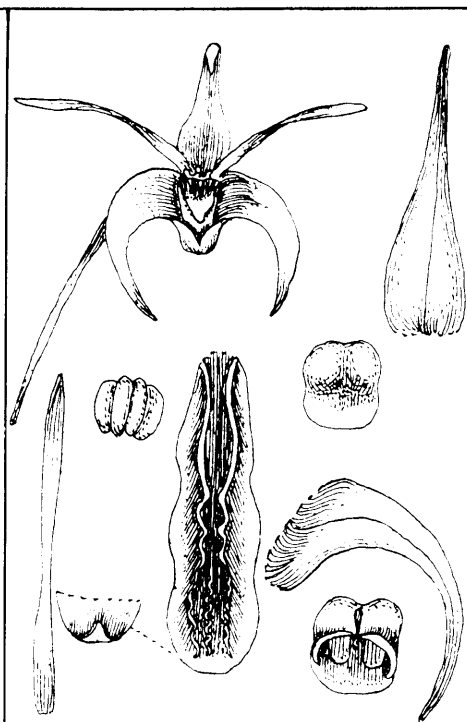
Dendrobium bulbophylloides Schltr.



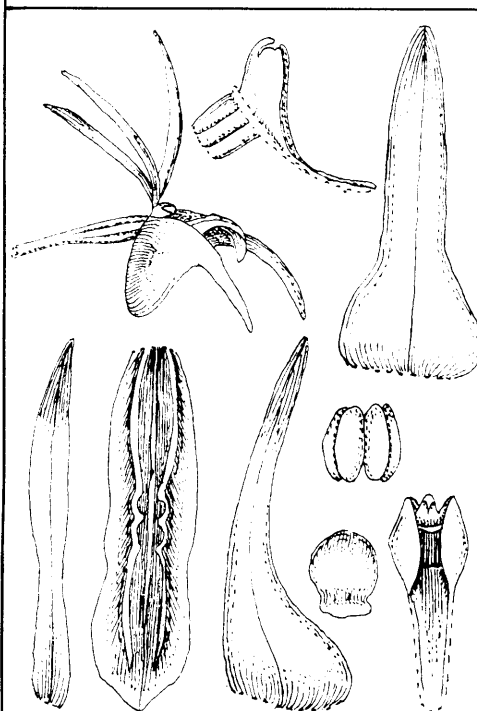
Dendrobium nummularia Schltr.



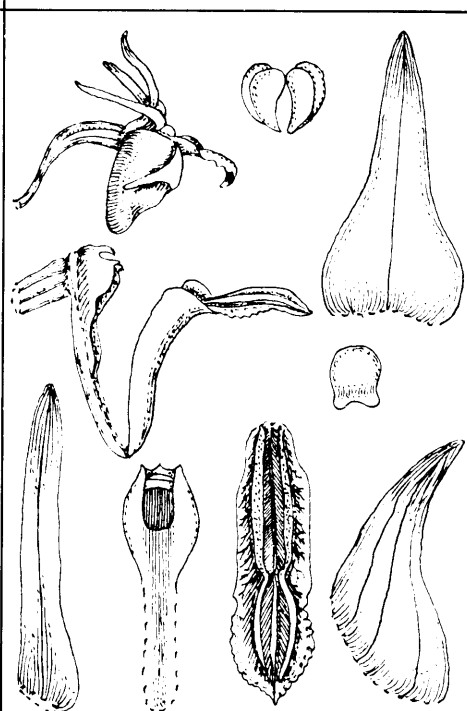
Dendrobium glabrum J.J. Sm.



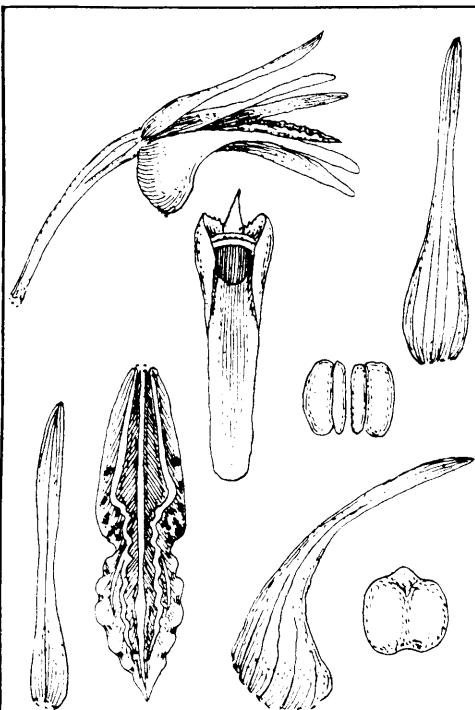
Dendrobium chrysotropis Schltr.



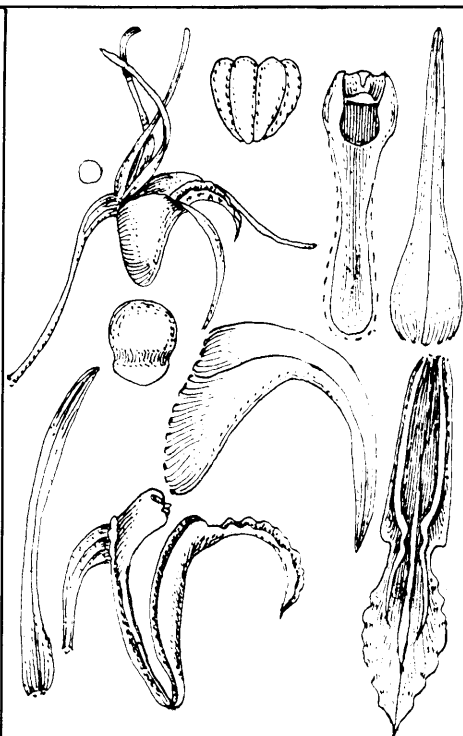
Dendrobium tropidophorum Schltr.



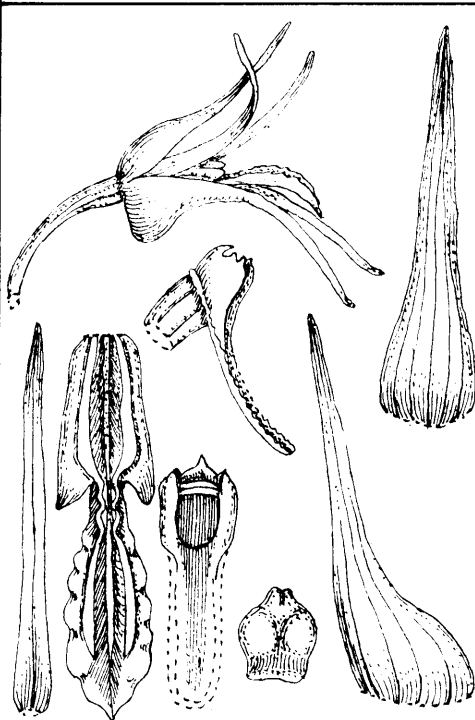
Dendrobium cyclobulbon Schltr.



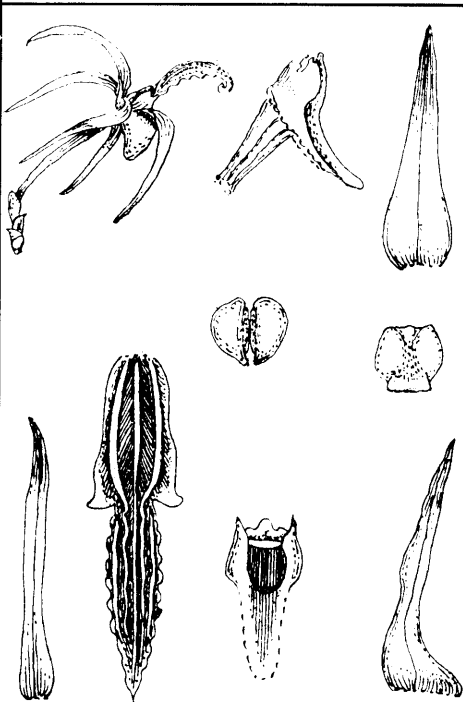
Dendrobium dichrotropis Schltr.



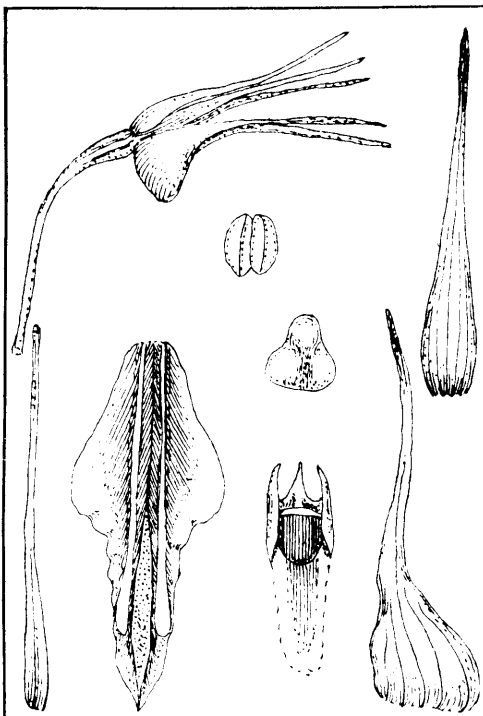
Dendrobium Jadunae Schltr.



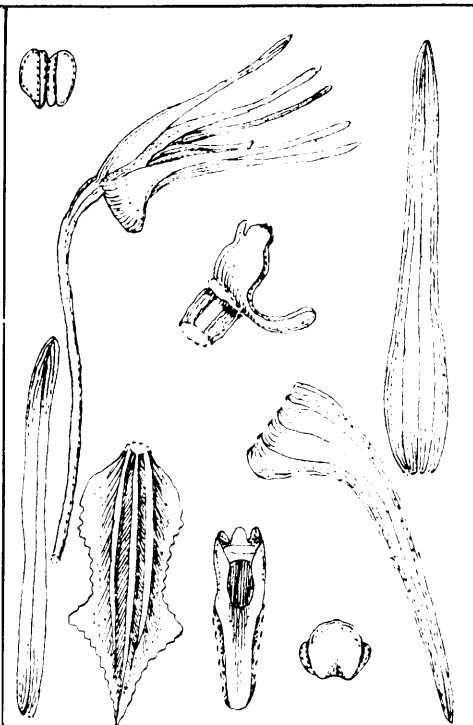
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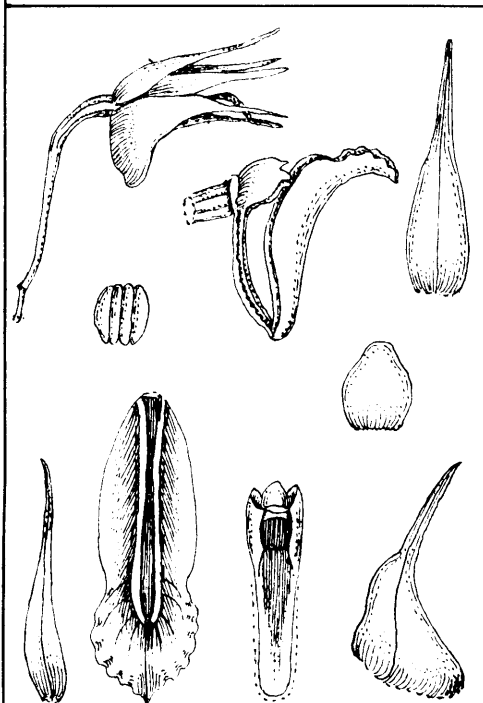
Dendrobium minjemense Schltr.



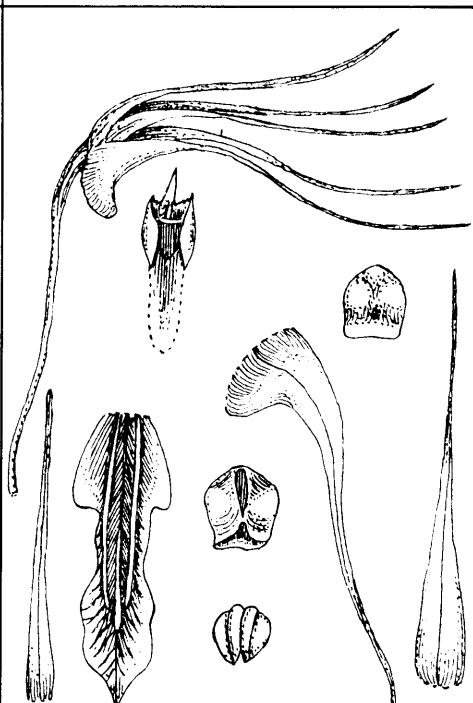
Dendrobium abbreviatum Schltr.



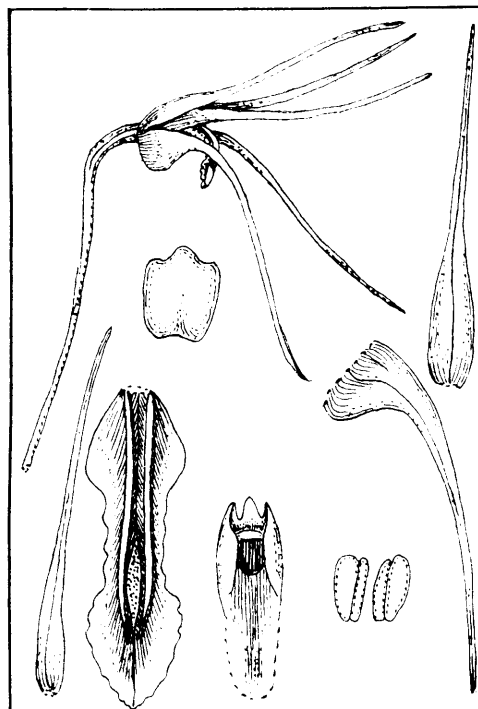
Dendrobium cadetioides Schltr.



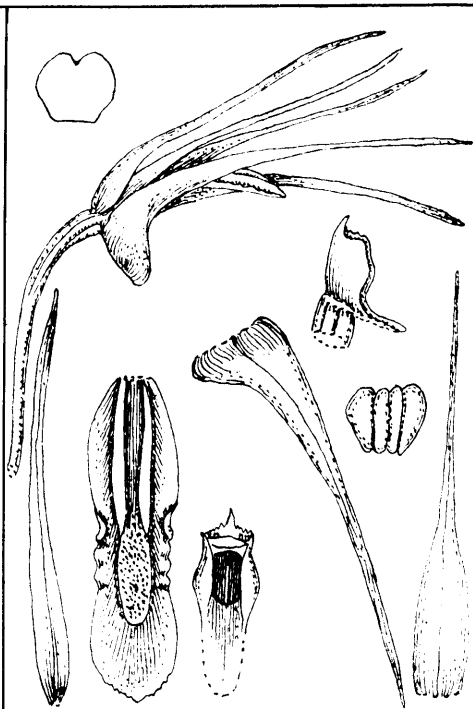
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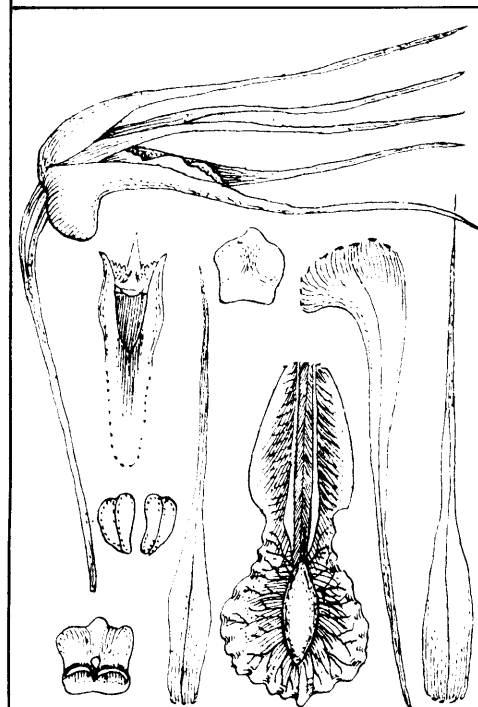
Dendrobium tentaculatum Schltr.



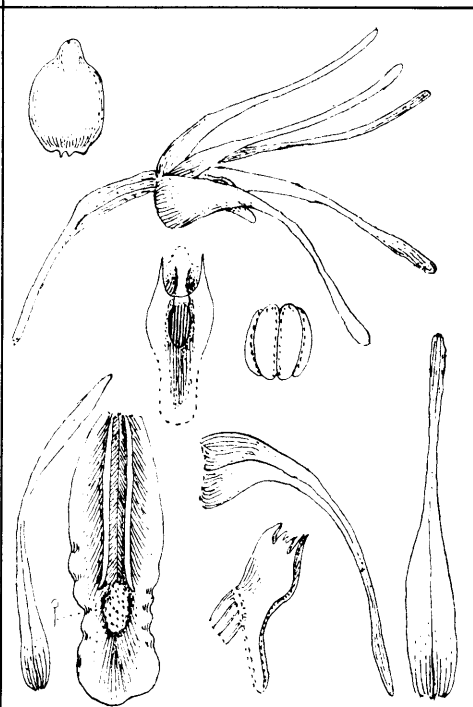
Dendrobium araneola Schltr.



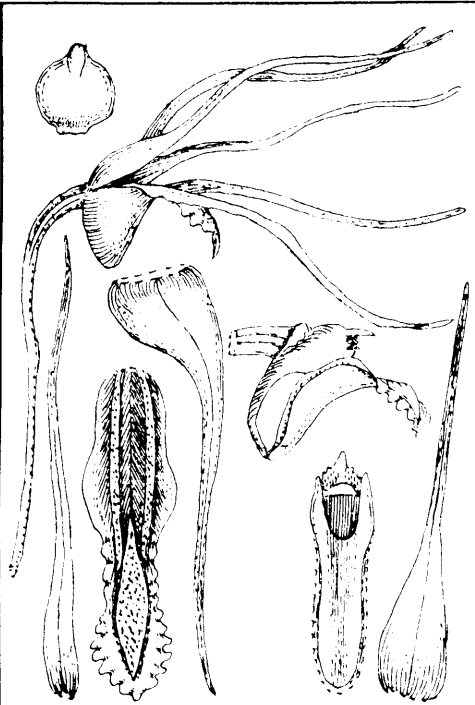
Dendrobium arachnoideum Schltr.



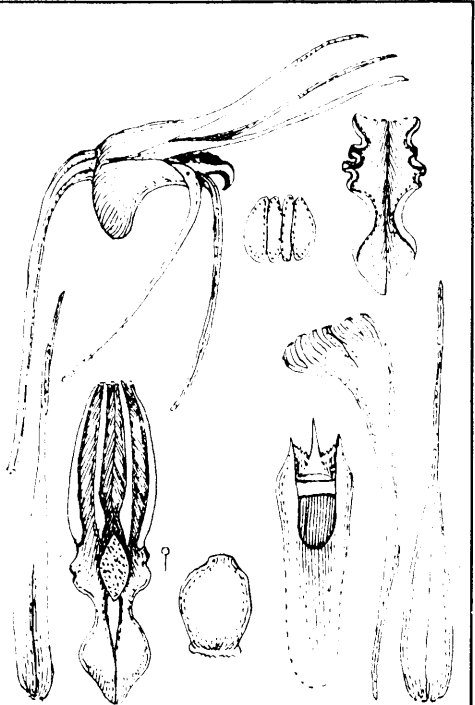
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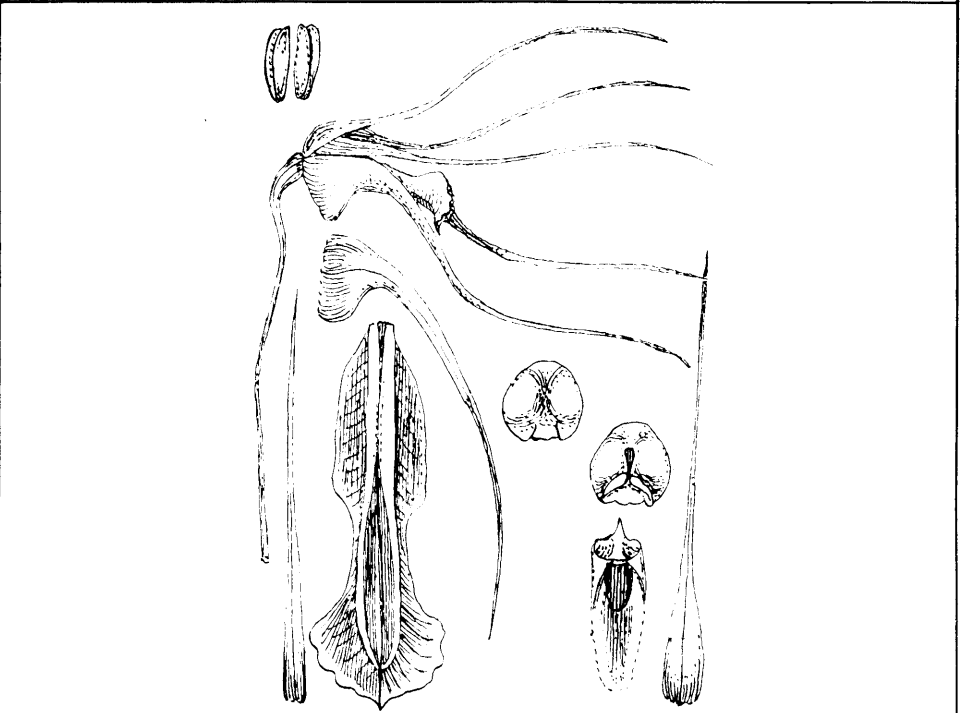
Dendrobium fariniferum Schltr.



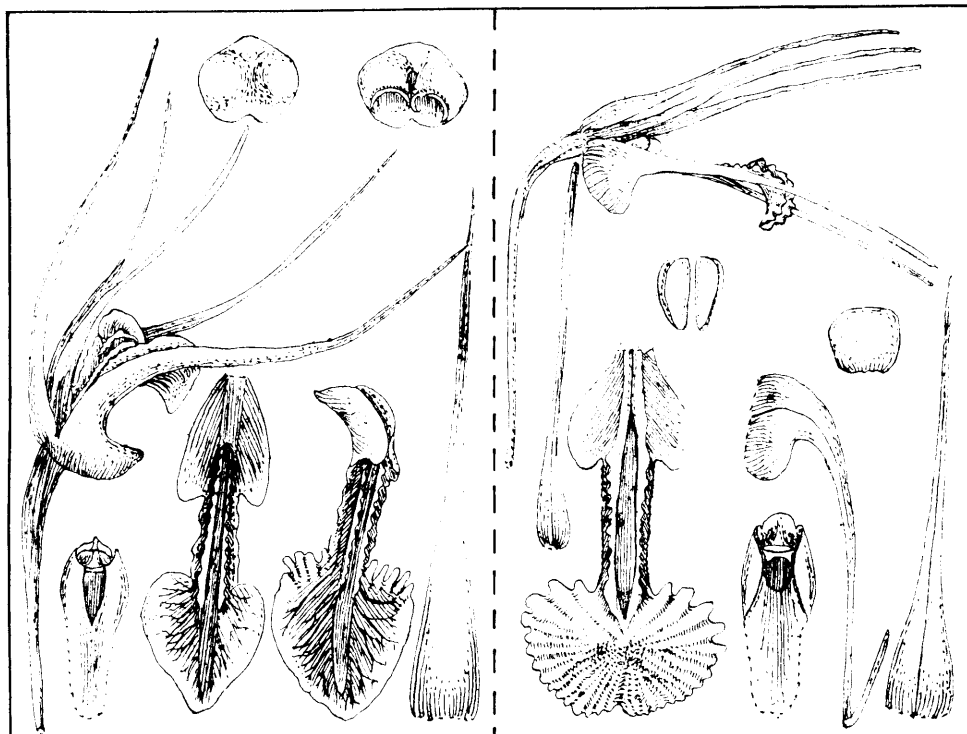
Dendrobium pulvilliferum Schltr.



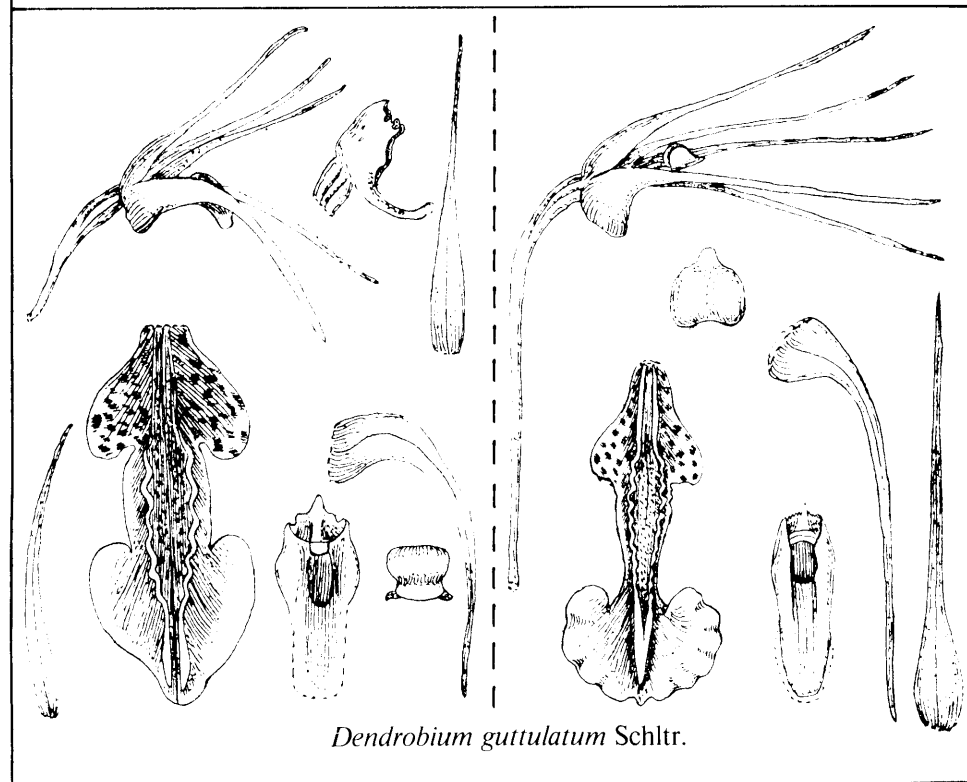
Dendrobium mischobulbum Schltr.



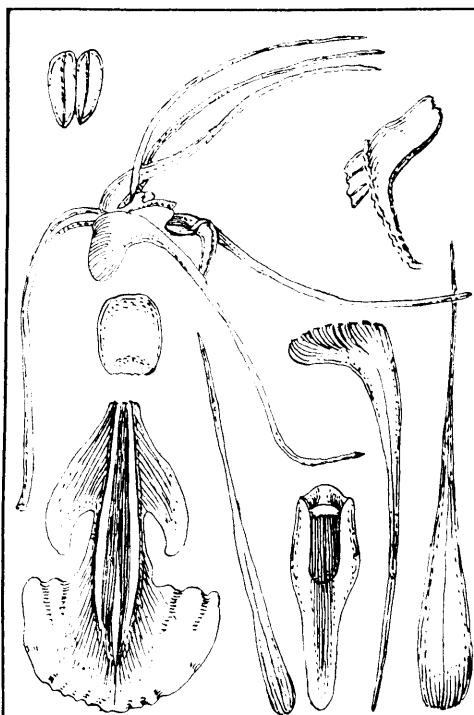
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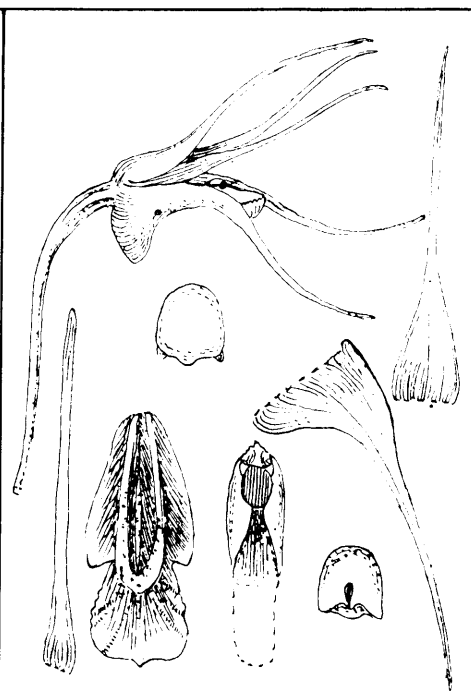
Dendrobium mekynosepalum Schltr.



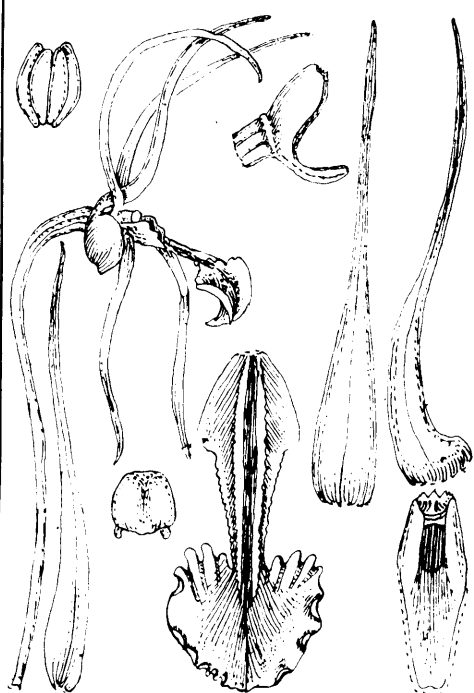
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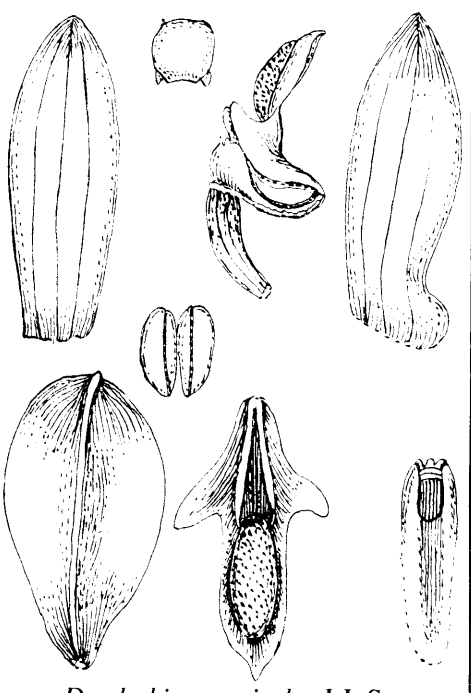
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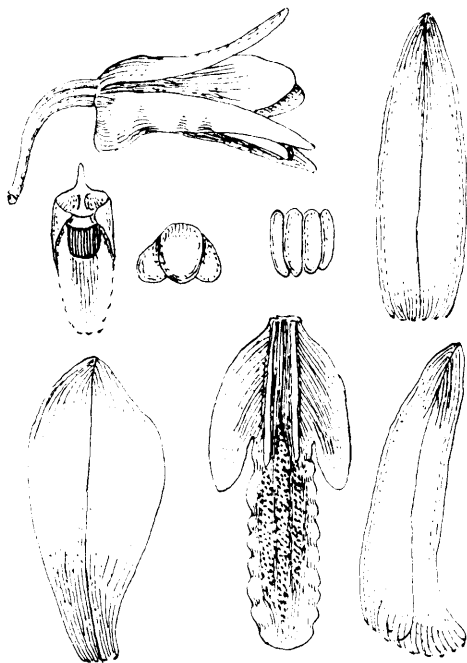
Dendrobium pentanema Schltr.



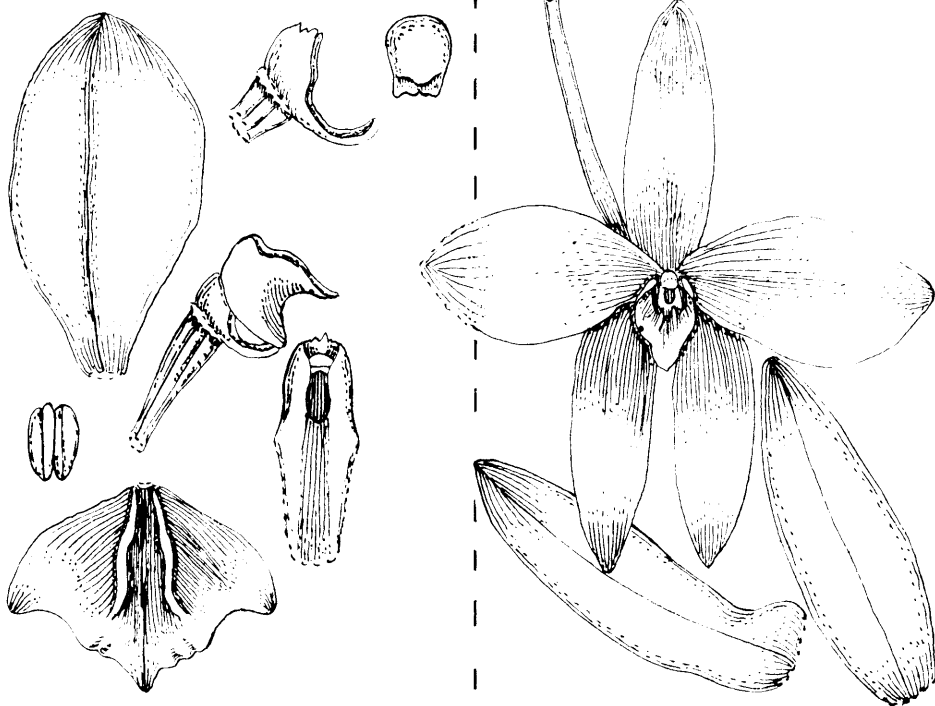
Dendrobium xanthocaulon Schltr.



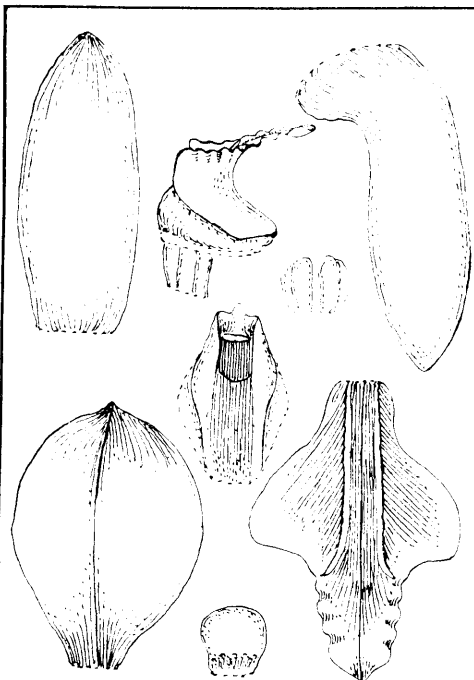
Dendrobium auricolor J.J. Sm.
var. *major* Schltr.



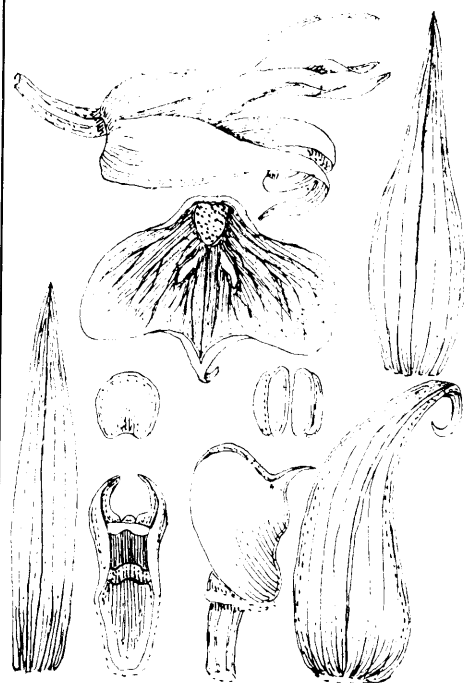
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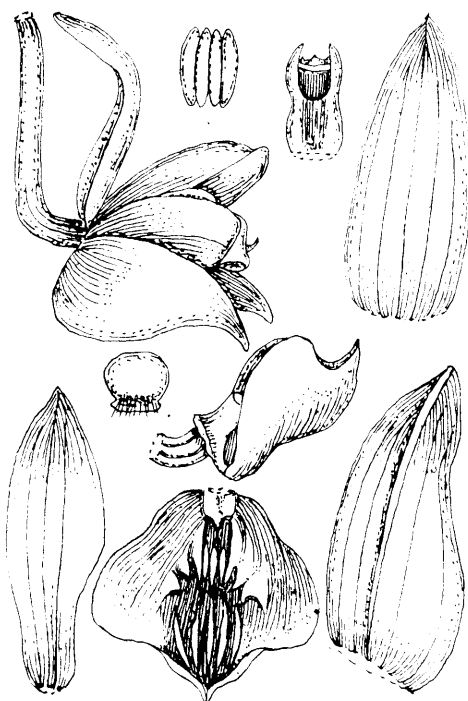
Dendrobium regale Schltr.



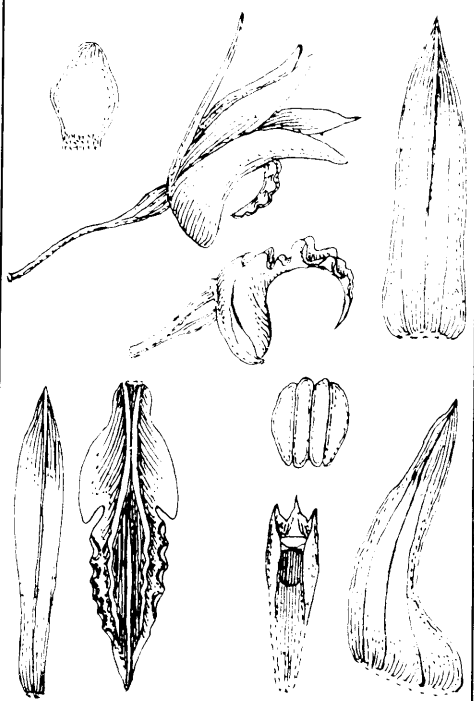
Dendrobium regale Schltr.
var. *euanthum* Schltr.



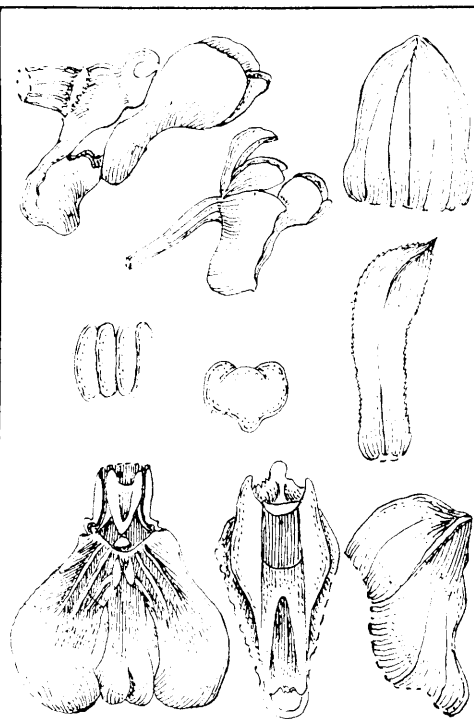
Dendrobium inaequale Rolfe



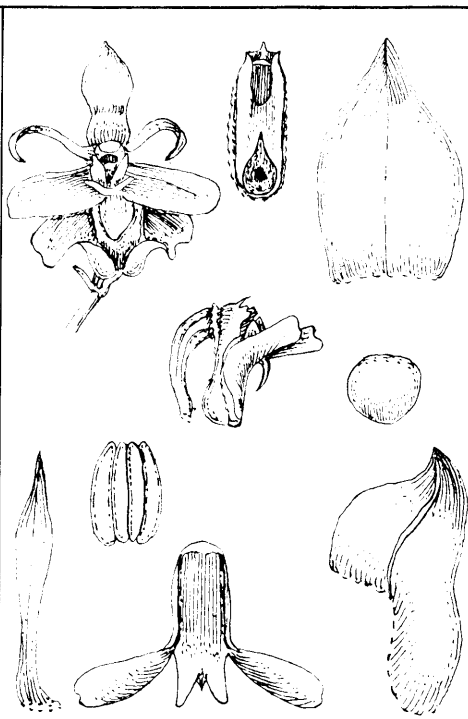
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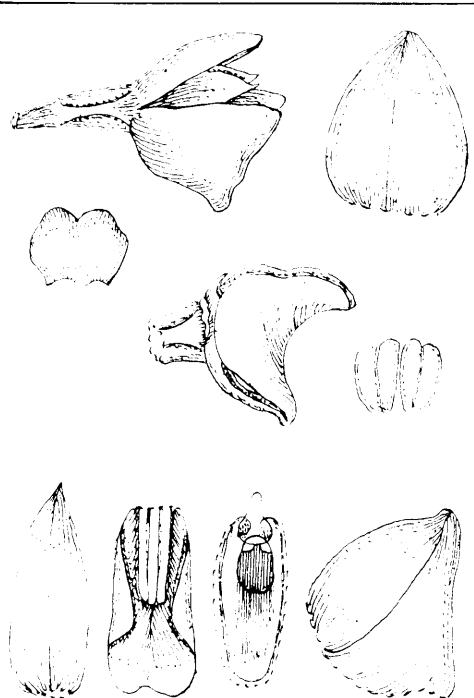
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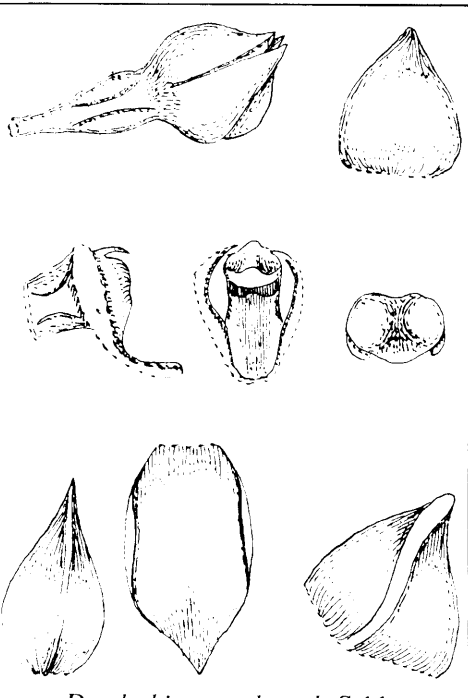
Dendrobium aberrans Schltr.



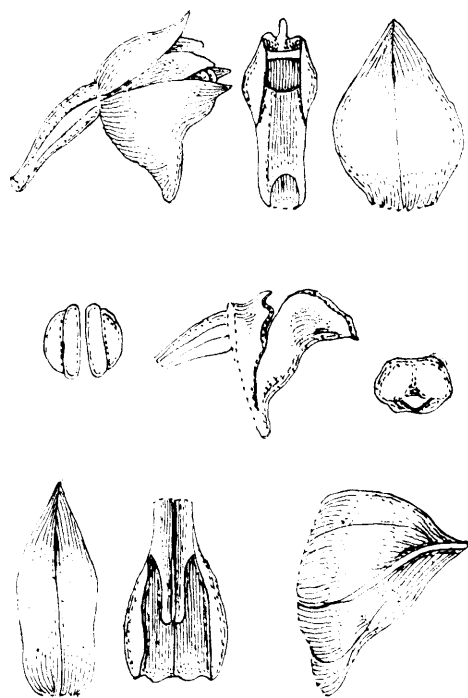
Dendrobium pleurodes Schltr.



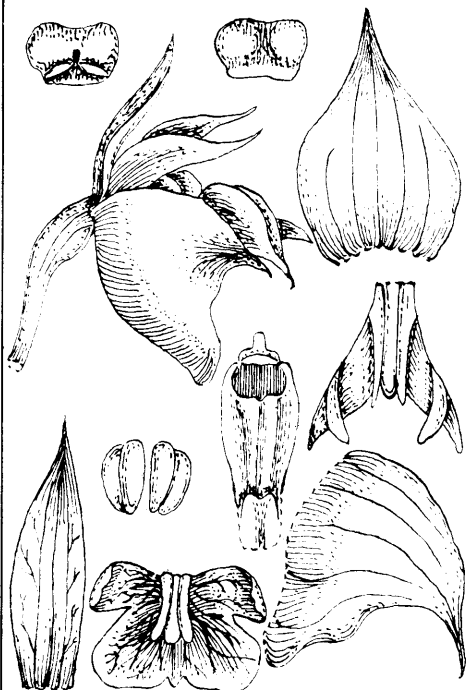
Dendrobium pachystele Schltr.



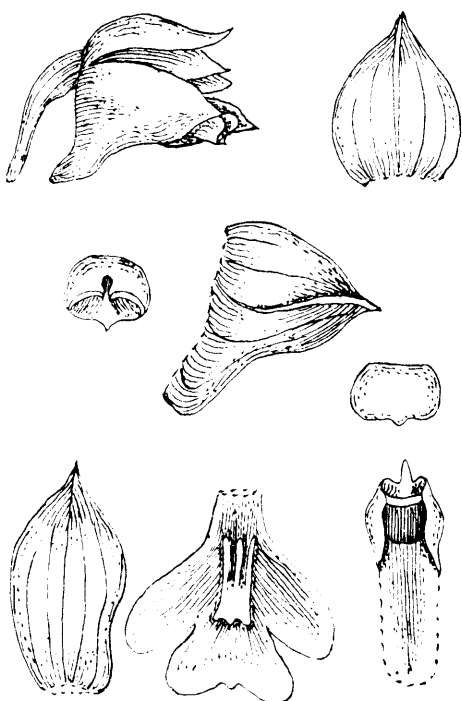
Dendrobium pachystele Schltr.
var. *homeoglossum* Schltr.



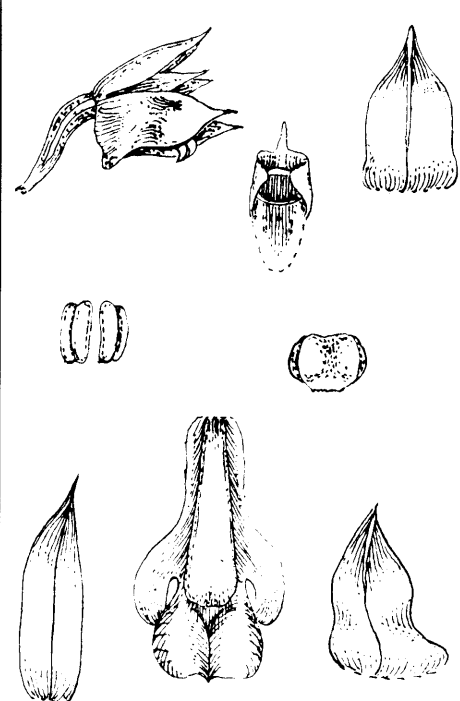
Dendrobium leucohybos Schltr.



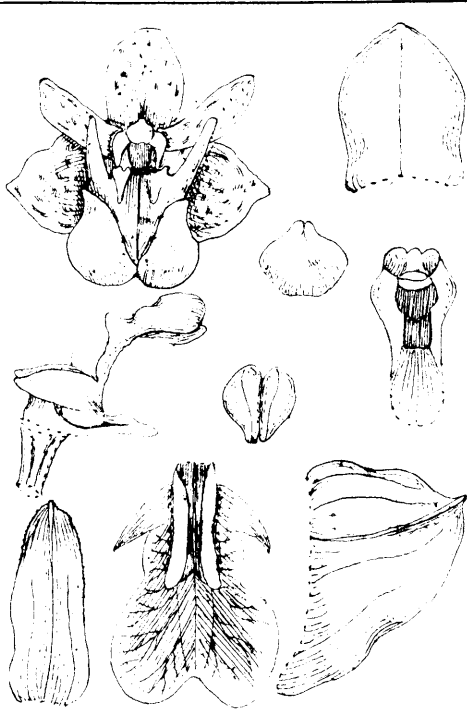
Dendrobium punamense Schltr.



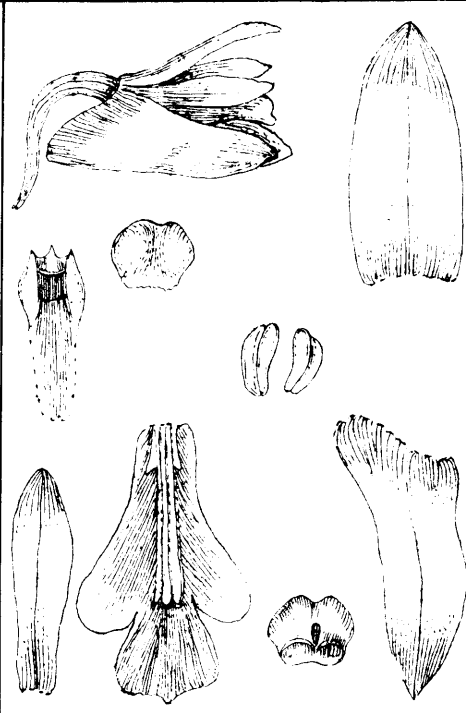
Dendrobium euryanthum Schltr.



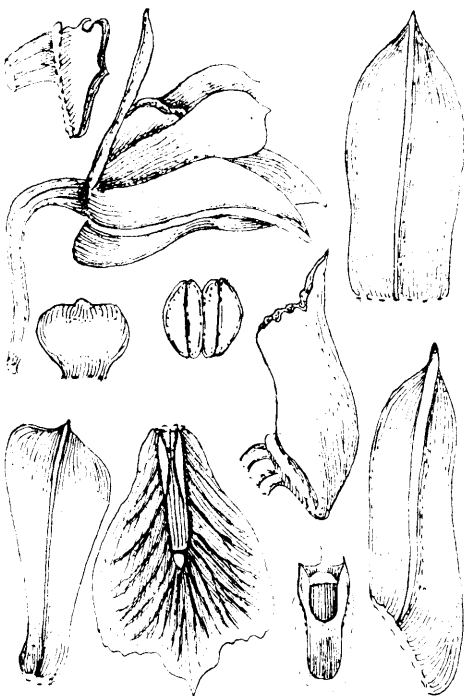
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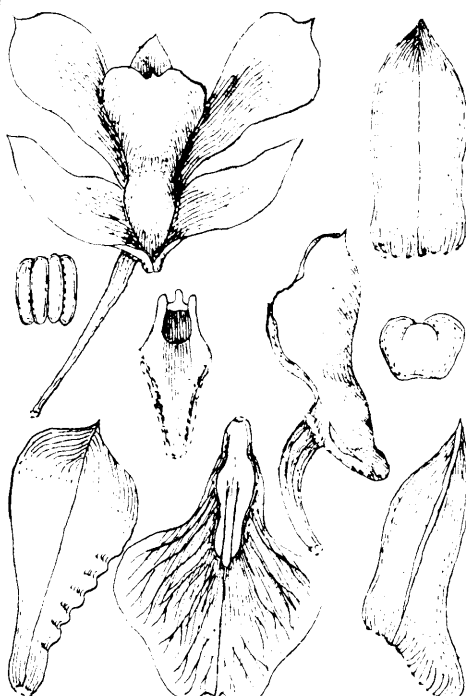
Dendrobium bifalce Lindl.



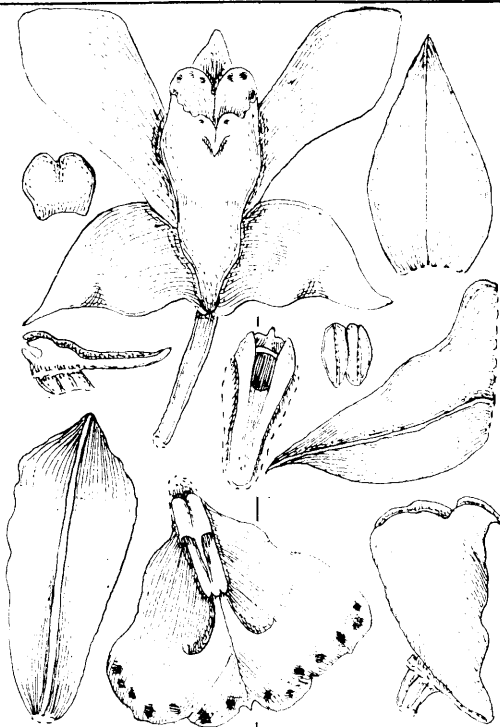
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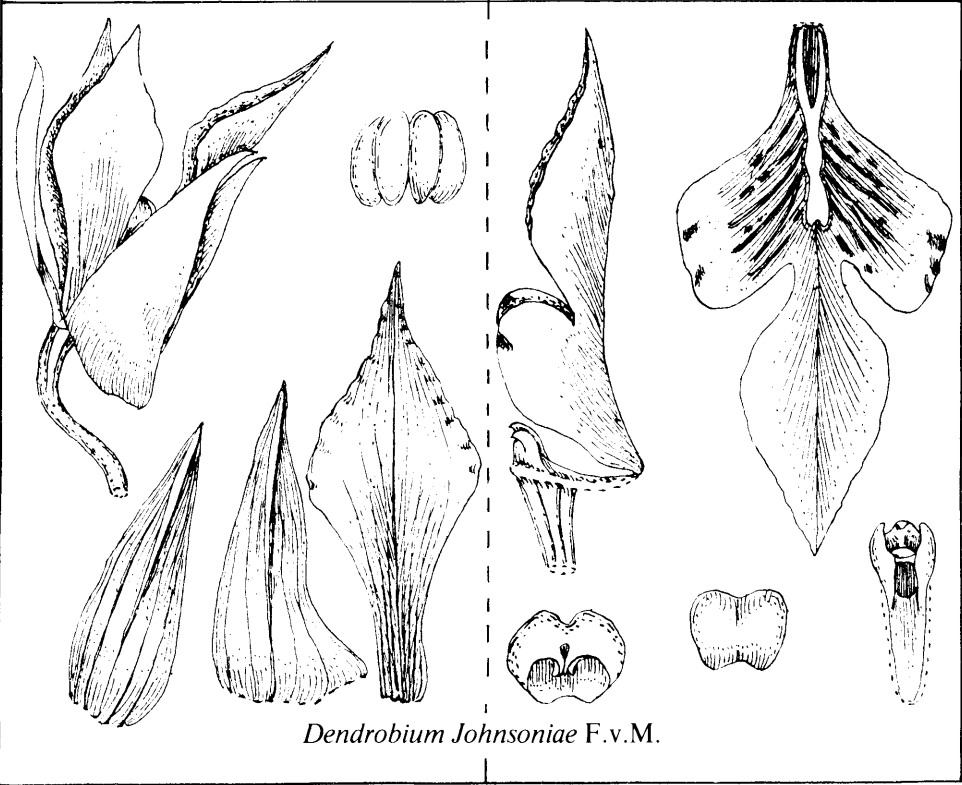
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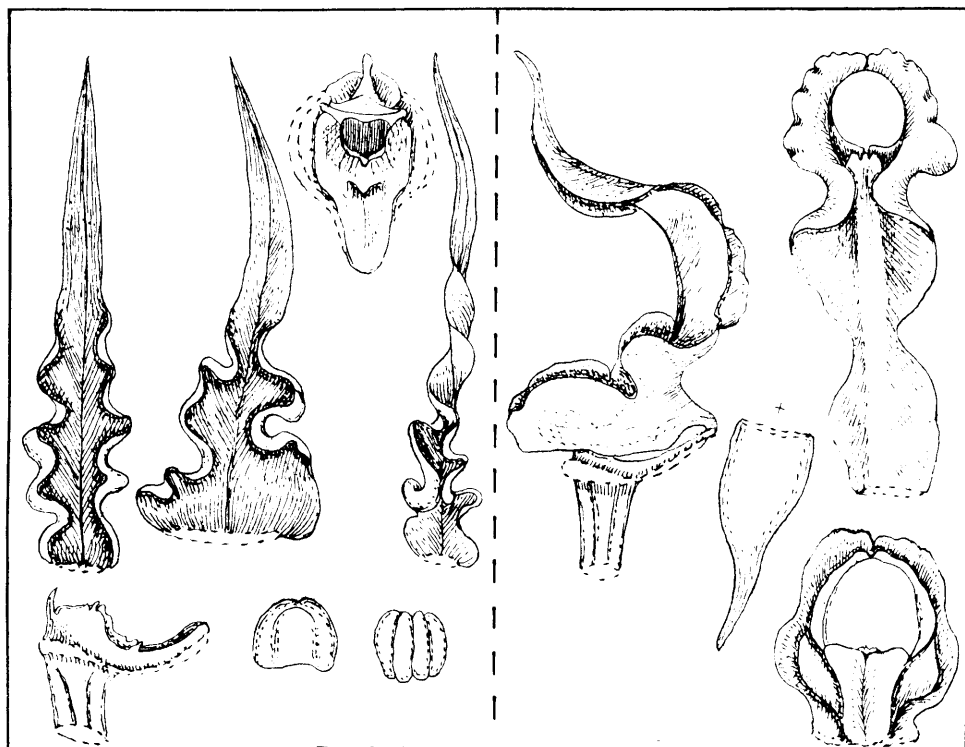
Dendrobium chloroleucum Schltr.



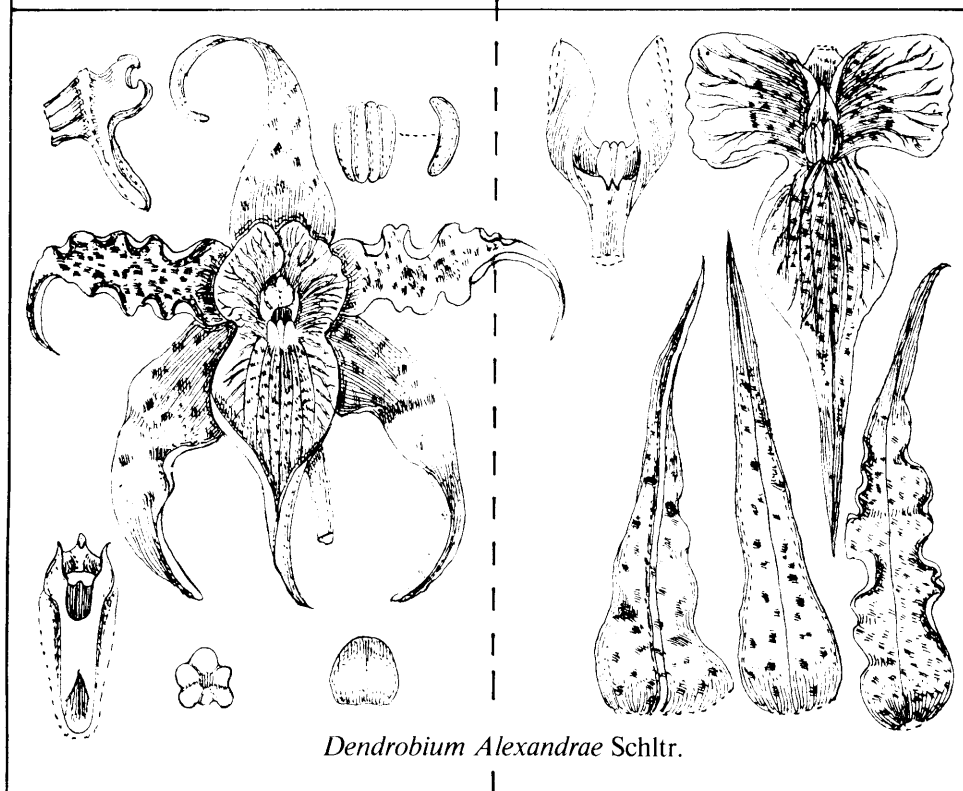
Dendrobium rhodostictum F.v.M. et Krzl.



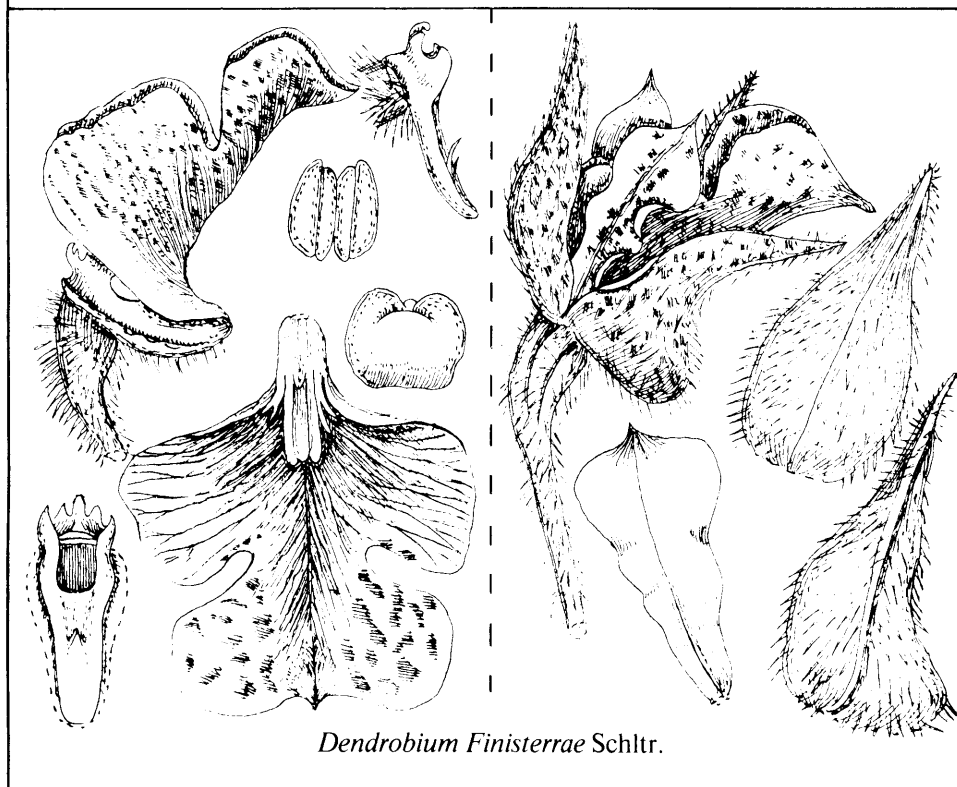
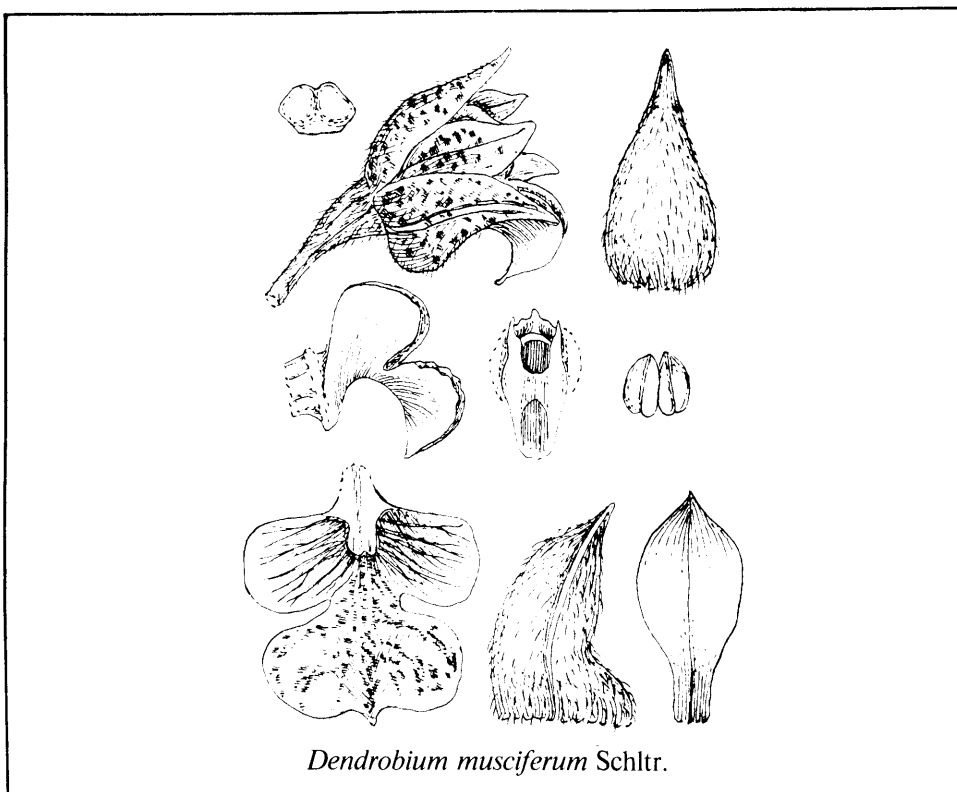
Dendrobium Johnsoniae F.v.M.

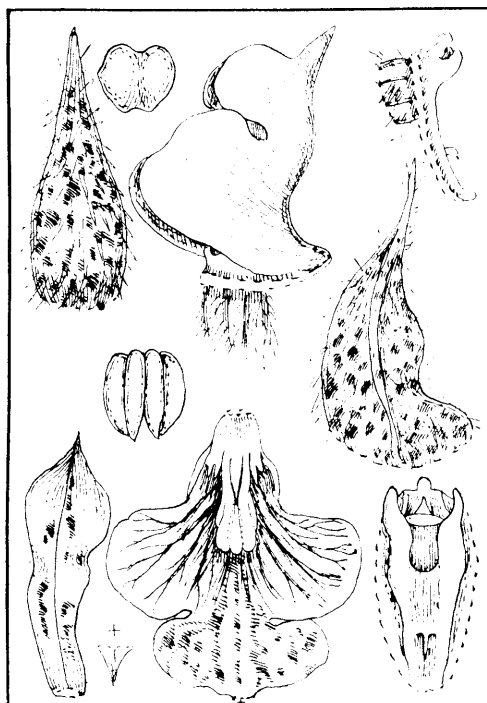


Dendrobium spectabile (Bl.) Miq.

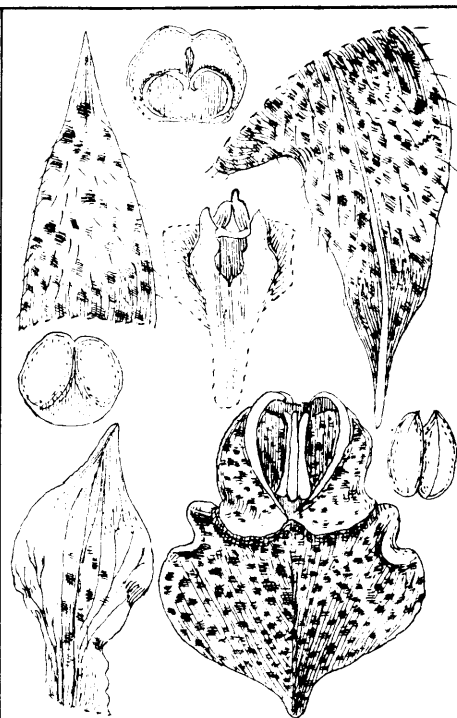


Dendrobium Alexandrae Schltr.

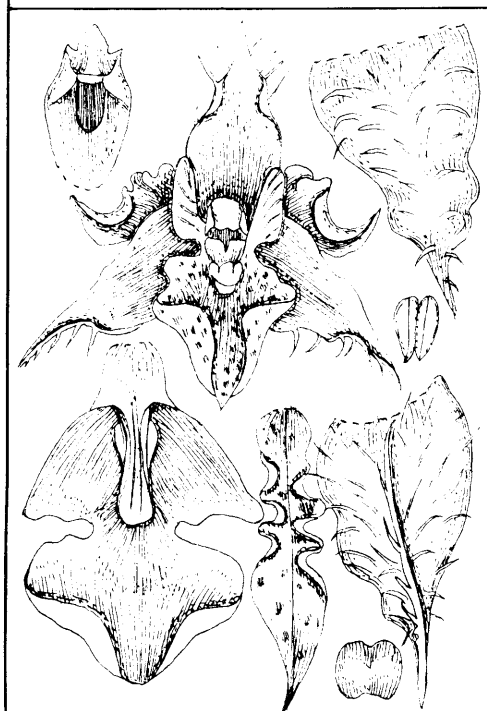




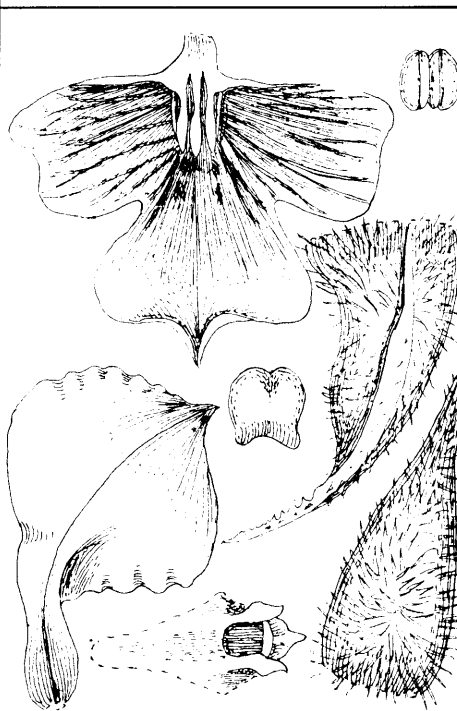
Dendrobium Finisterrae
var. *polystictum* Schltr.



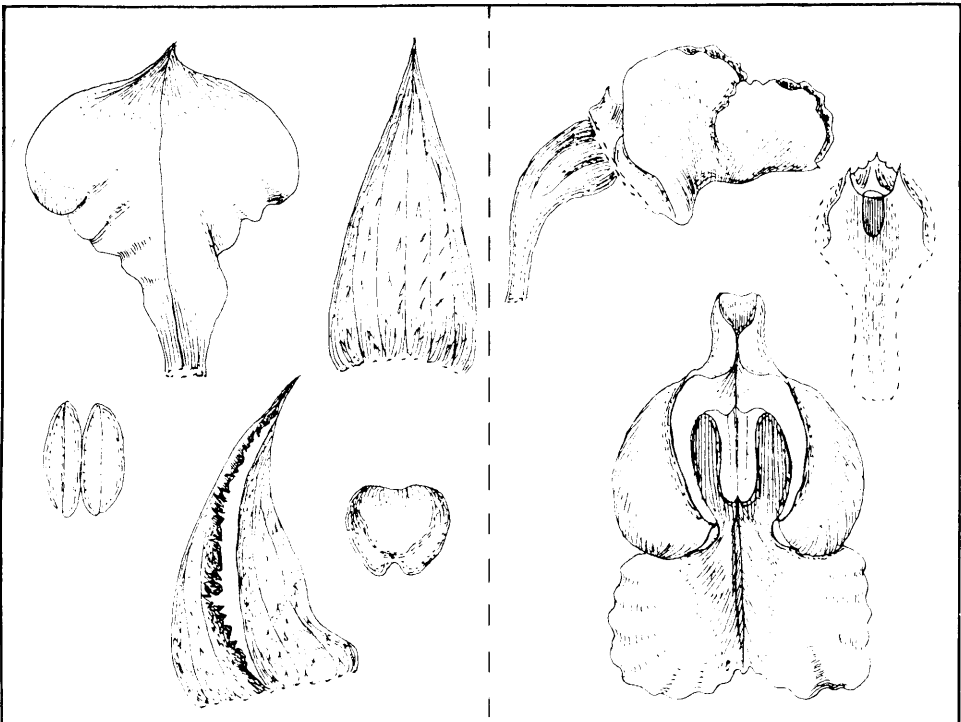
Dendrobium polysema Schltr.



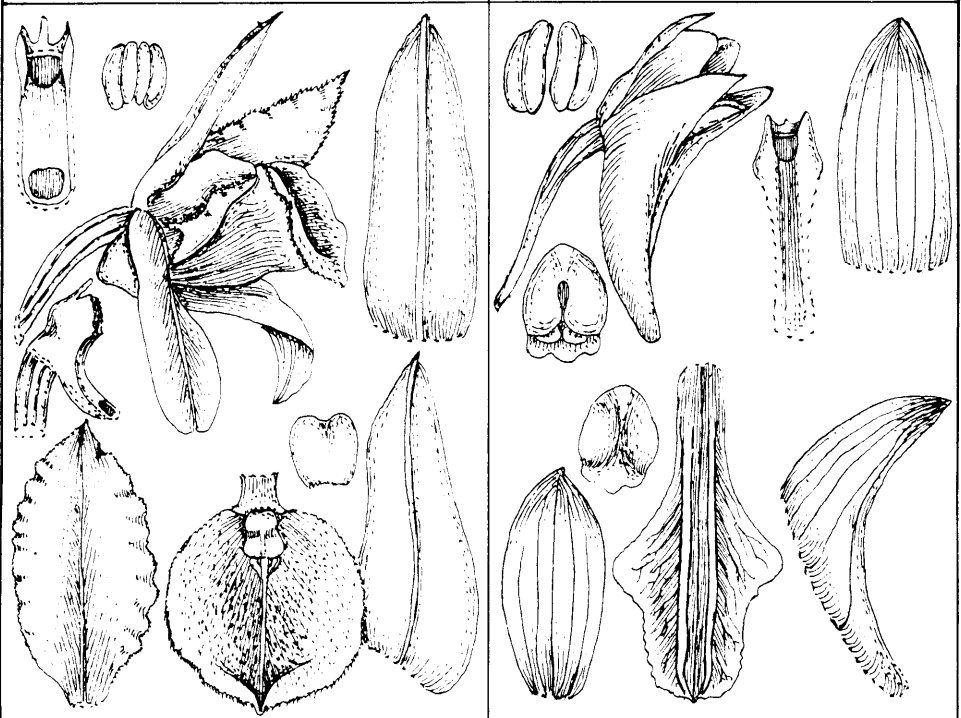
Dendrobium pulchrum Schltr.



Dendrobium eximium Schltr.

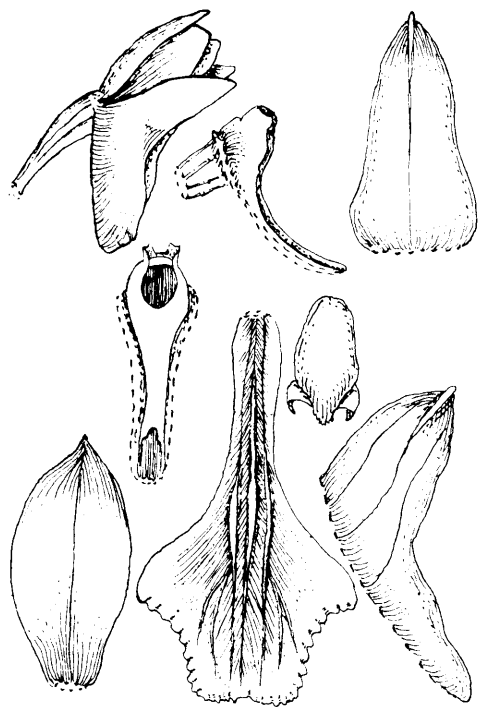


Dendrobium Forbesii Ridl. var. *praestans* Schltr.

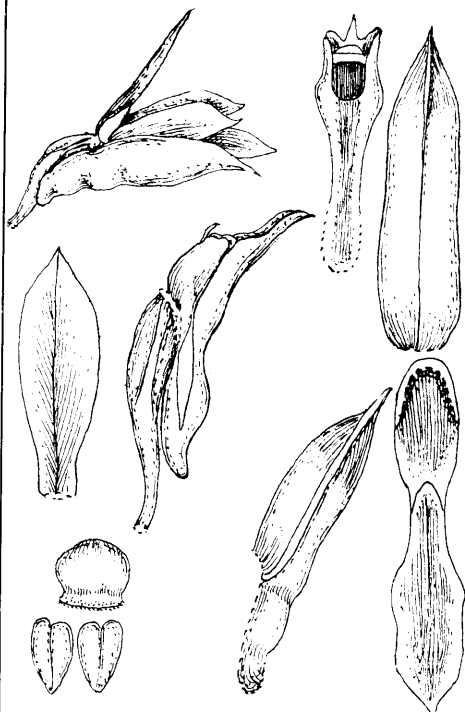


Dendrobium leucorhodum Schltr.

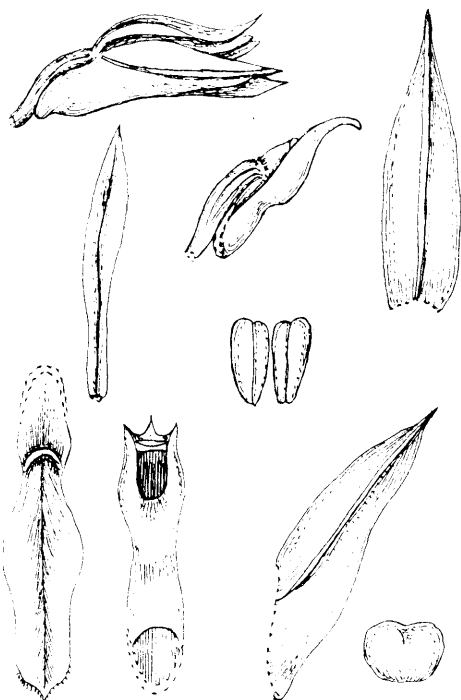
Dendrobium lamprocaulon Schltr.



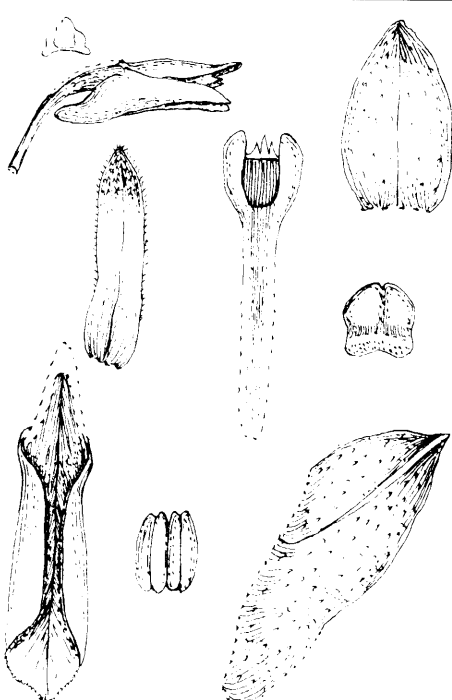
Dendrobium discocaulon Schltr.



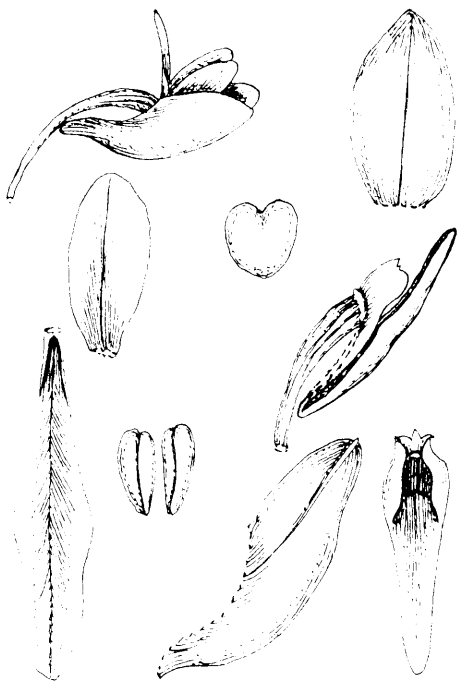
Dendrobium bracteosum Rchb. f.



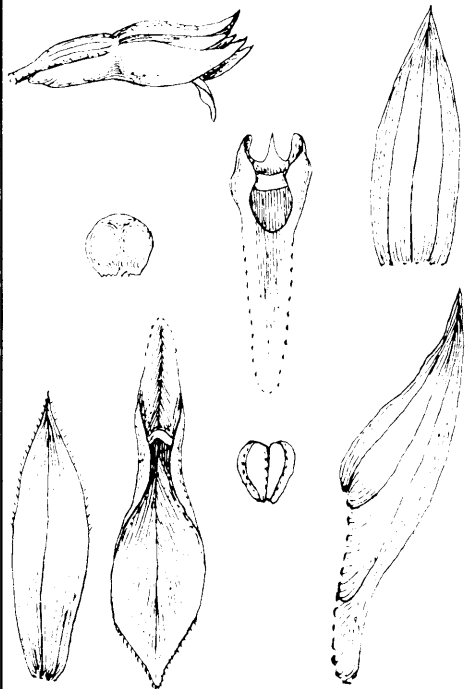
Dendrobium eitapense Schltr.



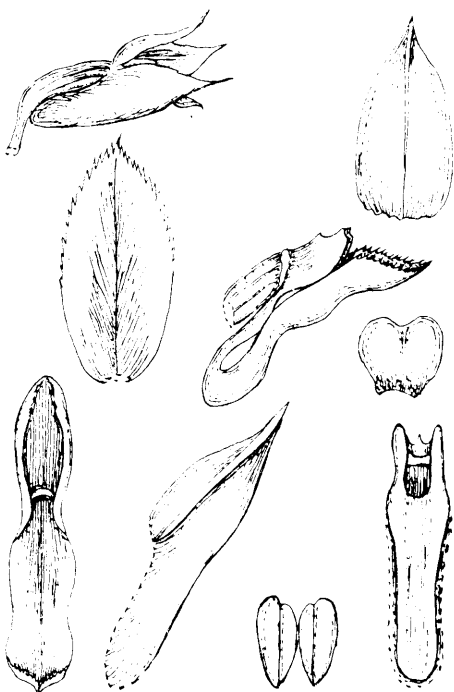
Dendrobium rarum Schltr.



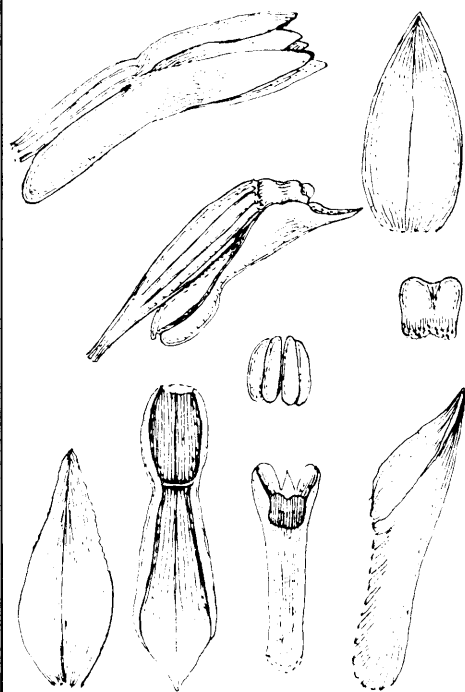
Dendrobium fulgidum Schltr.



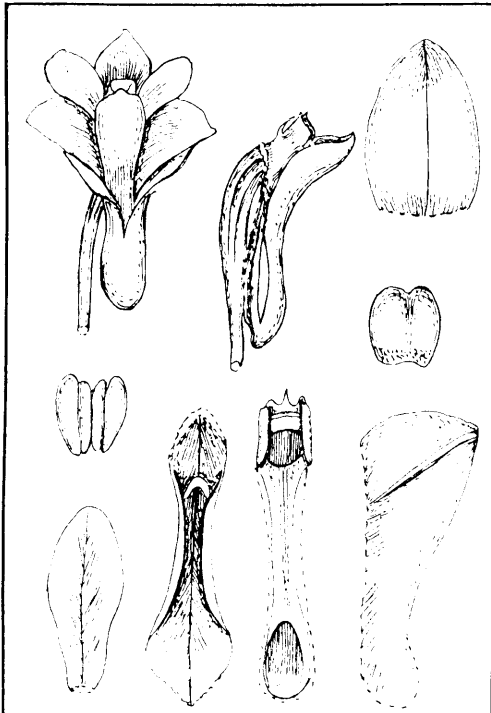
Dendrobium capituliflorum Rolfe



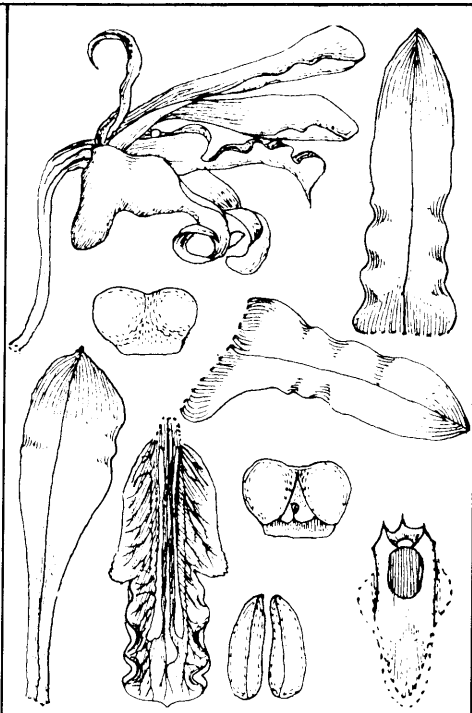
Dendrobium mimiense Schltr.



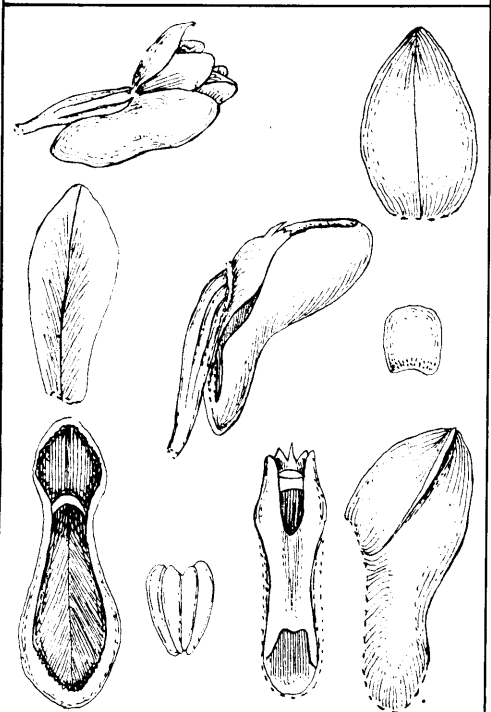
Dendrobium dichaeoides Schltr.



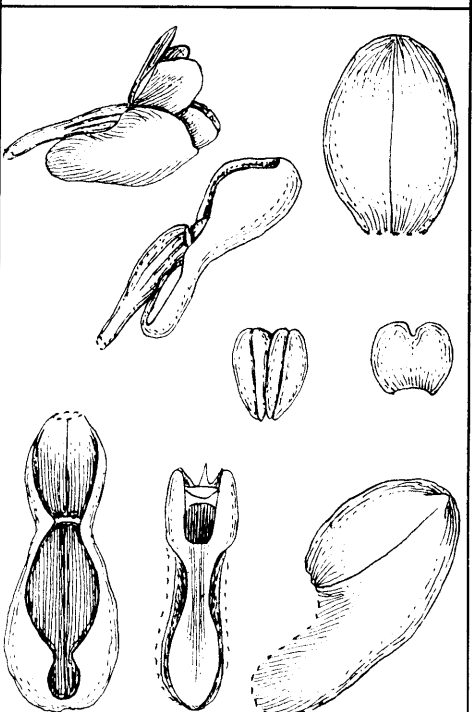
Dendrobium roseipes Schltr.



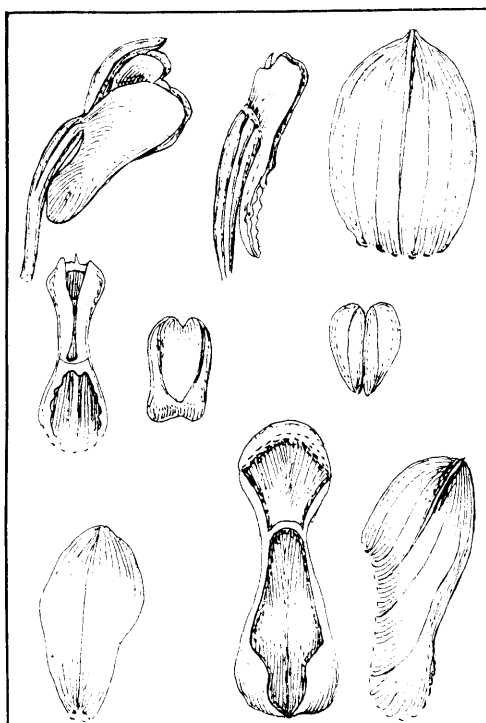
Dendrobium validum Schltr.



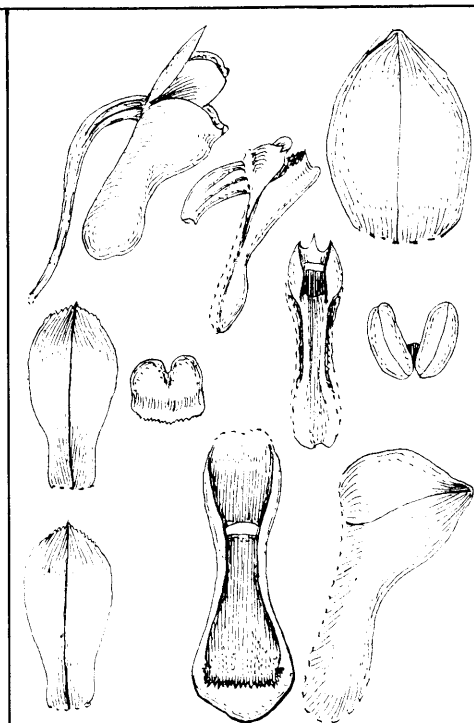
Dendrobium fornicatum Schltr.



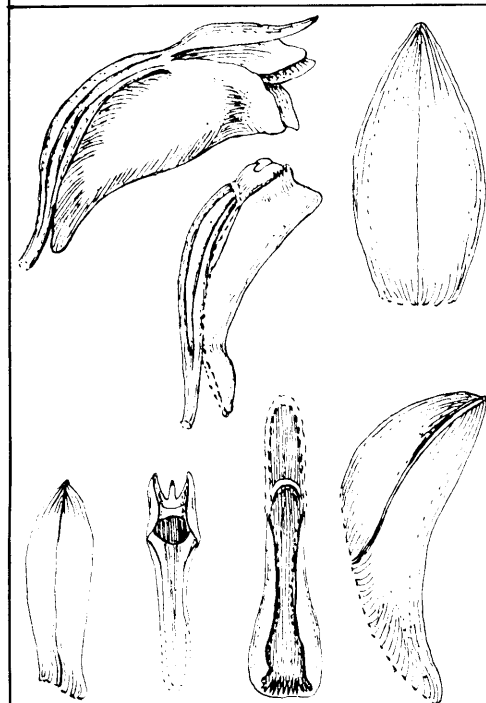
Dendrobium chrysoglossum Schltr.



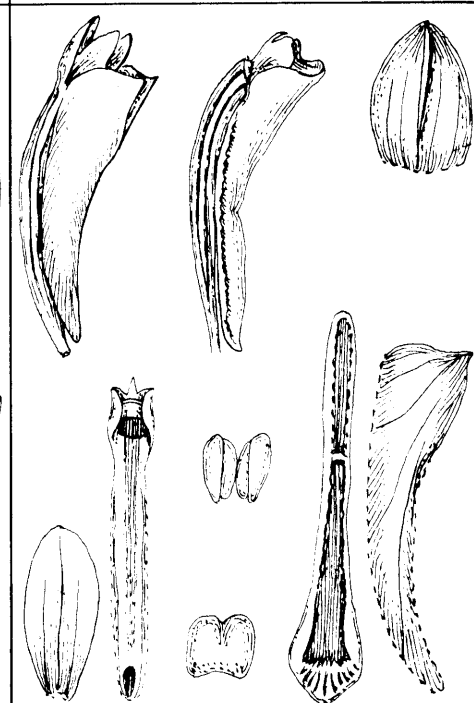
Dendrobium Hollrungii Krzl.



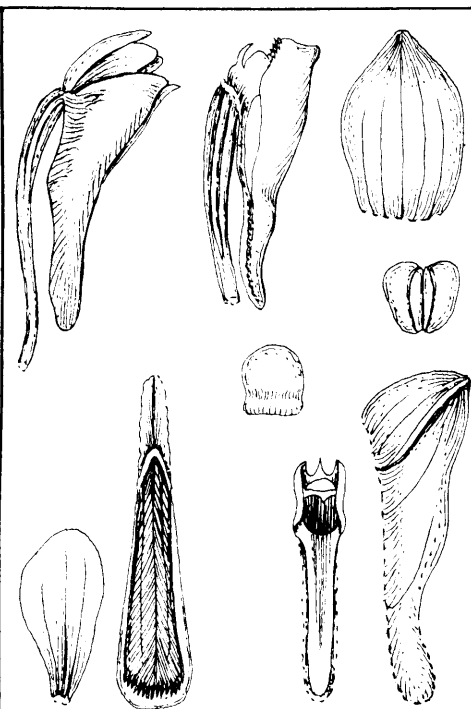
Dendrobium aemulans Schltr.



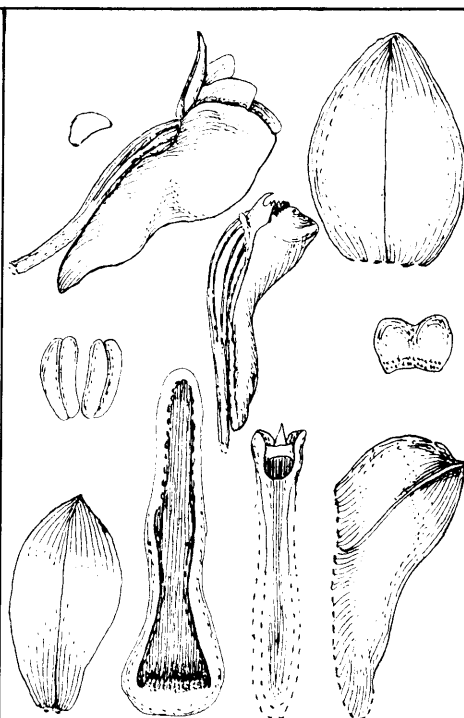
Dendrobium Lawesii F.v.M.



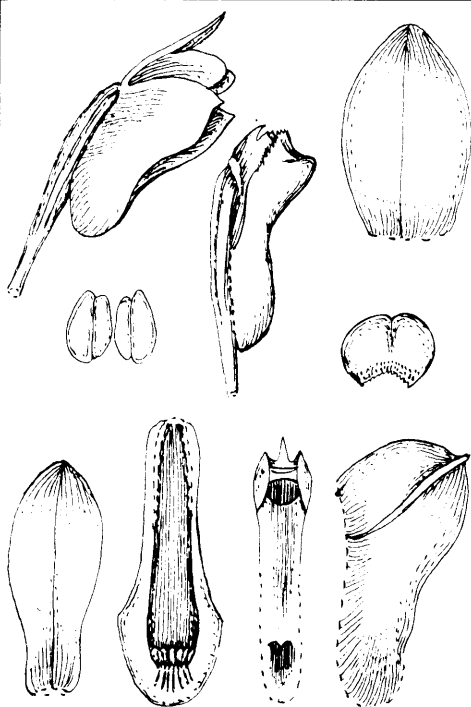
Dendrobium macrogenion Schltr.



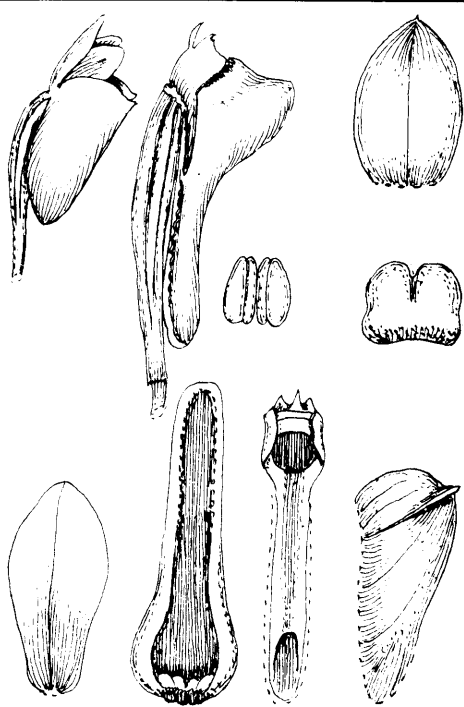
Dendrobium roseum Schltr.



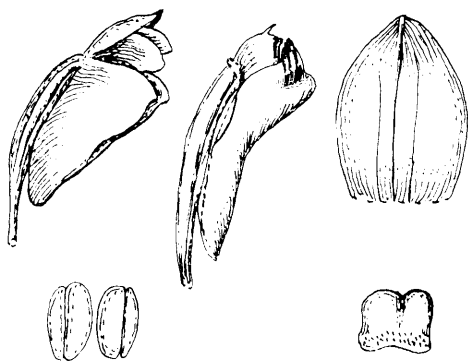
Dendrobium phlox Schltr.



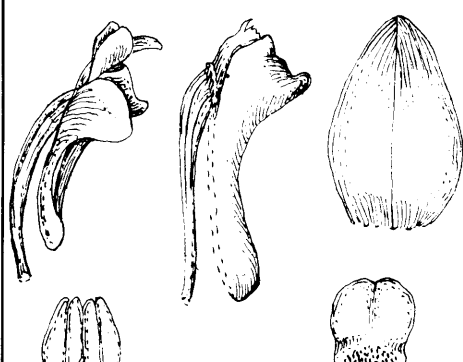
Dendrobium dichroma Schltr.



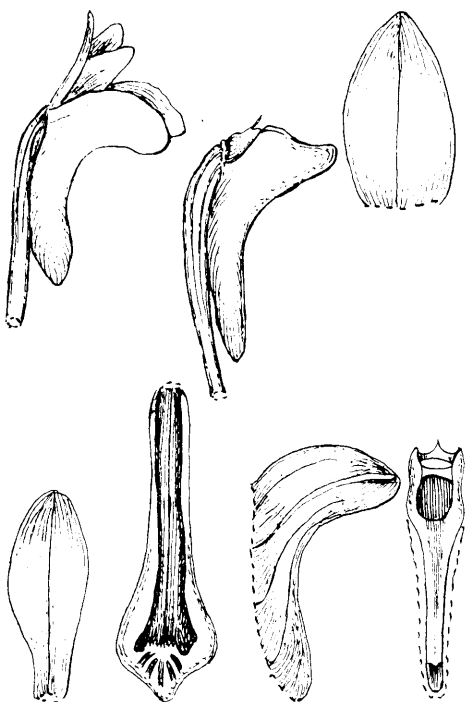
Dendrobium flammula Schltr.



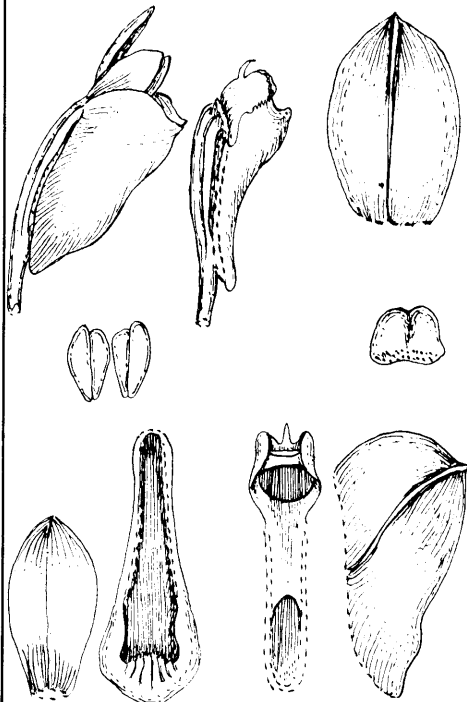
Dendrobium melinanthum Schltr.



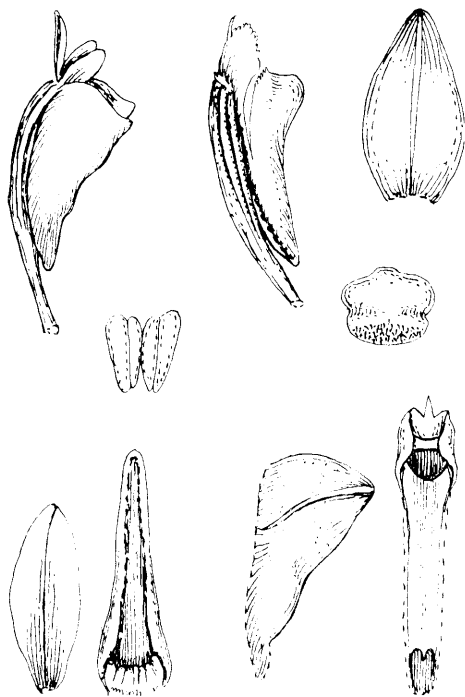
Dendrobium nubigenum Schltr.



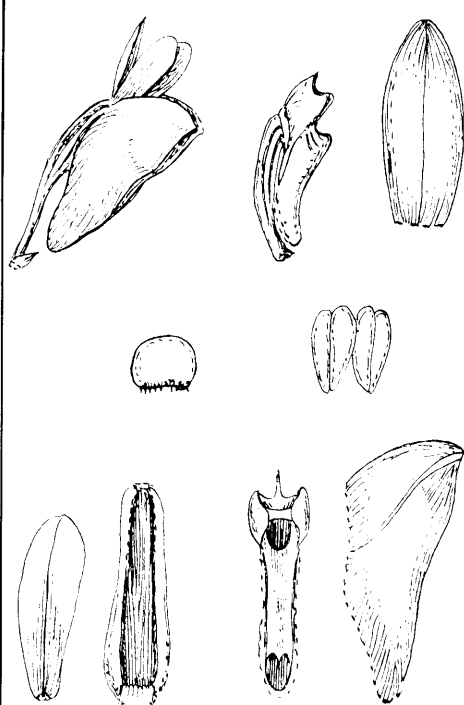
Dendrobium apertum Schltr.



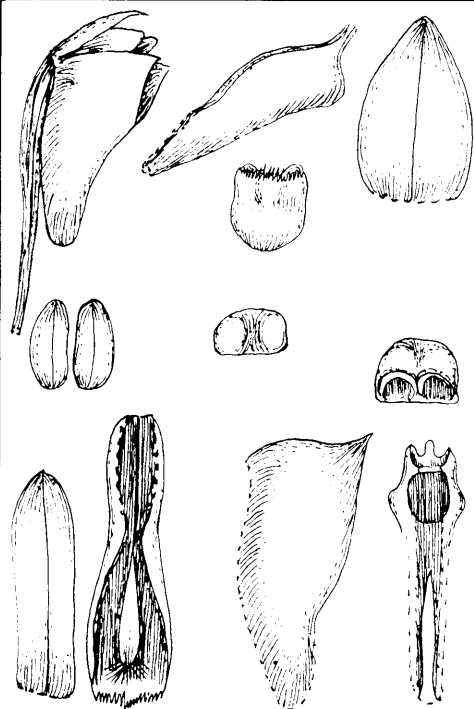
Dendrobium oreodoxa Schltr.



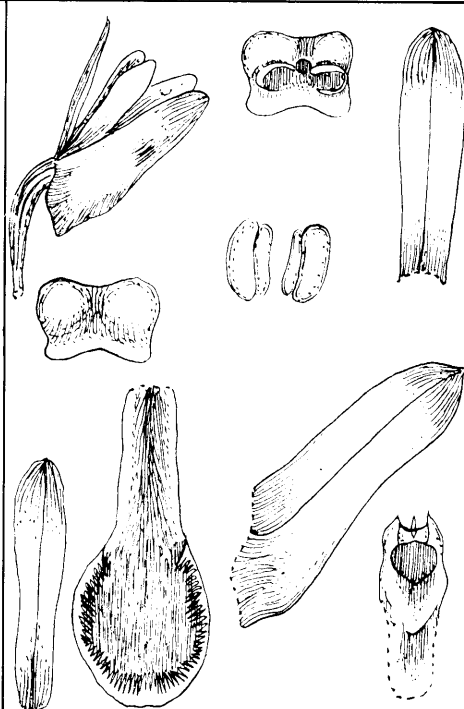
Dendrobium verruculosum Schltr.



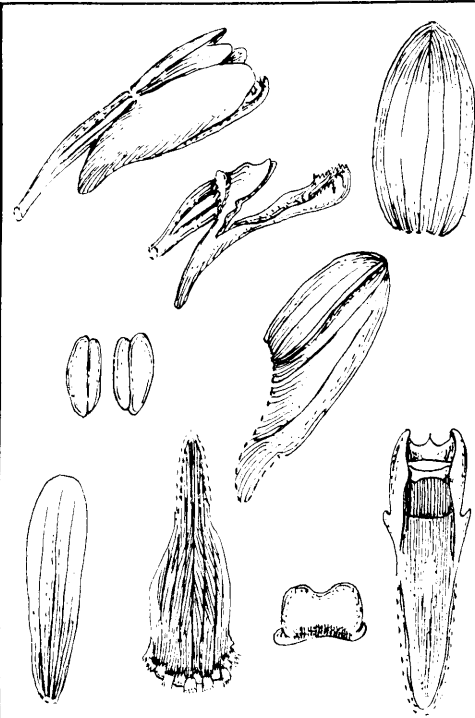
Dendrobium brevilabium Schltr.



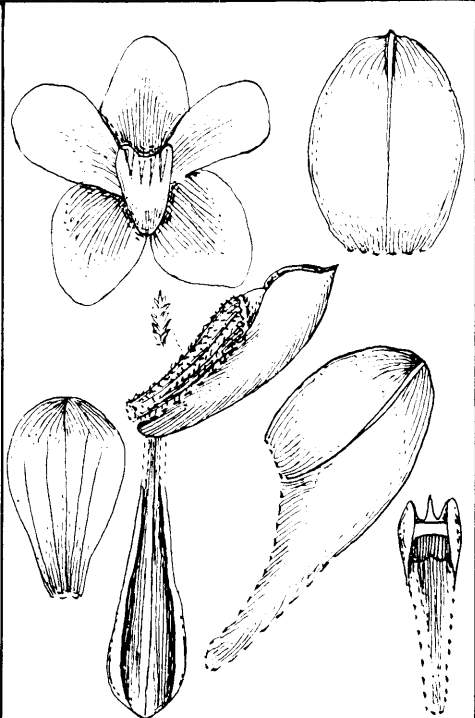
Dendrobium salmoneum Schltr.



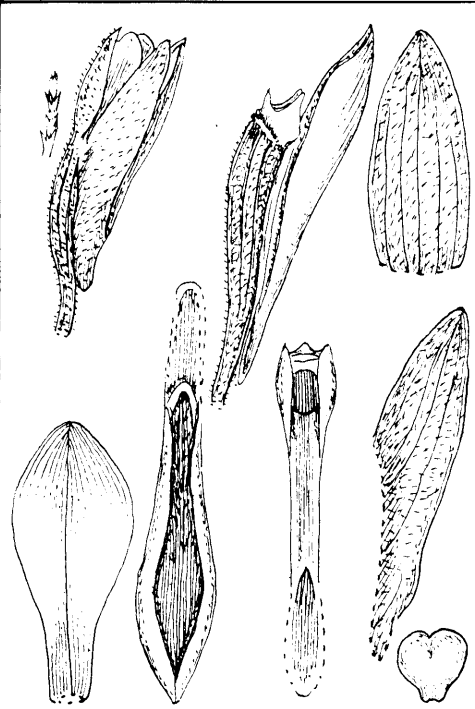
Dendrobium oreogenum Schltr.



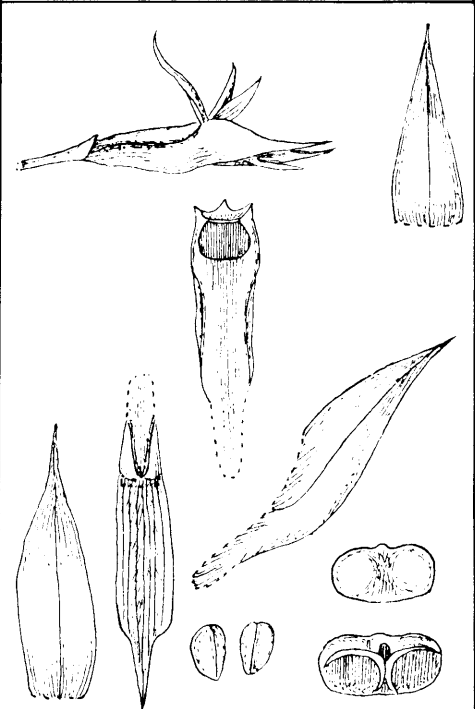
Dendrobium Loesenerianum Schltr.



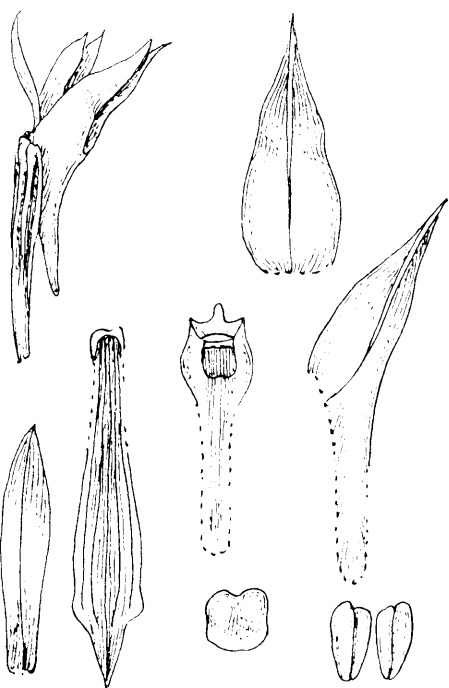
Dendrobium sophronites Schltr.



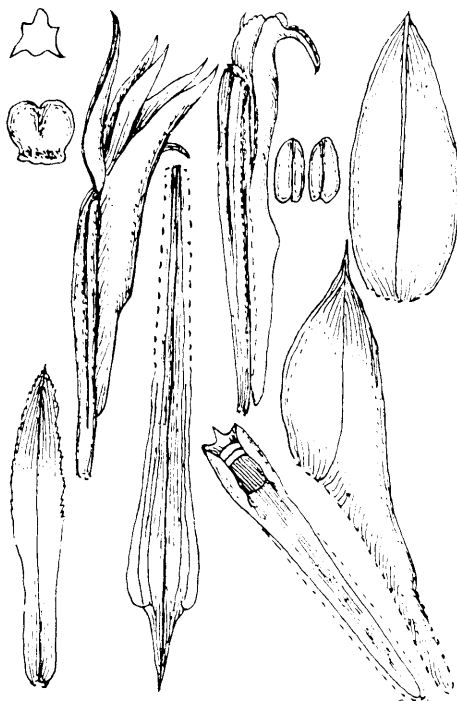
Dendrobium trachyphyllum Schltr.



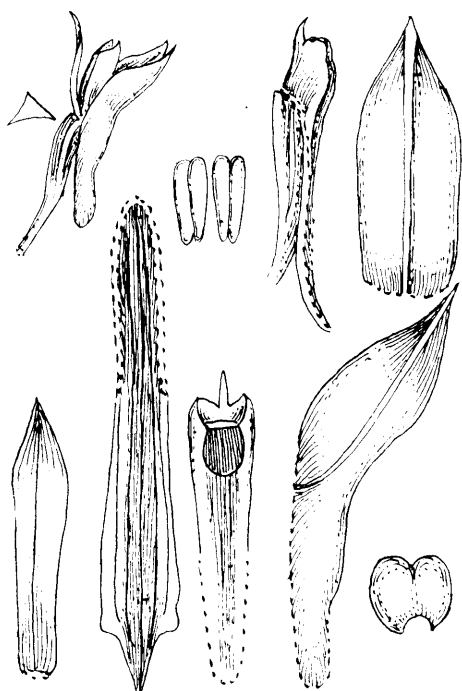
Dendrobium cyanocentrum Schltr.



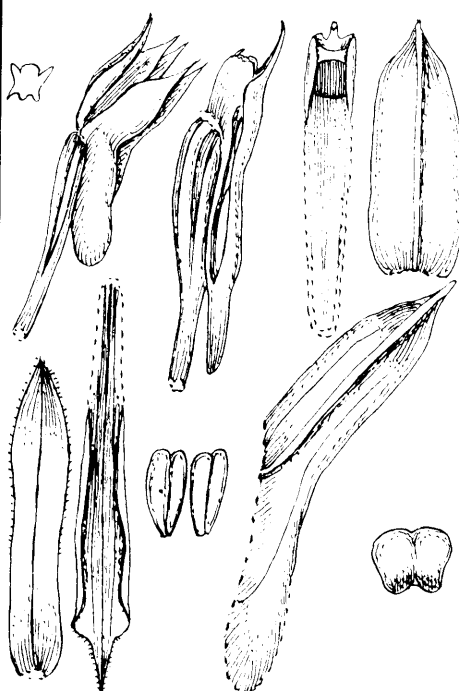
Dendrobium pumilio Schltr.



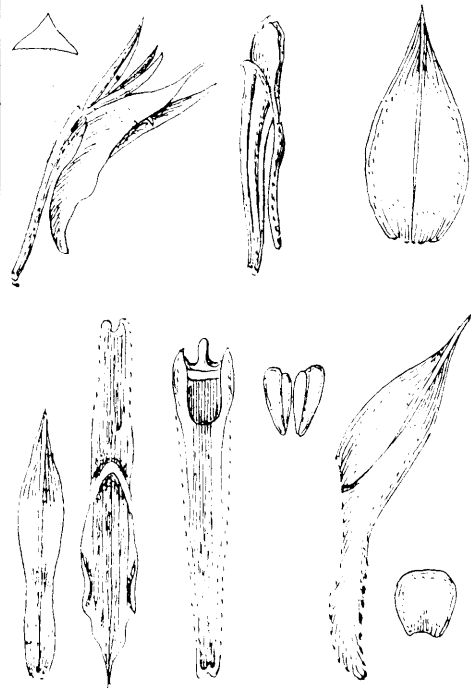
Dendrobium theionanthum Schltr.



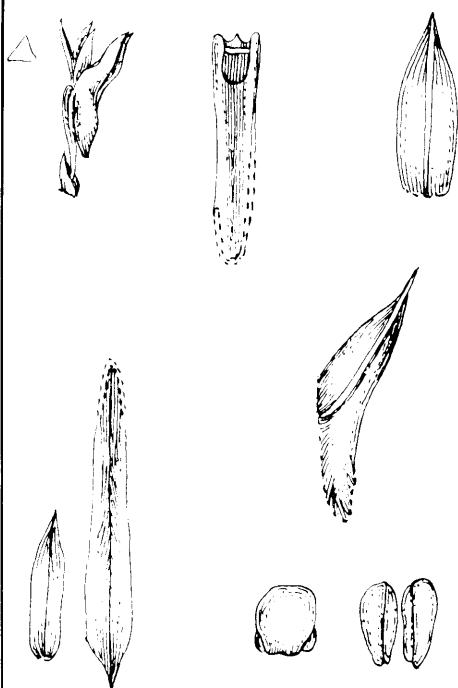
Dendrobium nardoides Schltr.



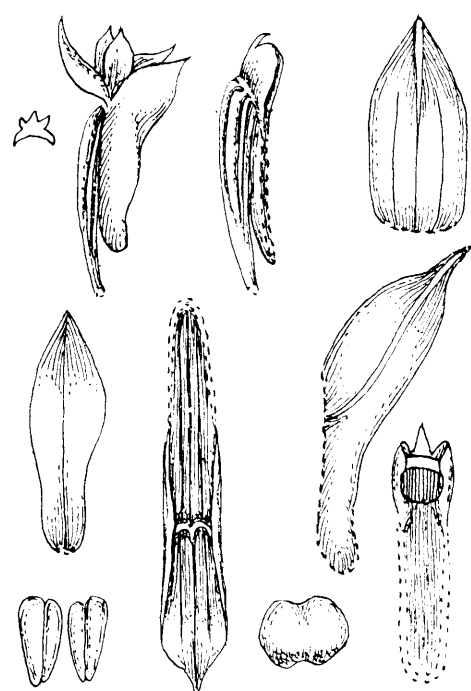
Dendrobium oligoblepharon Schltr.



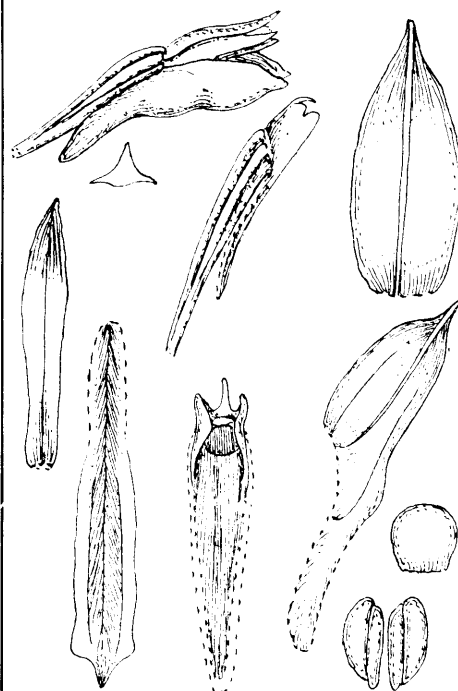
Dendrobium lapeyrouseoides Schltr.



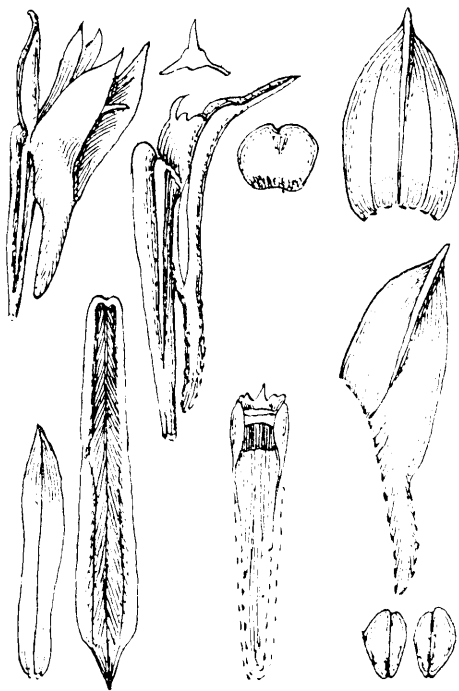
Dendrobium coerulescens Schltr.



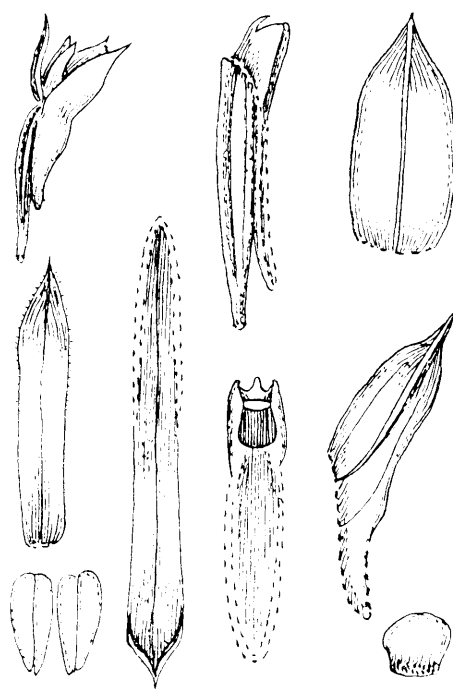
Dendrobium minutum Schltr.



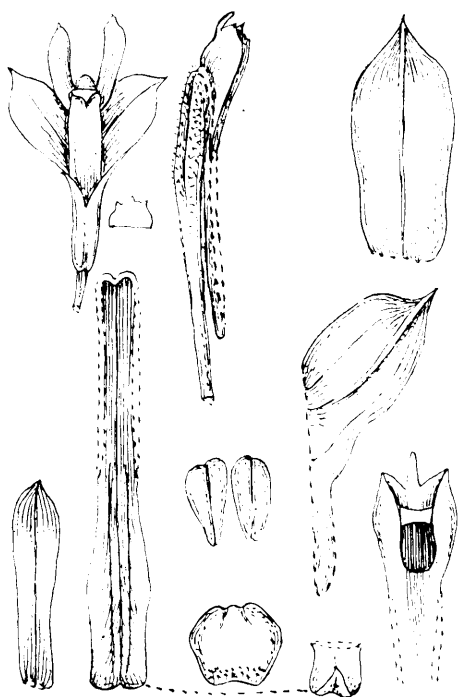
Dendrobium delicatulum Krzl.



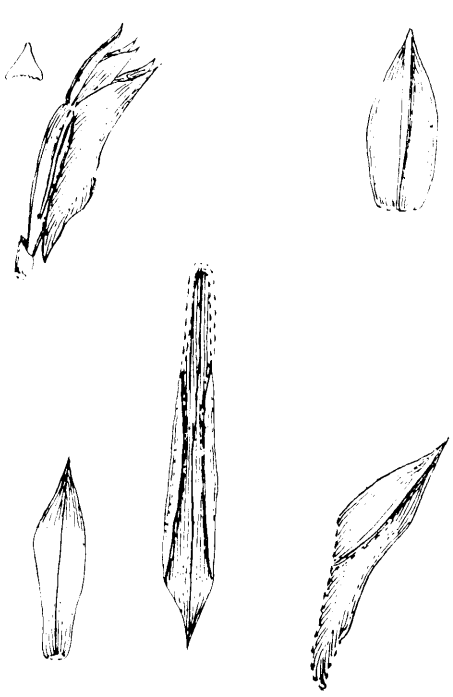
Dendrobium tricostatum Schltr.



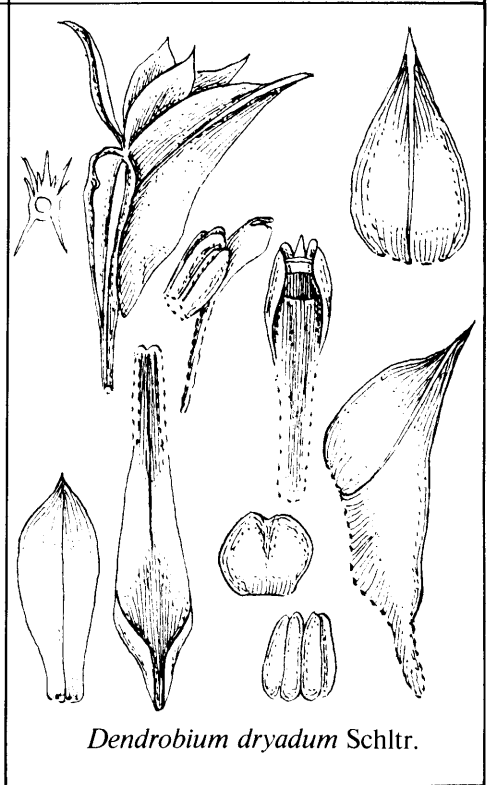
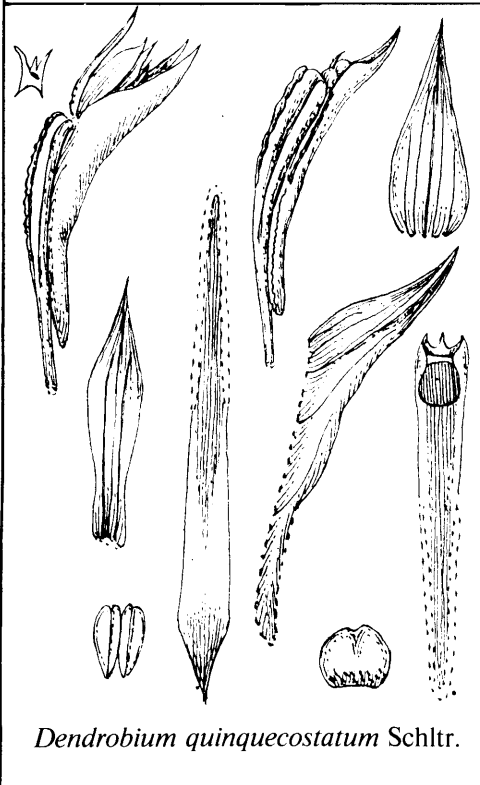
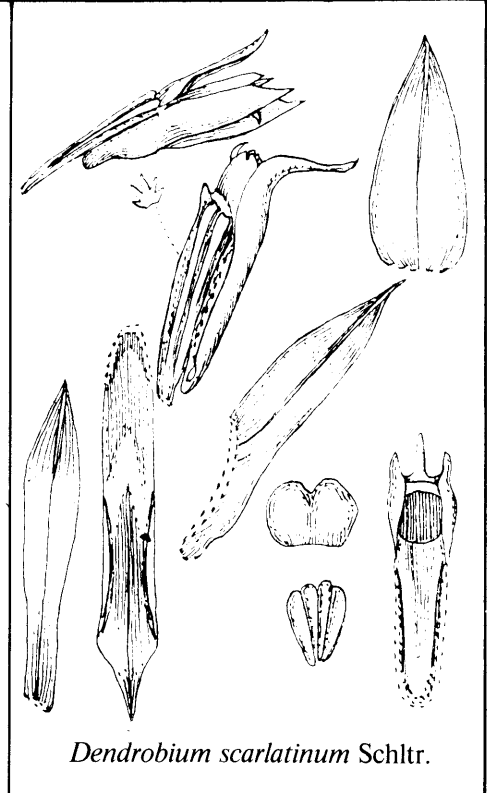
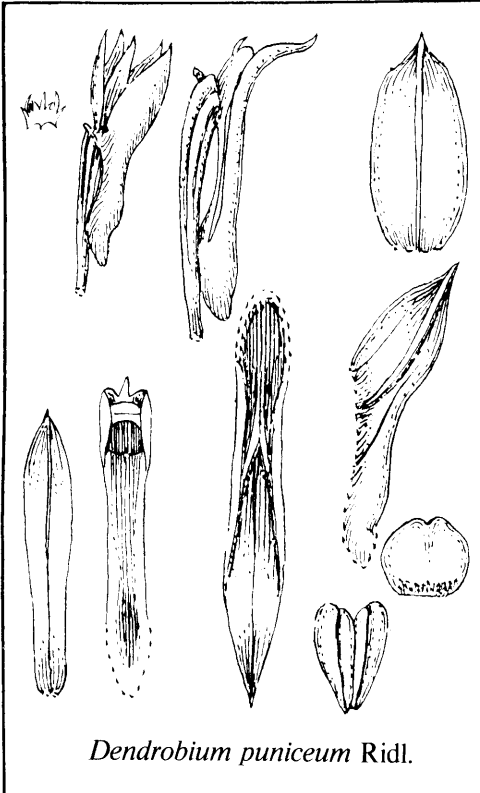
Dendrobium oreocharis Schltr.

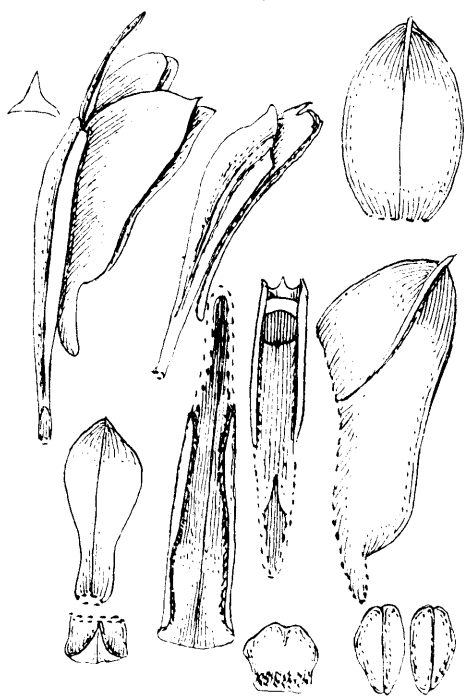


Dendrobium frigidum Schltr.

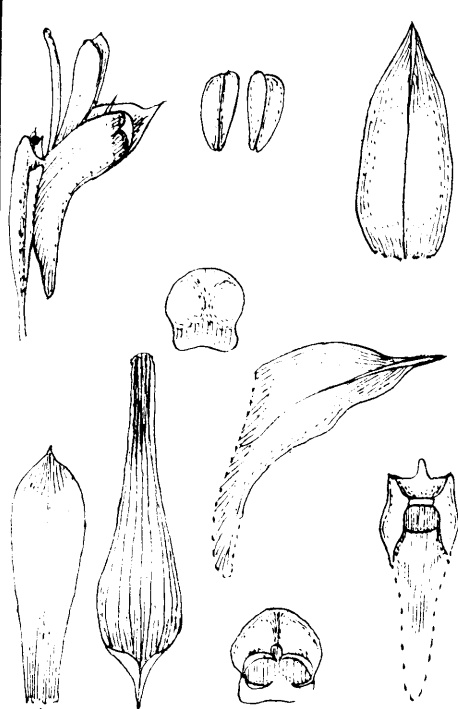


Dendrobium sulphureum Schltr.

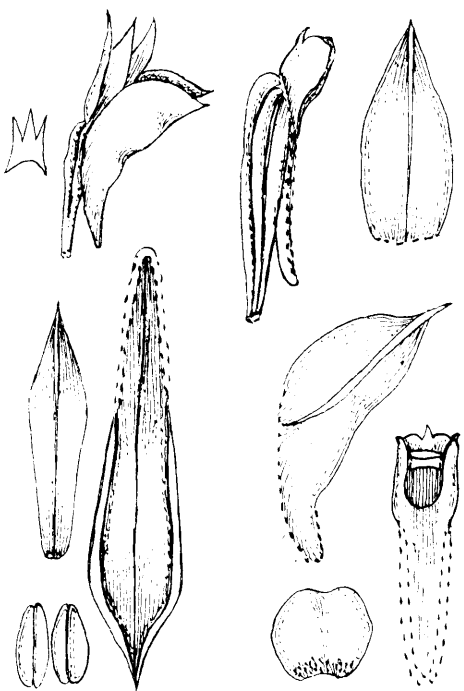




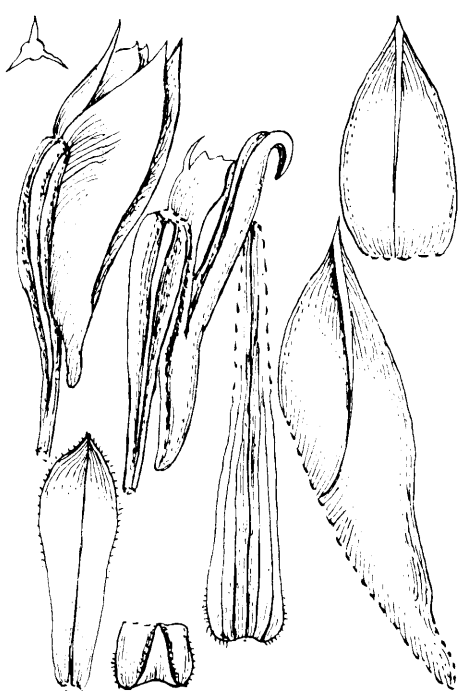
Dendrobium uncinatum Schltr.



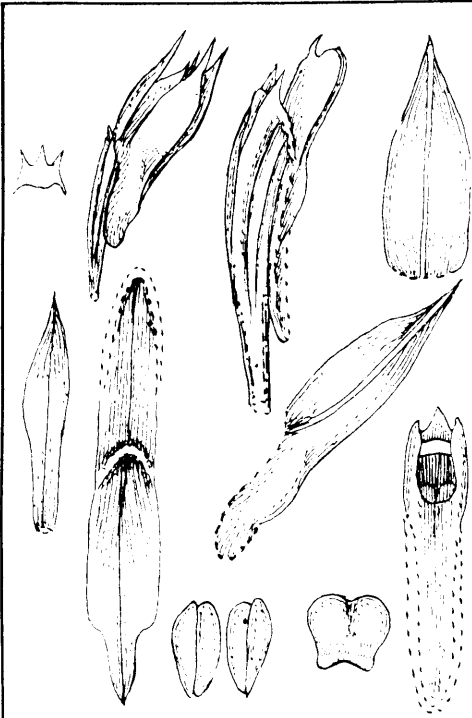
Dendrobium pentapterum Schltr.



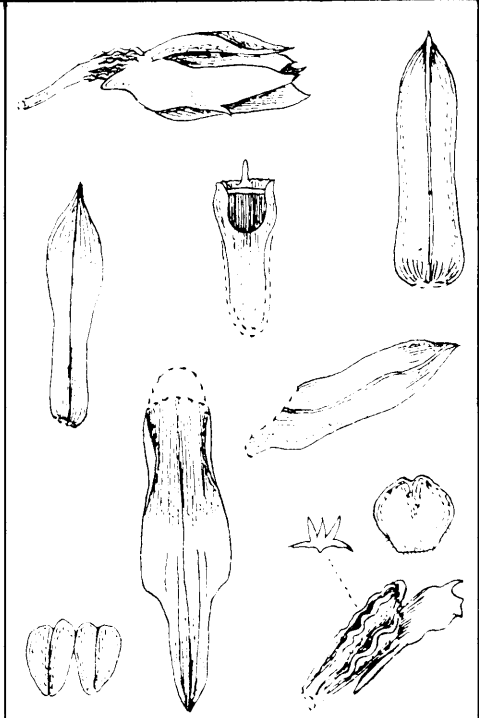
Dendrobium nebularum Schltr.



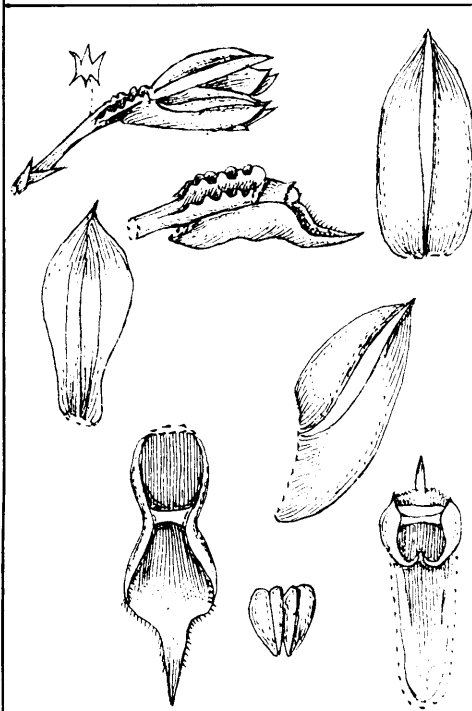
Dendrobium trialatum Schltr.



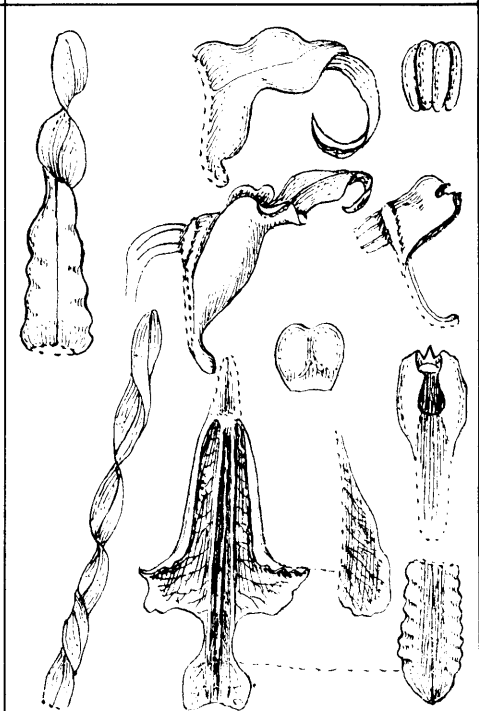
Dendrobium petiolatum Schltr.



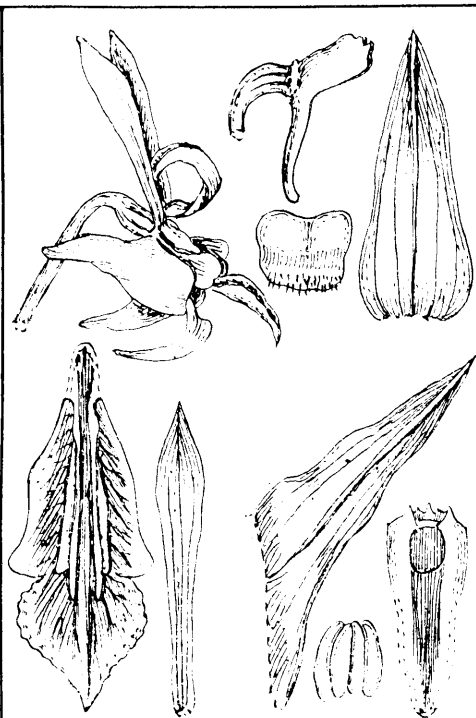
Dendrobium undatialatum Schltr.



Dendrobium maboroense Schltr.



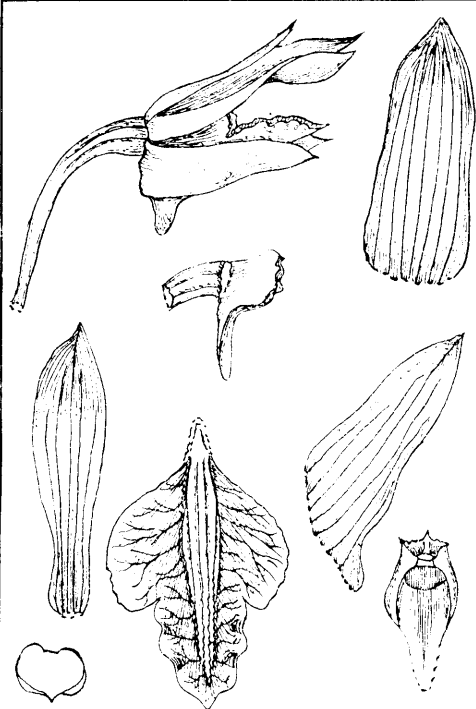
Dendrobium cochliodes Schltr.



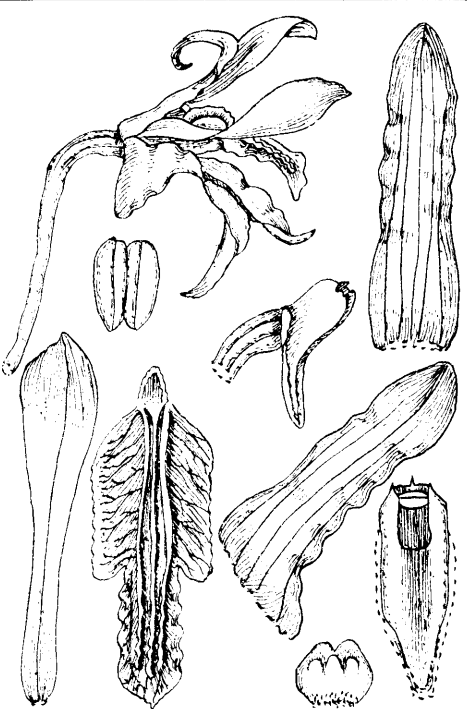
Dendrobium antennatum Lindl.



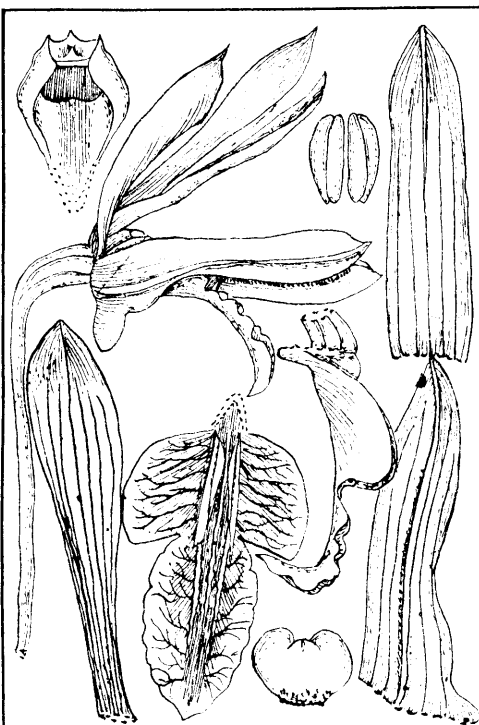
Dendrobium veratrifolium Lindl.



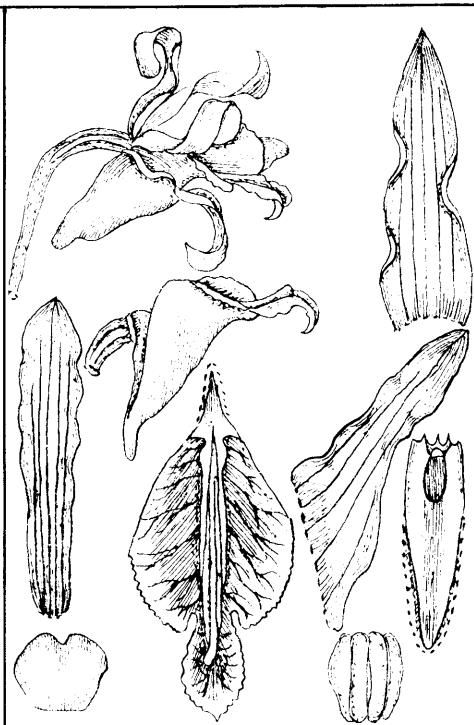
Dendrobium Mirbelianum Gaud.



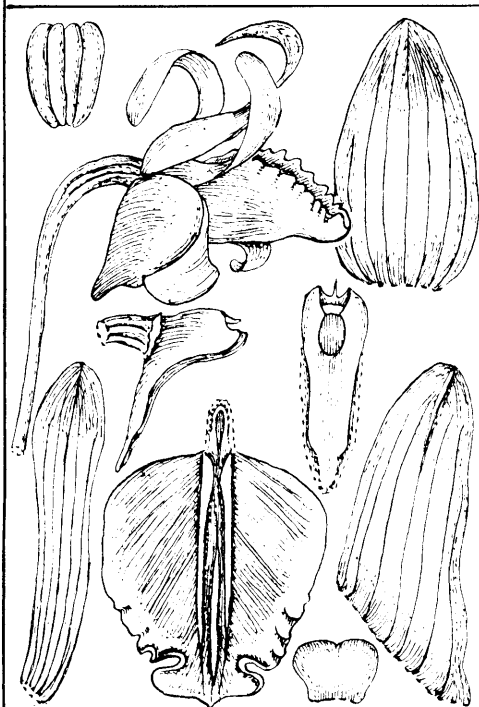
Dendrobium warianum Schltr.



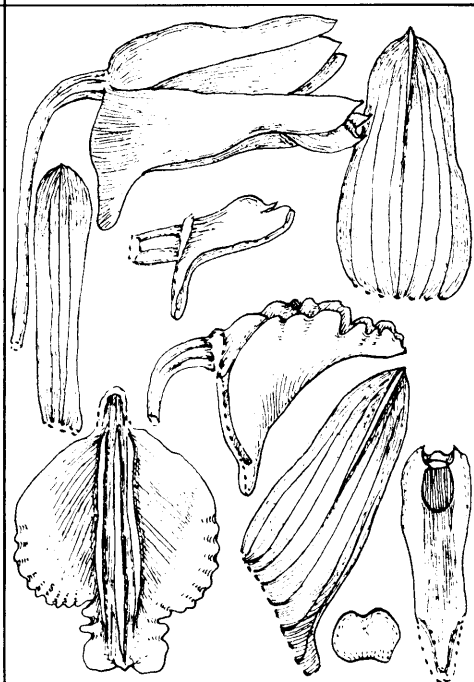
Dendrobium buluense Schltr.



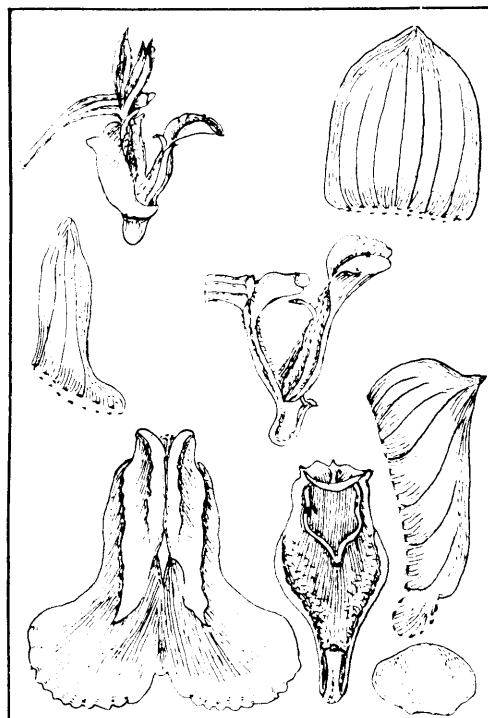
Dendrobium conanthum Schltr.



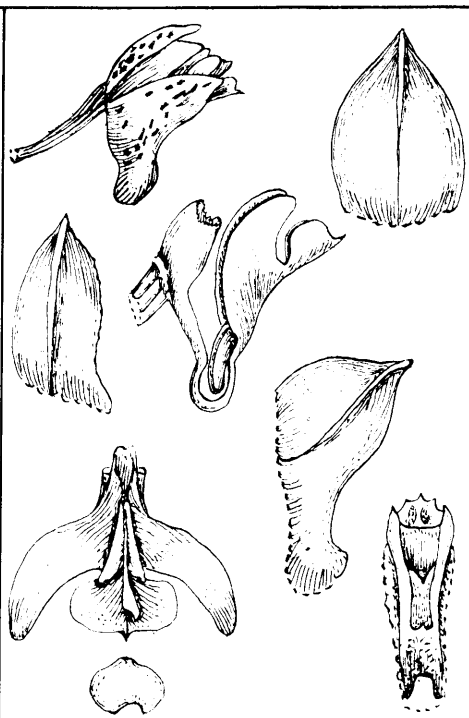
Dendrobium ionoglossum Schltr.



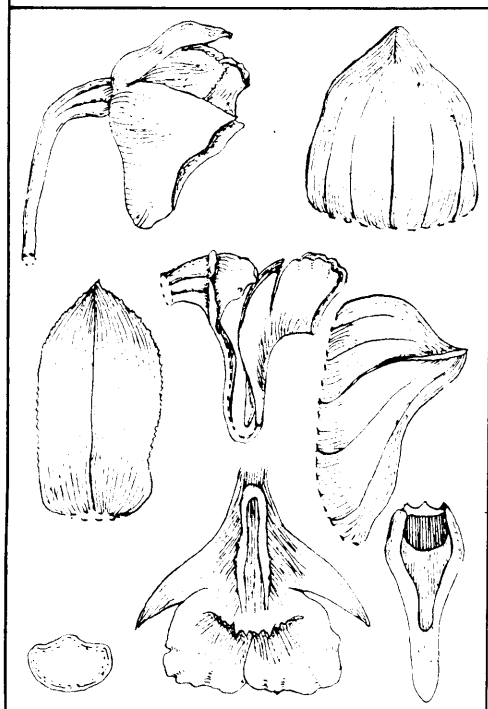
Dendrobium ionoglossum Schltr.
var. *potamophilum* Schltr.



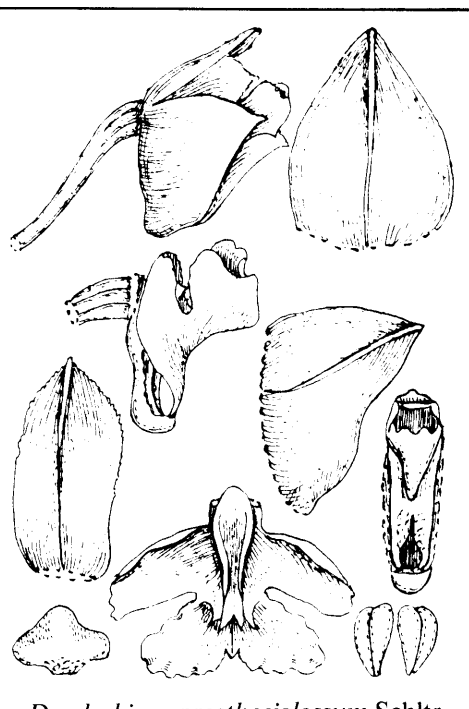
Dendrobium trachyrhizum Schltr.



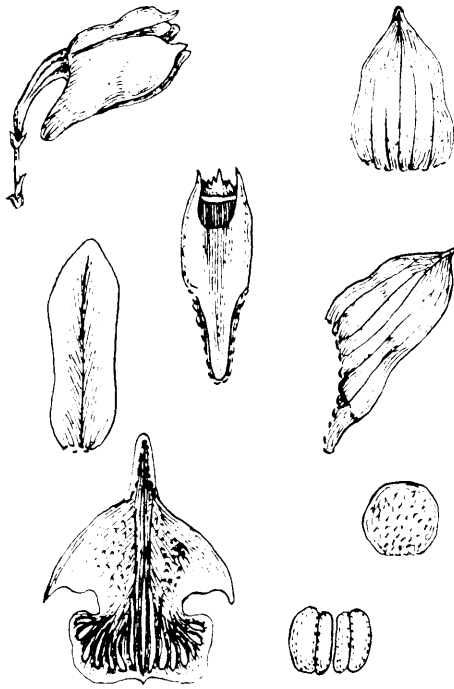
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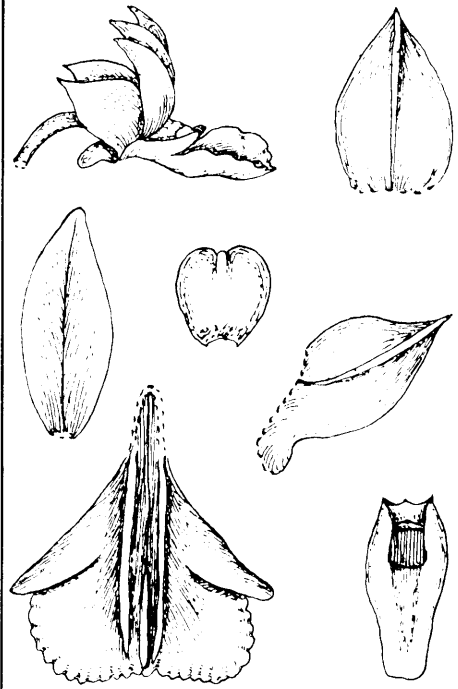
Dendrobium prosthecglossum Schltr.



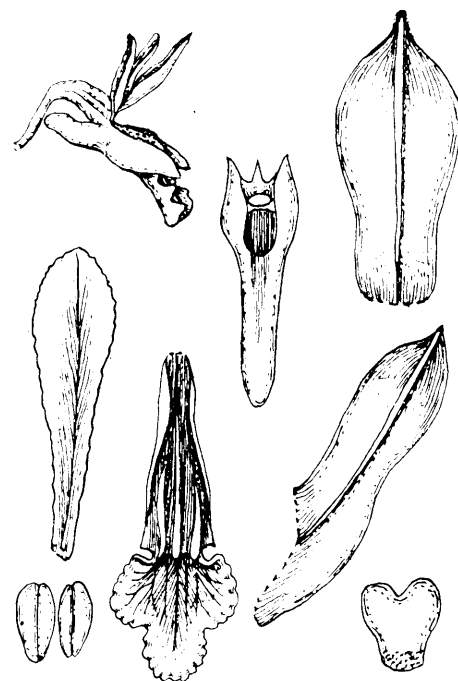
Dendrobium prosthecglossum Schltr.
var. *obtusilobum* Schltr.



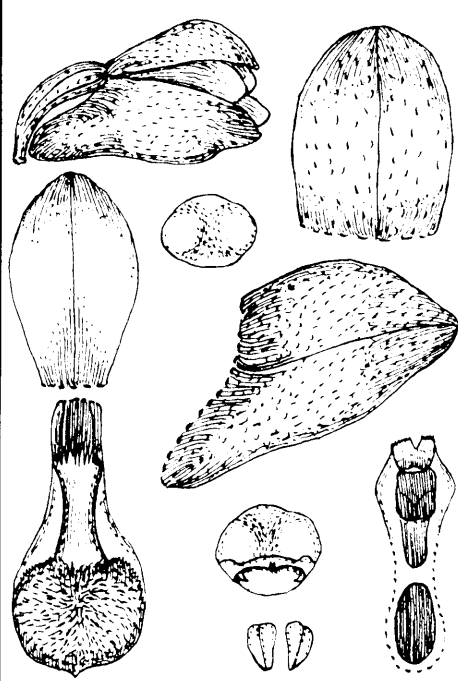
Dendrobium pluricostatum Schltr.



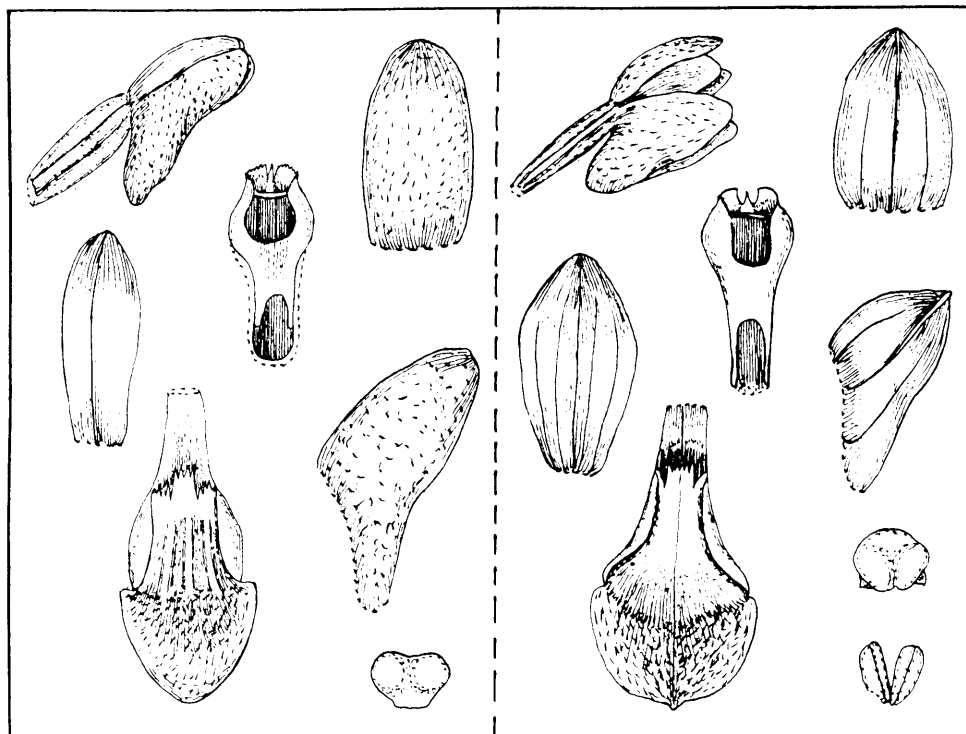
Dendrobium xanthophaeum Schltr.



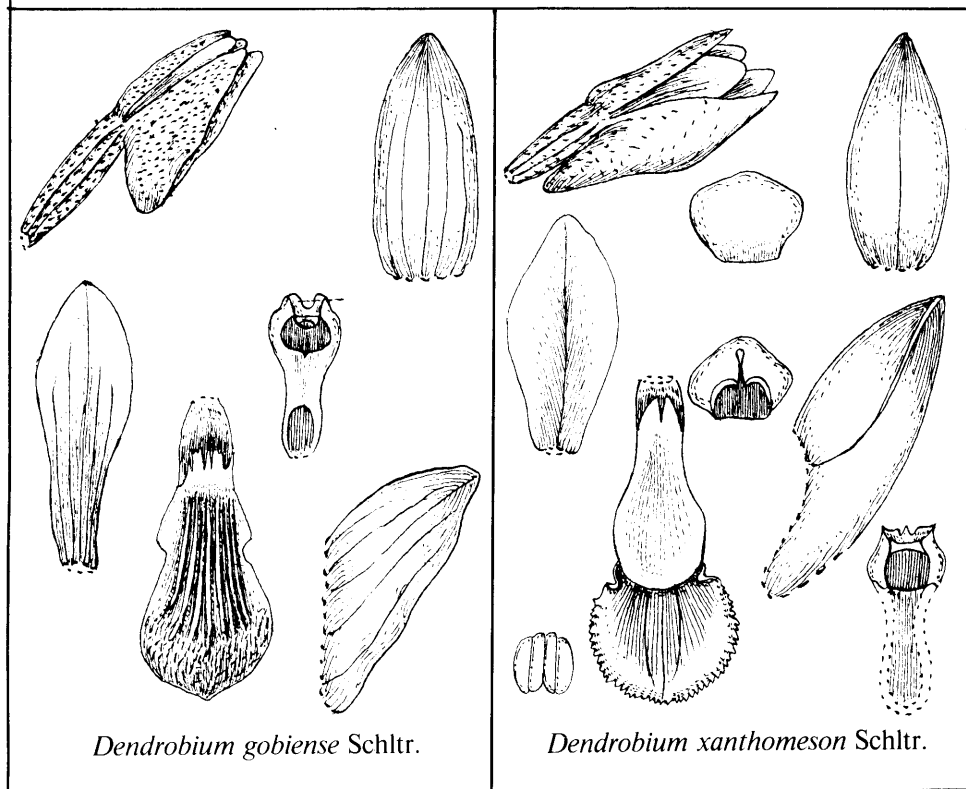
Dendrobium melanotrichum Schltr.



Dendrobium melanostictum Schltr.

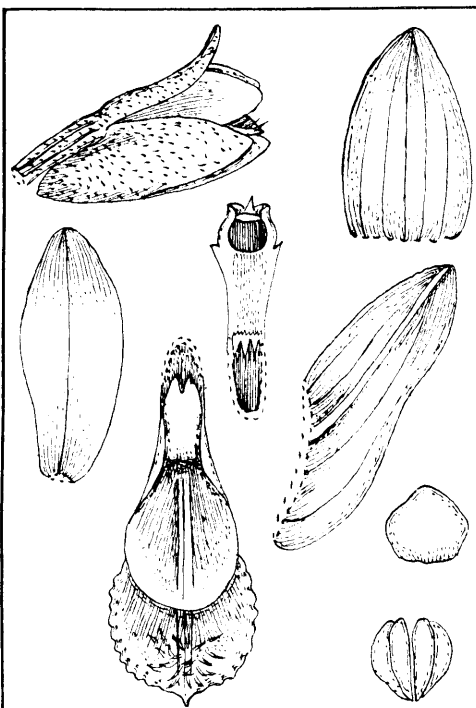


Dendrobium Kempterianum Schltr.

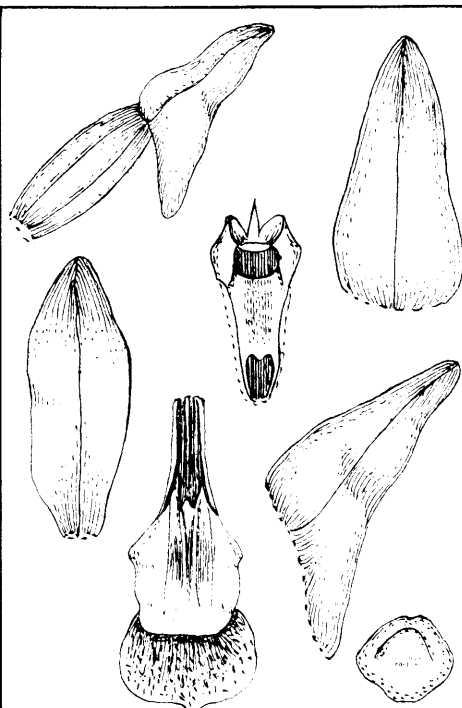


Dendrobium gobiense Schltr.

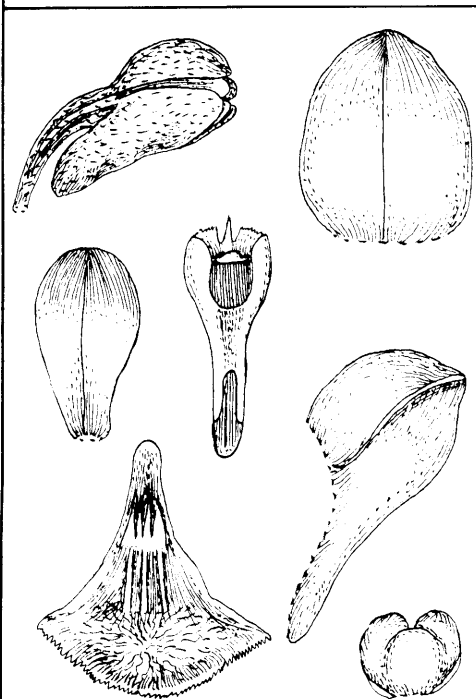
Dendrobium xanthomeson Schltr.



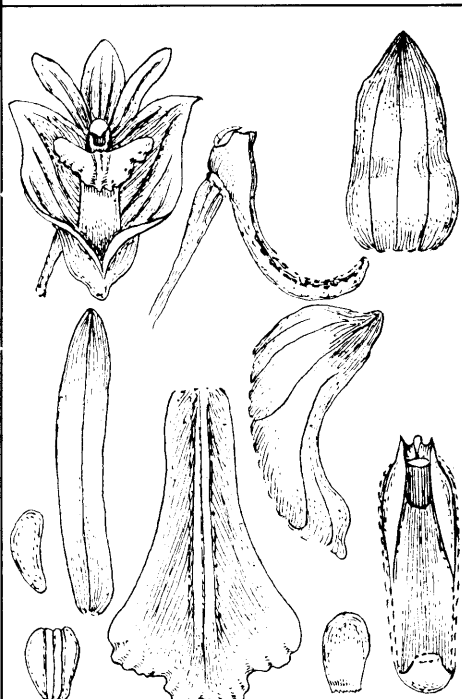
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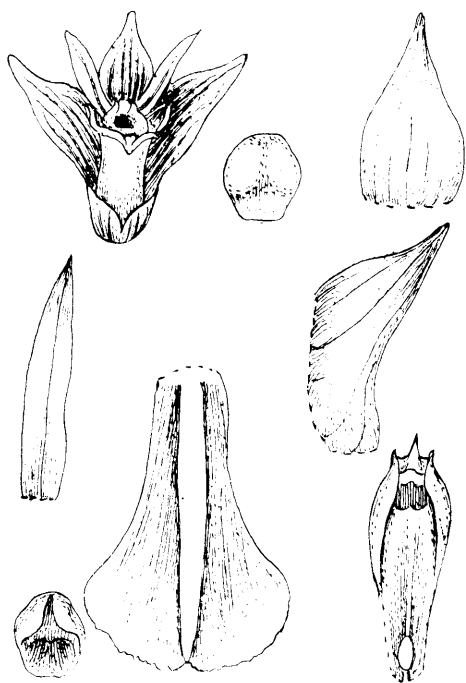
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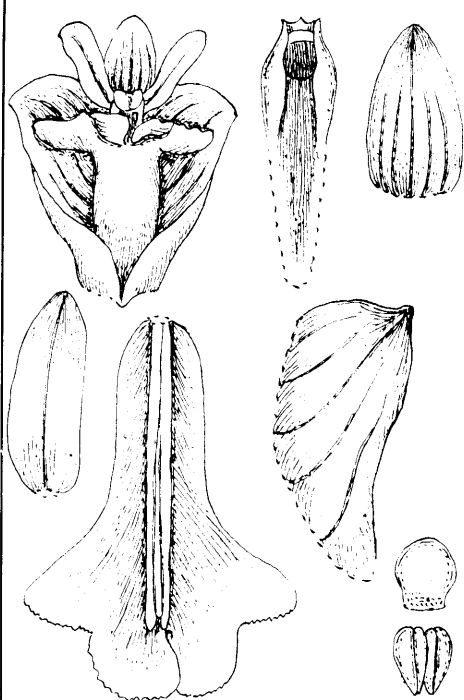
Dendrobium kaniense Schltr.



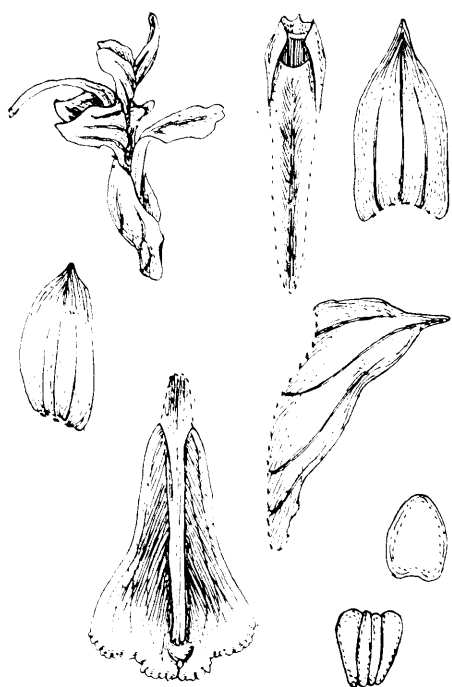
Dendrobium MacFarlanei F.v.M.



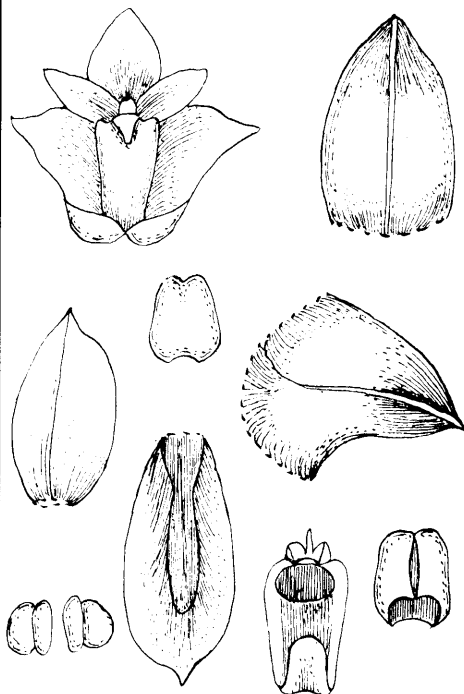
Dendrobium eboracense Krzl.



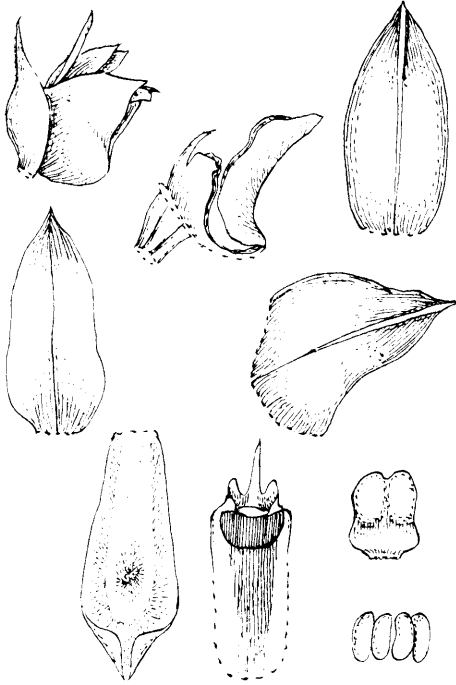
Dendrobium litorale Schltr.



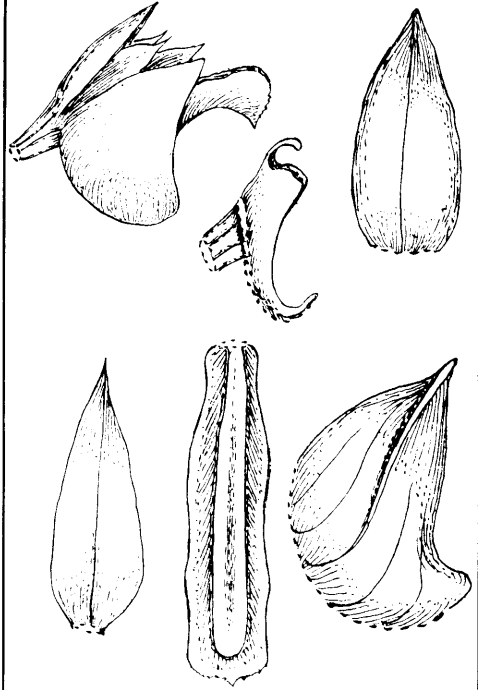
Dendrobium hymenocentrum Schltr.



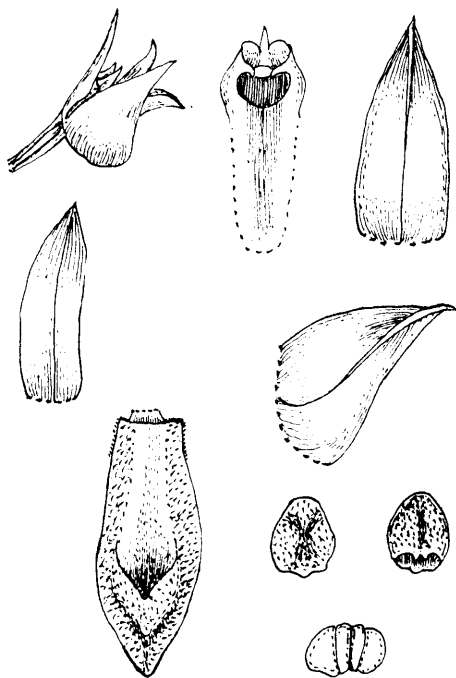
Dendrobium torricellianum Krzl.



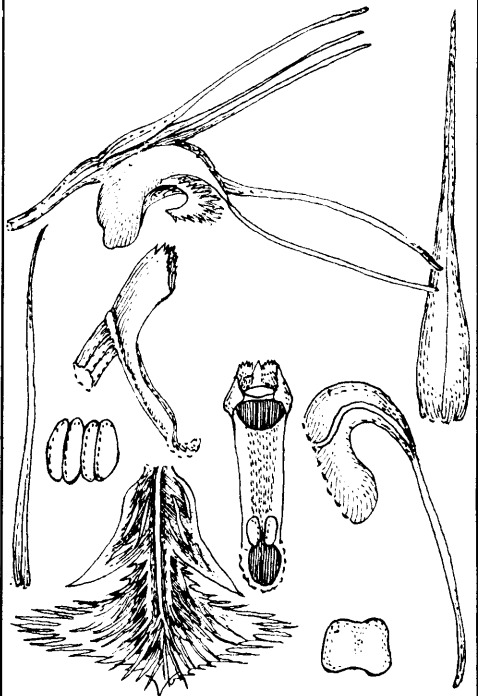
Dendrobium subsessile Schltr.



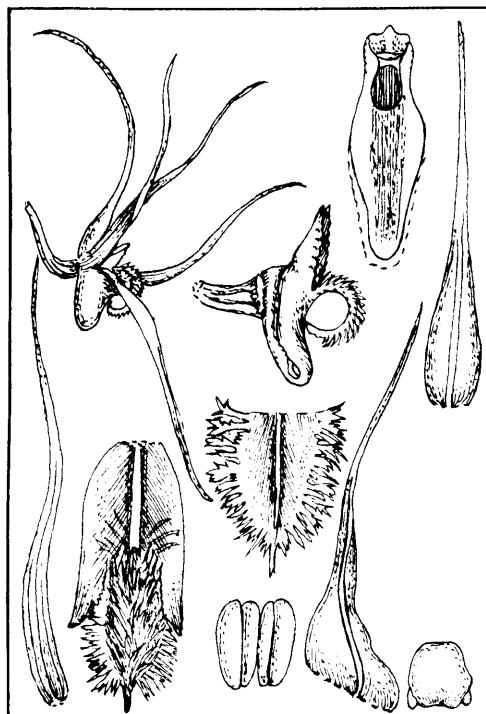
Dendrobium Govidjoae Schltr.



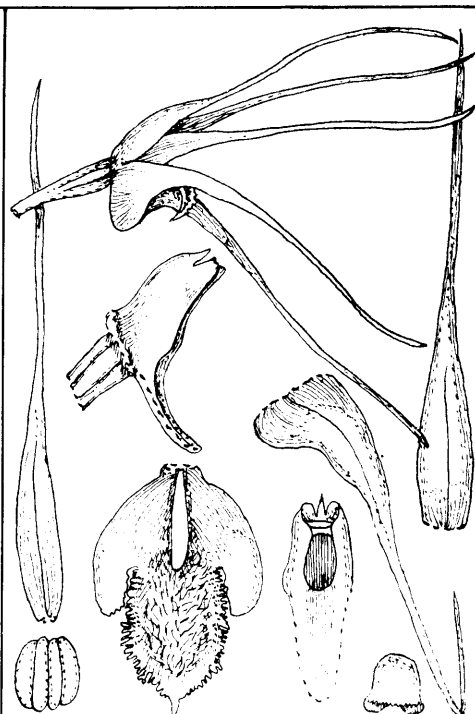
Dendrobium acianthum Schltr.



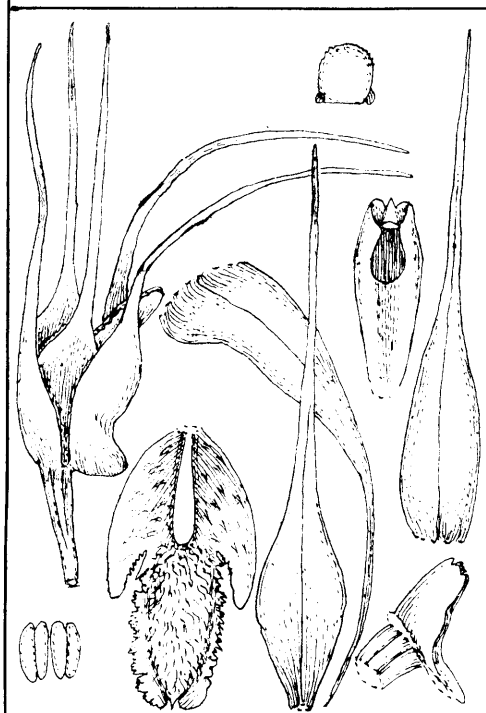
Dendrobium polyschistum Schltr.



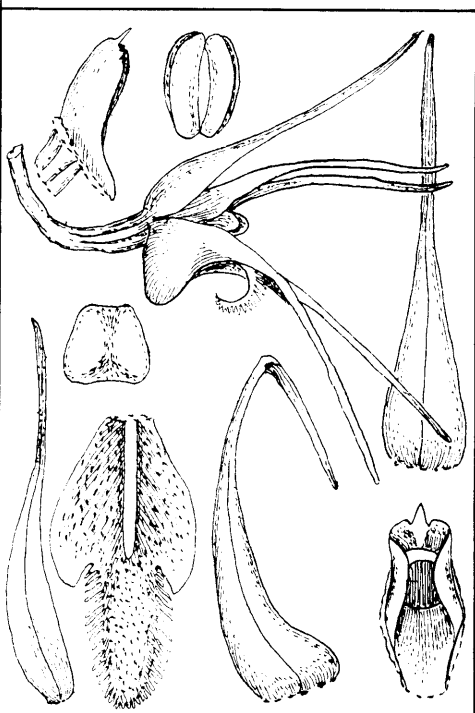
Dendrobium laceratum Schltr.



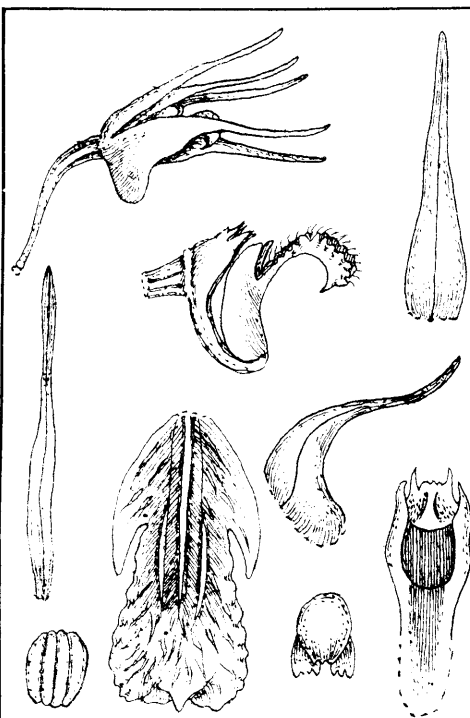
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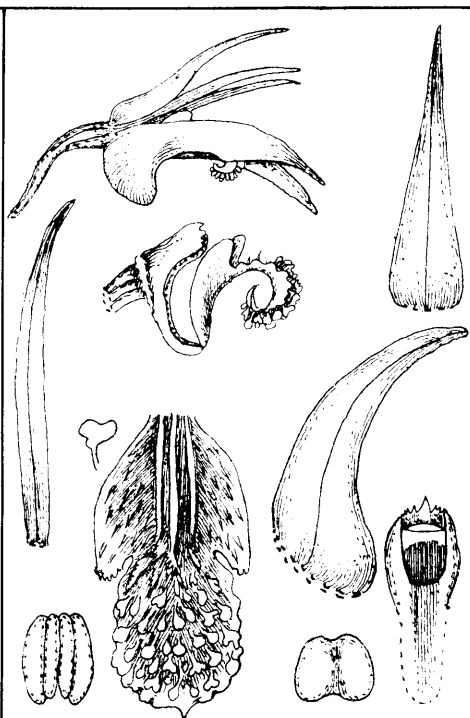
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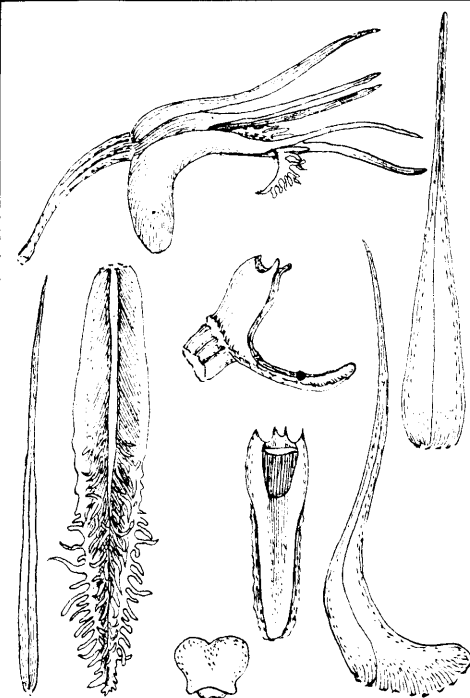
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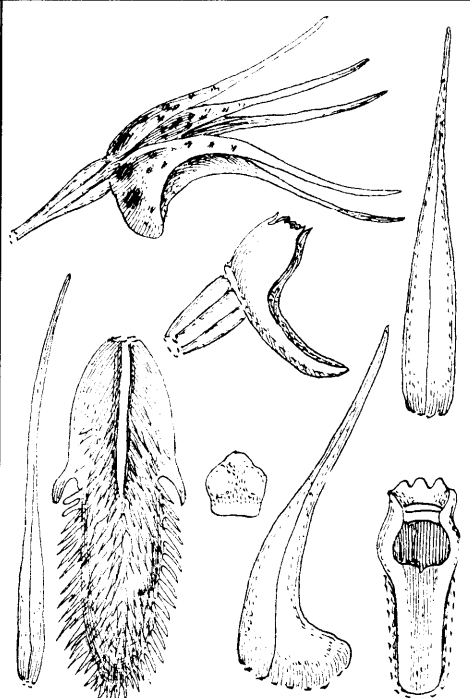
Dendrobium debile Schltr.



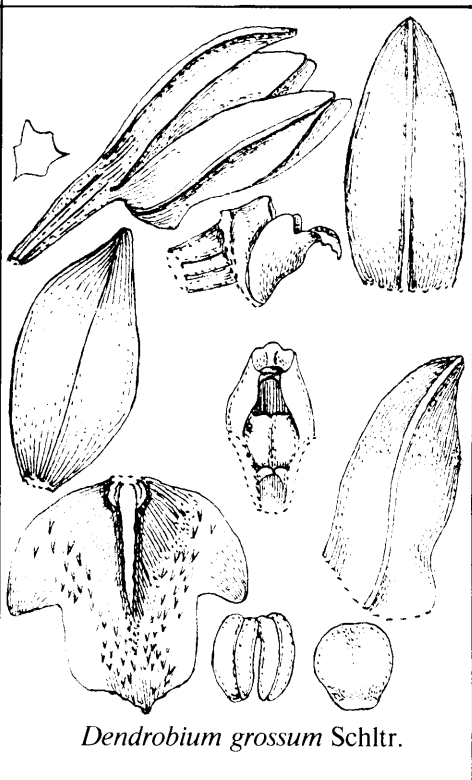
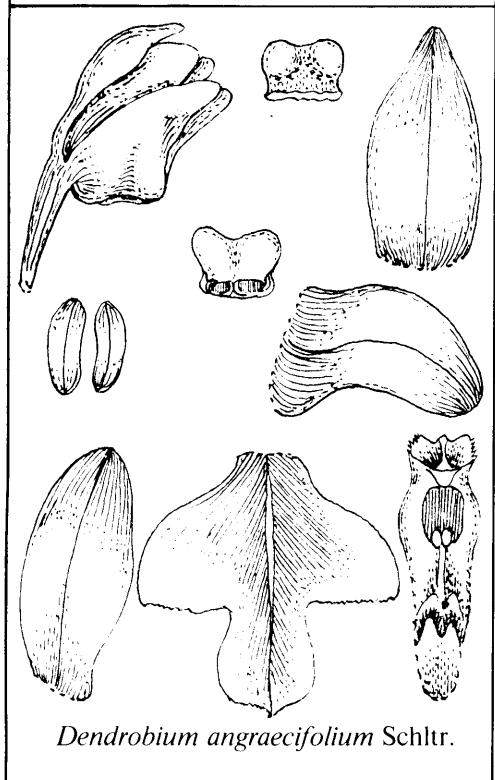
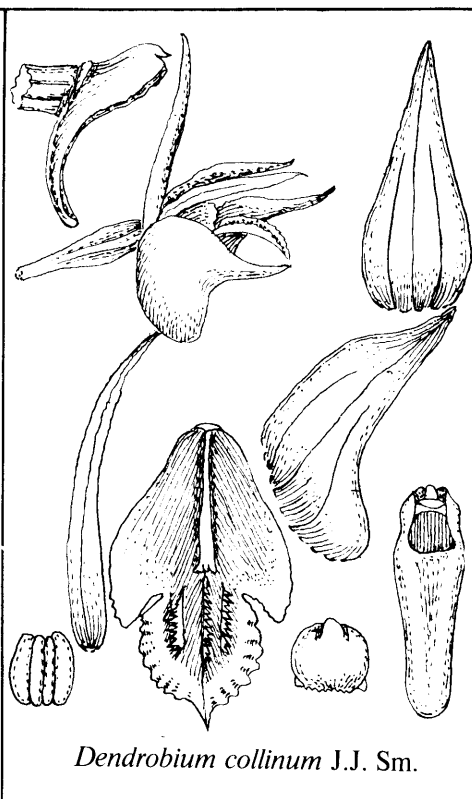
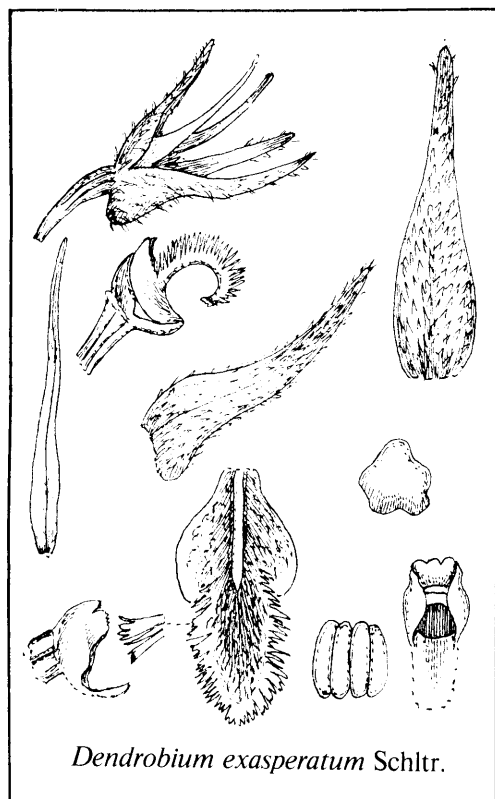
Dendrobium glebulosum Schltr.

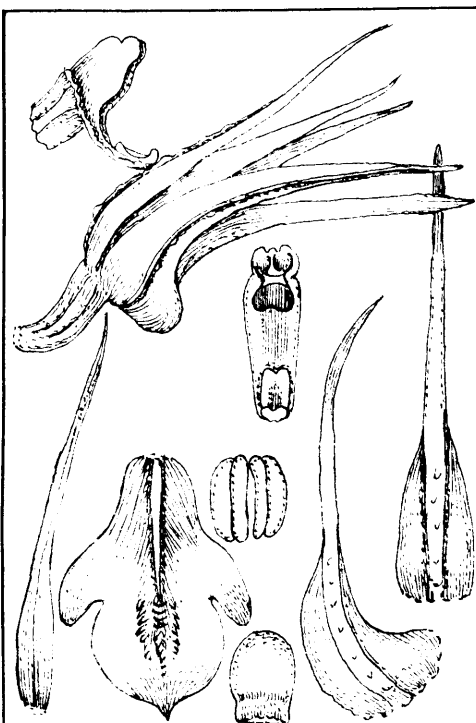


Dendrobium holochilum Schltr.

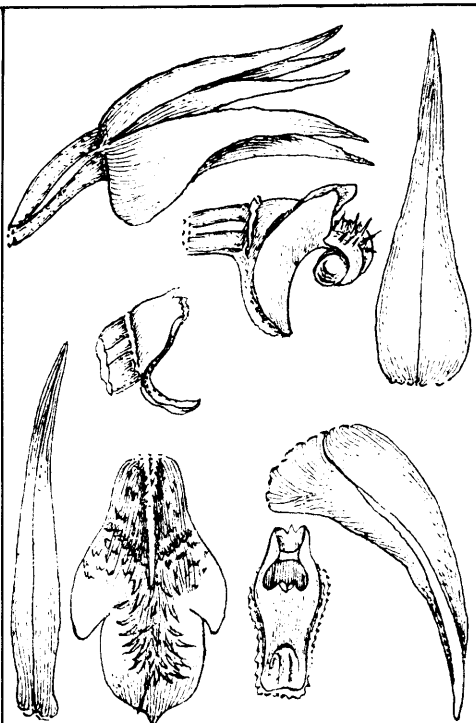


Dendrobium erectum Schltr.

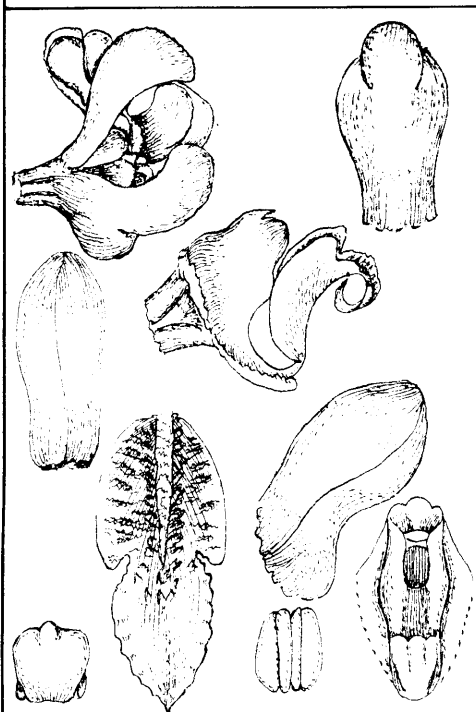




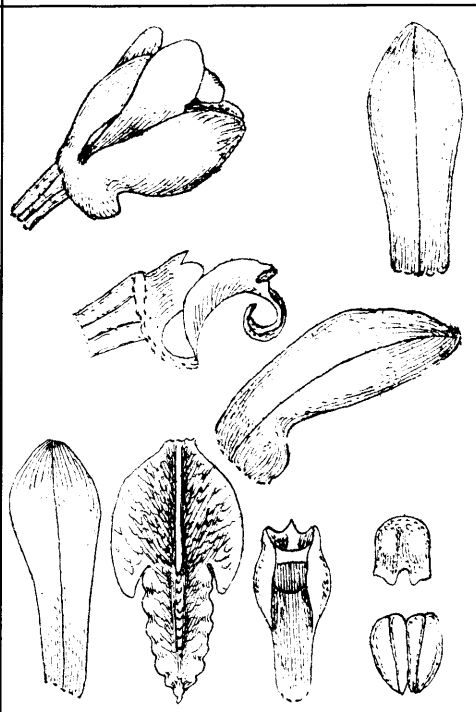
Dendrobium elatum Schltr.



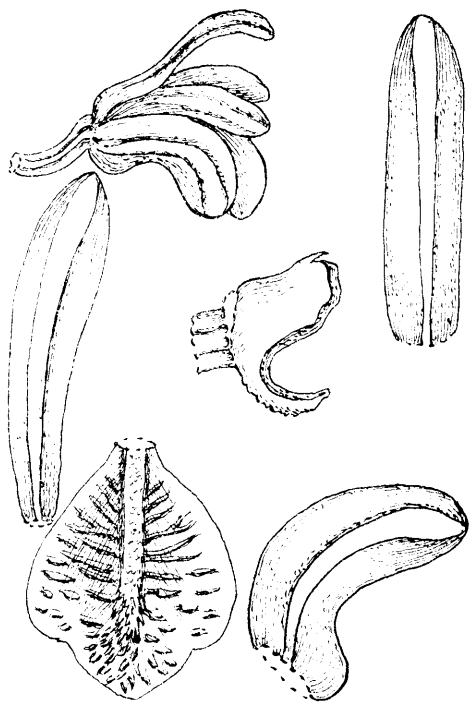
Dendrobium asperatum Schltr.



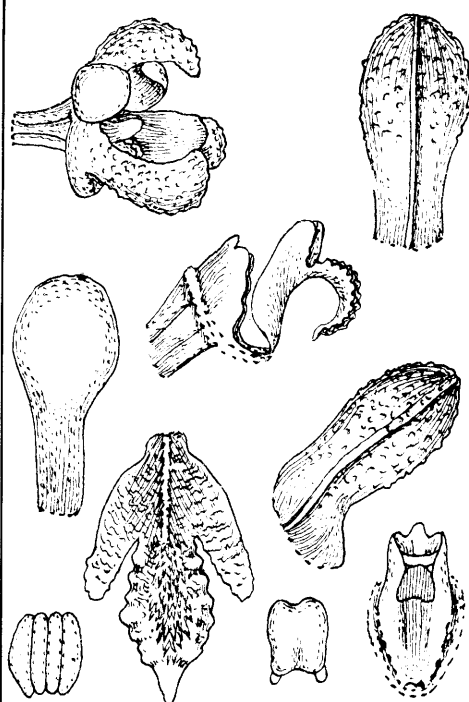
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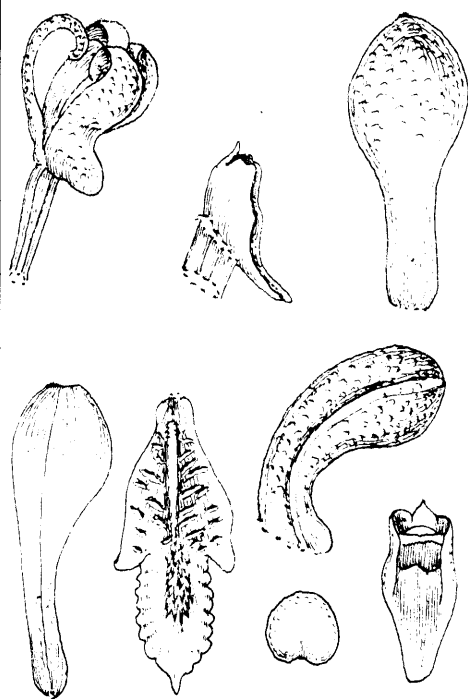
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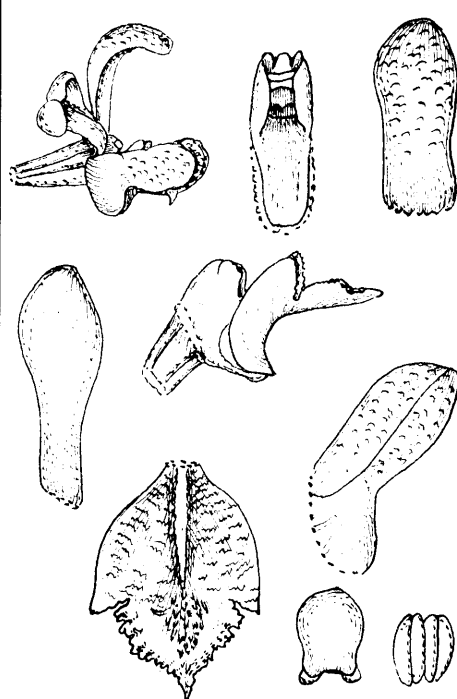
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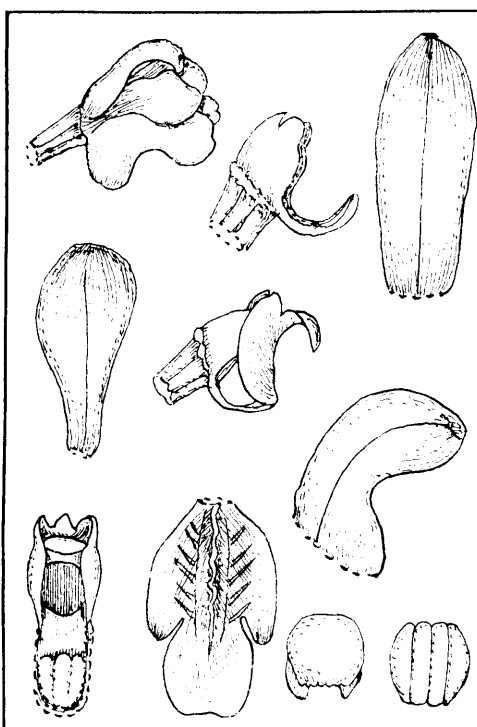
Dendrobium sarcodes Schltr.



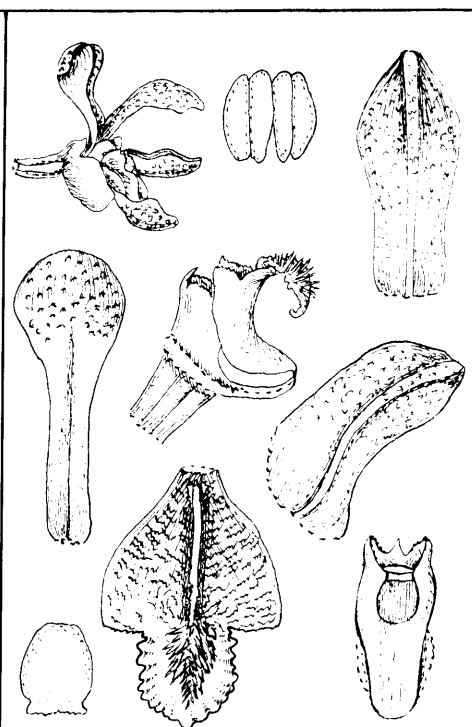
Dendrobium pachyanthum Schltr.



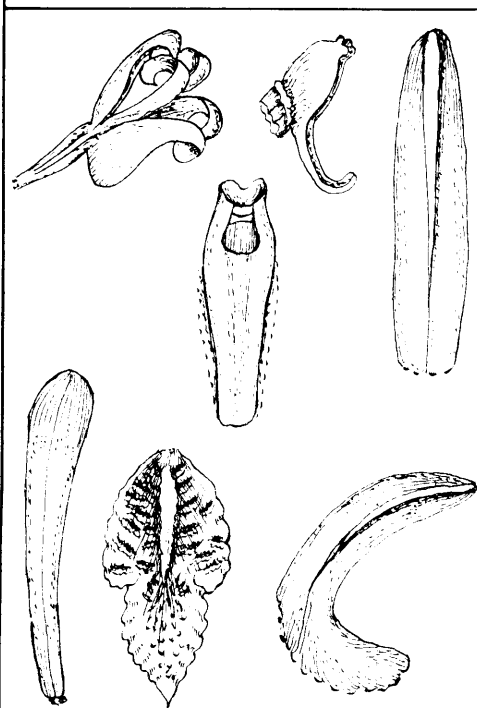
Dendrobium triste Schltr.



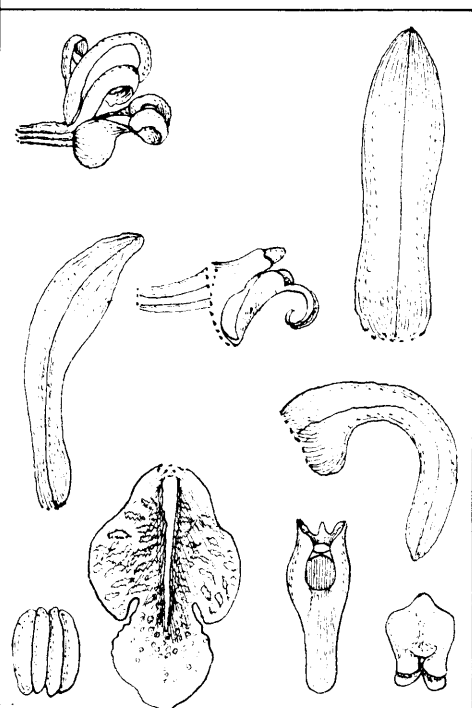
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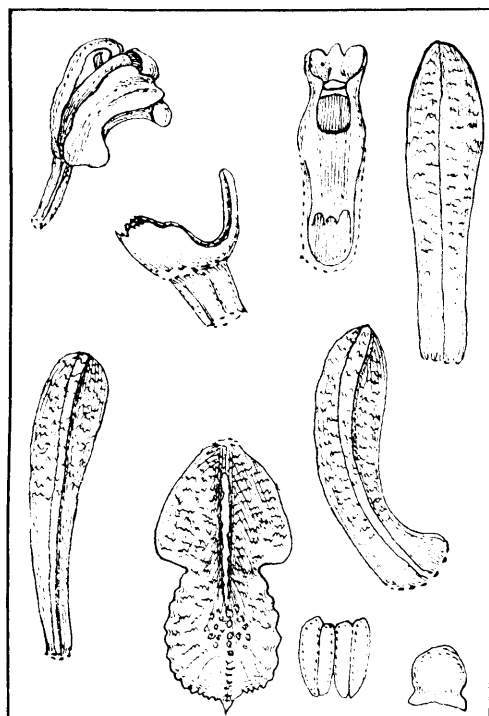
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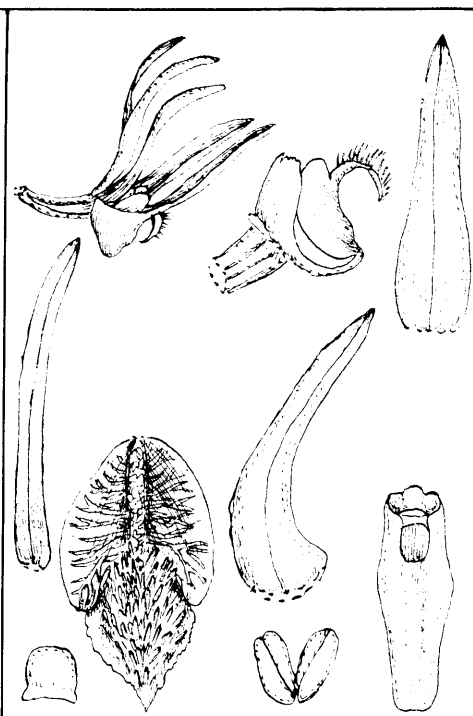
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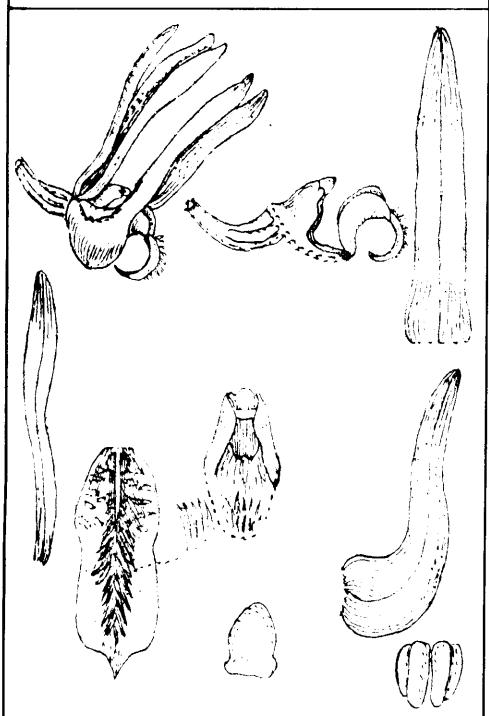
Dendrobium violaceo-pictum Schltr.



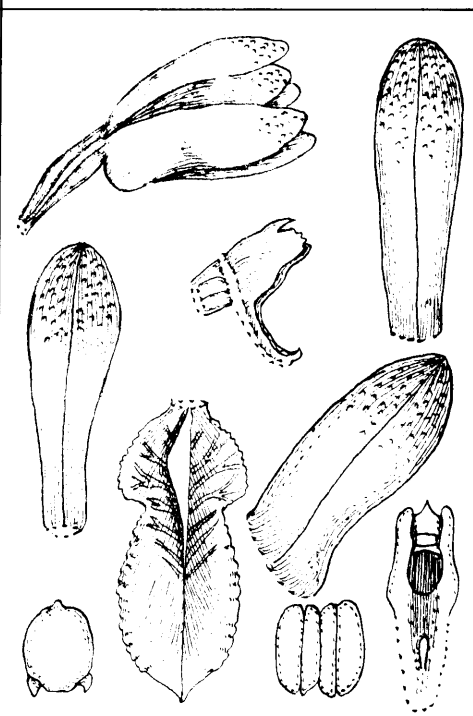
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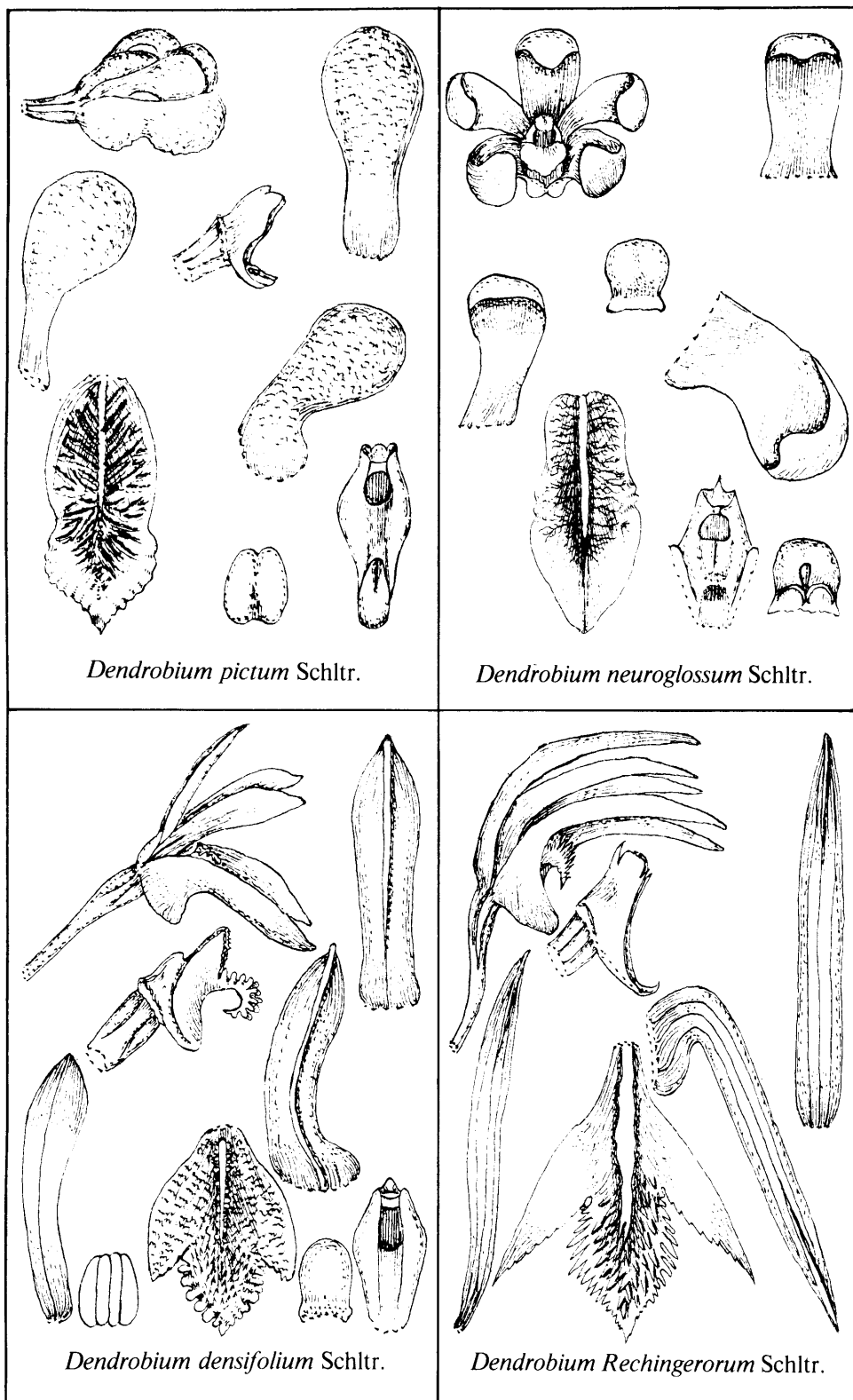
Dendrobium heteroglossum Schltr.

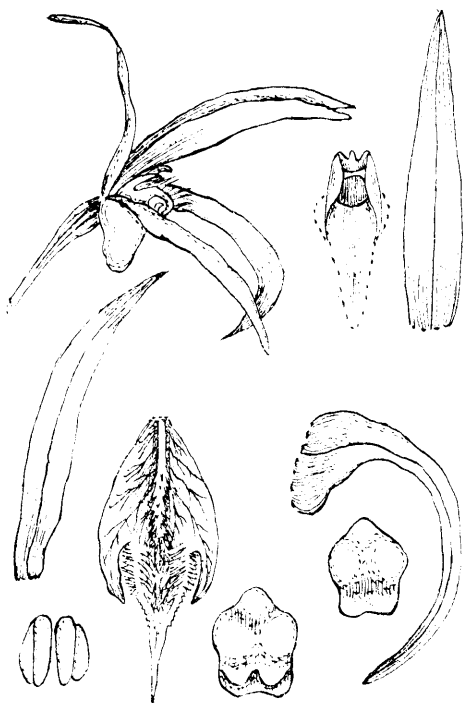


Dendrobium djamuense Schltr.

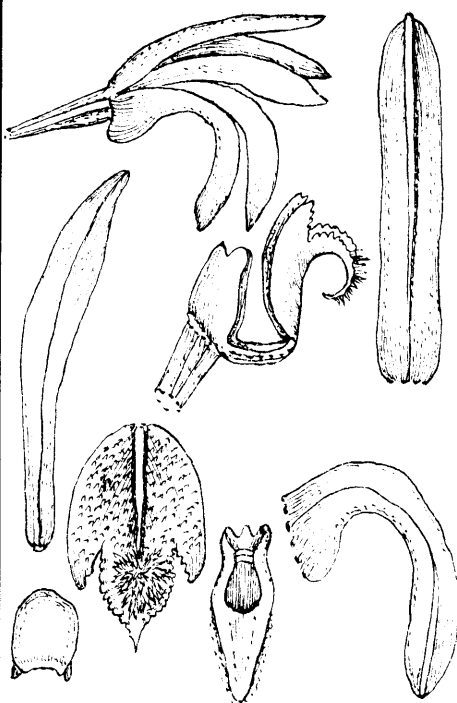


Dendrobium alticola Schltr.

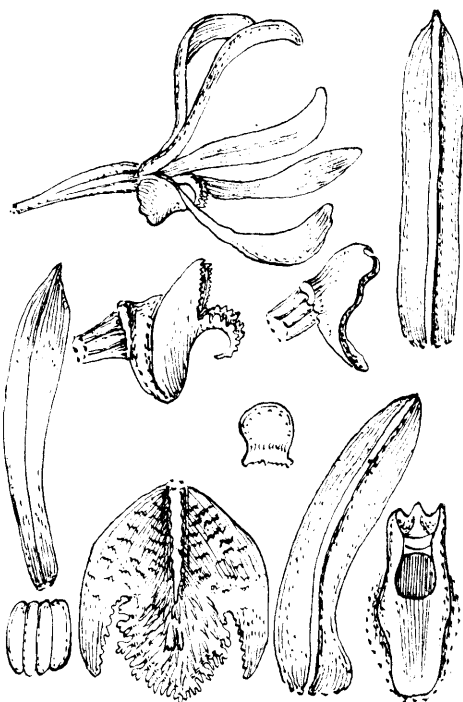




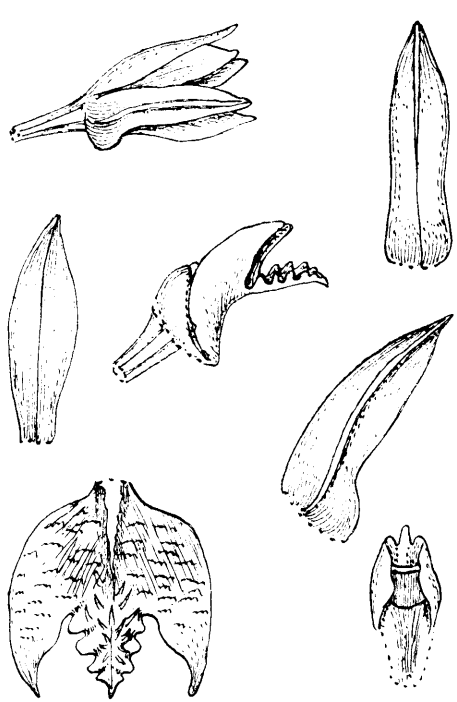
Dendrobium cyrtosepalum Schltr.



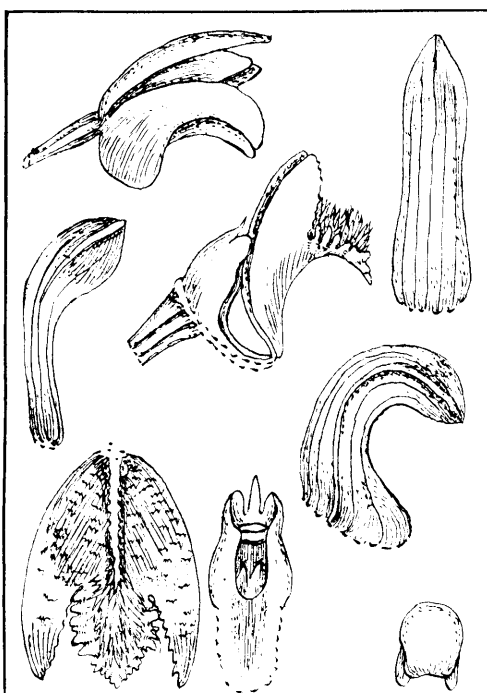
Dendrobium pulvinatum Schltr.



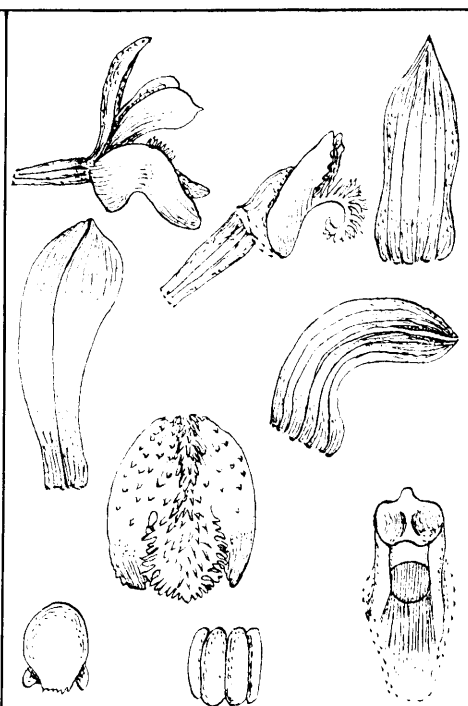
Dendrobium microglossum Schltr.



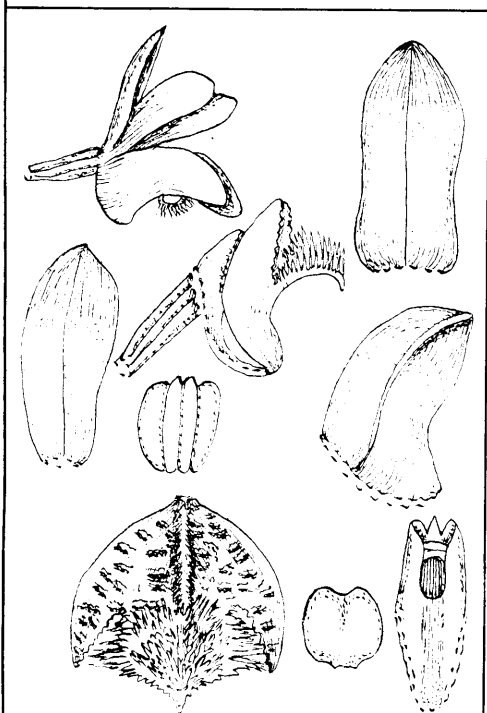
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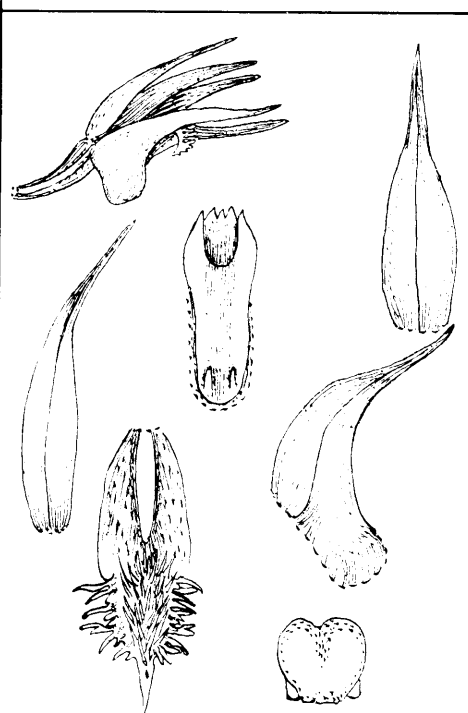
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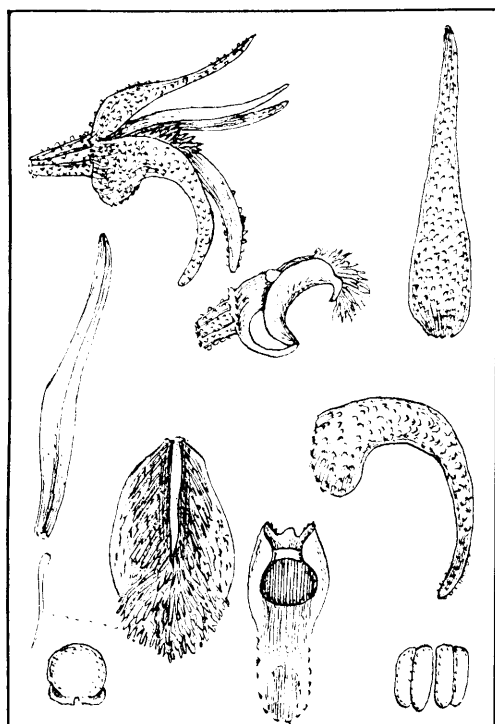
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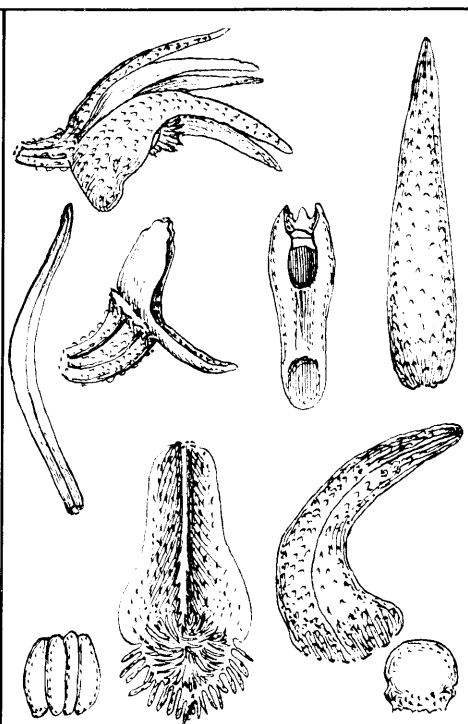
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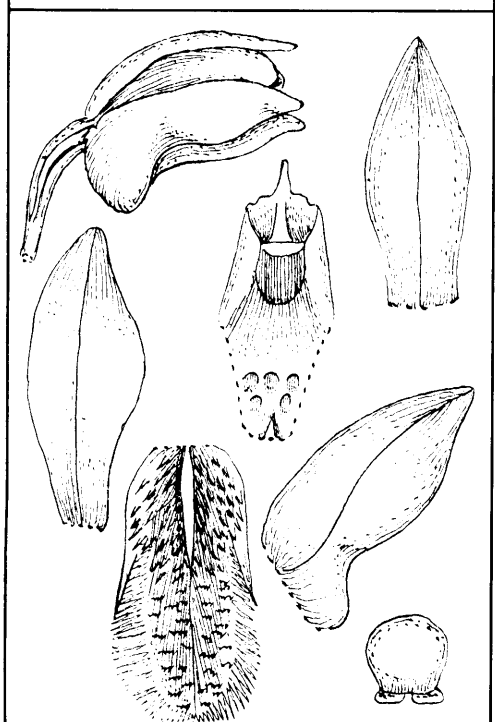
Dendrobium brunnescens Schltr.



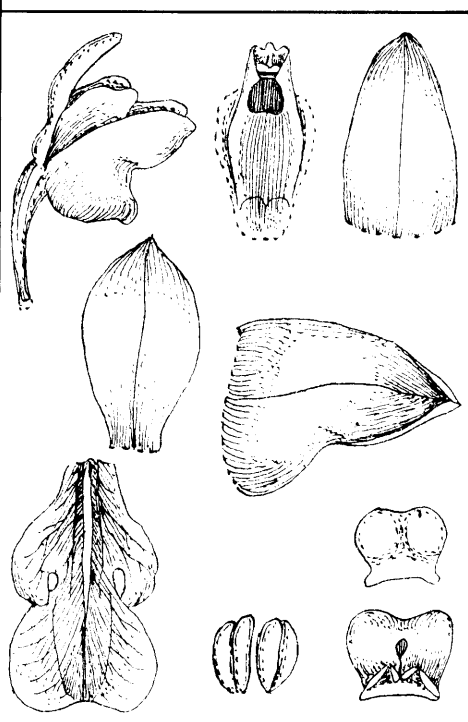
Dendrobium verruciflorum Schltr.



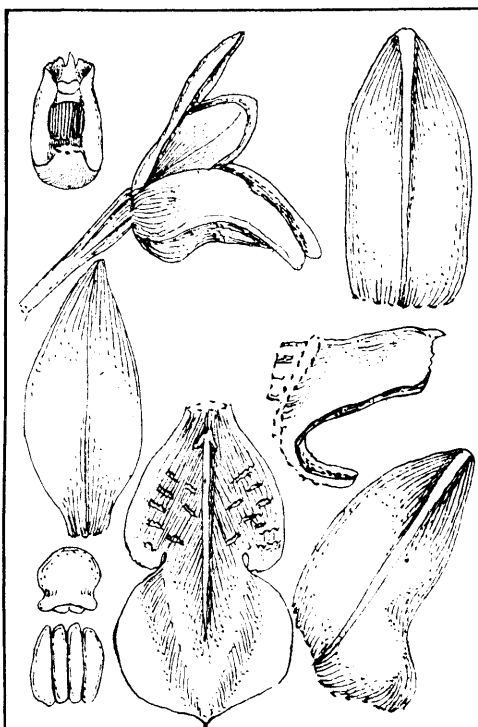
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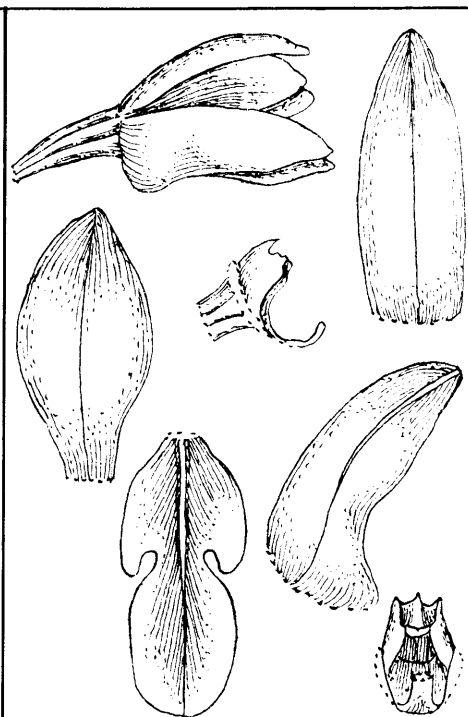
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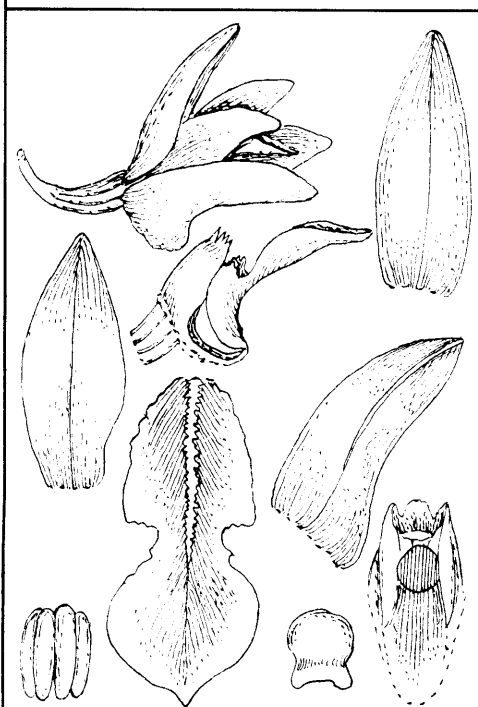
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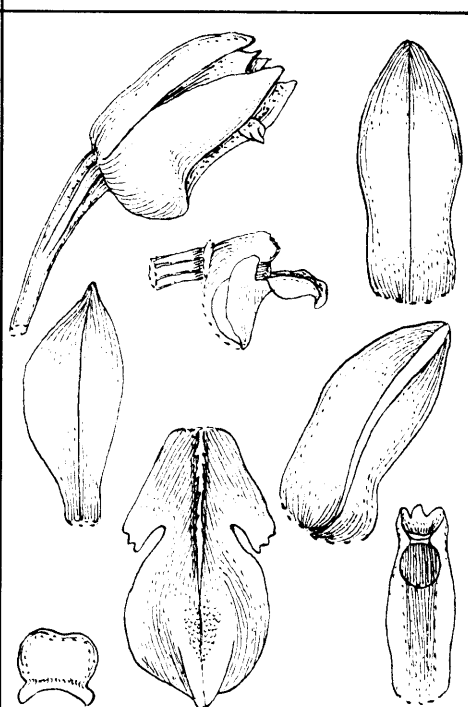
Dendrobium exaltatum Schltr.



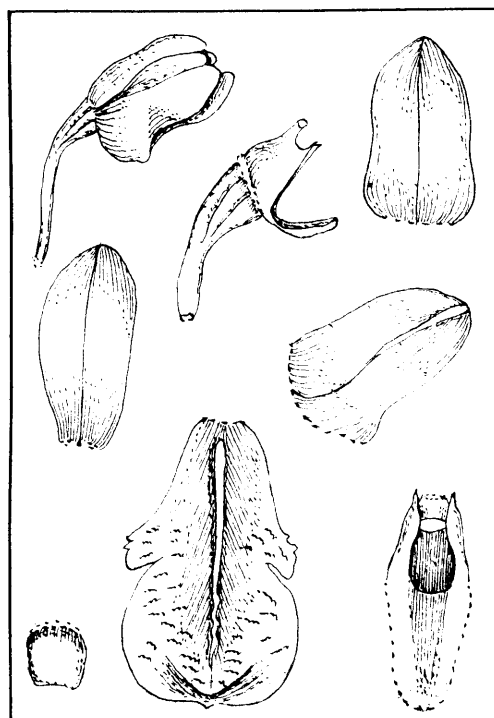
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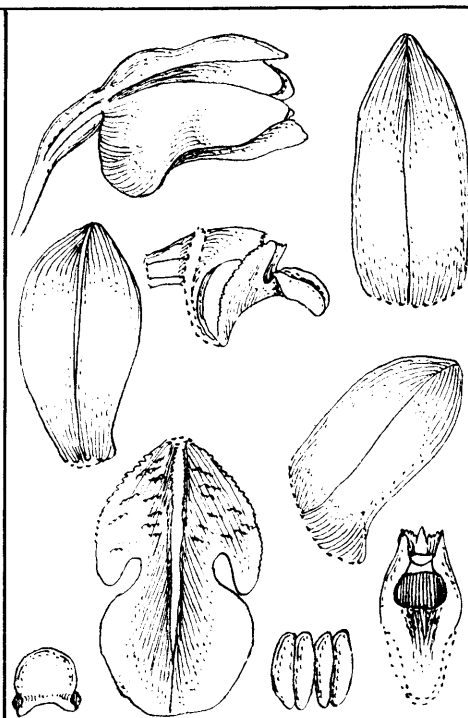
Dendrobium extra axillare Schltr.



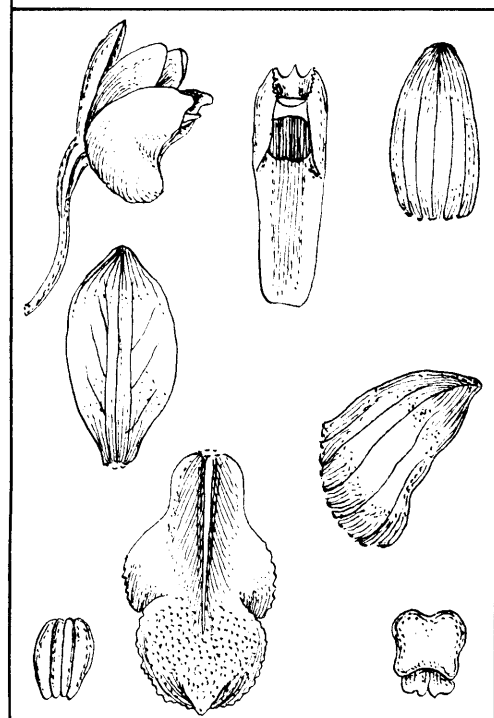
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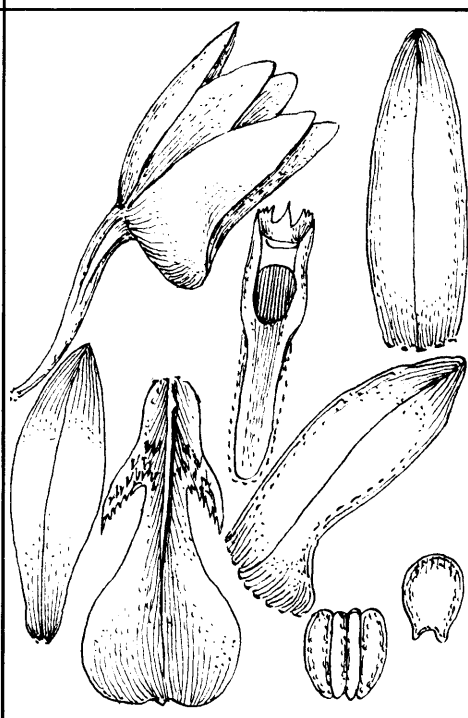
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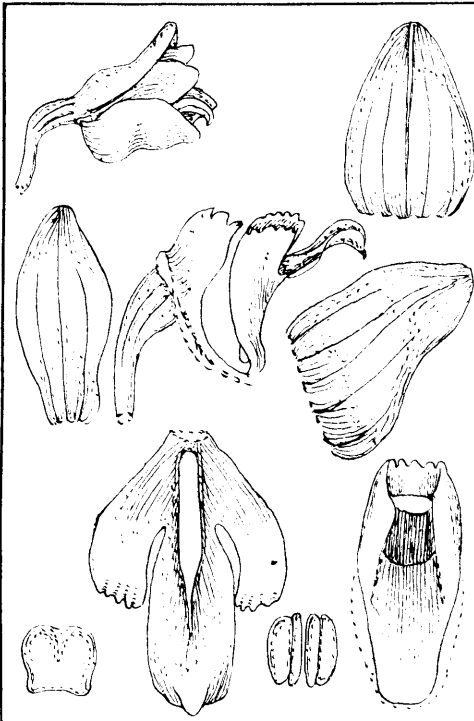
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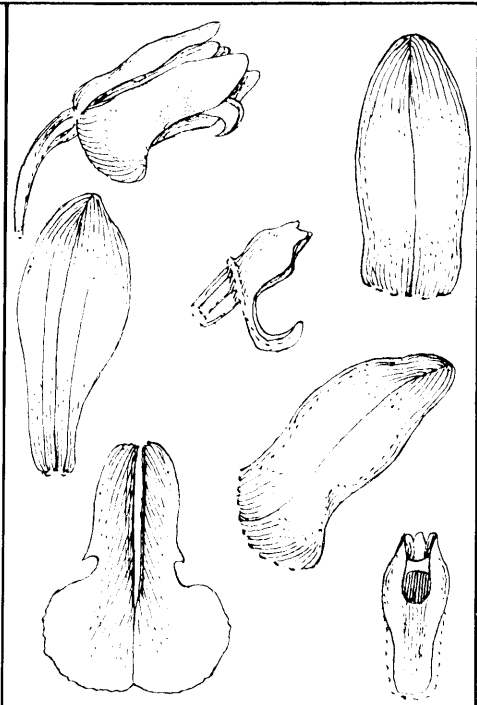
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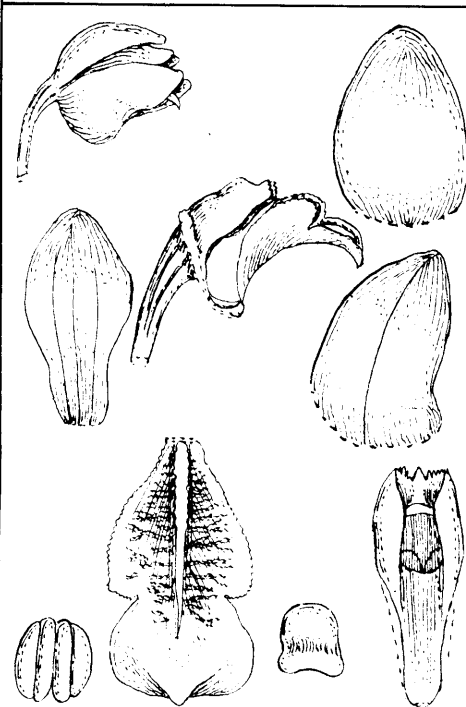
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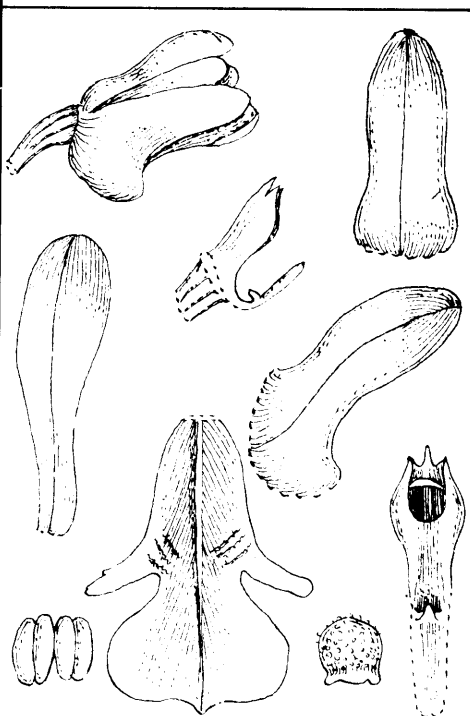
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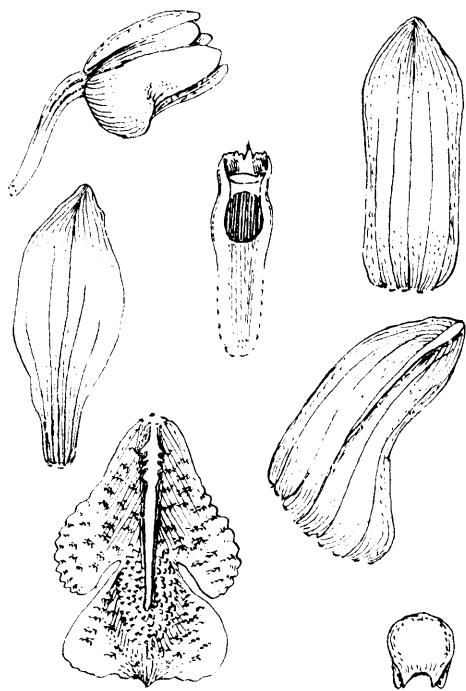
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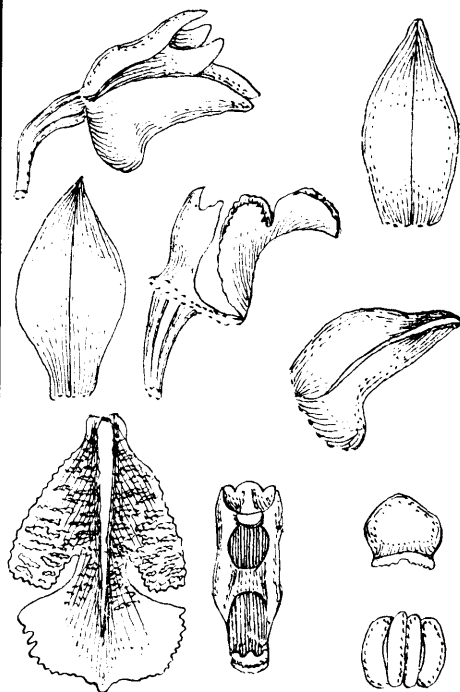
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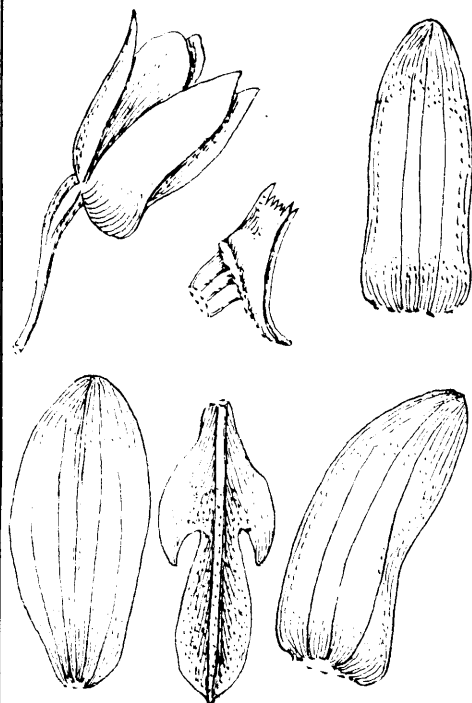
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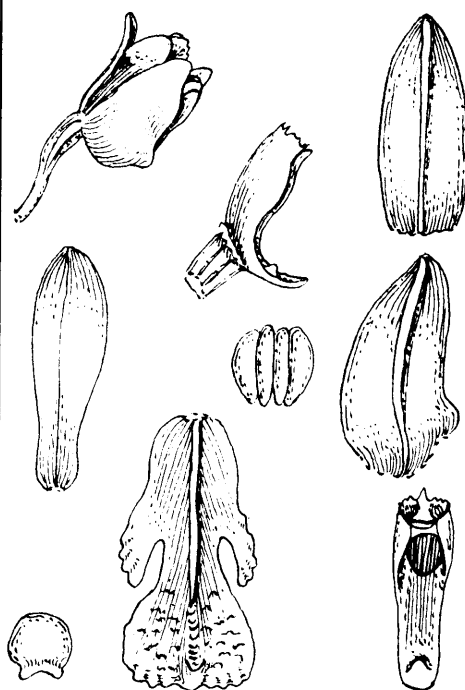
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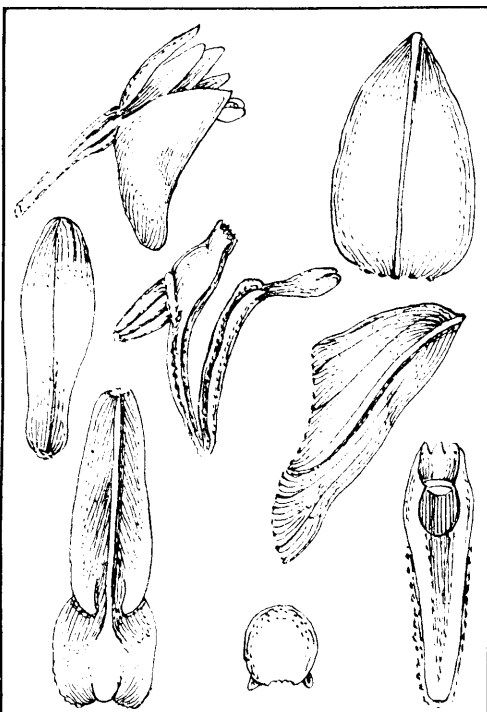
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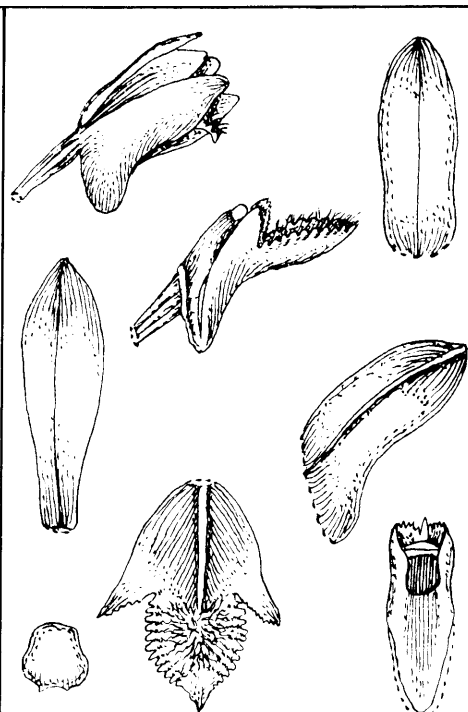
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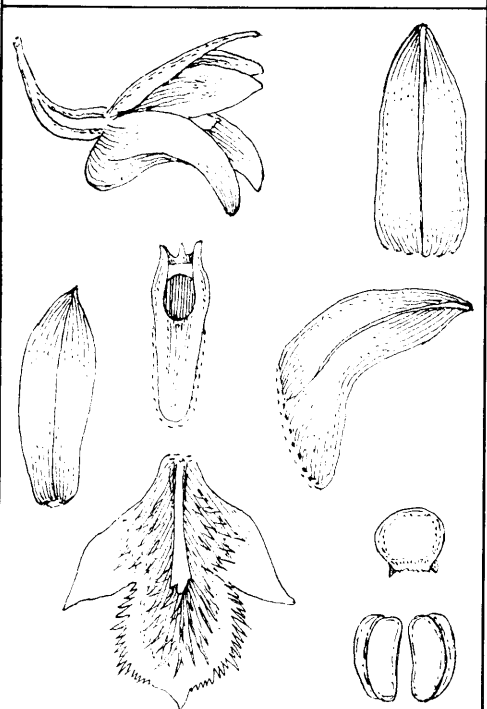
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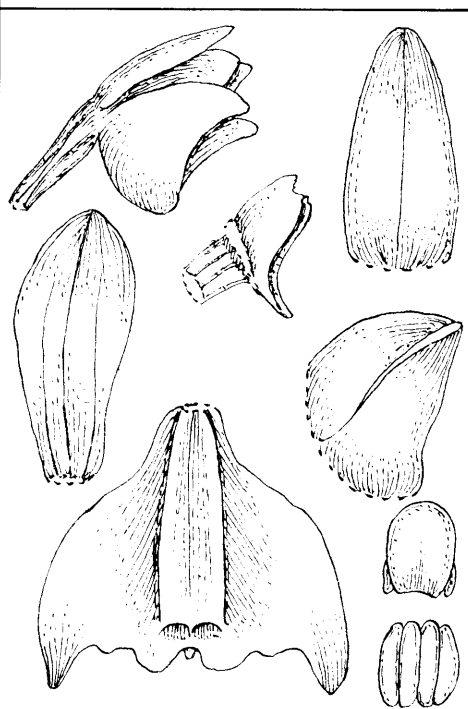
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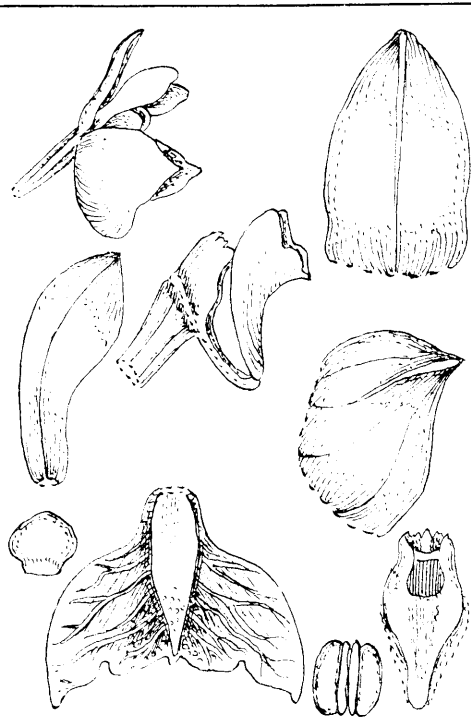
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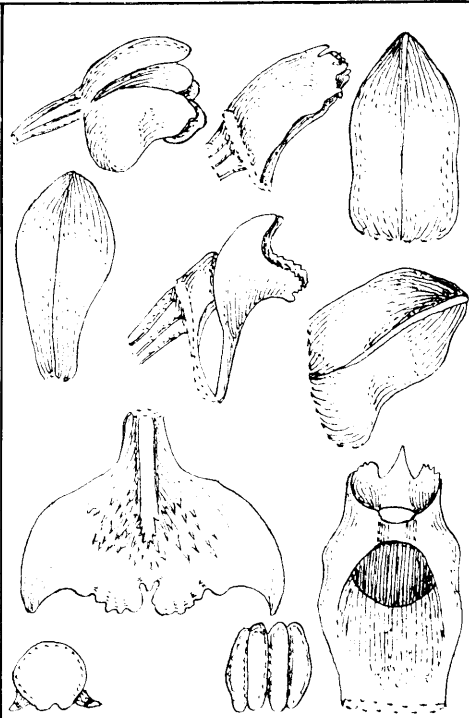
Dendrobium sarcophyllum Schltr.



Dendrobium erubescens Schltr.



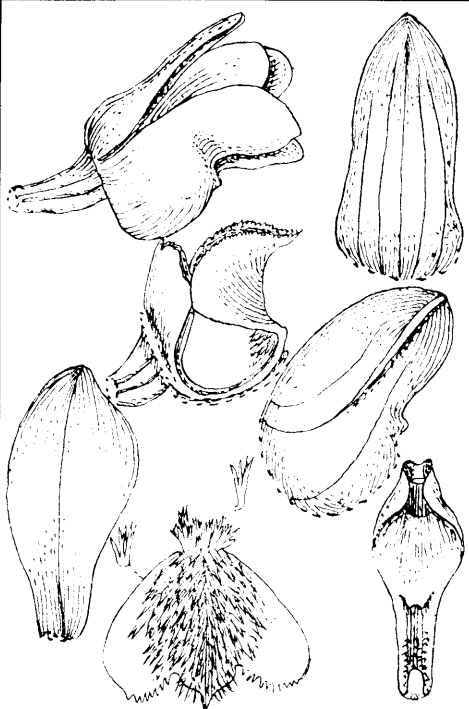
Dendrobium kenejianum Schltr.



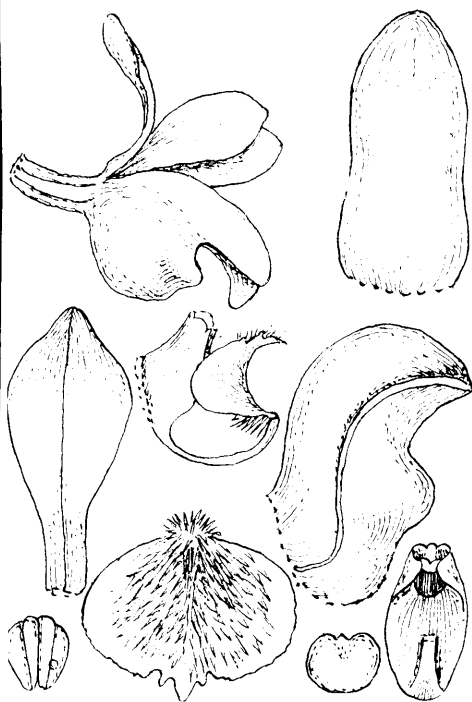
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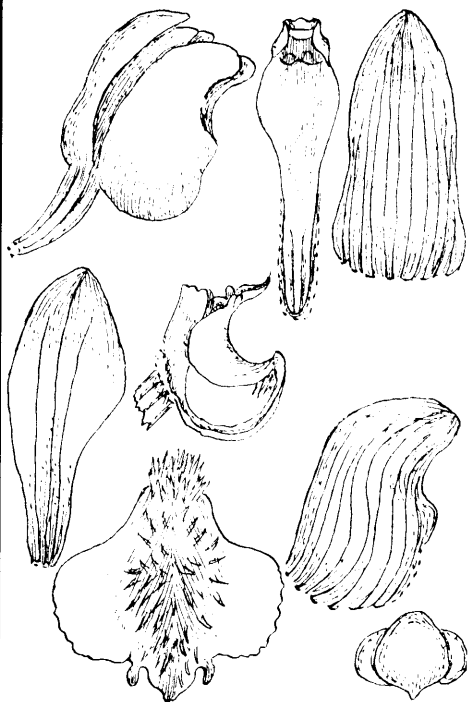
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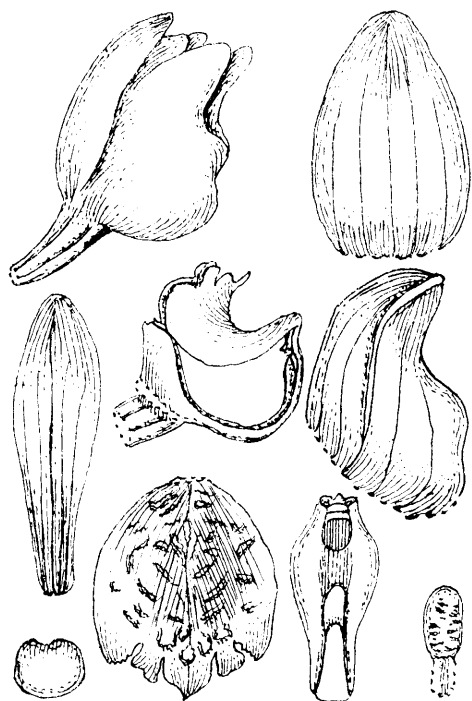
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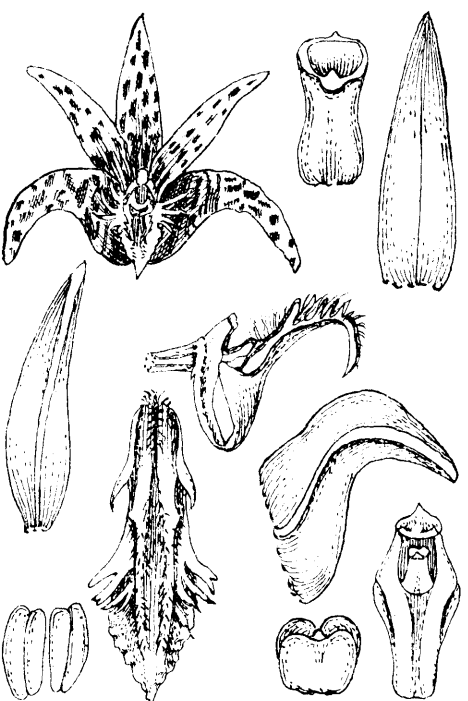
Dendrobium globiflorum Schltr.



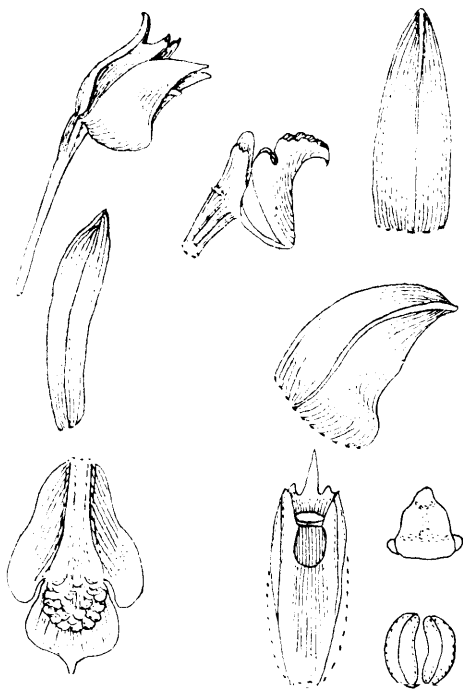
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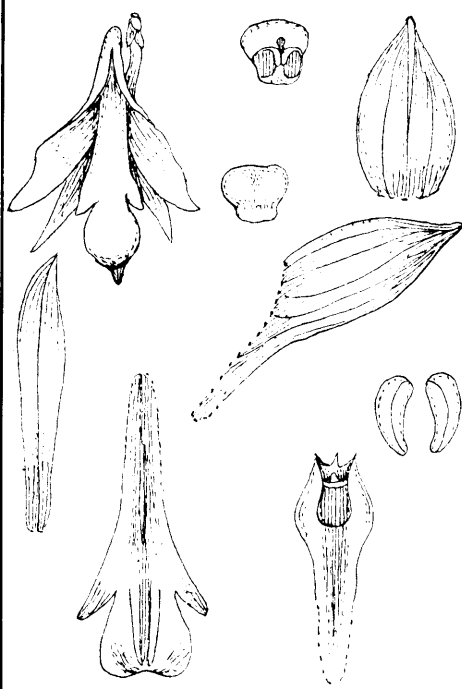
Dendrobium quinquelobatum Schltr.



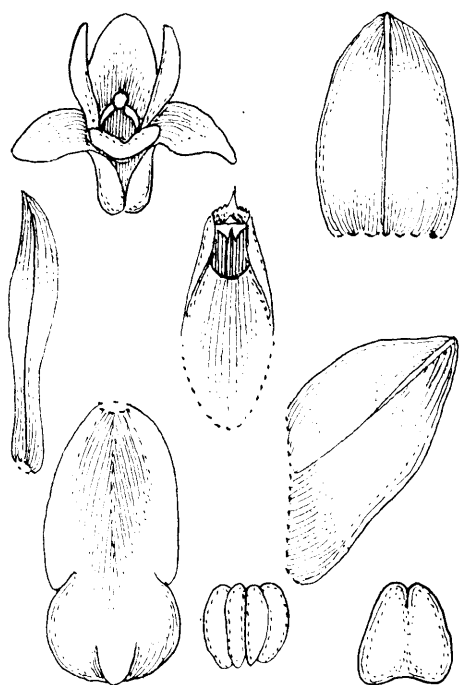
Dendrobium insigne Rchb. f.



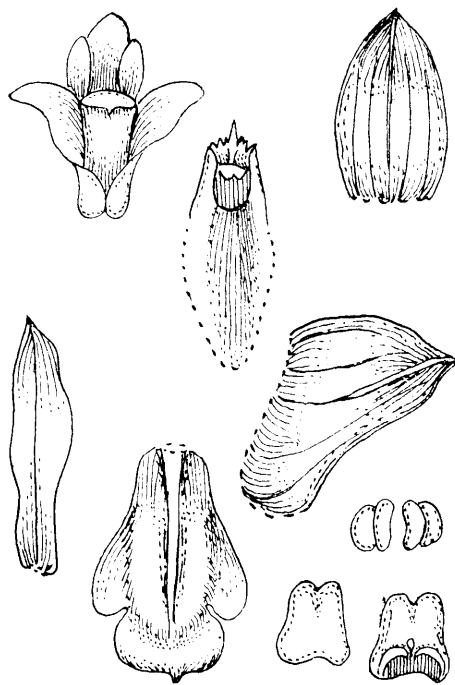
Dendrobium pleianthum Schltr.



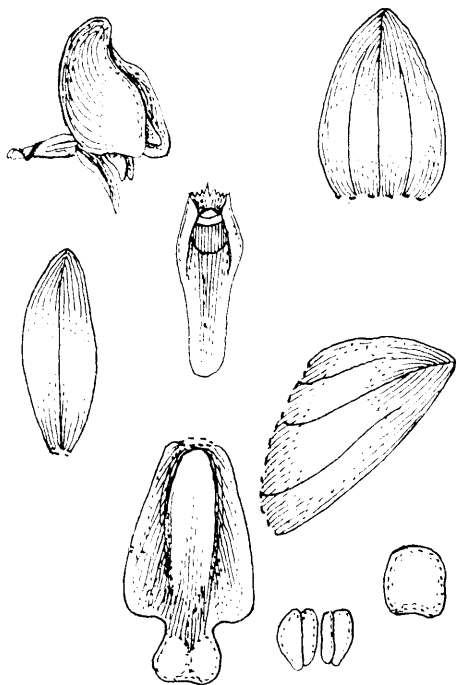
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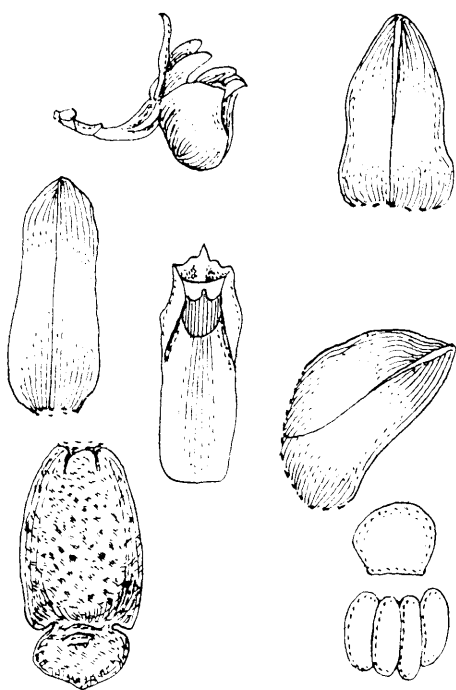
Dendrobium obovatum Schltr.



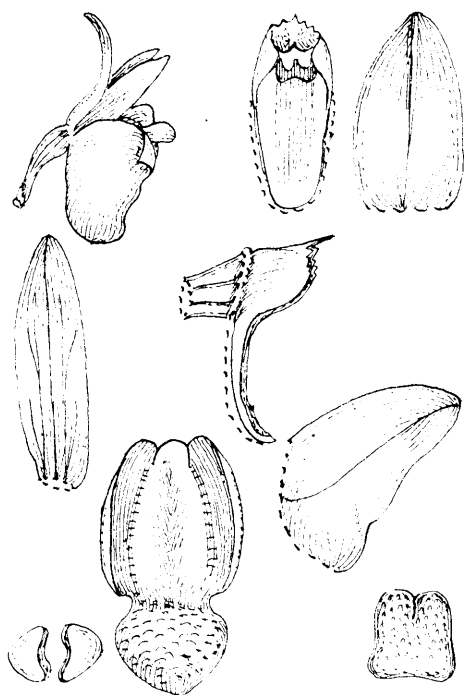
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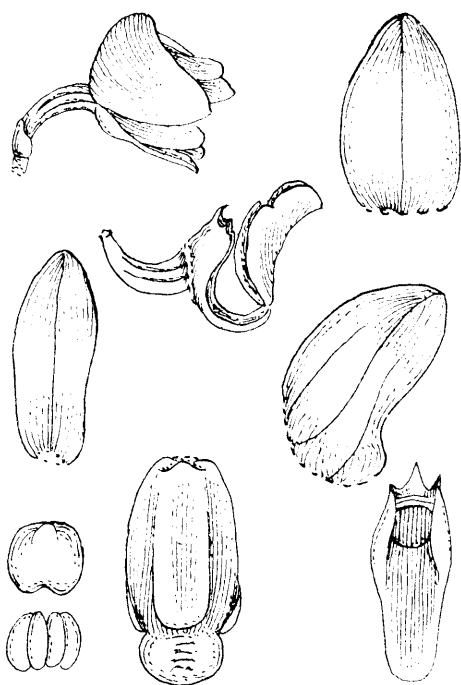
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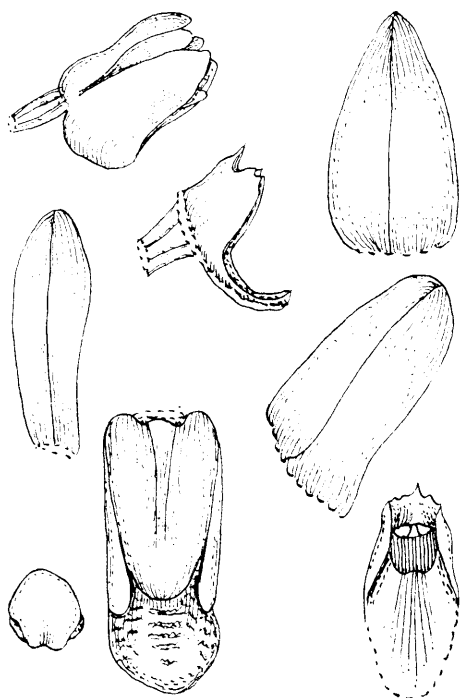
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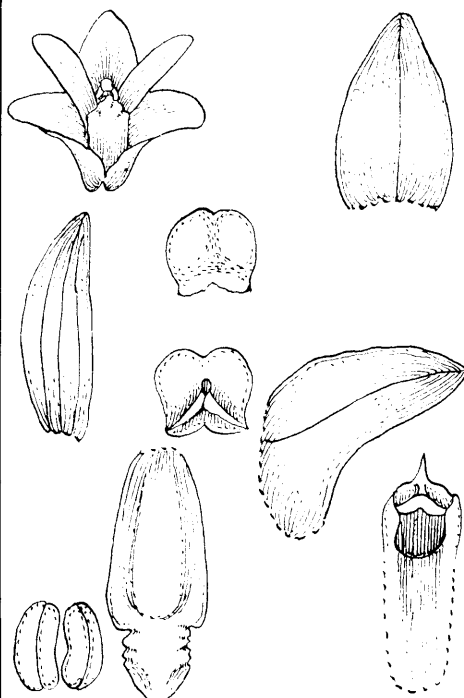
Dendrobium rhytidothera Schltr.



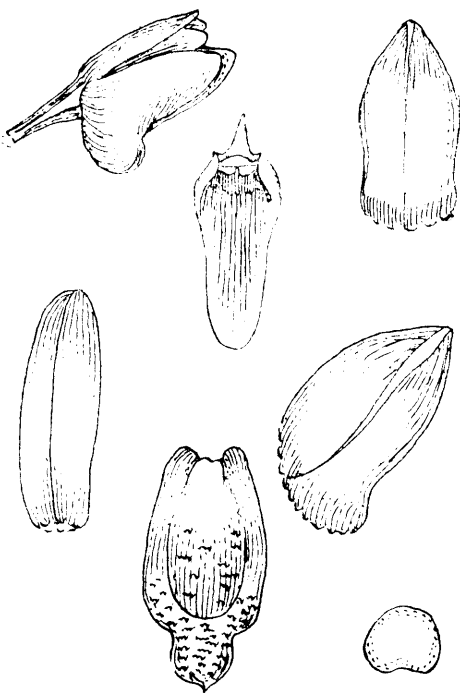
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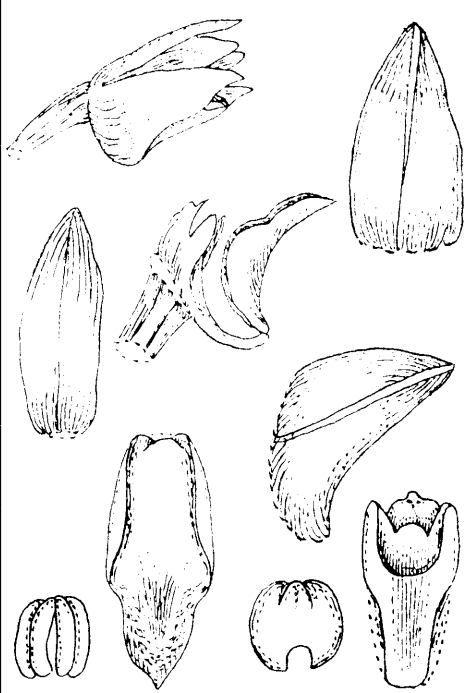
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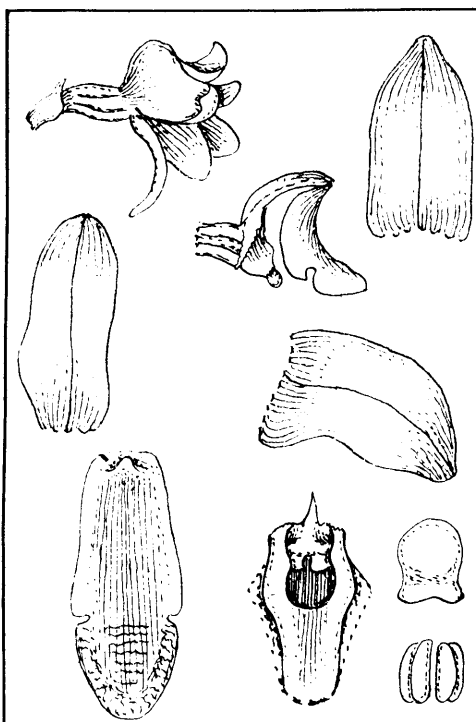
Dendrobium piestocaulon Schltr.



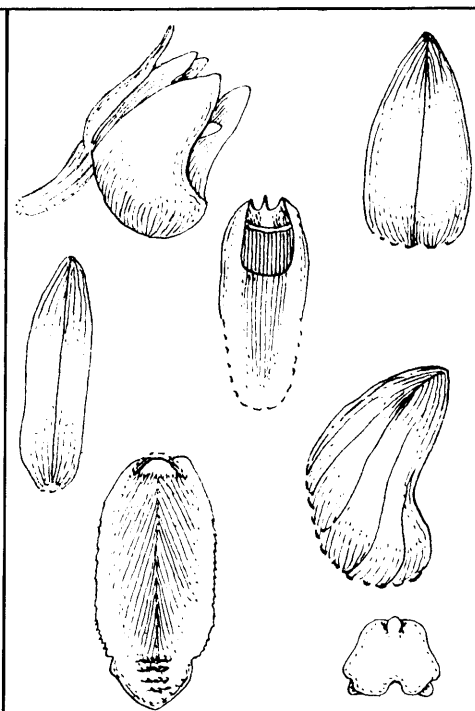
Dendrobium roseo-flavidum Schltr.



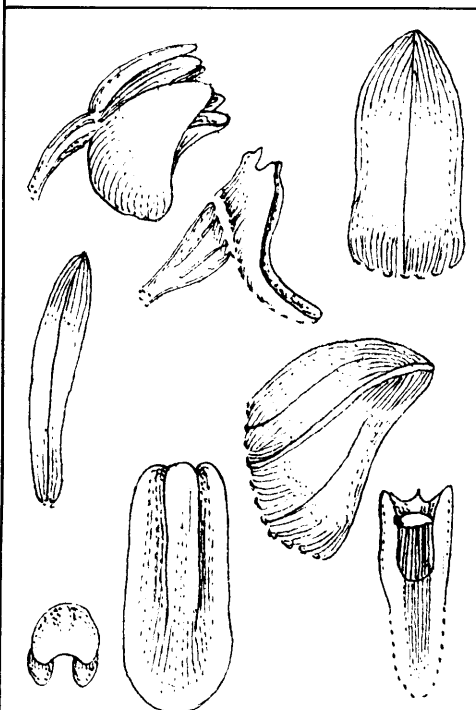
Dendrobium corticicola Schltr.



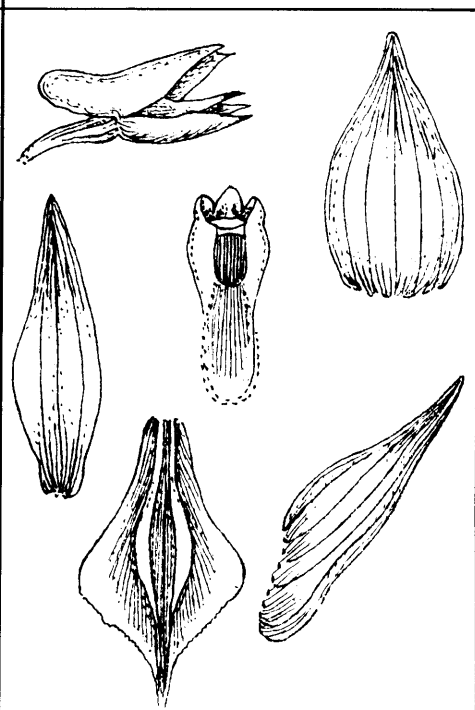
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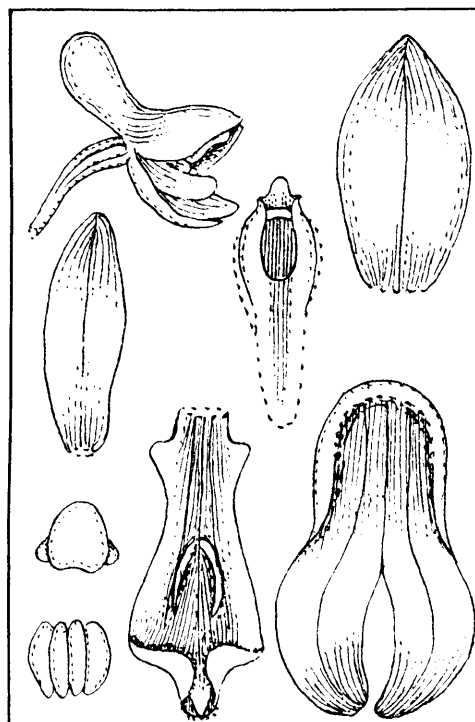
Dendrobium subserratum Schltr.



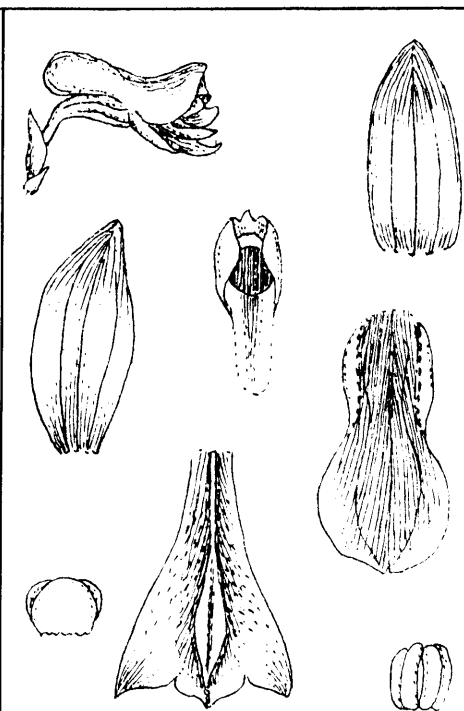
Dendrobium integrum Schltr.



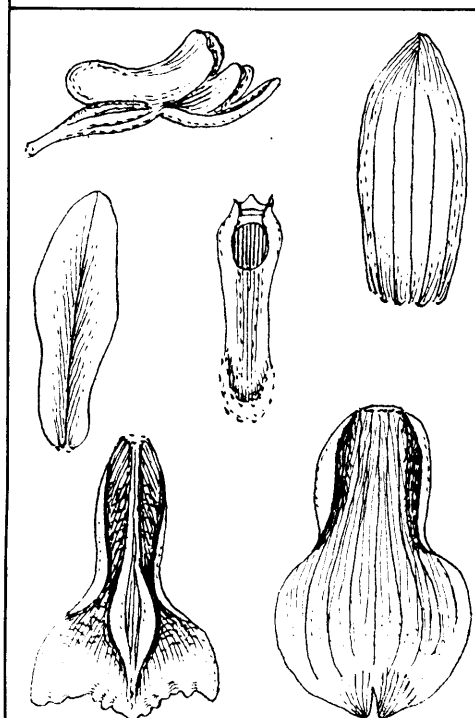
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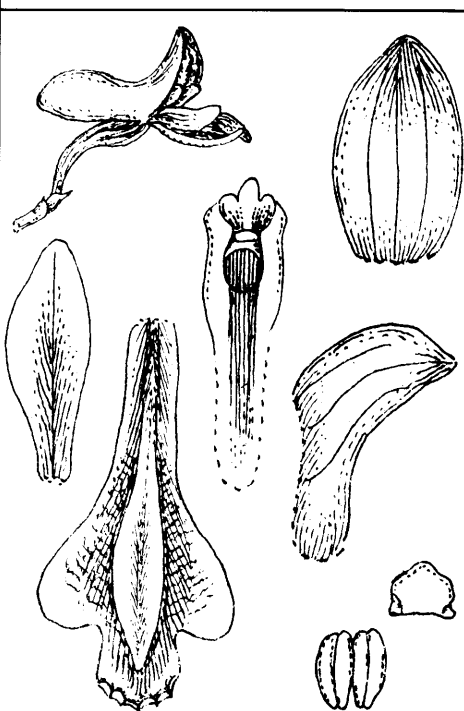
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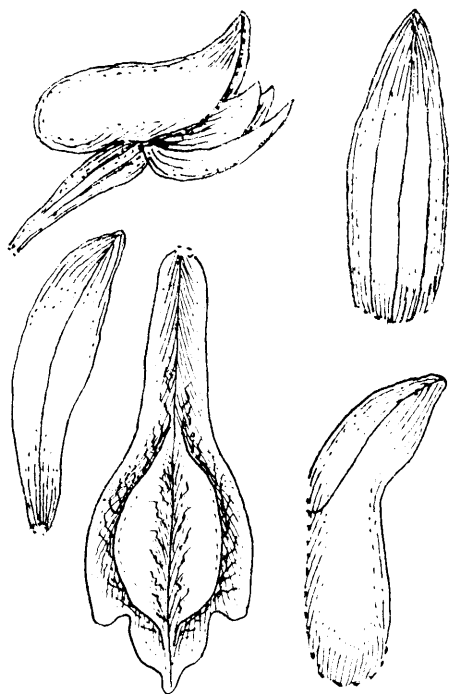
Dendrobium decumbens Schltr.



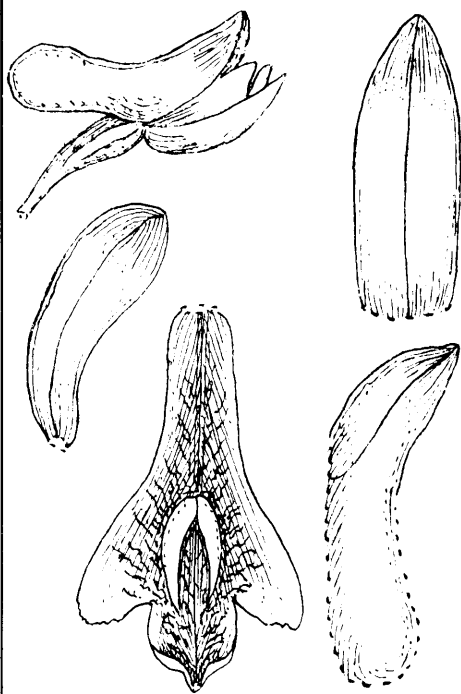
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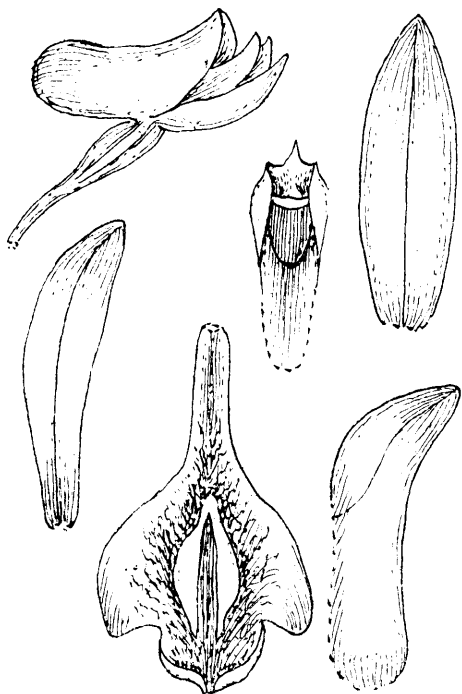
Dendrobium glossorhynchoides Schltr.



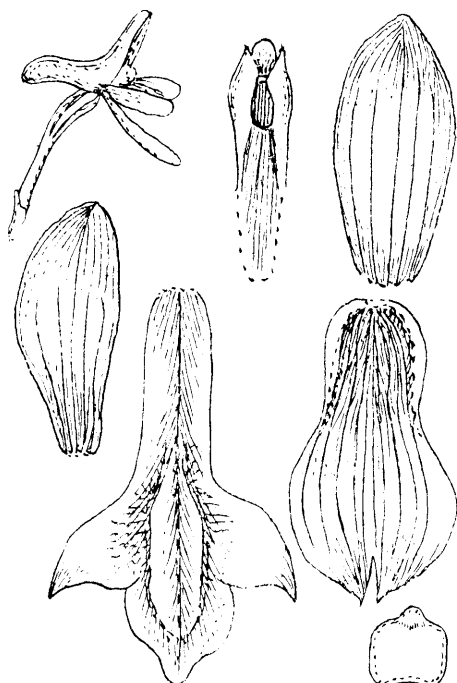
Dendrobium appendicula Schltr.



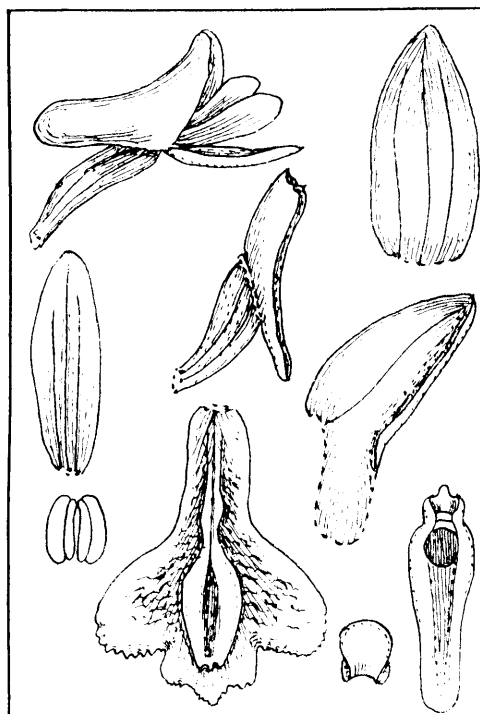
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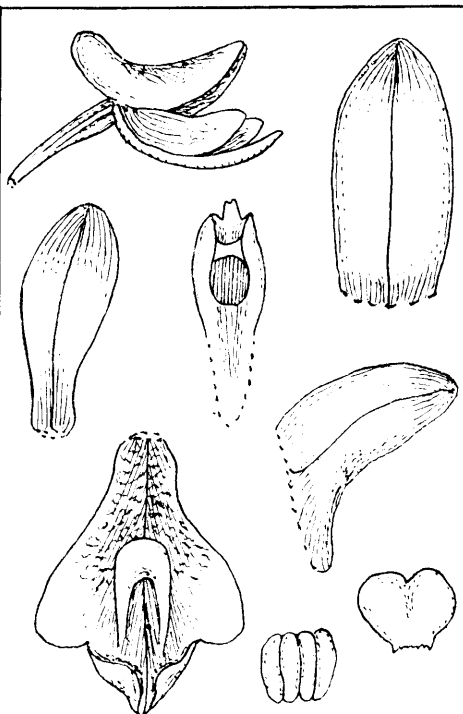
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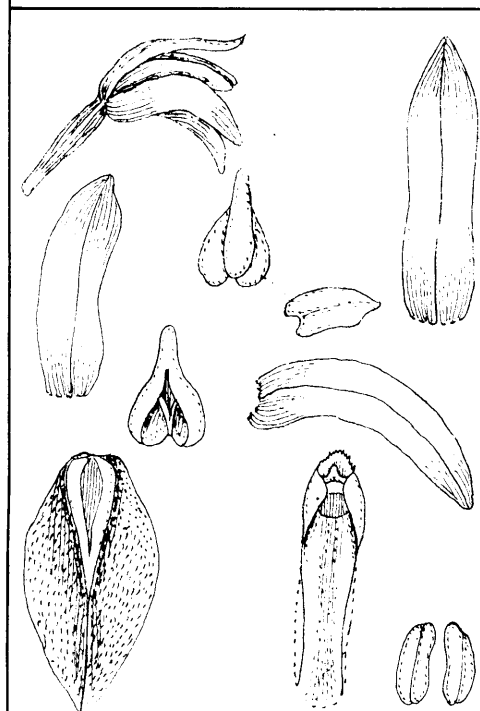
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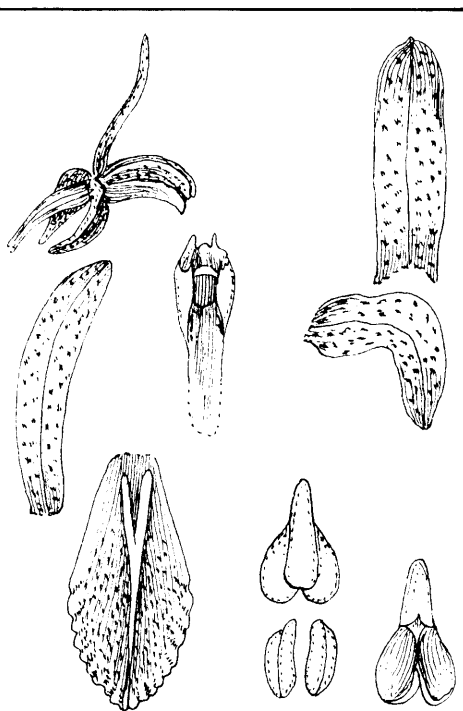
Dendrobium dischorens Schltr.



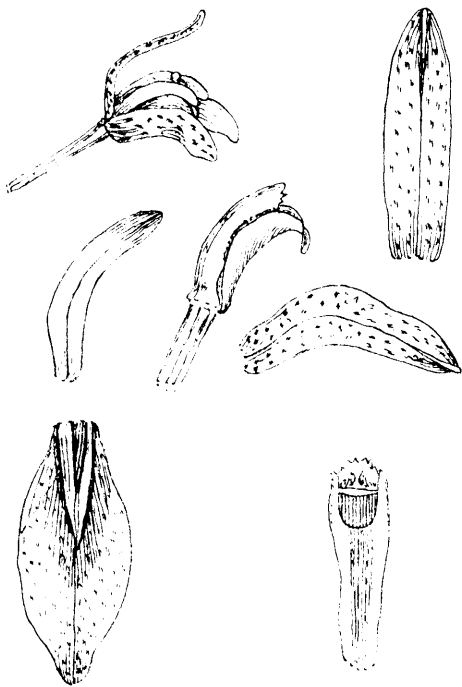
Dendrobium hippocrepiferum Schltr.



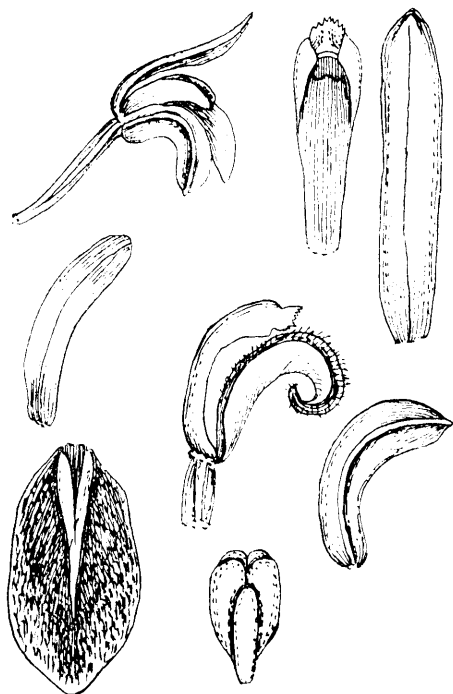
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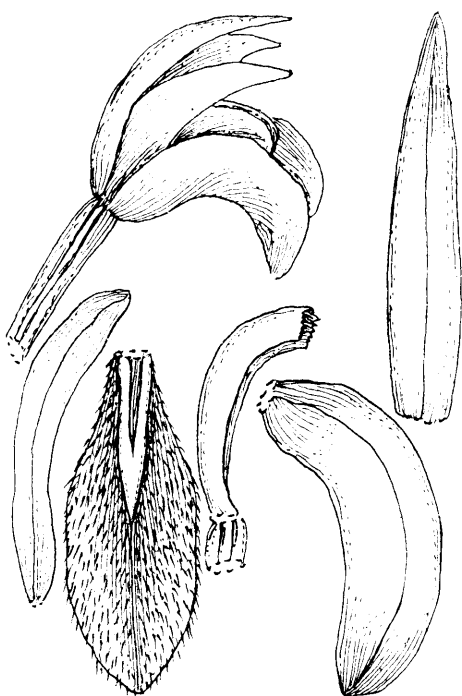
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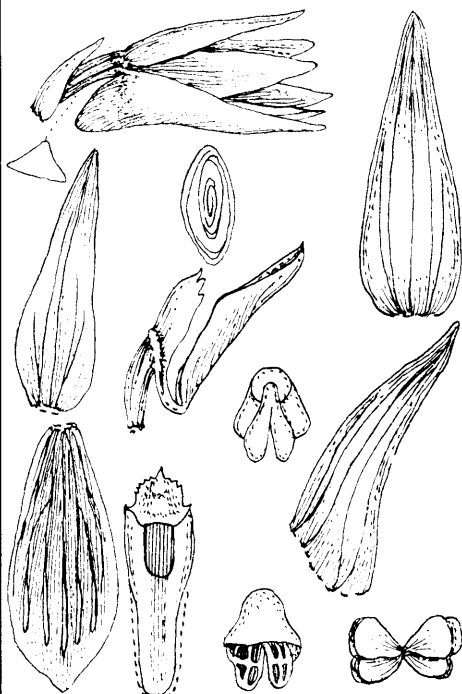
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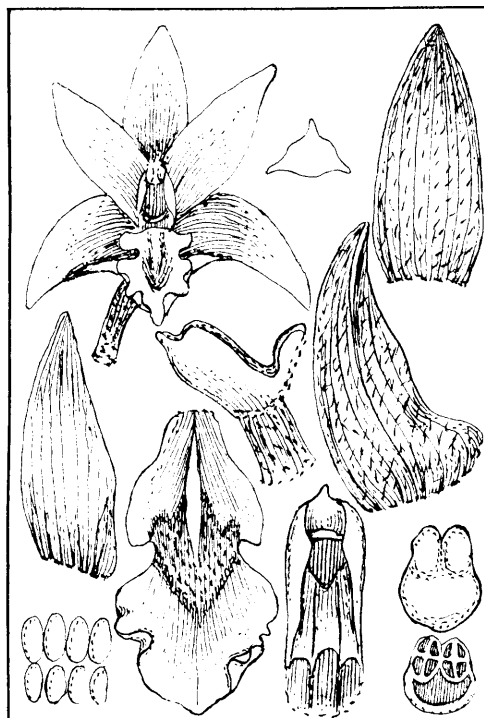
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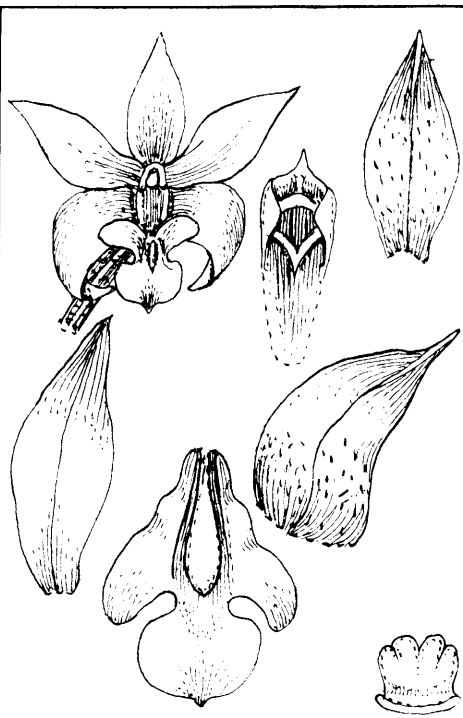
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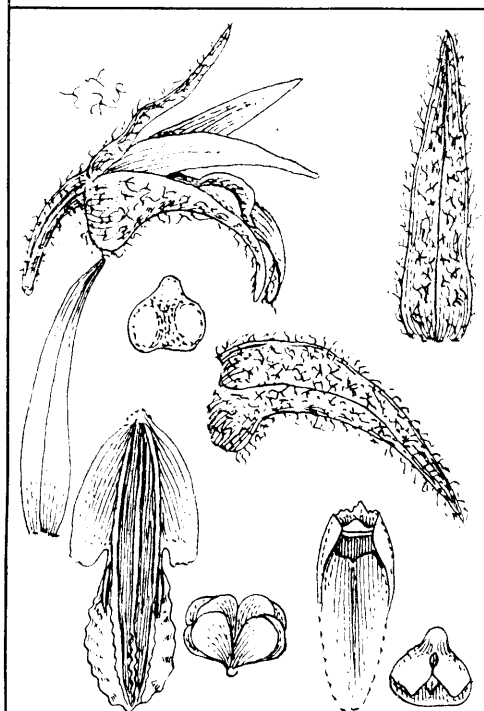
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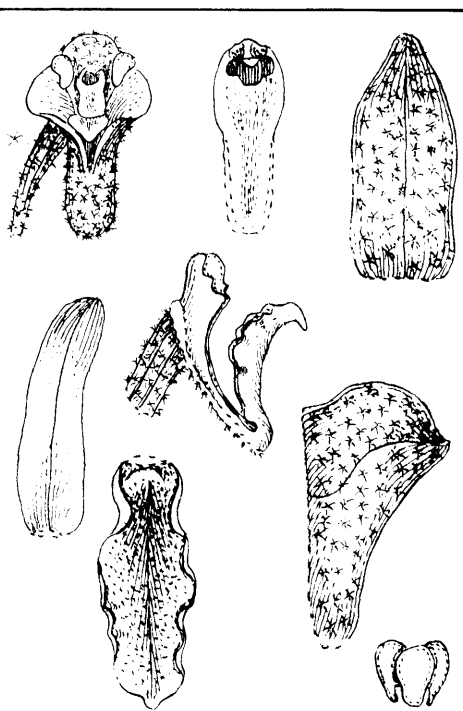
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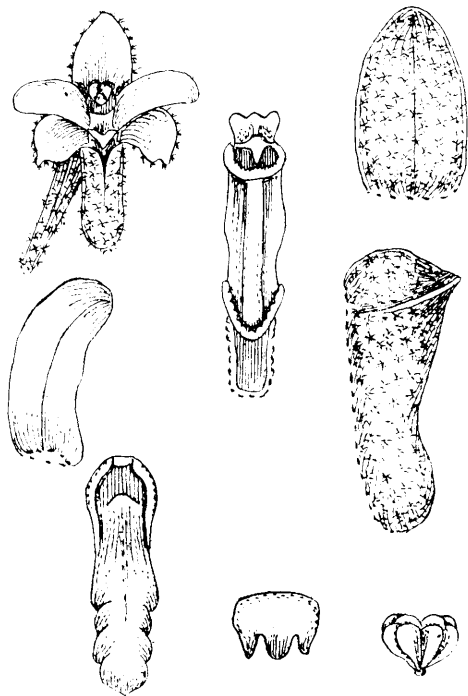
Eria imitans Schltr.



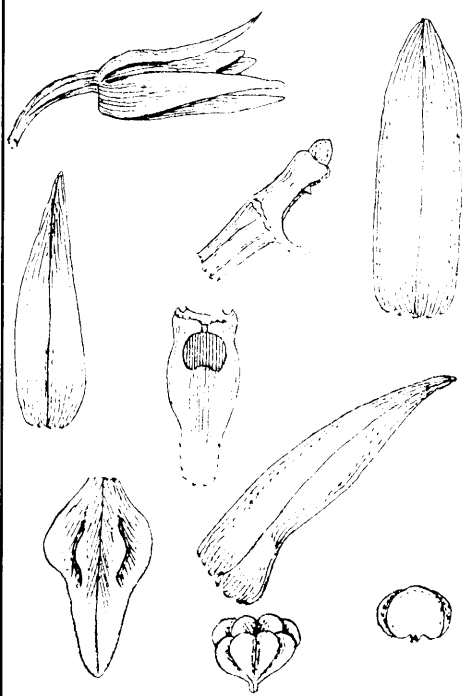
Eria Micholitzii Krzl.



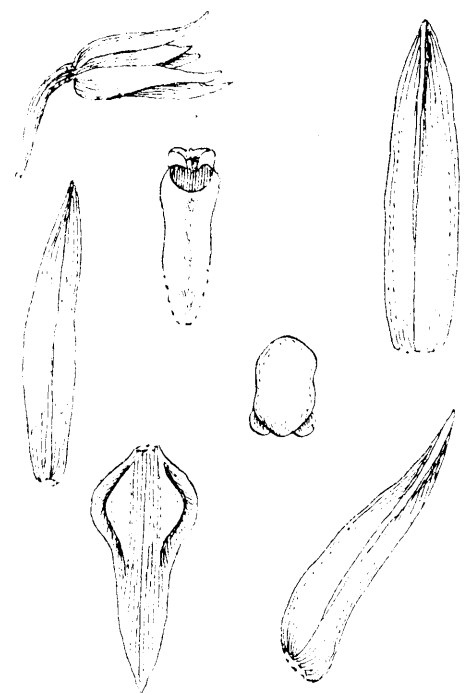
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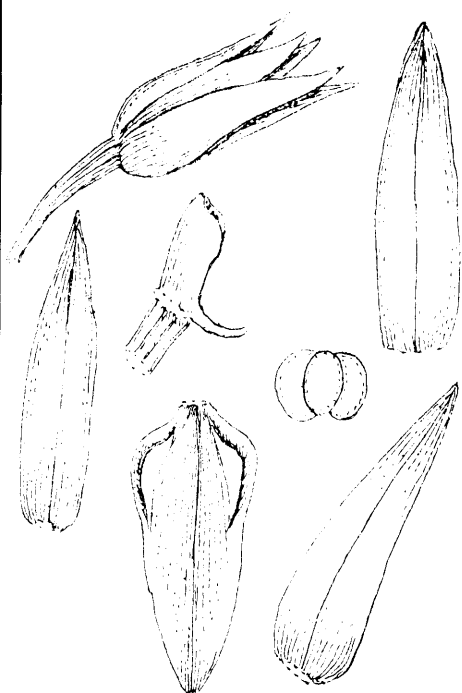
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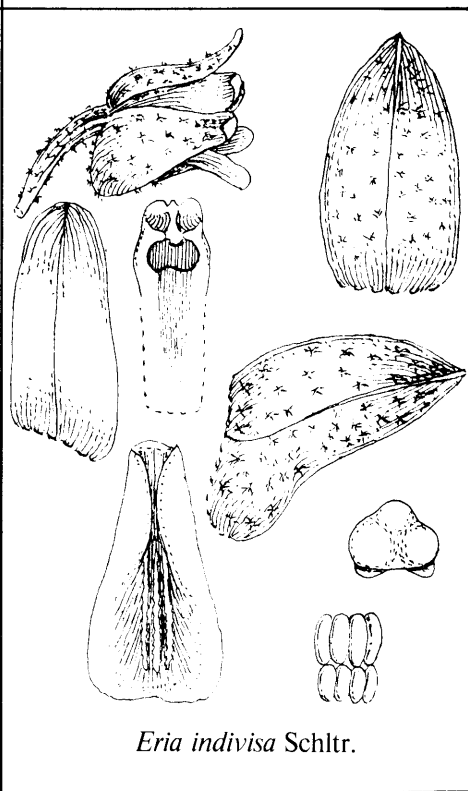
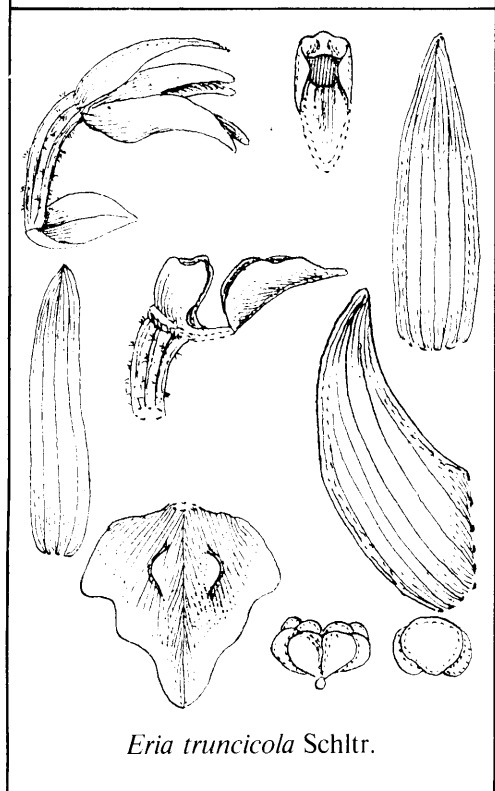
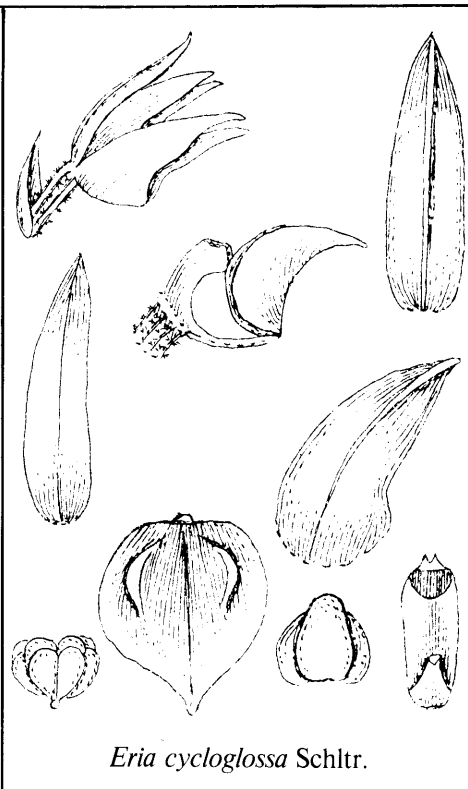
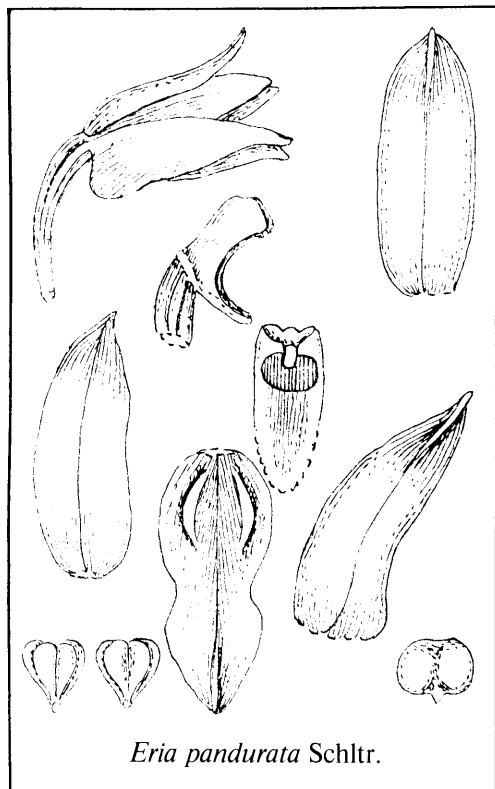
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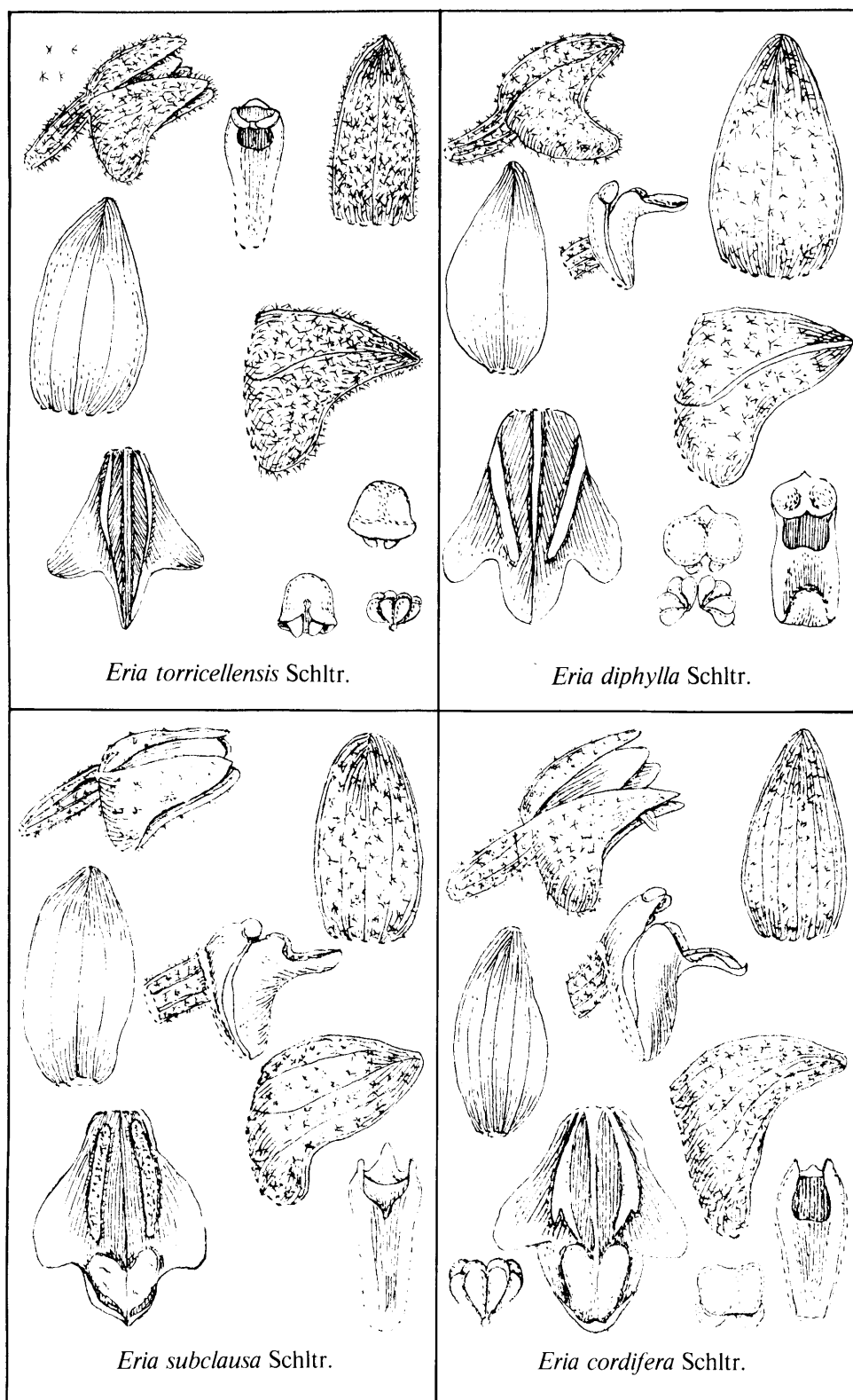


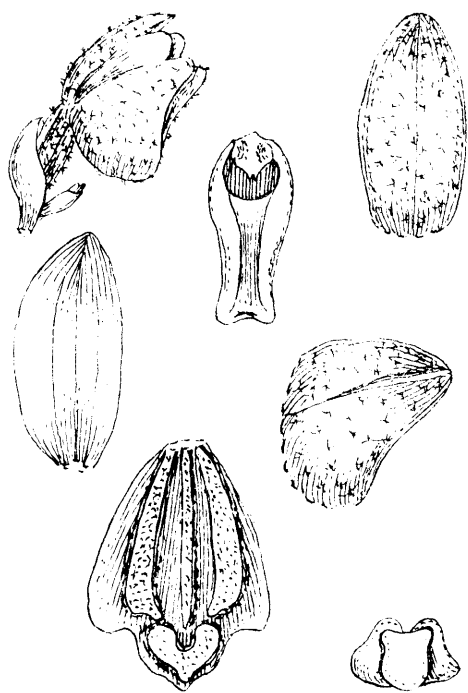
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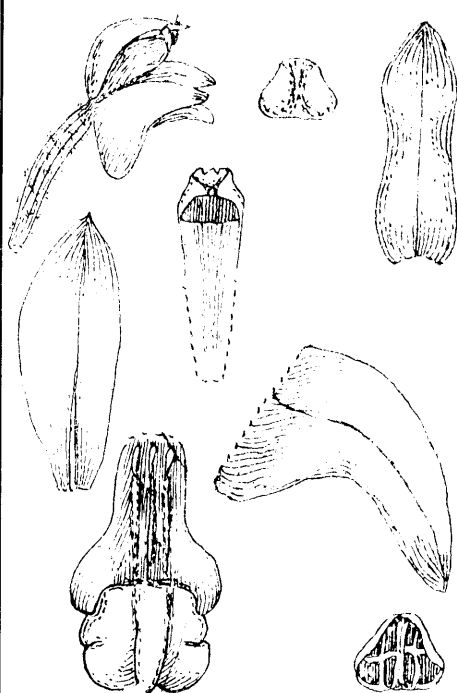
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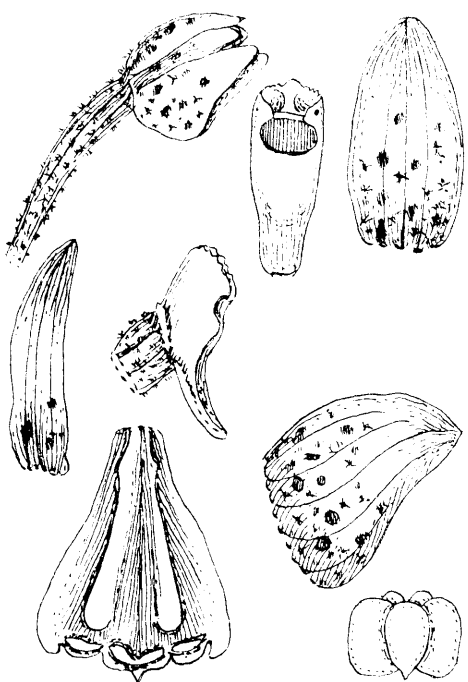




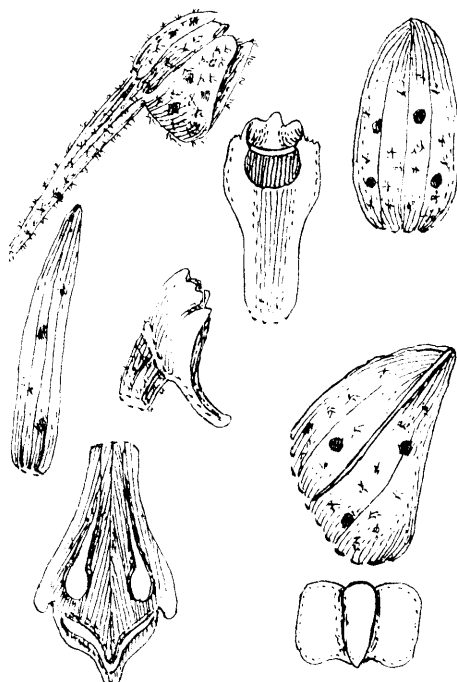
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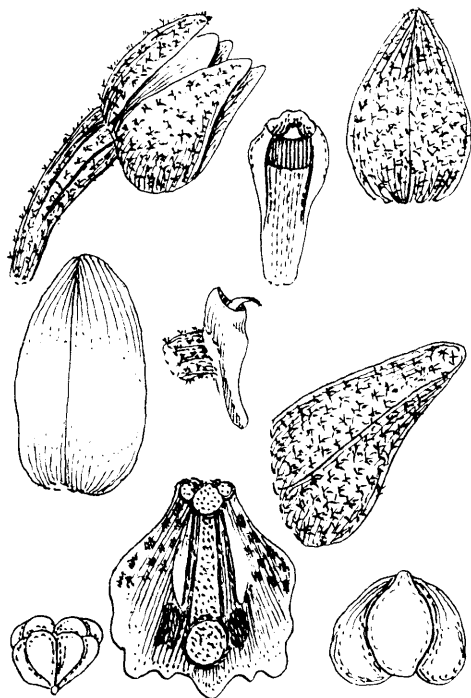
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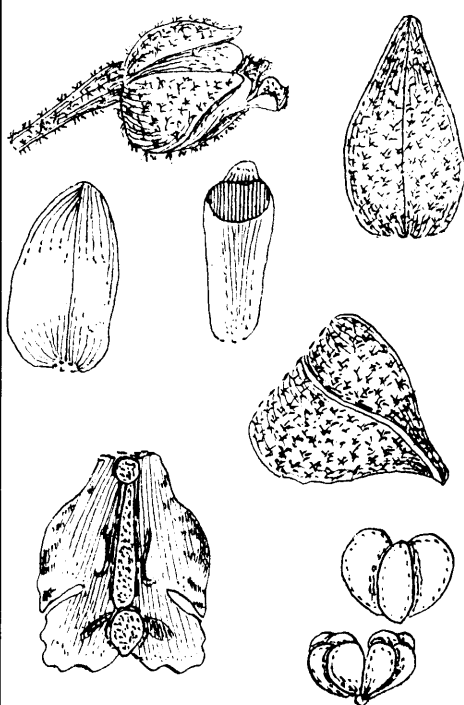
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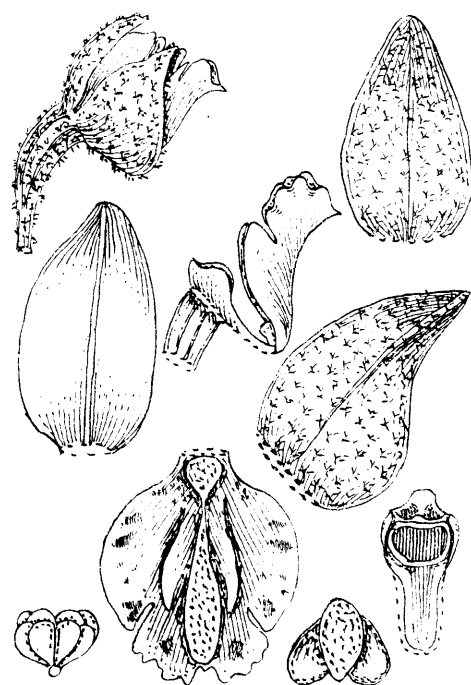
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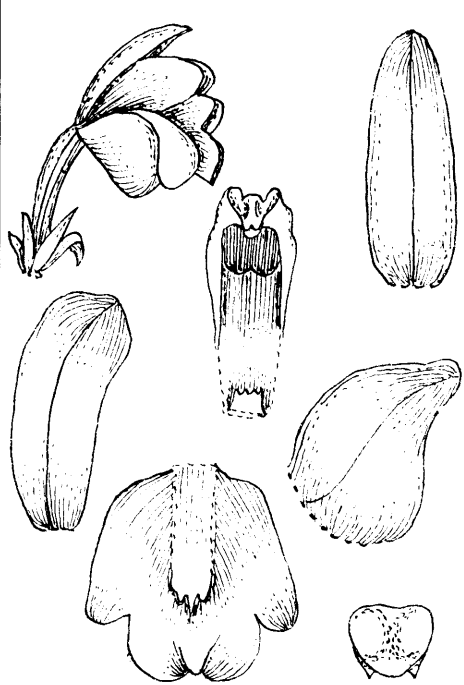
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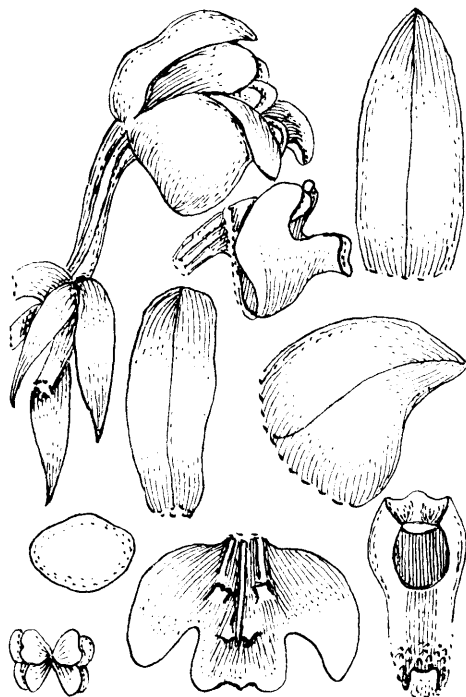
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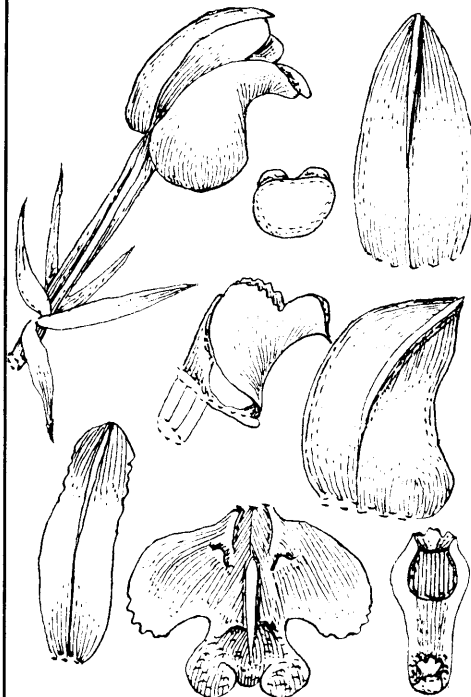
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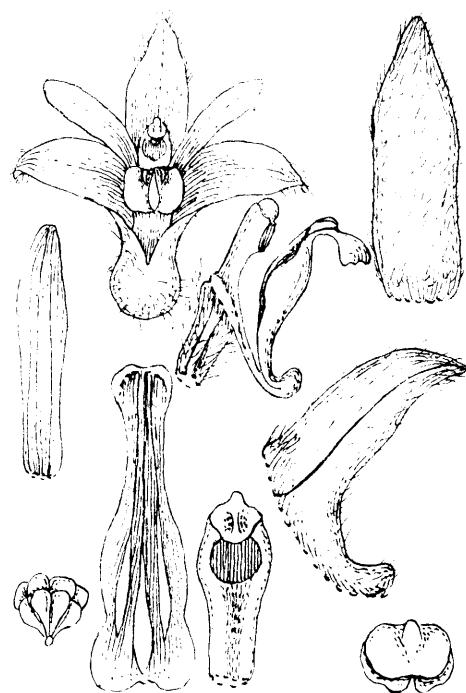
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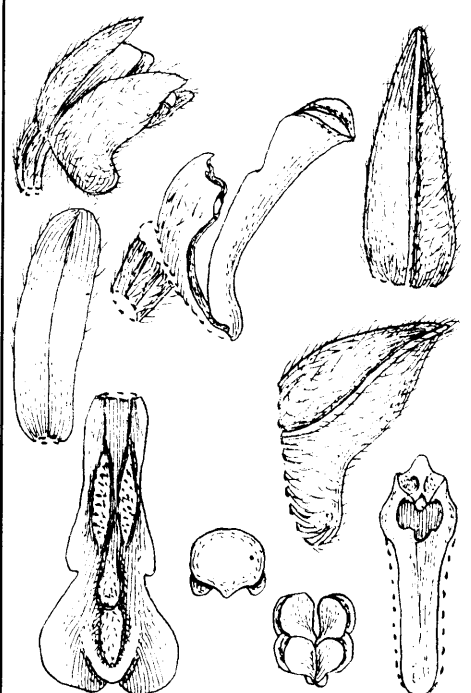
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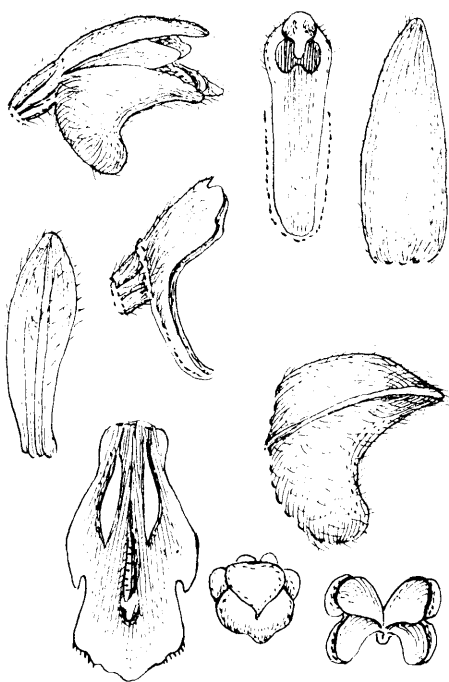
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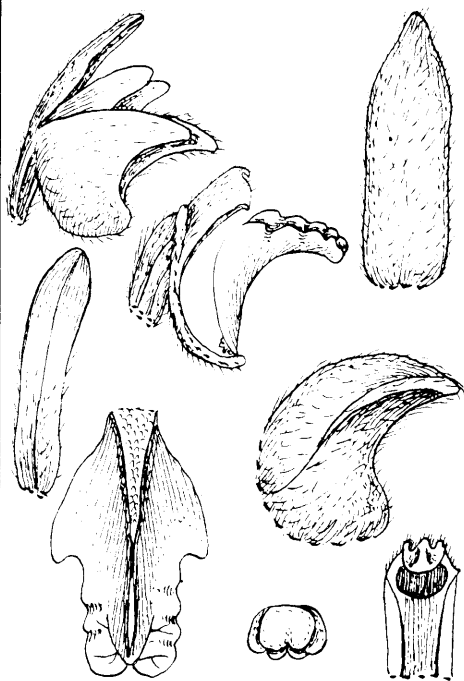
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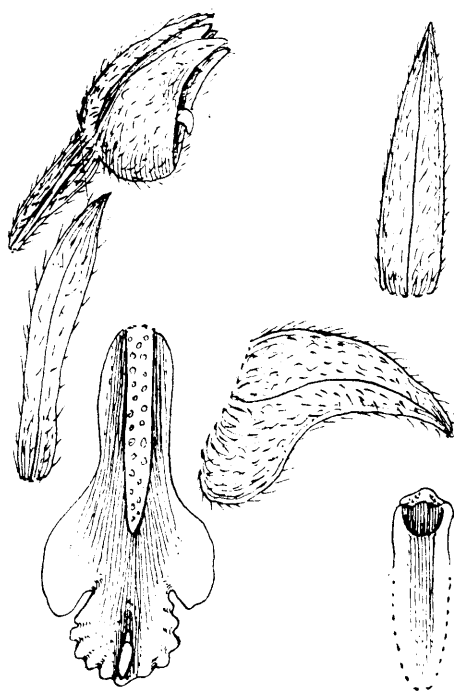
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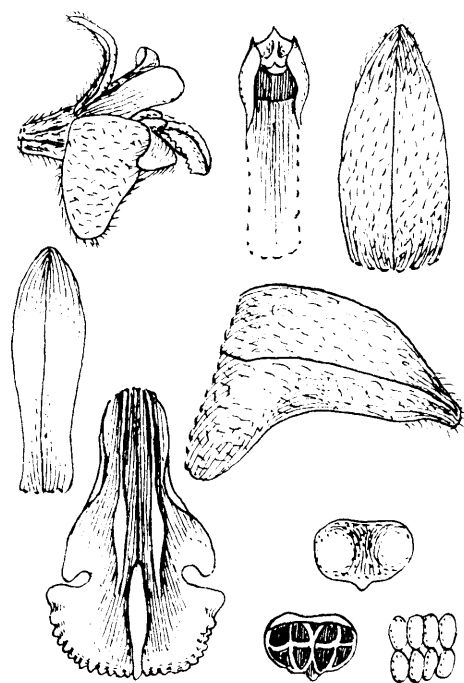
Eria rufa Schltr.



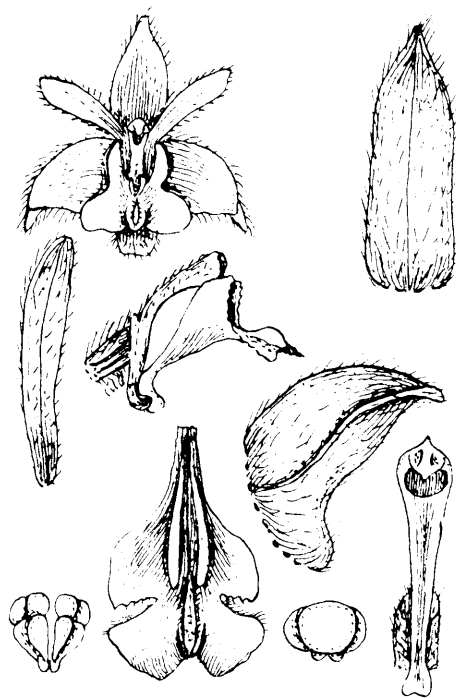
Eria bracteata Schltr.



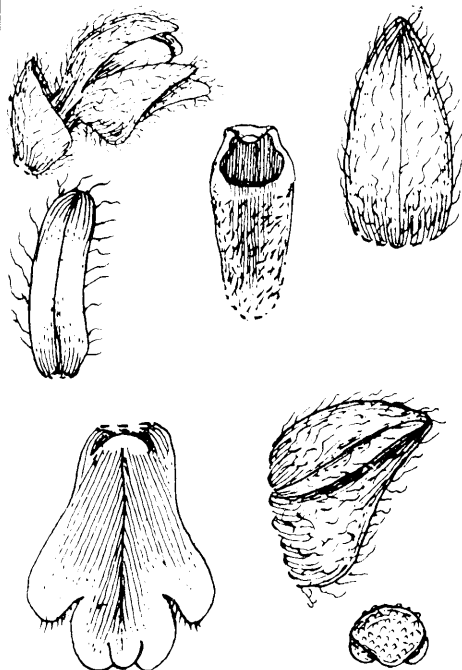
Eria phaeotricha Schltr.



Eria xanthotricha Schltr.



Eria collina Schltr.



Eria oreodoxa Schltr.

Group XXI *Bulbophyllinae*

Perhaps few groups of orchids have increased so greatly in number of species recently as the *Bulbophyllinae*, which, in this respect, probably approaches the *Dendrobiinae* and, so far as our Territory is concerned, has even surpassed it. Up to the present, we were of the opinion that British India, together with the Malay Peninsula, were by far the richest parts of the world in numbers of this group, but the exploration of the Sunda Islands has shown that quite as many species are to be found growing there, and now the exploration of Papuasias discloses the surprising fact that this group is represented more numerously in that part of the globe than in any other.

The division of the group into genera is by no means easy, because it is very difficult to find characters on the basis of which it is possible to define the polymorphic genus *Bulbophyllum* Thou. Thus, it became evident repeatedly that the small genera, which at first appeared very characteristic, were included frequently under *Bulbophyllum* only to find subsequently that such a position was quite untenable.

Even to this very day, views with regard to the limitation of this genus vary considerably all the more because recently there has been a growing tendency to unite *Cirrhopetalum* Lindl. with it. It is indisputable that the boundaries are not defined so sharply as one could wish but, for the proper oversight of this large group, it is decidedly advantageous not to unite everything as has been done often since Bentham's time.

Pfitzer assigned 11 genera to the *Bulbophyllinae* but, from these, he later on very properly excluded *Dendrochilum* Bl.

Sunipia Lindl. is better united with *Ione* Lindl. and, together with *Genyorchis* Schltr., these form a separate group which I have named *Genyorchidinae*. This group must be separated from *Bulbophyllinae* because of the pollinarium with the stipes and adhesive disc.

Megaclinium Lindl., *Bulbophyllaria* Rchb. f., *Epicrianthes* Bl. and *Osyricera* Bl. are to be added to *Bulbophyllum* Thou., so that *Drymoda* Lindl., *Monomeria* Lindl., *Cirrhopetalum* Lindl., *Bulbophyllum* Thou. and *Trias* Lindl. remain.

As I mentioned, this group has experienced an unexpected development in our Territory and has produced a few forms which are so isolated that I would like to consider them as separate genera. It is noteworthy that, with the exception of *Dactylorhynchus* Schltr. as an individual form, the genera are represented by several species.

It was only in the year 1905 that I described the genus *Pedilochilus* Schltr., which has now not less than 13 species.

There are several more new genera which it is necessary to define here, viz. *Saccoglossum* Schltr., excellently distinguished by the shape of its labellum; *Dactylorhynchus* Schltr., which possesses a peculiarly constructed column; and two more genera in which the dorsal sepal is connate with the lateral ones so as to form a tube, split in front in the case of *Monosepalum* Schltr., while it is in the form of a corolla in *Codonosiphon* Schltr., thus reminding one of *Masdevallia* R. et P. In *Bulbophyllum* Thou. there is an adhesion, or union, between the lateral sepals, but union between the latter and the dorsal sepal has not been heard of in this genus.

Two different column-forms have been noted in the group and those I will deal with more definitely when we come to consider the genus *Bulbophyllum*. I am not quite certain whether these characteristics are sufficiently important to be taken into account when circumscribing the genera. However, this is very probable, and in that case the two sections which I have described, viz. *Scaphochilus* and *Coelochilus*, would

have to be separated generically from *Bulbophyllum* Thou. It is also noteworthy that these forms appear to be restricted to Papuasia.

The genus *Cirrhopetalum* Lindl. which, contrary to J.J. Smith's opinion, I consider separate from *Bulbophyllum*, also occurs in New Guinea. Thus the following seven genera are represented in that region.

Saccoglossum Schltr., distinguished by its deep, sac-like lip of thin texture and by its footless column, the appendages of which are split into two thread-like segments.

Pedilochilus Schltr., now containing 13 species, all of which may be identified easily by their Cypripedioid labellum which is furnished with two auricles at the base. This genus, as well as *Saccoglossum* Schltr., are very natural ones.

Bulbophyllum Thou. I have allowed to remain as a relatively broad form, but I am becoming more and more inclined to think that a division would be appropriate.

Cirrhopetalum Lindl. has been united recently by some authors with *Bulbophyllum* Thou. I am strongly opposed to this, even if the circumscription is not so sharp as may seem desirable.

Dactylorhynchus Schltr. is a monotypic genus, which may be distinguished from the other *Bulbophyllinae* by its finger-shaped rostellum.

Codonosiphon Schltr. possesses sepals united into a bell-shaped tube.

Monosepalum Schltr. has rather handsome flowers, the sepals of which are united into a tube, split in front. To this genus belongs *M. muricatum* (J.J. Sm.) Schltr. (*Bulbophyllum muricatum* J.J. Sm.)

In the following key, we obtain a general review of the group:

- A. Dorsal sepal not connate with lateral sepals.
 - I. Labellum sac-like or slipper-shaped.
 - a. Labellum deeply sac-like;
column without foot *Saccoglossum* Schltr.
 - b. Labellum slipper-shaped,
2 auricles or lobes at its base *Pedilochilus* Schltr.
 - II. Labellum tongue-shaped, sometimes concave or convex.
 - a. Column with no definitely formed rostellum.
 - 1. Lateral sepals not very much
elongated or twisted *Bulbophyllum* Thou.
 - 2. Lateral sepals very much
elongated and so twisted that
the outer margins are in contact *Cirrhopetalum* Lindl.
 - b. Column with long rostellum *Dactylorhynchus* Schltr.
- B. Dorsal sepal connate with lateral sepals
 - I. Lateral sepals united in front for
half of their length; labellum not
movable, united with the almost
footless column *Codonosiphon* Schltr.
 - II. Lateral sepals united with dorsal
sepal into a tube, split in front,
lip movable on apex of elongated
column-foot *Monosepalum* Schltr.

The geographical distribution of the group coincides with that of the genus *Bulbophyllum* Thou., which will be considered in detail later on. As far as is known, the new genera mentioned here are Papuan, with the exception of *Codonosiphon* Schltr., which is found also in the Moluccas. Terrestrial species, or genuine ground orchids of the group, are so far not known.

74. *Saccoglossum* Schltr.

At present, I know two species of this genus which are described here for the first time. Though this genus, in its habit, resembles some *Bulbophyllum* species, it possesses very different flowers, the sac-like labellum of which is reminiscent of *Pedilochilus* Schltr., but differs from this generically.

In the structure of the column, the two species are distinguished by the fact that the column-foot is much shortened and the clinandrium combed, as in the sub-genus *Hapalochilus* of *Bulbophyllum* Thou. Besides this, the column is curved forward so that it extends into the sac of the lip. The lip is deeply saccate, erect, the margins not thickened and of thinner texture than is the case in the other genera of the group.

Both species show remarkable agreement in habit, but in the individual parts of the flowers, as well as in their colouring, there are striking and characteristic differences.

Saccoglossum Schltr., gen. nov.

Sepala patentia, intermedium erectum, ellipticum, lateralia oblique ovalia, intermedio latiora. Petala oblique ovalia vel-suborbicularia, sepalis subaequilonga vel duplo fere breviora. Labellum sacciforme obtusissimum, marginibus erectis, antice usque ad medium fere incisum, intus laeve, textura tenuius. Columna gracilis, curvata, basi incrassata, pede valde abbreviato, clinandrio inlacinias plures subulatas satis longas fisso anthera ovali-cucullata, carinato-umbonata, basi cordata, antice obtusa vel apiculata glabra. Pollinia oblongoidea, obliqua, in massas 2 compressa. Ovarium cylindraceum, glabrum.

Spezies 2 adhuc notae, montium Papuae indigenae.

Herbae epiphyticae, erectae vel patulae; radicibus filiformibus; rhizomate cauliformi pseudobulbis laxo obsesso, vaginis imbricantibus obtecto; pseudobulbis suberectis, rhizomati subparallelis, compressis unifoliatis, bene evolutis; foliis erectis, ovatis vel ovato-lanceolatis, acutis vel subacutis, glabris. Inflorescentiis fasciculatis abbreviatis, unifloris, basilaribus, pedunculo vaginulis paucis obsesso, pseudobulbis fere aequilongo; bractea ovata, parvula; floribus erecto-patentibus, pro affinitate mediocribus, glabris.

I have discussed already the differences between the genus and *Pedilochilus* Schltr., in that both differ from the other *Bulbophyllinae* by the formation of the lip. Both species, which are known to me, are epiphytes on the trees of the mist-forest of the ranges at altitudes of approximately 1000–1300 m.

1. *S. papuanum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 13–25 cm longum; rhizomate cauliformi, vaginis imbricantibus obtecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 2–3 cm distantibus, rhizomati parallelis, oblongis, compressis, unifoliatis, 1–1.5 cm longis, medio fere 0.4–0.6 cm latis; foliis erectis vel erecto-patentibus, ovato-ellipticis vel late ovatis, subacutis, glabris, 4–5 cm longis, infra medium 2–3.6 cm latis, inflorescentiis succedaneis fasciculatis, unifloris, pedunculo glabro, vaginulis paucis obsesso, pseudobulborum longitudine; bractea parvula, ovata, ovario multo brevior; floribus erecto-patentibus, glabris; sepalo intermedio ovato-lanceolato, subacuto, 0.9 cm longo, lateralibus oblique ovalibus, apiculatis, intermedio aequilongis; petalis oblique oblongis, obtusis, 6.5 mm longis; labello sacciformi, obtusissimo, 0.8 cm alto, ostio 0.7 cm diametiente, antice inciso; columna arcuata, glabra, 0.3 cm longa, basi incrassata, clinandrio in segmentas 5 subulatas utrinque producto; ovario cum pedicello glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100–1300 m—R. Schlechter no. 17962, flowering in July 1908; no. 19120, flowering in Jan. 1909; on trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 19015, flowering in Dec. 1908.

The first species of the genus which I found. It differs from *S. maculatum* Schltr. in its broader leaves, narrower and longer petals, the broader lip-sac and the column. The flowers are white-yellow with pale brown petals and a white lip with red streaks inside at the base.

2. *S. maculatum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 10–17 cm longum; rhizomate cauliformi, vaginis obtecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis suberectis, rhizomati subparallelis, compressis, ovalibus vel anguste ellipsoideis, unifoliatis, 1.5–2 cm distantibus, 1–1.7 cm longis, medio fere 0.3–0.6 cm latis; foliis erecto-patentibus, obliquis, elliptico-lanceolatis vel ovato-lanceolatis, glabris, 4.5–7.5 cm longis, infra medium 1.3–2.6 cm latis; inflorescentiis fasciculatis, succedaneis, unifloris, erecto-patentibus, pedunculis pseudobulborum longitudine, vaginulis paucis obsessis, glabris; bractea parvula, ovata, ovario multo brevior; floribus erecto-patentibus, glabris; sepalo intermedio lanceolato-elliptico, subacuto, 1.1 cm longo, lateralibus oblique ovalibus, apiculatis, intermedio aequilongis; petalis suborbicularibus, apiculatis, paulo obliquis, sepalis duplo brevioribus; labello sacciformi, obtusissimo, 7.5 mm alto, ostio 5 mm diametiente, antice inciso; columna incurva, gracili, glabra, 0.5 cm longa, basi incrassata, pede perbrevis, clinandrio utrinque in lacinias 5 divergentes subulatas satis longas fisso; anthera generis, obtusa, glabra; ovario cum pedicello glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests of the Dischore [Range] on the Govidjoa [Creek] (Waria District), alt. c. 1100 m—R. Schlechter no. 19790, flowering in June 1909.

Although at first sight this species looks extremely like *S. papuanum* Schltr., it is nevertheless, on closer examination, entirely different. The leaves are narrower, the flowers are of a different colour with broader and shorter petals, the lip-sac deeper and the segments of the clinandrium much longer. The flowers are white, the dorsal sepal and the petals spotted with pink.

75. *Pedilochilus* Schltr.

This genus, which I described in my account of the orchids collected on my first expedition to New Guinea published in the year 1905, seems to have many surprises, for, now, there are no less than 11 new species to be described here and I have to make room also for a *Bulbophyllum* species which I placed incorrectly. Thus, the genus now includes 13 species, all of which are found in German New Guinea.

When I described *P. papuanum* Schltr., the first species of the genus, the material at my disposal was too scanty to submit to the critical examination which I am now able to make with the plentiful supply in my possession. It is necessary, therefore, to add a few corrections to my original description of the genus. Therein, I omitted to mention that the labellum is furnished above the short claw with two auricles between which there is to be found a short, thick callus. Likewise, the margin of the labellum-sac is generally thickened and the middle veins of the lip are elevated into slight keels. In all the species the petals are twisted slightly at the middle vein in the shape of the letter S, so as to produce the forms which will be described under the individual species.

The 13 species below are well separated, and extremely easy to distinguish from each other. They are all inhabitants of the mist-forest formation and indeed appear to be confined to this. Like many of the other mist-forest epiphytes, their distribution is very local and even then nearly every mountain range produces its own particular species.

In my descriptions I have grouped these so that those with small flowers come first and the larger-flowered species follow.

1. *P. coiloglossum* Schltr., sp. nov. [Ed.—comb. nov.]

Bulbophyllum coiloglossum Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 199.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1100 m—R. Schlechter no. 14465, flowering in Apr. 1902; no. 20085, flowering in Sept. 1909.

From all the other species of the genus, this may be distinguished by its longer-creeping small rhizomes and the petals which are slit on the margins towards the apex.

In the size of flowers it somewhat approaches *P. pusillum* Schltr. The auricles at the base of the lip are falcate, bent backwards. The colour of the flowers is a muddy rose-red with darker stripes.

2. *P. pusillum* Schltr., sp. nov.

Epiphyticum, pusillum, caespitosum, usque ad 6 cm altum; rhizomate abbreviato, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideo-cylindraceis, unifoliatis, 4–5.5 mm altis, infra medium 2–3.5 mm diametientibus; folio erecto, elliptico-ligulato, apiculato vel subacuto, basi subpetiolato-angustato, 0.8–2.5 cm longo, medio fere 3–6 mm lato; scapis setiformibus, glabris, unifloris, vaginulis 2–4 distantibus, amplexantibus, minutis obsessis, 2–3.5 cm longis; bractea cucullata, obtusa, ovario pedicellato, multoties brevior; flore in genere inter minores, erecto, pallido; sepalis intermedio obovali, obtuso, glabro, 0.6 cm longo, lateralibus oblique oblongis, obtusis, glabris, intermedio aequilongis; petalis adscentibus, leviter curvatis, oblique oblongo-ligulatis, apiculatis, basi subunguiculato-angustatis, margine anteriore supra basin subangulato-dilatatis, glabris, 0.4 cm longis, labello circuitu obovato-calceolari, obtuso, brevissime unguiculato, auriculis supra basin recurvis, oblique oblongis, obtusis, callo interjecto obtuso antice sensim evanescente, nervis 3 intus dimidio inferiore paulo prominulis, labello toto 0.5 cm longo, supra medium 3.5 mm lato; columna brevi, glabra, brachiis subulatis, columna ipsa subaequilongis, pede satis longo incurvo; anthera galeato-cucullata, dorso minute papillosa; ovario cum pedicello gracili clavato, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18724, flowering in Nov. 1908.

This charming little species certainly approaches *P. coiloglossum* Schltr. in its flower size, but has a different habit and quite different floral segments. Although I found the species growing in colonies, there were, nevertheless, only a few plants in flower. The flowers are yellowish white with a few red spots, but the petals and the labellum are marked with many large spots.

3. *P. parvulum* Schltr., sp. nov.

Epiphyticum, parvulum, usque ad 6 cm altum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, apicem versus sensim paululo attenuatis, unifoliatis, 0.8–1.2 cm altis; infra medium 1.75–2.5 mm diametientibus; folio erecto, lineari-ligulato, subapiculato, glabro, 2.5–5 cm longo, medio fere 2–3 mm lato; scapo setiformi, glabro, vaginulis paucis dissitis obsesso, vix 1.5 cm excedente, unifloro; bractea parvula, cucullata, apiculata, ovario pedicellato fere 5-plo brevior; flore in genere inter minores, erecto; sepalis oblongo-ligulatis, apiculatis, glabris, 0.7 cm longis, extus nervo medio carinato-incrassatis, lateralibus obliquis; petalis ligulatis, acuminatis, leviter curvatis, supra basin extus convexo-gibbosis, glabris, 0.6 cm longis; labello e basi breviter unguiculato ovali, antice in lobulum vel apicem oblongum obtusum producto, subcalceolari, intus nervis 3 incrassatis ornato, marginibus incrassato, auriculis parvulis, recurvis oblongis obtusis, callo interjecto retrorso suborbiculari, labello toto sepalis fere aequilongo, 3.75 mm medio fere lato; columna brevi, semitereti, glabra, brachiis subulatis, tertiam partem basilarem labelli vix excedentibus, pede brevi incurvo; anthera ovoideo-cucullata, basi cordata, umbone oblongo magno donata, glabra; ovario pedicellato gracili, glabro, vix 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19707, flowering in June 1909.

Among the species known to me, up to the present, this one resembles most closely *P. angustifolium* Schltr., described below, because the petals of both species are narrower than those of the rest, but the latter differs in its growth and has longer leaves, larger flowers and the petals are ciliated. The colour of the flowers is golden yellow, the petals spotted with red.

4. *P. angustifolium* Schltr., sp. nov.

Epiphyticum, patulum, parvulum, usque ad 17 cm longum; rhizomate brevi, pseudobulbis dense obsessis; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis rhizomati subparallelis, subcylindraceis, unifoliatis, 1–1.7 cm longis, medio fere 1.5–2.25 mm diametientibus, apicem versus paululo attenuatis; folio lineari, acuto, basin versus subpetiolato-angustato, vulgo plus minusve falcato-obliquo, 8–11 cm longo, medio fere 3–4 mm lato; scapo setiformi, glabro, vaginulis paucis

minutis dissitis donato, 1.75–2.5 cm longo; bractea parvula, cucullata, apiculata, quam ovarium graciliter pedicellatum multo brevior; flore in genere inter minores, erecto, illo *P. parvuli* Schltr. paululo majore; sepalis elliptico-ligulatis, acutis, glabris, extus nervis 3 incrassatis, 0.8 cm longis, lateralibus obliquis, intermedio latioribus; petalis ligulatis, acutis, leviter curvatis, margine minutissime ciliolatis, nervo medio extus incrassatis, 6.5 mm longis; labello e basi breviter unguiculata circuitu late obovato-subcalceolari, quinta parte anteriore contracto lobuliformi semielliptico obtuso, nervis 3 incrassatis intus donato, auriculis parvulis basilaribus recurvulis, erecto-patentibus, anguste falcato-triangularibus, obtusiusculis, callo interjecto transverso brevi, obtusissimo, labello toto 0.8 cm longo, supra medium c. 3.75 mm lato; columna perbrevis, glabra, brachiis falcato-subulatis, vix sextam partem basilem labelli superantibus, pede brevi incurvulo; ovario gracillime pedicellato glabro, pedicello incluso c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18557, flowering in Oct. 1908.

I have already pointed out above that this species is related closely to *P. parvulum* Schltr., and on that occasion stated the principal differences. Therefore I will merely add here that, in *P. angustifolium* Schltr., the column arms are considerably shorter, a point which is especially noticeable in a comparison between the length of the column and length of the lip. The flowers are coloured a uniform golden yellow.

5. *P. ciliolatum* Schltr., sp. nov.

Epiphyticum, pusillum, caespitosum, c. 5 cm altum; rhizomate brevi, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceo-oblongoideis, unifoliatis, 5–7 mm altis, medio fere 2–3 mm diametentibus; folio erecto-patente, lanceolato, acuto, basi subpetiolato-attenuato, glabro, 1–1.5 cm longo, infra medium 0.3–0.5 cm lato; scapo erecto, setiformi, glabro, vaginulis paucis minutis dissitis donato, usque ad 4.5 cm longo, unifloro; bractea cucullata, obtusa, parvula, ovario pedicellato multo brevior; flore in genere vix inter mediocres, erecto; sepalis oblongis, apiculatis, 0.7 cm longis, extus nervis 3 incrassatis, intermedio marginibus minute ciliolato, lateralibus obliquis margine superiore tantum minute ciliolatis, intermedio paulo latioribus; petalis adscendentibus, concavulis, circuitu oblique ovato-lanceolatis, apiculatis, basi cuneatis, extus nervo medio carinato curvato, vix 4 mm longis, glabris; labello e basi breviter unguiculato, elliptico subcalceolari, apice in lobulum parvulum ovatum obtusiusculum productum, 0.5 cm longo, medio fere 2.25 mm lato, nervis 3 medianis incrassatis intus donato, auriculis basilaribus parvulis recurvis, oblique oblongis, obtusis, callo interjecto late triangulo obtusissimo humili; columna parvula, semitereti, glabra, brachiis subulatis, sextam partem basilem labelli haud superantibus; anthera oblongoideo-cucullata, antice truncata, glabra, umbone amplo donata; ovario cum pedicello glabro, gracili, 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria Valley), alt. c. 1200 m—R. Schlechter no. 19750, flowering in June 1909.

In habit, this species is mistaken easily for *P. pusillum* Schltr., described above, but it has different pseudobulbs and differently coloured flowers and, likewise, differs in its individual parts. The sepals are distinctly, but shortly, ciliated on the margins. This distinguishes this evidently rare species, in the single specimen I possess, from the remaining small-flowered forms. The flowers are a dark wine-red.

6. *P. papuanum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 219.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600–1800 m—R. Schlechter no. 14014, flowering in Jan. 1902; no. 18730, flowering in Nov. 1908.

I believe that I am able to assume, with moderate certainty, that the specimen collected by me under no. 18730 belongs to this species, which constitutes the TYPE of the genus. My original description of the species is, accordingly, to be supplemented thus: the basal auricles of the labellum small, recurved, falcate-triangular, obtuse, with a small rounded callus placed between them.

The leaves in the present specimen [no. 18730] are more elongated and tapering at

the base than in the Type, but otherwise both agree well. The flowers are yellowish with brown-spotted petals and labellum.

7. *P. guttulatum* Schltr., sp. nov.

Epiphyticum, parvulum, c. 10 cm altum; rhizomate abbreviato, dense pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis vel ovoideo-cylindraceutis, unifoliatis, 0.7–1.2 cm longis, infra medium 0.3–0.5 cm diametentibus; folio erecto, ligulato, oblique apiculato, basi sensim subpetiolato-angustato, 6.5–8.5 cm longo, medio fere 0.6–0.9 cm lato; scapo brevi, vaginulis paucis obsesso, pseudobulbis vulgo brevioribus, unifloro; bractea cucullata, apiculata, ovario multo brevioribus; flore in genere inter mediocres, dense purpureo-guttulato; sepalis obovato-oblongis, apiculatis, 0.9 cm longis, intermedio margine minutissime ciliolato, lateralibus obliquis glabris; petalis circuitu, genuflexo-ovatis, acutis, medio gibboso-curvatis, extus alticarinatis, glabris, margine anteriore supra basin angulato-dilatatis, 0.5 cm longis; labello e basi brevissime unguiculata circuitu ovali-calceolari, medio leviter constricto, antice in lobulum parvulum ovatum obtusiusculum productum, intus ecarinato, auriculis basilaribus adscendentibus oblique triangulis, obtusis, callo interjecto rotundato, antice evanescente, labello toto c. 0.9 cm longo, medio fere 0.4 cm lato; columna perbrevis, brachiis subulatis sextam partem basilem labelli vix excedentibus; anthera oblongo-quadrata, dorso bigibba, antice subexcisa, serrulata, umbone oblongo donata; ovario cum pedicello gracili glabro, 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20233, flowering Sept. 1909.

Among the species with medium-sized flowers, this may be recognised by its very short peduncle. It reminds one of *P. brachypus* Schltr., but the latter has broader leaves and larger flowers. The shape of the labellum, slightly constricted in the middle, is very characteristic of this species. The flowers are a pale earth colour, densely spotted with red.

8. *P. dischorensis* Schltr., sp. nov.

Epiphyticum, parvulum, 6–10 cm altum; rhizomate abbreviato, pseudobulbis dense obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis vel cylindraceuto-ovoides, unifoliatis, 0.8–1 cm longis, infra medium 4–5 mm diametentibus; foliis linearibus, minute apiculatis, basi subpetiolato-angustatis, glabris, 4–8 cm longis, medio fere 0.3–0.7 cm latis; scapis basilaribus, filiformibus, vaginulis paucis amplexantibus obsessis, glabris, unifloris, c. 2 cm longis; bractea cucullata, apiculata, ovario graciliter pedicellato multo brevioribus; flore erecto vel suberecto, in genere inter mediocres; sepalis ellipticis, apiculatis, basin versus sensim paulo angustatis, extus minute punctato-lepidotis, nervis 3 carinato-incrassatis, 1 cm longis, intermedio dimidio superiore margine subinconspicue ciliolato, lateralibus obliquis, eciliolatis, intermedio paululo latioribus; petalis circuitu rhombeis, basi brevissime unguiculatis, medio gibboso-curvatis, nervo medio extus incrassatis, 0.5 cm longis; labello e basi brevissime unguiculata circuitu late obovato-calceolari, antice in lobulum parvulum triangularem obtusum productum, marginibus praesertim apicem versus incrassato, intus nervo medio carinato, auriculis basilaribus parvulis, suberectis, oblongis, obtusis, callo interjecto rotundato, humili; columna brevi, glabra, brachiis subulatis, medium labelli subattingentibus; anthera oblongoideo-cucullata, umbone magno donata, glabra; ovario cum pedicello gracili 0.6–0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari, alt. c. 1200 m—R. Schlechter no. 19592, flowering in May 1909.

In habit this species is closest to *P. guttulatum* Schltr., but it has a longer peduncle, a differently shaped labellum and a longer column with longer arms. The flowers are whitish with red spots.

9. *P. petiolatum* Schltr., sp. nov.

Epiphyticum, parvulum, c. 8 cm altum; rhizomate decumbente, brevi; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis anguste ovoideis vel cylindraceuto-ovoides, unifoliatis, c. 2 cm altis, infra medium 0.6–0.7 diametentibus; folio erecto, oblongo-ligulato, apiculato, glabro, textura coriacea, basi in petiolum usque ad 2 cm longum attenuato, lamina 2.5–4 cm longa, medio fere 0.8–1.2 cm lata; scapo basilari, filiformi, glabro, vaginulis paucis distantibus obsesso, 3.5–4 cm longo, unifloro; bractea ovato-cucullata, breviter acuminata, ovario pedicellato multo minore; flore in genere inter mediocres, suberecto; sepalis oblongo-ellipticis, apiculatis, glabris, c. 1 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis adscendentibus, obovato-ellipticis, apice falcato-recurvis,

medio subgibboso-curvatis, 0.6 cm longis; labello e basi perbreveiter unguiculata obovato-calceolari, antice in lobulum parvulum obtusum producto, marginibus incrassato intus leviter tricarinato, auriculis basilaribus parvulis, recurvis, oblique oblongis, callo interjecto rotundato facie mox evanido, labello toto c. 1 cm longo, supra medium 5.5 mm lato; columna perbrevis, glabra, brachiis subulatis, tertiam partem basilem labelli vix excedentibus, pede incurvulo; ovario cum pedicello gracili, c. 0.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18815, flowering in Nov. 1908.

Of this exceedingly well-defined species, I have only a single flowering specimen. As the specific name denotes, the species is characterised by the distinctive shape of the petiole. A similar shape of leaf is found also in *P. brachypus* Schltr., described below. The flowers are pale yellow with red-spotted petals and labellum.

10. *P. flavum* Schltr., sp. nov.

Epiphyticum, parvulum, c. 10–12 cm altum; rhizomate brevi; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis approximatis, conico-cylindraceutis, unifoliatis, 1.5–1.8 cm altis, infra medium 0.4–0.6 cm diametientibus; folio erecto, anguste elliptico, acuto, basi in petiolum 1.5–2 cm longum sensim angustato, lamina 6–8 cm longa, medio fere 1.3–1.7 cm lata; scapo basilari, setiformi, vaginulis paucis distantibus, obsesso, c. 4–5 cm longo; bractea ovato-cucullata, breviter acuminata, ovario multo brevior; flore in genere inter minores, suberecto; sepalis oblongis, apiculatis, glabris, 1.1 cm longis, lateralibus obliquis, quam intermedium paulo latioribus; petalis adscendentibus leviter sigmoideo-curvatis, oblique oblongis, breviter acuminatis, glabris, nervo medio extus incrassatis, 0.7 cm longis; labello e basi perbreveiter unguiculata elliptico-calceolari, antice in lobulum parvulum, oblongum obtusum productum, marginibus paulo incrassato, intus nervis 3 incrassatis, auriculis basilaribus parvulis recurvis, anguste falcato-oblongis, obtusis, callo interjecto quadrato facie evanido; columna brevi, glabra, brachiis subulatis, tertiam partem basilem labelli paulo superantibus; ovario cum pedicello gracillimo glabro, 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18818, flowering in Nov. 1908.

This species is represented also only by a single specimen in my herbarium. The flowers remind me of *P. papuanum* Schltr., but are larger as well as longer, more slenderly stalked and the leaves are more than twice as broad as in *P. papuanum* Schltr. The flowers are yellow with sepals lightly red-lined inside and a few pale spots on the petals.

11. *P. longipes* Schltr., sp. nov.

Epiphyticum, gracile, 12–15 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis ovoideis, unifoliatis, 0.8–1 cm altis, infra medium 4–5 mm diametientibus; folio erecto, elliptico vel lanceolato-elliptico, acuto vel breviter acuminato, basi in petiolum plus-minusve distinctum angustato, glabro, petiolo incluso 2.5–6 cm longo, lamina medio 0.7–1.4 cm lata; scapo gracillimo, filiformi, glabro, unifloro, vaginulis paucis distantibus obsesso, usque ad 12 cm longo; bractea ovato-cucullata, apiculata, glabra, ovario graciliter pedicellato multo brevior; flore in genere inter majores, suberecto; sepalis oblongis, apiculatis, glabris, 1.4 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis adscendentibus sigmoideo-curvatis, oblique rhombeis, breviter acuminatis, glabris, nervo medio incrassatis, medio gibboso-curvatis, c. 0.6 cm longis; labello e basi perbreveiter unguiculata late ovali-calceolari, antice in lobulum parvulum triangulum obtusiusculum productum, intus nervis 3 incrassatis, auriculis basilaribus recurvis, falcato-triangulis, obtusis, callo interjecto rotundato-conico, parvulo, labello toto c. 1.2 cm longo, medio fere 0.6 cm lato; columna brevi, glabra, brachiis subulatis, tertiam partem basilem labelli haud superantibus; anthera oblongoideo-cucullata, glabra, umbonata; ovario cum pedicello gracili glabro, 1.1–1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19662, flowering in June 1909.

As the specific name implies, this species is recognised from the rest by the length of its peduncle. Otherwise, it is related closely to *P. flavum* Schltr., but has larger flowers and different floral segments. The flowers are yellow, with red longitudinal veins on the inside, the petals and labellum are spotted with light red.

12. *P. brachypus* Schltr., sp. nov.

Epiphyticum, compactum, 5–7 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis, ovoideis, unifoliatis, 1–1.5 cm altis, infra medium 0.4–0.6 cm diametientibus; folio erecto, elliptico, obtusiusculo, basi in petiolum brevem sed distinctum angustato, glabro, textura coriaceo, lamina 2.5–4.5 cm longa, medio fere 0.7–1.4 cm lata, petiolo 1–1.5 cm longo; scapo basilaris, abbreviato, c. 1 cm longo, vaginulis paucis amplectentibus obsesso, unifloro; bractea ovato-cucullata, apiculata, glabra, ovario pedicellato duplo fere brevior; flore in genere inter majores, erecto vel erecto-patente; sepalis oblongis, breviter acuminatis, c. 1.1 cm longis, intermedio intus minutissime papilloso, lateralibus obliquis intermedio paulo latioribus et longioribus; petalis e basi brevissime unguiculata oblique quadratis, breviter acuminatis, leviter sigmoideo-arcuatis, glabris, 0.5 cm longis; labello e basi perbrevis unguiculata late ovali-calceolari, antice in lobulum parvulum oblongum obtusiusculum producto, marginibus incrassato, auriculis basilaribus recurvulis, oblique oblongo-falcatis, callo interjecto humillimo, subinconspicuo, labello toto 0.9 cm longo, medio fere 4.5 mm lato; columna brevi, glabra, brachiis subulatis, tertiam partem basilem labelli haud excedentibus; anthera oblongoideo-cucullata, umbone oblongo antice papilloso donata; ovario cum pedicello glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18799, flowering in Nov. 1908.

Among all the species known and collected by me up to the present, this is the most compact. It reminds me of *P. guttulatum* Schltr. but has broader, and more substantial leaves with a definite petiole and, likewise, considerable difference in the shape of the floral segments. The flowers are thickly spotted with red and, therefore, similar in colour to those of *P. guttulatum* Schltr.

13. *P. stictanthum* Schltr., sp. nov.

Epiphyticum, parvulum, 7–10 cm altum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis, ovoideis, unifoliatis, 0.8–1.2 cm altis, infra medium 0.5–0.7 cm diametientibus; folio erecto vel suberecto, lanceolato-elliptico, acuto vel leviter acuminato, basi in petiolum c. 1–1.5 cm longum angustato, glabro, textura tenuiore, lamina 3.5–5.5 cm longa, medio fere 0.9–1.8 cm lata; scapo basilaris, gracilis, filiformis, glabro, vaginulis paucis distantibus obsesso 3.5–6 cm longo, unifloro; bractea ovato-cucullata, apiculata, glabra, ovario graciliter pedicellato multo brevior; flore in genere inter magnos, erecto vel suberecto; sepalis oblongo-ellipticis, subacutis vel acutis, glabris, 1.7 cm longis, lateralibus obliquis, intermedio paulo latioribus et longioribus; petalis e basi breviter subunguiculato-cuneata, oblongo-quadratis, leviter sigmoideo-arcuatis, apice truncato obscure subundulato-crenatis, 0.8 cm longis; labello e basi breviter unguiculata elliptico-calceolari, antice in lobulum parvulum oblongum producto, marginibus incrassato, intus leviter bicarinato, auriculis basilaribus recurvis, falcato-oblongis, obtusis, callo interjecto quadrato, bene alto, labello toto c. 1.5 cm longo, supra medium c. 0.7 cm lato; columna brevi, glabra, brachiis subulatis, sextam partem basilem labelli vix superantibus, pede incurvulo; anthera oblongoideo-cucullata, basi leviter cordata, umbone obovato antice minute papilloso donata; ovario cum pedicello gracili, glabro, 1.5–2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18570, flowering in Nov. 1908.

Among all the species of the genus known to me up to the present, this one possesses the largest flowers. Moreover, its lip is more deeply concave than in the other species. The petals, truncate at the apex, likewise distinguish the plant. The flowers are yellowish on the outside, and inside they are densely spotted red-brown.

76. *Bulbophyllum* Thou.

It is probable that few genera of orchids have presented such difficulty to monograph as *Bulbophyllum* Thou. The genus has never been treated collectively, except for a small attempt to divide it into sections by Lindley. It can thus be understood easily that the determination of its species, now over 700, is no simple task. The known material is very considerable and is dispersed over different herbaria, especially Reichenbach's

Herbarium (now belonging to the Royal Museum, Vienna), in the herbarium at Kew, in the Buitenzorg Herbarium, and in my own, which now contains possibly the most complete collection of recorded species, as well as a very good one of Indo-Malayan, African and New World species.

The number of species contained in the genus may, at the present time, reach 700, without the addition of the numerous novelties described here, so that the genus may prove to be the most prolific in the family.

Its division into sections, at least so far as the Asiatic species are concerned, has been given to us by Hooker fil. Pfitzer also has attempted to establish groups, but I can hardly regard his delimitations as a success, since in most cases they are based on single collections and are recorded as equivalent to sections; and also he has separated from *Bulbophyllum* Thou. such genera as *Bulbophyllaria* Rchb. f., *Megaclinium* Lindl. and *Epicrianthes* Bl., which, in spite of my endeavour to restrict the genus as much as possible, properly seem to belong to it.

I now propose to attempt a division of the genus into sub-genera and sections, so far as those found in our Territory are concerned, but I do not propose to consider those species belonging to the African sections (such as *Megaclinium*), nor to the American ones (such as *Bulbophyllaria*) nor those found exclusively in Indo-Malayan regions since the complete task could not be accomplished satisfactorily without, in the first place, examining the entire genus, a work which I hope to undertake in the near future.

During my New Guinea expedition, I was surprised to find, during my examination of the *Bulbophyllinae*, that there are two sharply defined column-forms, whereby the two principal groups may be recognised at once. In one of these groups the column always is thickened conspicuously at the base, and the foot is so much reduced that we may almost regard it as 'footless'; the column itself is considerably bent and the two stelidia are variously divided or modified into a knee-shaped, erect outgrowth with one or two teeth, but never subulate or straight (as in true *Bulbophyllum*). In most of these species the labellum is attached immovably to the base of the column. I will refer later to its structure.

The second, or true *Bulbophyllum*, always has a more-or-less, much shortened column with a very definite, and often very long, foot. The stelidia are subulate or reduced to a sharp tooth, or, as I will discuss later, are falcate, bent downwards and truncate, showing, as a group, a small constriction or lobe, but are never divided. The labellum is always movable and swings to-and-fro at the least touch.

In consideration of these characters, together with such as are found in the flower-parts, I would like to propose the following sub-genera:

The sub-genus, for which I propose the name *Hapalochilus*, possesses an almost footless column with arms more-or-less split or toothed. The labellum is mostly, or perhaps always, immovable and of a softer texture than is the case with species of the other groups. It is not impossible that this sub-genus may later have to be given the status of a genus.

Harpobrachium possesses the column of *Eu-Bulbophyllum*, but the column-arms are usually curved, falcate and bent downwards and it is also recognised easily by its constant habit. Its species, at least in the flowers in the dried state, always appear to be reddish or dark-brown.

Eu-Bulbophyllum represents the true *Bulbophyllum*, with elongated column-foot and more-or-less subulate stelidia, sometimes diminutive, and with a very movable labellum.

In *Antennisepalum* I would group those species which belong to the remarkable

form which, some years ago, I described under the name *B. antenniferum* Schltr. As I will explain later, this contains two sections.

Epicrianthes is considered best as a sub-genus next to *Eu-Bulbophyllum*, on account of the peculiar petal-appendages which are well illustrated in *B. epicrianthes* Lindl. This sub-genus has undergone such a considerable development in our Territory that one might be led to believe that New Guinea is the chief centre of development of the group.

In *Bisepalum*, finally, there exist forms which are distinguished from the true *Bulbophyllum* species by the reduction of the lateral petals. Cohesion of the lateral sepals is found occasionally in the section *Eu-Bulbophyllum*, but a true reduction I only know here, apart from the section *Trachychilus* of the sub-genus *Hapalochilus*, where it occurs in such distinct forms that it ultimately may become necessary to separate this sub-genus from *Bulbophyllum* Thou. Later I will mention how some of these species were called *Cirrhopetalum* and thus the sharpness in the characteristics of that genus was somewhat blurred or effaced.

We now come to the division of the sub-genera into sections:

Hapalochilus. I propose to divide this sub-genus into three sections which I shall separate as shown below (at least so far as the Papuan species are concerned). I again wish to emphasise the fact that this division refers only to the Papuan species, hence many sections are not referred to since they are restricted to other zones.

§ 1. *Scaphochilus* consists at present of two very characteristic species, with the labellum always located over the column, so that the flowers are inverted. The immovable labellum is characterised by the fact that at the base it is involuted like a paper-bag. The column entirely corresponds in form with that which I have characterised already for the sub-genus *Hapalochilus*. The sepals are reflexed during the hot hours of the day, but afterwards close regularly as the temperature falls. The flowers last only a few days, and the peduncles carry but a single flower.

§ 2. *Coelochilus*, also a new section, is related closely to *Scaphochilus*, especially in the structure of the column, which is footless or nearly so. The labellum, however, is differently shaped, i.e., it is more-or-less narrower, with the base usually terminating in two short auricles; it is convex-elliptical above (thus concave below), linguiforme or cylindrical in shape. As in the preceding section, the sepals are reflexed mostly during the hot hours of the day, but more-or-less closed at night. The petals are always small, as in *Scaphochilus*. The peduncles, which are usually very slender but rarely shortened, always bear a single terminal flower. In some species it is still uncertain as to whether the labellum is movably or immovably attached to the base of the column, but it is certain that the latter condition occurs in the majority of the species.

§ 3. *Trachychilus* contains species with the characters of the preceding section, but here the lateral sepals are connate as in the sub-genus *Bisepalum*.

I have placed the sub-genus *Harpobrachium* second because the column arms appear to approach nearest to those of *Hapalochilus*. In other respects, however, it appears to me to come closer to *Eu-Bulbophyllum* than to the first sub-genus which is circumscribed sufficiently in itself. Here I propose three different sections.

§ 4. *Manobulbon* is a section which is represented frequently in our Territory grouping itself around either *B. manobulbum* Schltr. or *B. cylindrobulbon* Schltr. The species are, partly, single-flowered and partly multi-flowered. I will refer later on to further details. From the next section, *Uncifera*, they are well separated and distinguished readily by their habit, although a close relationship in flower structure cannot be denied.

§ 5. *Uncifera* has been established lately on the basis of *B. ochroleucum* Schltr. and *B. ramosum* Schltr. and therefore corresponds with the section *Harpobrachium*, if I correctly understand the interpretation which is accepted so generally, but which might refer to many *Bulbophylla*. After examination of my Types, however, I am of the opinion that it should be restricted to those which are distinguished by a branching rhizome, by the habit, and by short, multi-flowered inflorescences. I therefore apply this designation to the section conditionally and in the hope that I have understood properly the rather imperfect definition by J.J. Smith.

§ 6. *Diceras* contains, up to the present, only a single species, which, however, is so outstanding on account of its labellum-structure that I find it necessary to regard it as the Type of a separate section. In habit, as well as in the structure of the column, I would have declared the plant to be a species of the section *Uncifera*, but it has short peduncles, each bearing only a single flower, and above all the two peculiar horn-like structures of a chamois at the base of the labellum, which also differs in shape from the *Uncifera* form. However, we have before us a very aberrant form which, under no circumstances, can have its origin in hybridization.

The sub-genus *Eu-Bulbophyllum* contains more than four-fifths of the total species of the genus, and must therefore be sub-divided into a whole series of sections which I will endeavour to describe. Many of these sections, for example *Dialeipanthé* and *Polyblepharon* are rather isolated while others are united more closely to their co-sections. It is clearly impossible to give a correct succession of sections in the form of a series in a polymorphic genus like this, which is distributed over the whole tropical zone and in which the development of parallel sections surely has often taken place. We must assume certain parallel series which have developed also in totally different directions. Further, we must not lose sight of the fact that many links in the chain of development are as yet unknown to us, and since they may no longer exist, they may never be known. We must be a little more careful with such apodeictical expressions about relationships as have been expressed lately by J.J. Smith.

These are the conditions which prevail in *Eu-Bulbophyllum*. I do not insist that this series of sections is the only correct one. As in the case of *Dendrobium* Sw. I will only attempt to restore a little order into the existing confusion and thereby create more-or-less well-defined sections according to the state of affairs and to group them as they appear to follow, after consideration of various points of view.

There is hardly another orchid group where the differences on which we depend for defining the sections break down, or in which the boundaries between contiguous sections are effaced so gradually as in *Eu-Bulbophyllum*. With an enormous amount of material at my disposal, I have made all possible comparisons in this direction and yet have been unable to discover distinguishing features on the basis of which the sections follow naturally. In most cases the binding-links for the completion of the chain appear to be missing.

I am compelled, therefore, to give the sections here in what I believe is the most fitting sequence. It is possible that when treating the whole genus, the series (or the parallel series respectively) will show fewer gaps, but I have not had the necessary time for such preliminary examination and study. Thus, it has happened that I have had to accept a smaller number of sections than I considered desirable. I hope that a future monograph will complete my work, which is to provide better foundations for the division of this enormous sub-genus.

I have arranged the sections, with a brief characterisation, as follows:

§ 7. *Hyalosema*. This section, which I have characterised* previously, contains a

*cf. Fedde, Repertor. X (1911), p. 92.

small group of Malayan-Papuan species, which group themselves around *B. grandiflorum* Bl. It contains, almost exclusively, larger-flowered species.

§ 8. *Sestochilus*. I restrict to this section the single-flowered species sometimes known as *Sarcopodium*. I have previously shown** that the multi-flowered species are closer relatives of the section *Lepidorhiza* and have segregated them as *Pahudia*.

§ 9. *Pahudia* has just been mentioned. From *Lepidorhiza* it may be distinguished by its umbellate and shortened peduncles, also by the labellum and column, the latter of which brings them closer to *Sestochilus*.

§ 10. *Lepidorhiza* was established by me at the same time as the previous section, and I am still of the opinion that it should be separated from *Sestochilus*.

With these two sections (9 & 10) begin the larger and multi-flowered Bulbophylla. I shall refer later to the characteristics of this section. *Lepidorhiza* is recognised by the more-or-less papillose condition of the roots, by the longer and slightly twisted lateral sepals, and by the labellum.

§ 11. *Brachyostele* is, as far as I can see, a very striking monotypic section. The large flowers of its racemes are of thinner texture than in *Lepidorhiza*, its sepals are sub-equal, its labellum very short and thick and the short lateral 'arms' are about half the height of the column. The plant, as I will later explain, evidently depends for its fertilisation upon blow-flies which are attracted to it by its penetrating stench. The pseudobulbs are very much reduced in size.

§ 12. *Stictosepalum* is also a monotypic section with racemes of very beautiful large flowers. These are distinguished by their shape, by their connate lateral sepals, which easily exceed the dorsal one, and by a short column with long stelia and by a short fleshy lip. The pseudobulbs here also are very much reduced.

§ 13. *Pachyanthe* contains a few Papuan species with fairly large flowers in racemes. The flowers have a distinct column-foot, but there is no definite mentum of the lateral sepals. The linguiform lip is rather flat and furnished with keels and teeth on the upper surface. The column is short and thick with an outstretched foot. The pseudobulbs are small but distinct.

§ 14. *Hymenobracte*a also represents a small Papuan section and is in itself well-defined, consisting of species that group themselves around *B. hymenobracteum* Schltr. These are all characterised by short, few-flowered racemes. The reversed flowers resemble those of the previous section, but show a very definite mentum of the short sepals. The labellum is rather flat and quite smooth. The short column has very much shortened stelia. The pseudobulbs are hardly visible.

§ 15. *Dialeipanth*e corresponds with the Ridley section *Intervallata* and is, as it now appears, very strongly developed in New Guinea. The species are recognisable by their wiry stems, at the top of which racemes of flowers develop singly at intervals. The species are very distinct as regards the flower segments. The column is frequently slender and possesses stelia reduced to small teeth. The pseudobulbs are distinct but often not very well developed.

§ 16. *Macrobulbon* contains one or two slightly differing Papuan species with very characteristic flowers, the lateral sepals being connate by their anterior margins. The pseudobulbs are conspicuously large and sometimes reach the size of an apple. With this section the series of the large-flowered species with multi-flowered inflorescences is concluded.

**cf. Fedde, Repertor. X (1911), p. 93.

§ 17. *Peltopus* also seems to be a purely Papuan group, which, until now, contained only a few species. These have slender single-flowered stems with medium-sized flowers, the sepals of which are long-lanceolate. The petals are small; the lip flat above with a concavity at the base into which fits the peltately thickened column-foot. The column is short and thick with obliquely truncated stelidia. The pseudobulbs are developed distinctly.

§ 18. *Schistopetalum* represents a small interesting group. Here the rhizome is a longer creeping one than in the preceding groups and the leaves are pressed more closely to the substratum. The short peduncles are single-flowered. The flowers, with their long-pointed sepals, resemble those of *Peltopus*, but here in this section, the petals are, with one exception, split into fine segments for at least half of their length. The labellum is thick and tongue-shaped. The column has long, subulate stelidia and a long, narrow foot. The pseudobulbs are more-or-less distinctly four-cornered and well developed.

§ 19. *Brachypus* contains a series of species usually with medium sized (seldom large) flowers on single-flowered peduncles, seldom exceeding the pseudobulbs in height and which appear in bunches so that the species are very rich in flowers. The flowers are variously shaped, the sepals are of equal length; the petals small, undivided and at times short-haired, the labellum small, thick and fleshy; the column short with subulate stelidia and a narrow, rather long foot. The pseudobulbs always are well developed, mostly ovate in shape and caespitose.

§ 20. *Papulipetalum* is related to the preceding section and has a short creeping rhizome. The pseudobulbs seldom are well developed and often petiole-shaped. The peduncles usually appear singly and are single-flowered. The flowers are on long slender pedicels, the lateral sepals usually exceeding the dorsal in length. The petals are small and have a tendency to form a short, blunt lobe on their front margins; usually they are furnished at the apex with distinct, and often very long papillae. The glabrous lip is very short and thick, often shorter, but seldom longer, than the column. The column is of medium length with blunt, subulate stelidia and a narrow foot.

The section is related closely to *Brachypus* by intermediate forms, but it will be better to keep it separate. The lateral sepals are usually long and show indications of a relationship with *Ephippium*.

§ 21. *Ephippium*, although it appears initially to be well-defined as a section is by no means so well separated from *Papulipetalum* and *Micromonanth* as might be expected. The species have a creeping rhizome, usually with rather widely separated pseudobulbs which may be reduced greatly in some cases. The single-flowered peduncles are very slender and bear medium-sized flowers, the somewhat large lateral sepals of which often are much elongated in front, and occasionally connate at the apices. The petals are extremely various. The labellum is elongated and, in many species, rostrate in shape, but not in all. The column has subulate stelidia and a narrower foot.

The group appears to be a natural one and yet it is not defined sharply. At first I thought the species with the rostrate, elongated lip might be separated, but had to abandon the idea because a close relationship between them and the short-lipped species could be recognised.

§ 22. *Micromonanth* approximately agrees with Ridley's section *Monanthaparva*, but it excludes species which have a very long-creeping filamentous rhizome on which the pseudobulbs stand well apart. The species belonging here have pseudobulbs which grow more-or-less compactly as a mat. Their flowers are very polymorphic and thus

separate parts show greater variation than in other orchid genera. It is probable that a further sub-division of this section will become necessary later. The stelidia of the column are always subulate and outstretched.

§ 23. *Nematorhizis* appears to be a natural group of very small, long-creeping species which usually were included in *Monanthoparva*. These species are represented in New Guinea by an interesting series and are distinguished from *Micromonanth*e by a column in which the stelidia are short and blunt.

§ 24. *Scyphosepalum* is a small group related closely to *Micromonanth*e, from which it is distinguished by its habit, which resembles that of *Nematorhizis*, and by its scyphoid lateral sepals. It approaches *Nematorhizis* in its stelidia which here likewise are short and blunt.

§ 25. *Polyblepharon* is so very distinctive in its first, typical species, that I thought it would be necessary to establish a separate sub-genus, but the gradual disappearance of first one and then another characteristic, proved that these did not indicate any very close connection with certain other, apparently quite unrelated, sections. This section especially might be suitable for phylogenetic studies in the genus *Bulbophyllum*. The labellum, at first so very typical, loses more and more of its characteristics as we pass from species to species, until at last, as in *B. navicula* Schltr., an ordinary *Bulbophyllum* labellum remains. In all species the lateral sepals are connate and, with few exceptions, the labellum is very hairy and often lobed at the base. Unless further sub-divided this section may prove one of the largest in our Territory. It possesses some of the most interesting forms in the genus.

§ 26. *Hybochilus*. I have, previously, characterised this section and included in it a single species from Java and the Celebes. Most Papuan species are distinguished from the western forms by the pendant habit and bead-like string of pseudobulbs, but they are connected by a Papuan form to one another. The species are well separated from one another and show a close relationship with those of *Polyblepharon* from which, however, they may be distinguished by their free lateral sepals. All the species have sepals which are more-or-less tapering or pointed in front.

§ 27. *Sphaeracron* also shows relationship with *Polyblepharon*, but it possesses sepals which are clavate, shortly thickened at their apices or antennae-like. The labellum is distinguished from that of *Hybochilus* by the absence of the basal tubercle which is nearly always present in *Polyblepharon*. In habit these species are identical with those in the previous section.

§ 28. *Leptopus* contains a series of, obviously, the same Papuan species which unite the hanging or pendant structure of the last group with the general flower characteristics of *Micromonanth*e. The stems, apparently, are rooted only at the base, but as a matter of fact the roots force themselves along the rhizome, always covered below the sheath of the latter and form a true stem after the rhizome has died-off. At a later point I will refer to these conditions in more detail. This structure will be distinctive also in the groups following immediately, until finally we return again to the racemose inflorescence of the very first habit-form. The peduncles appear singly and the flowers are not of particularly delicate consistence, nor are the sepals very characteristic and still less the glabrous petals. The labellum has tubercles or keels on its upper side at the base or in the centre. The pseudobulbs are slender and cylindrical with a leaf of substantial texture.

§ 29. *Rhizocaulon* possesses the habit described above, more distinctly than the previous section and the vegetative peculiarity reaches its peak here, because the species are of thinner texture and the rhizomes are therefore more frail. The

pseudobulbs are more compressed, sometimes flattened or disc-like, the leaves thin, the peduncles standing in tufts and developing one after another, the leaves acquire a twist whereby the blades seem to be in the same plane. The flowers are of medium size, the sepals with short hairy margins or papillose on the inside; the petals are densely haired and the labellum is covered below with hairy papillae. The short column has subulate stelidia and a very well developed narrow foot. In the structure of the lip and its papillose covering the species resemble those of the next section.

§ 30. *Fruticicola* is constituted by a large number of species which are grouped around *B. fruticicola* Schltr. All have strikingly uniform flower structure and habit. The pseudobulbs are more-or-less appressed to the rhizome and are cylindrical. The flowers appear singly on very short, single-flowered peduncles. The sepals are short and pointed; the petals small; the labellum small, thick and tongue-shaped, blunt at the apex and with one or two exceptions, thickly covered below with papillae, but always glabrous above. The short column has two subulate-pointed stelidia which exceed the anther. Such a shortening of the rhizome occurs in some species that they grow like upright sympodia, while others hang down loosely for as much as 60 cm.

§ 31. *Epibulbon* represents a group of very characteristic species which correspond very similarly in habit as the species of *Epiblastus* Schltr. of the *Glomerinae*. The flower structure shows a distinct relationship with *Fruticicola*, but the sepals are elongated and the labellum glabrous except at the base, where on the upper surface it is covered with a few papillae. This section, like the previous, is a very natural one, and is recognised easily without examining the flowers. There is, likewise, a striking and unmistakable uniformity in the flower structure of all the species. The labellum is evidently always of a red colour.

§ 32. *Oxysepalum* contains the familiar forms which are distinguished by the reduction of the pseudobulbs, by the fleshy leaves and by the very short single-flowered inflorescences. This section often has been treated in detail and is fairly constant in its characteristics. However, *B. dichotomum* J.J. Sm. represents an aberrant form, which appears to have some similarity to certain species of *Macrouris*. The flowers are always white or yellow.

§ 33. *Pelma* consists of a whole series of species which not only represent those which were included by A. Finet and J.J. Smith, but also, amongst others, *B. fractiflexum* J.J. Sm. which does not differ in its flower-structure from *Pelma*. In this section we have the best proof that the characters taken from the inflorescence may vary in different circumstances, although they may be fairly consistent for the genus. I will show, by means of the material in hand, that in this case single-flowered and multi-flowered species occur in the same section. The section as such is sufficiently well known from the description of the genus by A. Finet. Later on I will refer to certain details.

§ 34. *Macrouris* is a natural section of species with elongated sympodia which are seldom erect in habit, sometimes creeping, but usually loosely pendant. The rhizome is always very slender, the pseudobulbs distinct, the delicate inflorescences normally multi-flowered, although there also exists a single-flowered species. The very delicate flowers are white or whitish, often with a yellowish or reddish labellum, which are always simple in shape. The sepals are tailed. The column is very much shortened with short stelidia and a long, narrow foot.

§ 35. *Ischnopus* contains a series of mostly red or yellow-flowered species which develop their extremely slender-stemmed inflorescences at the base of the distant, not crowded, pseudobulbs. Irrespective of the colouring, the species are distinguished well from those of the last section by the structure of the flowers. The lateral sepals are a

little longer than the dorsal, the petals are generally more spatulate. The lip is thicker and firmer in consistence and sometimes hairy. The species are recognised easily by their habit.

§ 36. *Aphanobulbon*, which I have characterised already, is founded on those species which are grouped around *B. gibbosum* Lindl., *B. flavescens* Lindl. and *B. unguiculatum* Rchb. f. The section is so characteristic that I will not go into details. It may suffice to say that the species, in which there is a remarkable reduction of the pseudobulbs, have small white or pale-coloured flowers in an upright, few to many flowered raceme. The leaves generally are narrowed downwards into the petiole. The flower structure reminds one of the last two sections.

§ 37. *Globiceps* is represented in our Territory by one, possibly two, species, and is recognised easily by its close, globose inflorescence of usually short, dark purple flowers. The sepals are fairly short and broad. The petals are small. The labellum is broad and blunt and the column is short with tooth-shaped stelidia and a distinct foot. The pseudobulbs are much reduced so that the plants occasionally remind one of species of *Aphanobulbon* when not in flower.

This section concludes the review belonging to the sub-genus *Eu-Bulbophyllum* which are represented in our Territory and the remaining sub-genera remain to be discussed.

The next sub-genus is *Antennisepalum* which is characterised by the presence of inturned, short-stemmed antennae at the points of the sepals and of pedicels shortly jointed at the top. Here two separate sections may be distinguished.

§ 38. *Lepanthanthe*. Up to the present this is a monotypic section containing only *B. lepanthiflorum* Schltr. which, in its habit, closely reminds one of the species of the section *Rhizocaulon* although it has the entirely differently constructed flowers of *Antennisepalum*. The inflorescences are more fasciculate and, due to a twisting of the peduncle, they are placed at the back of the leaves. They consist of short-stemmed, cyme-like, abbreviated racemes. The flowers resemble those of the next section in structure, but the sepals are more spreading and the labellum shorter and thicker. In spite of the very different habit, the close relationship of this section with the following one is indisputable.

§ 39. *Trachyrachis* is distinguished from *Lepanthanthe* by its very different habit. Its creeping rhizome produces erect leaves at intervals on much-reduced pseudobulbs, the elongated peduncles bear multi-flowered racemes, the rachis being covered by papillae or other excrescences. The sepals incline together campanulately and the lip is more-or-less linguiforme.

The sub-genus *Epicrianthes*, so far as is known, contains only one section, the species of which are similar in habit, but well separated by the flowers.

§ 40. *Polyrhopalon*, as I called this section, has species which resemble those of *Rhizocaulon* in habit. The flowers are of various sizes and are borne on very short single-flowered peduncles. I will refer later to the further characteristics of this sub-genus and section.

The last sub-genus to engage our attention is *Bisepalum*. All the sub-genera, with the exception of *Hapalochilus* hitherto considered, contained species in which the three sepals [not petals] are free or more rarely coherent in such a way as to be separated easily. In the final two sections belonging to the sub-genus *Bisepalum*, however, the lateral sepals are united definitely and firmly.

§ 41. *Cycloglossum* is, until now, monotypic, being represented by a small species with the habit of *Micromonanthe*, having single-flowered peduncles. The flowers are

reversed and hairy inside. The petals are very tiny, even for a *Bulbophyllum*, and the circular-shaped labellum is scarcely longer than the column, the stelia of which are suppressed completely. The lateral sepals are connate as far as the middle.

§ 42. *Hedyothyrsus* may be regarded also as the Type section of the sub-genus and it differs considerably from the previous section by reason of its connate sepals. In *Hedyothyrsus* the rhizome is much elongated; the large pseudobulbs and leaves are, therefore, placed singly, the very slender peduncles bear a more-or-less unilateral raceme of large and beautiful flowers. The lateral sepals are united almost to the apices and exceed the dorsal sepal in length considerably. The labellum is genuflexed and much widened at the base. The short column has stelia more-or-less obliquely truncate, falcate and bent upwards. At the base of the long, narrow column-foot there is a tooth which fits into a small cavity at the base of the labellum, thus enabling the latter to recline backwards. It is peculiar that the dorsal sepal is provided with two protuberances which do not occur elsewhere in the genus.

This concludes the enumeration of the sections of the genus so far as they concern our Territory. From what has been said, it will be understood perhaps how difficult it is to circumscribe the individual sections, since they often differ from the form of the standard species in one or more characters. In this respect the genus is so absolutely different from other genera in the Territory, that at first I suspected strong hybridization influences at work. This supposition, however, is decidedly contradicted by the fact that a large portion of the differing species always occur in colonies, and cannot be regarded therefore as hybrids, which would obliterate even trustworthy section or genus characters.

In considering the *Bulbophyllinae* of many neighbouring countries and floral zones, we arrive at the same result and are compelled to exclude the theory of strong hybridization. Moreover, as far as I have observed, New Guinea appears to be a country in which the conditions for hybridization of these species are unfavourable or at least not nearly as favourable as in the Andes of South America and similar regions. The developing series of the section *Polyblepharon*, which I will later describe, will show what 'jumps' in the genus, from case to case, from series to series, species to species, are possible; 'jumps' which apparently frustrate all attempts to unite even the species of the larger sections in a natural way. I am afraid that in this group we have not recognised the proper group differences and that the characters which should receive consideration are, up to the present, unknown to us. It is also noteworthy and perhaps remarkable when considering such 'jumps' in species characters, that it is only in rare cases that the species are not defined sharply from each other. I hope, however, that by the study of the *Bulbophyllinae* of New Guinea some more light will be thrown on our knowledge of the genus, for I am convinced that a considerable number of the sections enumerated will form a natural series, at least for our Territory.

In conclusion, I shall deal briefly with the geographical distribution of the genus. From what follows it will be seen that New Guinea is the chief centre of dissemination. The radiation towards the east is not very important, where, as usual, the eastern boundary of the genus seems to be in the Tongan, Samoan and Society Islands. Towards the south we find species in constantly diminishing numbers distributed over Australia and, lastly, even in New Zealand. In the north the species are distributed over the Celebes, the Philippines and Japan, probably being represented in their northern limit by *B. drymoglossum* Makino. Towards the west the number of species is very considerable. The Moluccas and Sunda Islands are hardly poorer than our own Territory: Java alone contains about 50 species and, lastly, in India we must determine a secondary 'centre', because, evidently, here have developed some groups which are

not represented elsewhere. Coming to Africa, it will be seen that even here the genus has experienced a singular development. Here we find special characteristic groups and even some with two-leaved pseudobulbs, a condition observed in a few Asiatic species, but unknown east of Asia. From Africa, inclusive of the eastern islands (Madagascar etc.), there have been reported about 100 species of *Megaclinium* Lindl., about which I am still undecided, although I have had abundant opportunity to study them in their native habitat. However, throughout, the African species represent sections very little or quite unknown in the east.

It is remarkable that America should produce a by no means inconsiderable number of species, viz. about 40. The forms which occur here are partly a separate form-circle and partly species more-or-less related to those of Africa. This indicated that there has been an influx from the east. On the far side of America, towards the west, we again meet the genus where we left it in the Society Islands. I will deal with the closer relationship and geographical distribution of the individual sections when I describe them.

§ 1. *Scaphochilus* [Ed.—*Scyphochilus*]

In this first section I have included two species which resemble each other very closely in flower-structure, although specifically they are undoubtedly very different. The section is very closely related to *Coelochilus*, but easily separated from it by the shape of the labellum in all the species in this large section. In *Scaphochilus* [Ed.—*Scyphochilus*] the labellum is spathiform or scyphoid especially towards the base, whereas it is constructed quite differently in *Coelochilus*. The column is similar in both sections, and, as in *Saccoglossum*, so absolutely different from that in the true *Bulbophylla*, that at first I thought of treating these two sections as separate genera, but I was not prepared to do this since I had not seen sufficient material of some species to warrant such a step. Light will be shed presumably on this question when the whole genus, or, still better, the whole group is treated monographically.

The mobility of the labellum, which has been included in the definition of the genus, may be decisive here. Unfortunately, this point, which claimed my attention in the later examination of the living material, was not cleared up sufficiently for all species, and it is not easy to decide it now, conclusively, in the dry material. It is certain, however, that the labellum is immovable in the two species of this section, and this applies also in *Coelochilus* where I have been able to establish this characteristic with certainty in all but a few species.

The reduction of the column foot, whereby the column becomes reminiscent of that in *Liparis*, is very remarkable and characteristic. The same column construction is found again in *Saccoglossum* Schltr. and *Codonosiphon* Schltr.

The two species of the section known up to the present are epiphytes of the primary rain-forests of the hills and *B. scyphochilus* Schltr. is found even at an altitude of 150 m and rises up to the boundary of the mist-forest, while *B. cucullatum* Schltr. appears to be restricted to an altitude of 500–800 m.

1. *B. cucullatum* Schltr., sp. nov.

Epiphyticum, parvulum, usque ad 10 cm altum; rhizomate brevi, dense pseudobulbis obsessa; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis clinandraco-conicis, unifoliatis, 1.3–2 cm altis, infra medium 0.2–0.3 cm diametientibus; folio erecto vel suberecto, oblongo-ligulato, acuto, basi breviter subpetiolato-angustato, glabro, 3–7 cm longo, medio fere 0.5–1 cm longo; scapis basilaribus, gracillimis, filiformibus, glabris, vaginulis paucis distantibus donatis, 4–5 cm longis, unifloris; bractea elliptico-cucullata, subacuta, glabra, ovario pedicellato multoties brevior; flore pulchello, in sectione magno, suberecto, inverso; sepalo intermedio anguste elliptico-spathulato, breviter acuminato, glabro, extus nervis 3 prominulis donato, 1.5 cm longo, lateralibus ellipticis,

breviter acuminatis, glabris, obliquis, intermedio aequilongis sed distincte latoribus, nervis 3 prominulis ornatis, reflexis; petalis oblique rhombeo-ovatis, acuminatis, basi subunguiculato-cuneatis, glabris, 0.3 cm longis; labello supero e basi brevissime unguiculata marginibus praesertim basi incurvis circuitu elliptico-cucullato, obtusiusculo, maculis minute purpureo-papillosis picto, 1.3 cm longo, supra medium (haud explanato) 0.8 cm lato; columna arcuata, basi ampliata, subapoda, brachiis abbreviatis, breviter paucidentatis; anthera ovato-cucullata, cordata, umbone magno oblongo donata, glabra; ovario cum pedicello filiformi, glabro, c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17714, flowering in May 1908.

This very pretty plant is distinguished easily from *B. scyphochilus* Schltr. by its larger and differently coloured flowers, its lip here being more trumpet-shaped, while in *B. scyphochilus* on the contrary, it is more boat-shaped. I will deal with the wider differences when speaking of *B. scyphochilus*. The flowers are dark violet-red, the labellum whitish, covered with black-brown, large papilliform spots.

2. *B. scyphochilus* Schltr., sp. nov.

Epiphyticum, parvulum, 10–13 cm altum; rhizomate decumbente brevi, densius pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylinandraco-conicis, unifoliatis, demum longitudinaliter plurisulcatis, 1.5–2 cm longis, infra medium 0.3–0.6 cm diametentibus; foliis erectis, elliptico-ligulatis, apiculatis vel breviter acuminatis, glabris, basi sensim in petiolum brevem angustatis, glabris, petiolo incluso 7–12 cm longis, lamina medio fere 1.1–2 cm lata; scapis aggregatis, setiformi-gracillimis, glabris, vaginulis paucis distantibus squamiformibus obsessis, 5–6.5 cm longis; bractea minuta, elliptica, amplexante; flore erecto, in sectione parvulo, inverso; sepalis oblongis, apiculatis, extus glabris, intus pilis flexuosis pilosulis, c. 1 cm longis, lateralibus obliquis; petalis parvulis, oblongis, obtusiusculis, margine grosse ciliatis, 2.5 mm longis; labello supero, circuitu ovato-lanceolato, dimidio anteriore leviter attenuato, obscure verruculoso-ruguloso, marginibus praesertim dimidio inferiore naviculari-incurvis, obtuso, 0.8 cm longo, infra medium haud explanato 3.5 mm lato; columna graciliore, leviter curvata, basi leviter incrassata, subapoda, brachiis bidentatis, dente anteriore subulato, posteriore duplo brevior; anthera ovato-cucullata, altiumbonata, glabra; ovario cum pedicello setiformi, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees by the creeks near Kelel in the Minjem Valley, alt. c. 150 m—R. Schlechter no. 16152, flowering in June 1907; on trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17729 (TYPE), flowering in May 1908; on trees in the forests of the Ibo Range, alt. c. 800 m—R. Schlechter no. 19018, flowering in Dec. 1908; on trees in the forests on the Maijen [River], alt. c. 200 m—R. Schlechter no. 16152, flowering in Sept. 1908. [Ed.—collection numbers repeated and the latter would appear incorrect and is possibly 18152.]

This species has exactly the same section characters as *B. cucullatum* Schltr., but it differs externally in the smaller flowers. Moreover, the sepals are hairy on the inside, the petals ciliated, the labellum tapering to the front and the front tooth of the stelidia is much longer. The flowers are violet-red with a darker labellum, the petals white, spotted with red in the anterior half.

var. *phaeanthum* Schltr., var. nov.

Differt a forma typica floribus flavido-brunneis, petalis rubromaculatis.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 500 m—R. Schlechter no. 17867, flowering in June 1908.

Differs from the type in its yellow-brown flowers. I have found it only once, but it was plentiful in that locality. In consequence of its very different flower colouring, I at first mistook it for a separate species until examination proved that it was only a variety of the widely distributed *B. scyphochilus*.

§ 2. *Coelochilus*

The majority of those *Bulbophyllum* species which are distinguished by a footless or almost footless column have been placed in this section. It has been explained already

in *Scyphochilus* that it is probable that these two sections may have to be treated at a later date as separate genera.

The section is related closely to *Scyphochilus*, the habit of which it usually possesses, but it is distinguished by the structure of the labellum, which is convex above and correspondingly excavated below, appearing very concave in consequence of its revolute margins; it is also furnished with one to three keels or crests at the base. This section displays a great variation in habit which may, at a later date, render a further division possible, particularly if it should be separated from *Bulbophyllum* Thou. A great number of the species form close, caespitose patches, while others creep a fairly long distance or form pendant fascicles. The inflorescences are always single-flowered.

As far as can be established at present, the section is a pure Papuan [Papuanian] one. It is remarkable that no species appear to have been described from British Papua, although possibly they may occur as often as here.

Dutch New Guinea on the other hand has supplied nine [Ed.—only eight are listed] species which surely belong here, viz. *B. callipes* J.J. Sm., *B. stabile* J.J. Sm., *B. coloratum* J.J. Sm., *B. cruciatum* J.J. Sm., *B. alkmaarense* J.J. Sm., *B. frustrans* J.J. Sm., *B. quadricaudatum* J.J. Sm. and *B. holochilum* J.J. Sm.

The species which I have to describe here are distributed as epiphytes over the whole Territory. A number of them occur on trees, more seldom on shrubs of the primary rain-forests of the hilly country, where they are found not infrequently, especially along the streams and rivers.

However, the bulk of the species enjoy the habitat of the mist-forests of the mountains where I have observed them up to an altitude of 2500 m—in rather cold regions.

In the following descriptions the tufted caespitose forms will be treated first, next the creeping ones and lastly the species with pendant stems. In conjunction with this, the size of the flowers will be considered.

3. *B. pulchrum* Schltr., sp. nov.

Epiphyticum, caespitificum, usque ad 18 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis valde approximatis, conico-cylindraceis, unifoliatis, 1.5–3 cm altis, infra medium 0.5–0.7 cm diametentibus; foliis ligulatis, obtusis vel subobtusis, basi subpetiolato-angustatis, glabris, textura coriaceis, 8–15 cm longis, medio fere 1.7–2.4 cm latis; scapis basalibus aggregatis, filiformibus, erectis, vaginulis paucis distantibus parvulis obsessis, glabris, 8–10 cm longis, unifloris; bractea elliptico-cucullata, apiculata, ovario graciliter pedicellato multoties brevior; flore erecto vel suberecto, specioso, in genere inter majores; sepalis lanceolatis, elongato-acuminatissimis, glabris, 4.2 cm longis, lateralibus obliquis, intermedio latioribus; petalis minutis falcato-ovalibus, dimidio superiore irregulariter denticulatis, breviter apiculatis, margine anteriore supra basin in lobulum brevem triangulum obtusum productis, c. 2.25 mm longis; labello e basi minute ac obtuse auriculata supra basin elliptico-dilatato, elongato-acuminatissimo, convexo, dimidio inferiore bicarinato, c. 4 cm longo, medio 0.8 cm lato, glabro; columna arcuata, apoda, brachiis oblique rhombeis, porrectis, antice breviter paucidentatis; anthera oblongoideo-cucullata, apiculata, umbonata; ovario cum pedicello gracillimo glabro, c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20186, flowering in Sept. 1909.

It is interesting that in this, the following three species and in *B. quadricaudatum* J.J. Sm., we have five species which are related closely but differ in the characters of the petals, the column and the colour of the flowers. Of most of these species I have plentiful material for observation and know that these differences are constant. *B. pulchrum* is related most closely to *B. quadricaudatum* J.J. Sm., but differs in the petals and column. The beautiful flowers are white, the sepals striped with dark purple and the labellum yellow with many brown dots and a snow-white apex.

4. *B. nitidum* Schltr., sp. nov.

Epiphyticum, humile, 10–13 cm altum; rhizomate decumbente, brevi; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, c. 2 cm altis, infra medium 0.5 cm diametientibus; foliis erectis, anguste ligulatis, obtusis, basi subpetiolato-angustatis, glabris, textura coriaceis, 6–11 cm longis, medio fere 0.8–1.3 cm latis; scapis basilaribus, erectis, gracillimis, filiformibus, vaginulis paucis dissitis parvulis donatis, glabris, 5–9 cm longis, unifloris; bractea elliptica, amplexante, apiculata, ovario graciliter pedicellato multo brevior; flore specioso, erecto vel suberecto, in genere inter majores; sepalis reflexis, lanceolatis, elongato-acuminatissimis, glabris, 4–4.5 cm longis, lateralibus intermedio paulo latioribus; petalis minutis, e basi transverse oblonga falcato-apiculatis, vix 0.2 cm altis; labello e basi minute et obtuse auriculata concavula lanceolato-dilatato, convexo, elongato-acuminatissimo, subtus pilosulo, infra basin bicarinato, sepalis paulo brevior, infra medium 0.6 cm lato; columna apoda, incurvula, brachiis abbreviatis decurvis paucidentatis, dente inferiore alius plus duplo longiore, clinandrio dorso bidentato; anthera oblongo-quadrata, cucullata, umbonata, glabra; ovario cum pedicello gracili c. 3 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19729, flowering in June 1909.

In beauty this species is not inferior to the others. It is distinguished easily by the petals, by the more lanceolate and narrower labellum and by the column. The sepals are white, red-streaked; the petals white with two red spots; the labellum white, red-spotted, with a snow-white apex.

5. *B. formosum* Schltr., sp. nov.

Epiphyticum, pro genere validum, 15–17 cm altum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 2.5–4 cm altis, infra medium 0.5–0.7 cm diametientibus; foliis erectis, oblongo-ligulatis, obtusis, cum apiculo minuto, basi subpetiolato-angustatis, glabris, 8.5–13 cm longis, medio fere 1.5–2.3 cm latis; scapis basilaribus, erectis, gracillimis, filiformibus, unifloris, vaginulis paucis dissitis parvulis donatis, 10–12 cm longis; bractea elliptico-amplexante, subacuta, ovario graciliter pedicellato multo brevior; flore erecto vel suberecto, specioso, in genere inter majores; sepalis reflexis, lanceolatis, elongato-acuminatis, glabris, 6.5 cm longis, intermedio lateralibus angustior; petalis late et oblique rhombeo-falcatis, cuspidato-acuminatis, supra medium utrinque paucidentatis, margine anteriore sublobatis, c. 3 mm longis; labello e basi minute et obtuse auriculata elliptico-lanceolato, elongato-acuminato, convexo, dimidio inferiore minute et dense papilloso, subtus transversim ruguloso, basi bicarinato, sepalis subaequilongis, medio fere 0.8 cm lato; columna graciliore, apoda, leviter curvata, brachiis subquadratis, minute serrulatis margine inferiore dente decurvo donatis, clinandrio pro genere alto tridentato; anthera oblongo-cucullata, altius umbonata; ovario cum pedicello gracillimo glabro, vix 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 18514, flowering in Oct. 1908.

Likewise a beautiful plant which, in the size of its flowers, even excels the two previous species. It is distinguished by the shape of the petals, the papillose lower half of the labellum and in the column. The flowers are white, the sepals red-streaked, the labellum densely and finely dotted red and with a white apex.

6. *B. speciosum* Schltr., sp. nov.

Epiphyticum, speciosum, humile, 15–20 cm altum; rhizomate decumbente, brevi; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 2–3 cm altis, infra medium 0.4–0.6 cm diametientibus; foliis erectis, elliptico-ligulatis, obtusiusculis vel subacutis, basi subpetiolato-angustatis, glabris, textura chartaceis, 11–16 cm longis, medio fere 1.5–1.8 cm latis; scapis basilaribus, erectis, gracillimis, filiformibus, unifloris, vaginulis paucis distantibus parvulis obsessis, 8–10 cm altis; bractea elliptico-cucullata, breviter acuminata, ovario graciliter pedicellato multo brevior; flore erecto vel suberecto, specioso, in genere inter majores; sepalis lanceolatis, elongato-acuminatis, glabris, c. 4.4 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis minutis, late falcato-rhombeis, cuspidato-apiculatis, margine dimidio superiore subcrenatis, glabris, 0.2 cm longis; labello e basi obtuse et minute concavo-auriculata lanceolato-dilatato, elongato-acuminatissimo, convexo, apicem versus leviter flexuoso, subtus basi bicarinato, 3–8 cm longo, infra medium 0.6 cm lato, glabro; columna incurvula pro affinitate crassiuscula, subapoda, brachiis

porrectis subquadratis, brevibus, margine serrulatis, margine inferiore dente lineari-porrecto donatis, clinandrio serrulato-dentato, truncato; anthera rhomboideo-oblonga, cucullata, umbone magno oblongo donata; ovario cum pedicello gracillimo, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17259 (TYPE), flowering in Jan. 1908; on trees in the forests on the Njonge [Creek] near Ambo (Finisterre Range), alt. c. 600 m—R. Schlechter no. 18122, flowering in Aug. 1908.

From the other three species described previously and from *B. quadricaudatum* J.J. Sm., this beautiful species is distinguished by the thick-set column and shape of the stelidia. The petals resemble closely those of *B. formosum* Schltr., but they are different in shape. The sepals are white, thickly streaked with red towards the base, the labellum golden yellow, with a snow-white apex.

7. *B. fasciatum* Schltr., sp. nov.

Epiphyticum, humile, 11–17 cm altum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 2–3 cm altis, infra medium 4–5.5 mm diametientibus; foliis erectis, elliptico-ligulatis, obtusis cum apiculo minuto, basi sensim subpetiolato-angustatis, glabris, textura coriaceis, 8–12 cm longis, medio fere 1.5–2 cm latis; scapis basilaribus, erectis, gracillimis, filiformibus, unifloris, vaginulis paucis distantibus parvulis obsessis, 5–6.5 cm longis; bractea elliptica, apiculata, amplexante, ovario graciliter pedicellato multoties brevior; flore erecto vel suberecto, pulchello, in genere inter magnos; sepalis reflexis, lanceolato-ligulatis, subacutis, glabris, 3 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis minutis, falcato-oblongis, obtusissimis, margine anteriore basi lobulo obtuso auctis, margine posteriore basi obtuse angulatis, c. 1.5 mm altis; labello e basi minute et breviter concavo auriculata ligulato obtuso, convexo, glabro, subtus excavato, 2.5 cm longo, medio expanso 6.5 mm lato; columna pro affinitate crassiuscula, apoda, subincurvula, basi ampliata, brachiis abbreviatis, breviter 3-lobulatis; anthera reniformi-cucullata, apiculata, umbonata, glabra; ovario cum pedicello gracili, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range on the upper Waube [Creek] (Waria District), alt. c. 600 m—R. Schlechter no. 19460, flowering in May 1909.

To a certain extent, by means of this species, a transition is created between the species described previously and the three following ones. It is recognised by the fact that, although resembling *B. pulchrum* Schltr. in habit, it does not possess a labellum which is long-pointed towards the apex. The flowers are white, the outside tinged with red, the labellum white with one white-yellow and two brown-red central stripes.

8. *B. longilabre* Schltr., sp. nov.

Epiphyticum, pusillum, usque ad 10 cm altum; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis, obtuse tetragonis, unifoliatis, 1–1.5 cm altis, infra medium 0.6–1 cm diametientibus; foliis erectis, ligulatis, obtusis cum apiculo minuto, basi subpetiolato-angustatis, glabris, textura chartaceis, 3.5–7 cm longis, medio fere 0.8–1 cm latis; scapis basilaribus, erectis vel suberectis, filiformibus, unifloris, vaginulis paucis parvulis obsessis, 2.5–3.5 cm longis; bractea amplexante, ovali, apiculata, ovario gracillime pedicellato multo brevior; flore in genere vix inter majores, erecto vel suberecto; sepalis reflexis, e basi lanceolata linearibus, obtusis, glabris, c. 2.5 cm longis, lateralibus obliquis; petalis adscendentibus, oblongo-falcatis, obtusis, glabris, 3.5 mm longis; labello linguiformi, lineari-convexo, obtuso, glabro, superne carina longitudinali donato, subtus excavato, sepala distincte superante, 3 cm longo; columna gracili curvata, subapoda, brachiis decurvis aliformibus, obtuse trilobulatis; anthera oblongoide-quadrata, cucullata, obtusa, umbonata, glabra; ovario cum pedicello gracillimo glabro, c. 2.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17157 (TYPE), flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19029, flowering in Dec. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17971, flowering in July 1908; no. 18140, flowering in Sept. 1908.

A very characteristic species. It is recognised easily by the labellum which very

distinctly exceeds the sepals in length. It is related closely to *B. alticola* Schltr., described below. The species is proof that many New Guinea orchids are restricted to a small area. I have often found the plant in a small area, but always as single specimens, although outside this I never found a trace of it again. The flowers are white, the sepals finely streaked with red towards the base, the petals red.

9. *B. dolichoglottis* Schltr., sp. nov.

Epiphyticum, pusillum, caespitificum, 4–5 cm altum; rhizomate abbreviato, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis, obtuse tetragonis, unifoliatis, 0.5–0.8 cm altis, infra medium 2.5–3.5 mm diametentibus; foliis erectis, ellipticis vel elliptico-ligulatis, obtusis vel obtusiusculis cum apiculo minuto, basi breviter petiolato-angustatis, glabris, textura subcoriaceis, 1.2–3.3 cm longis, medio fere 0.4–0.8 cm latis; scapis basilaribus, erectis, filiformibus, unifloris, vaginulis paucis amplexantibus obsessis, glabris, 1.5–2 cm altis; bractea parvula ovali, apiculata, ovario pedicellato multo brevior; flore erecto vel suberecto, in genere mediocri, illo *B. longilabris* Schltr. simili, sed minore; sepalis anguste lanceolato-linearibus, obtusis, glabris, 2 cm longis, lateralibus obliquis; petalis adscendentibus, falcatis, oblique obovato-spathulatis, obtusis, glabris, 0.3 cm longis; labello e basi obtuse et breviter auriculata lineari, obtuso, convexo, glabro, superne leviter carinato, subtus excavato, 2.4 cm longo; columna gracili arcuata, apoda, brachiis brevibus pluridentatis, dente inferiore deflexo lineari longiore; anthera ellipsoideo-cucullata, umbonata, papillosa; ovario cum pedicello gracili glabro, 0.8–1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, on the upper Waube Creek (Waria District), alt. c. 700 m—R. Schlechter no. 19451, flowering in May 1909.

A close relative of *B. longilabre* Schltr., but smaller in all its parts and well distinguished by the flower-colouring, the petals and the column. The flowers are streaked with red on the outside, white inside, the labellum snow-white, the petals red-spotted.

10. *B. alticola* Schltr., sp. nov.

Epiphyticum, pusillum, 5–6 cm altum; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, 0.7–1 cm altis, infra medium 0.3–0.5 cm diametentibus; foliis erectis, lanceolato-ligulatis, subacutis, basi subpetiolato-angustatis, glabris, textura subcoriaceis, 2.5–4 cm longis, medio vel infra medium 0.4–0.6 cm latis; scapis basilaribus, erectis vel suberectis, filiformibus, unifloris, vaginulis paucis amplexantibus obsessis, glabris, 1.5–2 cm altis; bractea elliptica, apiculata, amplexante, ovario pedicellato multo brevior; flore erecto vel suberecto, in genere inter mediocres; sepalis reflexis, lanceolato-linearibus, obtusiusculis, glabris, 2.1 cm longis, lateralibus intermedio paululo latioribus, obliquis; petalis falcatis, anguste lanceolatis, acuminatis, glabris, 3.75 mm longis; labello e basi minute et obtuse concavo-auriculata lineari-ligulato, subacuto, convexo, glabro, subtus excavato, sepalis aequilongo; columna graciliore curvata, apoda, brachiis quadratis antice inaequaliter denticulatis; anthera oblongoideo-cucullata, apiculata, umbonata, glabra; ovario cum pedicello gracillimo glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18807, flowering in Nov. 1908.

This pretty little species closely approaches *B. dolichoglottis* Schltr. and *B. longilabre* Schltr. but is distinguished from the latter by the smaller dimensions of its vegetative organs and smaller flowers, and from both by its very different petals. The flowers are violet-pink with a snow-white lip.

11. *B. decurvulum* Schltr., sp. nov.

Epiphyticum, humile, 10–20 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideo-conicis vel conico-cylindraceutis, unifoliatis, 1–4 cm altis, infra medium 0.3–0.7 cm diametentibus; foliis erectis, lanceolato-ligulatis, acutis, basi subpetiolato-angustatis, glabris, 6–18 cm longis, medio fere 1.1–2.5 cm latis; scapis abbreviatis, unifloris, vaginulis paucis amplexantibus obsessis, 1–2 cm longis; bractea elliptico-cucullata, acuminata, ovario pedicellato multo brevior; flore mediocri, erecto vel suberecto; sepalis ellipticis, apiculatis, glabris, 1.7 cm longis, lateralibus recurvis, intermedio distincte latioribus; petalis decurvis, oblique lineari-ligulatis, obtusis, glabris, 0.8 cm longis; labello elliptico, obtusiusculo, glabro, leviter concavulo,

marginibus praesertim basin versus incrassatulis, glabro, 1.5 cm longo, medio fere 0.6 cm lato; columna leviter arcuata basi ampliata, apoda, brachiis leviter decurvulis paucidentatis, cum dente inferiore paulo longiore; anthera ovato-cucullata, breviter acuminata, umbonata, glabra; ovario cum pedicello glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Mimi Mountain (Waria District), alt. c. 800 m—R. Schlechter no. 19465, flowering in May 1909.

A very characteristic species which is not related closely to any other currently known species. The sepals are cherry-red and white-margined, the petals dark carmine-red; the labellum brown, edged with golden yellow.

12. *B. rhynchoglossum* Schltr., sp. nov.

Epiphyticum, gracile, pusillum, 7–10 cm altum; rhizomate brevi, decumbente; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis approximatis, ovoideis, unifoliatis, 0.5–1 cm altis, infra medium 0.3–0.5 cm diametientibus; foliis erectis, lineari-ligulatis, subacutis vel minute apiculatis, basi angustatis, glabris, textura subcoriaceis, 2–4.5 cm longis, medio fere 0.2–0.6 cm latis; scapis basilaribus, erectis, gracillimis, filiformibus, vaginulis paucis distantibus parvulis obsessis, unifloris, glabris, 3–5 cm longis; bractea ovata, amplexente, ovario graciliter pedicellato multo brevior; flore erecto vel suberecto, in genere inter mediocres; sepalis reflexis, lanceolatis, acutis, glabris, 1.8 cm longis, lateralibus paulo obliquis; petalis falcato-lanceolatis, acutis, glabris, vix 0.3 cm longis; labello e basi breviter et obtuse auriculata anguste lanceolato-linguiformi, acuto, glabro, 1.2 cm longo, medio 2.25 mm lato; columna graciliore, leviter arcuata, glabra, subapoda, brachiis porrectis, antice 3-dentatis; anthera rhomboideo-cucullata, umbonata, glabra; ovario cum pedicello gracili glabro, c. 1.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19665, flowering in June 1909.

This species is very characteristic in the shape of the labellum and is related more closely to the species following than those earlier described. The flowers are red, the labellum whitish at the apex.

13. *B. trigonocarpum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 218.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14379, flowering in Apr. 1902.

Unfortunately, I have not found this species again and possess only two plants and one dissected flower. According to this material I must regard it as a relative of *B. rhynchoglossum* Schltr., but its position is not quite certain on account of the rather scanty material.

The flowers are golden yellow.

14. *B. gobiense* Schltr., sp. nov.

Epiphyticum, pusillum, 8–10 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 1.2–1.4 cm longis, infra medium 3.5–4.5 mm diametientibus; foliis erectis, lanceolato-ligulatis, acutis vel minute apiculatis, basi subpetiolato-angustatis, glabris, 4–7.5 cm longis, 0.6–1 cm latis; scapis basilaribus, erectis, gracillimis, filiformibus, glabris, vaginulis paucis distantibus parvulis obsessis, 5–6 cm longis; bractea ovali, amplexente, ovario graciliter pedicellato multoties brevior; flore suberecto, mediocri; sepalis reflexis, oblongis, acutis, glabris, extus nervis 3 incrassatis, 1.3 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis minutis ovato-subfalcatis, acuminatis, glabris, vix 1.5 mm longis; labello e basi minute et obtuse concavo-auriculata sensim dilatato, elliptico, convexo, obtusiusculo, speculo glabro excepto superne minute verruculoso, marginibus recurvulis, subtus concavo, bicarinato, c. 1 cm longo, medio fere 0.4 cm lato; columna parvula, graciliore, curvata, basi ampliata, apoda, brachiis oblique truncatis, antice paucidentatis; anthera alticordata, umbone magno oblongo donata, glabra; ovario cum pedicello gracillimo, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees on the Waria [River] near Gobi, alt. c. 350 m—R. Schlechter no. 19850, flowering in June 1909.

A very pretty little species which is related closely to *B. chrysoglossum* Schltr., but differs in the petals and the labellum. The flowers are dark purple; the labellum golden

yellow, purple towards the base, the petals white with purple spots.

15. *B. chrysoglossum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 198.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–1000 m—R. Schlechter no. 14564, flowering in Apr. 1902; no. 20032, flowering in Sept. 1909.

The specimens collected on my last expedition were rather more slender than the Type. [Ed.—no. 14564.] Better material of the species now shows that the labellum is slightly warty-papillose and, likewise, the appendage of the anther.

The flowers are red, sometimes with yellowish tips, the labellum is golden yellow.

16. *B. trachyglossum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 217.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14685, flowering in July 1902.

This species, as I have stated previously, is closely related to *B. chrysoglossum* Schltr. Apart from the colour of the flowers, it is recognised by the more pointed leaves; the labellum which is covered thickly with papillae, narrower and distinctly contracted from the middle, and the column-arms which are not two-toothed, as in *B. chrysoglossum*, but are serrate in front. The flowers are dark purple.

17. *B. chrysochilum* Schltr., sp. nov.

Epiphyticum, parvulum 10–16 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 1.5–3 cm altis, infra medium 0.3–0.4 cm diametientibus; folio erecto, elliptico-lanceolato, acuto vel subacuto, basin versus angustato, 9–13 cm longo, medio fere 1–2 cm lato; scapis erectis, gracillimis, filiformibus, unifloris, vaginulis paucis arcte amplexentibus distantibus obsessis, glabris, 5–6 cm longis; bractea elliptica, amplexente, ovario gracili multo brevior; flore erecto, in sectione mediocri, illo *B. chrysoglossi* Schltr. simili; sepalis reflexis, oblongo-ligulatis, subacutis, glabris, c. 1 cm longis, lateralibus obliquis, sublanceolatis; petalis oblique suborbiculari-ovatis, breviter acuminatis, glabris, minutis, vix 0.75 mm longis; labello e basi auriculata angusta circuitu lanceolato-ligulato, obtuso, marginibus recurvis, subtus sulcatis, tertia parte basilari excepta superne perdense et brevissime papilloso-puberulo, toto 7.5 mm longo, medio fere 2 mm lato; columna minuta, incurvula, apoda, brachiis porrectis brevibus, antice paucidentatis; anthera oblongoideo-cucullata, umbone magno oblongo donata, basi cordata, glabra; ovario cum pedicello gracili glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17969, flowering in July 1908.

Is related closely to *B. trachyglossum* and *B. chrysoglossum* but is distinguished by its larger and broader leaves, the broader and shorter petals, the shape of the lip and the anther. The flowers are dark red with paler tips on the inside, the labellum is golden yellow.

18. *B. stenophyllum* Schltr., sp. nov.

Epiphyticum, caespitificum, humile, 7–11 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, unifoliatis, 1.3–2 cm altis, infra medium 3.5–6 mm diametientibus; folio erecto vel suberecto, oblique lineari, apiculato, basi paulo angustato, 5–9.5 cm longo, medio fere 3–5 mm lato, glabro; scapis basilaribus, erectis, filiformibus, unifloris, vaginulis paucis distantibus, obsessis, glabris, 3–4 cm longis; bractea parvula elliptica, amplexente, glabra, ovario pedicellato multo brevior; flore erecto, in genere inter mediocres, suberecto; sepalis reflexis, oblongo-ligulatis, minute apiculatis, glabris, 0.8 cm longis, lateralibus paulo obliquis et intermedio paululo latioribus; petalis falcato-lanceolatis, acuminatis, margine anteriore supra basin subangulato-dilatatis, c. 1.5 mm longis; labello e basi minute concavo-auriculata tertia parte basilari angustato, deinde ligulato, obtusiusculo, medio paululo dilatato, superne leviter papilloso, marginibus recurvis subtus concavo, 0.6 cm longo, medio fere 1.75 mm lato; columna parvula basi dilatata, subapoda, brachiis abbreviatis, antice breviter biangulatis, quadratis; anthera cucullata, umbone oblongo apiculato donata, glabra; ovario gracillime pedicellato glabro, pedicello incluso 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 900 m—R. Schlechter no. 18108, flowering in Aug. 1908; on trees in the forests of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 18521, flowering in Oct. 1908.

Among the species related to *B. chrysoglossum*, this one is distinguished by the narrow leaves and the lanceolate, falcate petals. The flowers are whitish with rose-red veins, the labellum golden yellow with a brown-red apex.

19. *B. microrhombos* Schltr., sp. nov.

Epiphyticum, pusillum, c. 5 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideis vel cylindraco-ovoideis, 0.8–1.2 cm altis infra medium 3.5–5.5 mm diametientibus; folio erecto vel suberecto, ligulato vel oblongo-ligulato, minute apiculato, glabro, 2–3 cm longo, medio fere 0.4–0.8 cm lato; scapis basilaribus, gracillimis, filiformibus, vaginulis paucis distantibus obsessis, glabris, 2.5–3 cm longis, unifloris; bractea minuta, elliptica, vaginante, ovario pedicellato multoties brevior; flore erecto vel suberecto, in sectione mediocri; sepalis ligulatis subapiculatis, glabris, 0.8 cm longis, lateralibus paulo obliquis; petalis minutis oblique rhombeis, acutis, glabris, c. 1 mm longis, labello e basi minute concavo-auriculata in quarta parte basali leviter constricto, deinde sursum paululo ampliato, circuitu convexo-ligulato, obtusiusculo, marginibus revolutis subtus excavato, quarta parte basilarum excepta superne minute papilloso-puberulo, 5.5 mm longo, medio fere 1 mm lato; columna parvula curvata, pede incrassata, subapoda, brachiis abbreviatis antice inaequaliter angulato-bidentatis; ovario cum pedicello gracili, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19757, flowering in June 1909.

In its flowering stage this plant rather gives one the impression of a small specimen of *B. chrysoglossum*, but differs from the latter in the thicker pseudobulbs, much shorter leaves and small rhomboid petals. The column also is distinctly different. The flowers are red; the labellum golden yellow and red at the base.

20. *B. Jadunae* Schltr., sp. nov.

Epiphyticum, decumbens, pusillum, 2.5–3.5 cm altum; rhizomate brevi, decumbente, dense pseudobulbis obsessis; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindracois, unifoliatis, plus minusve depressis, 0.3–0.6 cm longis, medio vel infra medium 1.5–2.5 mm diametientibus; folio erecto vel suberecto, oblanceolato vel oblanceolato-elliptico, obtuso, basi sensim subpetiolato-angustato, 1.5–2.5 cm longo, medio fere 0.4–0.6 cm lato; scapis setiformibus, gracillimis, erectis, basi vaginulis paucis obsessis, 1–1.5 cm longis, unifloris; bractea parvula, elliptica, amplexante, ovario pedicellato multoties brevior; flore in sectione vix mediocri, suberecto; sepalis recurvis, glabris, c. 1 cm longis, intermedio lanceolato, obtusiusculo, lateralibus obliquis, oblongo-ligulatis, obtusiusculis, nervis 3 extus leviter prominulis; petalis ascendentibus, obovato-ligulatis, obtusis, subfalcatis, 2.75 mm longis; labello immobili e basi concavo-auriculata, paulo ampliato circuitu oblanceolato-ligulato, dimidio anteriore paulo ampliato, marginibus recurvis valde convexo, obtuso, superne carina mediana obtusa donato, subtus longitudinaliter carinato, 0.9 cm longo, dimidio superiore 2.5 mm lato; columna arcuata, gracili, apoda, brachiis paucilaceratis, clinandrio dorso lacerato elato; anthera cordata, quadrato-cucullata, umbone oblongo donata; ovario cum pedicello gracillimo glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19300, flowering in Apr. 1909.

A charming little species which stands rather isolated, but on the other hand seems to show a certain affinity with *B. longilabre* Schltr. In habit it is distinguished easily from the species described above by its depressed pseudobulbs. The sepals are white with red stripes, the petals dark red and white towards the base, the labellum red with a white claw.

21. *B. mystrochilum* Schltr., sp. nov.

Epiphyticum, decumbens, c. 4 cm altum; rhizomate abbreviato, dense pseudobulbis obsessis; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-cylindracois, unifoliatis, glabris, 0.7–1 cm longis, infra medium 2.5–4 mm diametientibus; folio erecto vel suberecto, anguste ligulato, minute apiculato, basin versus sensim subpetiolato-angustato, glabro, 2–2.5 cm longo, 2.5–4 mm lato;

scapo valde abbreviato, unifloro, vaginulis paucis oblecto, c. 0.5 cm longo; bractea triangulata, acuta, ovario pedicellato multo brevior; sepalis patentibus, oblongis, breviter acuminatis vel apiculatis, margine minute ciliolatis, lateralibus obliquis, margine superiore eciliolatis; petalis minutis oblique oblongo-ligulatis, obtusis, margine sparsim ciliolatis; labello immobili cochleato-pandurato, basi minute auriculato, dimidio anteriore cochleari-obovato, concavulo, obtusissimo, subtus dense puberulo, margine ciliolato, 3.5 mm longo, dimidio superiore 1.5 mm lato; columna leviter arcuata, subapoda, brachiis porrectis antice biangulatis, oblongo-quadratis; anthera reniformi-cucullata, umbone elliptico apiculato donata, glabra; ovario pedicellato glabro, pedicello gracili incluso c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 19181, flowering in Jan. 1909.

Of this species, unfortunately, I possess only a small plant with a single flower. It is characterised in the section by the shape of the lip and stands isolated completely. The flowers are whitish with red veins; the labellum is red with a yellow apex.

22. *B. melinoglossum* Schltr., sp. nov.

Epiphyticum, humile, 4–7 cm altum; rhizomate valde abbreviato-radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideo-cylindraceis, unifoliatis, 0.5–0.9 cm altis, infra medium 0.2–0.4 cm diametientibus; folio erecto, anguste elliptico-ligulato, minute apiculato, basi angustato, glabro, 2.5–6.5 cm longo, medio fere 0.7–1.4 cm lato; scapis basilaribus, abbreviatis, unifloris, vaginulis paucis parvulis obsessis; bractea elliptica, apiculata, ovario pedicellato multo brevior; flore erecto vel erecto-patente, in sectione inter minores; sepalis lanceolato-ligulatis acutis, glabris, c. 1.1 cm longis, lateralibus obliquis; petalis circuite ovato-lanceolatis, subacutis, supra basin utrinque in lobulum abbreviatum obtusum dilatatis, glabris, c. 1 mm longis; labello e basi angustata minute concavo-auriculata infra medium dilatato, lanceolato-ligulato, obtuso, marginibus revolutis, superne convexo tertia parte basali excepta minutissime papilloso-puberulo, subtus concavo, carina bipartita puberula usque ad medium fere decurrente, toto 0.8 cm longo, medio fere 2.5 mm lato; columna leviter arcuata, basi dilatata, subapoda, parvula, brachiis abbreviatis quadratis, dente decurvo donatis, antice truncatis, clinandrio lacerato; anthera cordato-ovata, obtusa, umbone oblongo papilloso donata; ovario cum pedicello gracili glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19879, flowering in June 1909.

This constitutes a very characteristic species which, with the habit of *B. kelelense* Schltr., combines the much shortened flower-scape of the species related to *B. chrysoglossum* Schltr. The flowers are rose-red; the labellum pale yellow and red at the base; the petals white with red spots.

23. *B. kelelense* Schltr., sp. nov.

Epiphyticum, humile, 7–14 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis aggregatis, cylindraceo-ovoideis, unifoliatis, 1–2.3 cm altis, infra medium 4.5–10 mm diametientibus; folio erecto oblongo-ligulato, apiculato, basi sensim paulo angustato, glabro, 5–12 cm longo, medio fere 1–2.5 cm lato; pedunculis basilaribus aggregatis, brevissimis, vaginulis paucis oblectis, c. 7 mm longis, unifloris; bractea minuta, triangula, acuta, ovario multo brevior; flore erecto, in sectione inter minores; sepalis reflexis lanceolatis, acutis, glabris, 0.6 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis oblique subfalcato-lanceolatis, acutissimis, supra basin margine utrinque sublobato-dilatatis, 1.25 mm longis; labello sessili, linguiformi-cylindraceo, obtusiusculo, infra medium paululo constricto, basi subauriculato-marginato, tertia parte basilaribus excepta sparsim verruculoso-auriculato, 4.5 mm longo, medio fere 1 mm diametro; columna leviter arcuata parvula, subapoda, brachiis brevibus laceratis; anthera ovato-cucullata, umbone oblongo donata, glabra; ovario cum pedicello gracili, glabro; c. 5.5 mm longo.

Kaiser-Wilhelms-Land: On trees alongside the creeks near Keel on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16155, flowering in June 1907.

With this species begin those forms with almost sessile inflorescences. This species is related to the next one, but has very different floral segments. The flowers are red.

24. *B. leontoglossum* Schltr., sp. nov.

Epiphyticum, humile, 6–12 cm altum; rhizomate valde abbreviato, radicibus filiformibus, elongatis,

flexuosis, glabris; pseudobulbis cylindraceo-ovoideis vel ovoideis, unifoliatis, 0.7–1.7 cm altis, infra medium 0.3–0.7 cm diametientibus; folio elliptico-ligulato vel ligulato, apiculato, basi sensim paulo angustato, glabro, 4–10 cm longo, medio fere 0.7–1.5 cm lato; pedunculis vulgo aggregatis, brevissimis, vaginulis paucis obtectis, 2–3 mm longis, unifloris; bractea parvula apiculata, ovario multo brevior; flore erecto vel suberecto, in sectione inter minores; sepalis oblongis, apiculatis, glabris, 4 mm longis, lateralibus obliquis; petalis minutis subfalcatis, lanceolato-ligulatis, subacutis, glabris, c. 1 mm longis; labello immobili, oblongoideo-cylindraceo, obtuso, dimidio anteriore dense muricato-papilloso, basi superne subauriculato-marginato, 3 mm longo, medio fere 1.5 mm diametro; columna leviter curvatula, apoda, brachiis porrectis antice truncatis, margine superiore tridentatis, dente anteriore longiore; anthera ovato-cordata, cucullata, umbone oblongo donata, glabra; ovario cum pedicello brevi glabro, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River] at the foot of the Torricelli Range, alt. c. 150 m—R. Schlechter no. 20354, flowering in Sept. 1909.

Of this very distinctive species there is, unfortunately, only very scanty material. It is recognised easily from its relatives by the short, thick lip. The flowers are dark cherry-red with a whitish column.

25. *B. aureoapex* Schltr., sp. nov.

Epiphyticum, humile, 4–9 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis aggregatis, ovoideis, unifoliatis, 0.8–1.2 cm altis, infra medium 4–7 mm diametientibus; folio erecto, elliptico vel oblongo, obtusiusculo vel minute apiculato, basi cuneato-angustato, glabro, 3–7.5 cm longo, medio fere 1.6–2.5 cm lato; pedunculis basilaribus brevissimis, unifloris, vaginulis paucis obtectis, c. 2 mm longis, bractea minuta acuminata, ovario multoties brevior; flore in sectione inter minores, erecto-patente; sepalis reflexis, oblongo-lanceolatis, acuminatis, glabris, 0.6 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis falcato-lanceolatis, acuminatis, infra medium utrinque margine leviter sublobato-dilatatis, c. 1.75 mm longis; labello immobili, semicylindraceo, lineari-ligulato, apiculato, basi superne marginato, subtus sparsim subverrucosa-rugoso, 0.4 cm longo; columna leviter arcuata, apoda, brachiis porrectis, antice truncatis, margine superiore subdentatis, apiculo terminatis; anthera ovato-cordata, cucullata, glabra, umbone oblongo apiculato donata; ovario cum pedicello brevi glabro, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees on the banks of the Garup [River] at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 20021, flowering in Sept. 1909.

It is related to *B. leontoglossum*, but is distinguished by its broader leaves, the shape of the flower and the very different floral parts. The flowers are dark carmine-red with a golden yellow tip to the labellum and a white column. The petals are whitish with a red spot above the base.

26. *B. cruciatum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XLV (1911), p. 8.

Kaiser-Wilhelms-Land: On tree-trunks in the mountain forests near Jaduna, alt. c. 300 m—R. Schlechter no. 19297, flowering in Apr. 1909.

I believe this species has been identified quite correctly with that described by J.J. Smith, although, according to the drawing made by me from living material, it differs from that given in Smith's illustration in 'Nova Guinea' VIII, t. CII.f.c. in the shape of the lateral sepals and in the dense, papillose hairiness. J.J. Smith has had a copy of my drawing from the beginning of 1910.

The flowers are whitish on the outside, inside spotted with carmine-red, the labellum yellow-brown, finely dotted with red, the column white.

27. *B. immobile* Schltr., sp. nov.

Epiphyticum, decumbens, c. 12–15 cm altum; rhizomate repente, dense pseudobulbis obsesso, polyrhizo; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis oblique depresso-conicis, suborbicularibus, c. 1 cm altis, usque ad 2 cm diametientibus, unifoliatis; folio erecto oblanceolato-ligulato vel anguste elliptico-ligulato, minute apiculato, basi subpetiolato-angustato, glabro, textura subcoriaceo, 8–13 cm longo, medio vel supra medium 1.2–2 cm lato, pedunculis basilaribus singulis, brevissimis, unifloris, vaginulis paucis obtectis, c. 3 mm longis; bractea minuta, ovario multo brevior;

flore erecto vel suberecto, illo *B. cruciati* J.J. Sm. simili et fere aequimagno; sepalis patentibus, glabris, c. 7.5 cm longis, intermedio lineari-ligulato, subacuto, lateralibus oblique oblongo-lanceolatis acuminatis, petalis subfalcatis circuitu ovato-lanceolatis, acutis, supra basin margine anteriore in dentem falcatum linearem productis, margine posteriore lobulo obtuso triangulo donatis, 1.5 mm longis; labello immobili, e basi obtuse auriculata lineari-ligulato, obtusiusculo, infra medium leviter constricto, superne tertia parte basali excepta minute verruculoso-papilloso, 6.5 mm longo, c. 1.25 mm lato; column arcuata, basi paulo ampliata, apoda, brachiis rhombeis brevibus, apice in apiculum adscendentem productis; anthera oblongoideo-cucullata, umbonata, glabra; ovario cum pedicello brevi glabro, c. 0.8 cm longo.

Kaiser-Wilhelms-Land: On the branches of large primary forest trees near Kelel on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16184, flowering in June 1909 [Ed.—probably 1907].

A close relative of *B. cruciatum* J.J. Sm. from which it may be distinguished by the striated flowers, the shape of the petals, the more slender labellum and the column-arms. The flowers are white, striated with purple, the labellum striated with brown.

28. *B. leucorhodum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, c. 20 cm longum; rhizomate cauliformi, dense pseudobulbis obsessio; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis approximatis, conico-cylindraceutis, unifoliatis, 1.3–1.5 cm longis, infra medium 3–4 mm diametientibus; folio erecto, ligulato, obtuso, basi subpetiolato-angustato, glabro, textura subcoriaceo, 7–10 cm longo, medio fere 0.8–1.3 cm lato; pedunculo brevissimo, unifloro, vaginulis paucis oblecto, c. 4 mm longo; bractea lanceolata, ovario fere aequilonga, acuta; flore in sectione inter minores, erecto-patente; sepalis patentibus vel subreflexis, glabris, 7.5 mm longis, oblongis, breviter acuminatis, lateralibus obliquis, intermedio paulo latioribus; petalis oblique lineari-ligulatis, basi et infra apicem paulo dilatatis, margine minute subdentulato-irregularibus, 3 mm longis; labello anguste linguiformi, obtuso, infra medium leviter constricto, basi incrassatione oblonga donato, subtus foveolato, 5 mm longo, supra medium 2 mm lato, incrassatione basali excepta minutissime papilloso-punctato; columna subrecta, subapoda, brachiis triangulari-falcatis adscendentibus, brevibus; anthera rotundato-cucullata, glabra, umbonata, apice minute trilobulata; ovario cum pedicello perbrevis, glabro, c. 0.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17149, flowering in Jan. 1908.

With this species begin those species of the section which are distinguished by their stem-like rhizomes, growing either upwards or overhanging. Some of these species are branched. The species described here is distinguished easily from the rest by the colour of the flowers and by the narrow petals. These petals will be found only on the following species, *B. Pemae* Schltr. The flowers are otherwise lustrous red with a snow-white dorsal sepal.

29. *B. Pemae* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 25 cm longum; rhizomate cauliformi, simplici vel subsimplici, vaginis latis arcte amplexentibus oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceutis, facie leviter compressis, rhizomati subappressis, unifoliatis, 4–6 mm longis, medio fere c. 2 mm diametientibus; folio erecto, lineari-ligulato, apiculato, basi subpetiolato-angustato, glabro, 3–5.5 cm longo, medio fere 4–6 mm lato; pedunculis singulis juxta basin pseudobulborum, brevissimis, unifloris, vaginulis paucis oblectis, c. 5 mm longis, bractea lanceolata, acuta, ovario aequilonga; flore in sectione inter minores, erecto-patente; sepalis oblongis, apiculatis, glabris, 0.4 cm longis, lateralibus reflexis, basin versus paulo dilatatis, obliquis; petalis oblique ligulatis, obtusiusculis, margine anteriore infra apicem paululo dilatatis, c. 2 mm longis; labello immobili spathulato-ligulato, obtuso, carnosulo, leviter subverruculoso-pustuloso, 3.25 mm longo; columna mediocri, pro genere subgraciliore, subapoda, petalis paulo brevior, brachiis adscendentibus, antice truncatis, angulo superiore apiculatis; anthera ovato-cucullata, glabra, apiculata, dorso umbonata; ovario sessili cylindraceuto, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema on the Waria [River], alt. c. 400 m—R. Schlechter no. 19422, flowering in May 1909.

An interesting species which most closely approaches *B. warianum* Schltr.

described below, yet differs in the narrow petals and the other floral segments. The flowers are whitish, striated with red; the labellum with reddish pustules.

30. *B. warianum* Schltr., sp. nov.

Epiphyticum, adscendens vel patulum, usque ad 20 cm longum; rhizomate cauliformi, sensim elongato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraco-conicis, unifoliatis, satis densis, rhizomati subparallelis, 1.2–1.7 cm longis, supra basin 2.5–4 mm diametientibus; foliis erectis vel suberectis, ligulatis vel lineari-ligulatis, minute apiculatis, basi attenuatis, glabris, 4–7 cm longis, medio fere 0.7–0.9 cm latis; inflorescentiis unifloris, valde abbreviatis, pedunculo c. 4 mm longo, vaginis amplexantibus obecto; bractea vaginis simili, apiculata, ovario brevior; flore in sectione inter minores, glabro; sepalis oblongis, apiculatis, 0.5 cm longis, lateralibus reflexis, obliquis, intermedio paululo latioribus; petalis rhomboideo-ellipticis, subacutis, leviter obliquis, 1.75 mm longis; labello immobili, carinoso, ligulato, obtusiusculo, subtus sulcato, medio subconstricto, c. 4 mm longo; columna apoda, leviter curvata, petalis paulo brevior, brachiis subporrectis oblongo-quadratis, paucidentatis, dente intermedio longior; anthera oblongo-cucullata, umbone apiculato donata, glabra; ovario sessili glabro, cylindrico, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on Waube Creek, in the Waria Valley, alt. c. 400 m—R. Schlechter no. 19438, flowering in May 1909.

As previously stated, this species stands near *B. Pemae* Schltr. It has, nevertheless, quite different petals and a smooth glabrous labellum. The flowers are violet with white tips; the petals violet, column white.

31. *B. stictanthum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 40 cm longum; rhizomate elongato, cauliformi, flexuoso, vaginis satis amplis cucullatis obecto, laxe pseudobulbis obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis erecto-patentibus, cylindraco-conicis, unifoliatis, 1.5–2 cm longis, supra basin 3.5–4.5 mm diametientibus; folio suberecto, elliptico-ligulato, apiculato, basi subpetiolato-angustato, glabro, 5–8 cm longo, medio fere 1.2–2 cm lato; pedunculis valde abbreviatis, unifloris, vaginis obiectis; bractea vaginis simili, ovario paulo brevior; flore in sectione inter minores, glabro; sepalis ovalibus, apiculatis, reflexis, c. 0.5 cm longis, lateralibus obliquis basi margine anteriore paulo dilatatis; petalis minutis oblique ovato-lanceolatis, acutis, 1.5 mm longis; labello immobili oblongo, obtuso, carnosulo, subtus sulcato, 3.5 mm longo; columna apoda, leviter curvata, petalis duplo longior, brachiis rhombeis margine superiore paucidentatis; anthera oblongoideo-cucullata, umbonata, glabra; ovario cylindrico, sessili, glabro, 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19536, flowering in May 1909.

A species standing rather isolated as regards flowers and habit, with small dainty flowers, but which will hardly come into favour on account of its very short peduncles. The flowers are whitish with sepals thickly spotted with red and red-brown lip.

32. *B. acanthoglossum* Schltr., sp. nov.

Epiphyticum, patulum usque ad 25 cm longum; rhizomate cauliformi, elongato, vaginis amplexantibus obsesso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis usque ad 5 cm distantibus, subcylindricis, unifoliatis, rhizomati subparallelis, 1.2–1.5 cm longis, supra basin 3–4 mm diametientibus; folio erecto, oblongo-lanceolato, subacuto, basi subcuneato, glabro, 5.5–6.5 cm longo, medio fere 1.4–2 cm lato; pedunculis brevissimis, vaginis obiectis, unifloris; bractea lanceolata, acuminata, ovario subaequilonga; flore in sectione inter minores; sepalo intermedio oblongo-ligulato, apiculato, glabro, 8.5 mm longo, lateralibus obliquis, aequilongis, ovato-oblongis, apiculatis; petalis circuitu oblique ovato-oblongis, obtusis, infra medium margine utrinque lobulo brevi obtuso donatis, 1.5 mm longis; labello immobili, anguste ligulato, obtuso, utrinque spinuloso-papilloso, basi concavo-auriculato, 7 mm longo; columna apoda curvata, petalis subduplo longior, brachiis inaequaliter dentato-lobulatis; anthera cucullata, carinato-umbonata, glabra; ovario sessili, cylindrico, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20122, flowering in Sept. 1909.

Is distinguished easily from its relative, *B. oxyanthum* Schltr., by its prickly-papillose slender labellum. The flowers are red, the labellum brownish with yellow apex, the column green-yellow.

33. *B. monosema* Schltr., sp. nov.

Epiphyticum, patulum, 15–20 cm longum; rhizomate flexuoso, cauliformi, vaginis oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 1.5–2 cm distantibus, subcylindraceis, unifoliatis, 1.2–1.7 cm altis, supra basin 2.5–4 mm diametientibus; folio erecto, lanceolato-ligulato, acuto vel subacuto, basi cuneato, glabro, 5.5–8 cm longo, infra medium 1.4–2.2 cm lato; pedunculo unifloro, valde abbreviato, vaginis oblecto, 2–3 mm longo; bractea vaginis simili, ovario paulo brevior; flore in sectione inter minores; sepalis lanceolatis, apiculatis, recurvis, glabris, c. 0.9 cm longis, lateralibus obliquis basi margine superiore paulo dilatatis; petalis oblique latirhombeis, apiculatis, supra medium margine subdenticulatis, c. 1.5 mm longis; labello immobili anguste carnosoligulato, basi excepta muriculato-papilloso, subtus sulcato, 0.9 cm longo; columna apoda leviter curvato, brachiis quadratis, superne serrulatis cum dente apicali subulato; anthera cordato-cucullata, umbone apiculato donata, glabra; ovario cylindrico, sessili, c. 0.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 18541, flowering in Oct. 1908.

This species must be regarded as very closely related to *B. acanthoglossum* Schltr. The flowers are red, the labellum yellow-brown, the petals yellowish with a red spot; the column pale yellow.

34. *B. oxyanthum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 213.

Kaiser-Wilhelms-Land: On trees at the edges of creeks in the forests of the Torricelli Range, alt. c. 500 m—R. Schlechter no. 14394, flowering in Apr. 1902.

In habit this species is much like *B. acanthoglossum* Schltr. but it shows important differences in its flowers. The flowers are yellowish, the labellum reddish in the middle.

35. *B. torricellense* Schltr., sp. nov.

Epiphyticum, erectum, vel patulum, 10–17 cm longum; rhizomate cauliformi, vaginis cucullatis oblecto; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 1.2–1.5 cm distantibus, cylindraceis, brevibus, unifoliatis, 3–4.5 mm longis, 1.5–2 mm diametientibus; folio elliptico vel elliptico-ligulato, acuto vel subacuto, basi late cuneato, glabro, 4–6.5 cm longo, medio fere 1.5–2.2 cm lato; pedunculo perbrevis, vaginis paucis oblecto, unifloro; bractea vaginis simili ovario brevior; flore in sectione inter minores; sepalis lanceolatis, apiculatis, glabris, c. 0.7 cm longis, lateralibus obliquis, basi margine superiore paulo dilatatis; petalis falcato-incurvis, ovato-lanceolatis, dimidio superiore angustatis, margine anteriore medio subangulatis, glabris, 1.75 mm longis; labello immobili carnosoligulato, speculo basali excepto muriculato-papilloso, 6 mm longo, subtus basi sulcato; columna apoda, brachiis 4-dentatis; anthera oblongoideo-cucullata, glabra, umbonata, apiculato, ovario sessili, glabro, cylindrico, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20154, flowering in Sept. 1909.

From the related *B. oxyanthum*, this species may be distinguished by its compact growth, broader leaves, the colour of the flowers and the differently shaped floral segments. The flowers are pale yellow with dark purple petals and labellum.

36. *B. xanthophaeum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 10–25 cm longum; rhizomate cauliformi, vaginis cucullatis obsesso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1.5–2.3 cm distantibus, cylindraceis, unifoliatis, 0.8–1.3 cm altis, infra medium 3–4.5 mm diametientibus; folio erecto, elliptico vel elliptico-ligulato, subacuto vel minute apiculato, glabro, 4–8 cm longo, medio fere 1.3–2.6 cm lato; pedunculo valde abbreviato, vaginis paucis oblecto, unifloro; bractea vaginis simili, ovario plus minus brevior; flore in genere inter minores; sepalis oblongis, apiculatis, glabris, 0.7 cm longis, lateralibus obliquis, basi margine superiore paulo ampliatis; petalis oblique latirhombeis, subacutis, margine medio subangulatis, 1.25 mm longis; labello immobili, anguste oblongo-ligulato, obtuso, minute subverruculoso, subtus sulcato, 5.5 mm longo; columna subapoda, leviter curvata, brachiis quadratis, antice truncatis, margine superiore serrato-laceratis; anthera cordato-cucullata, umbone amplo apiculato ornata, glabra; ovario sessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Panebo (Minjem District), alt. c. 450 m—R. Schlechter no. 16943 (TYPE), flowering in Dec. 1907; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17242, flowering in Jan.

1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19019, flowering in Dec. 1908; on trees on the Ngoye [Creek] near Ambo, at the foot of the Finisterre Range, alt. c. 600 m—R. Schlechter no. 18131, flowering in Aug. 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 19156, flowering in Jan. 1909.

This species, *B. oxyanthum* and *B. torricellense* are related very closely to one another and, externally, look exceedingly alike. Nevertheless, I regard them as different species, because of the difference in the shape of the floral segments, a difference which appears to be quite constant. The flowers are yellow with brown shading; the labellum dark brown with a yellow apex.

§ 3. *Trachychilus*

The four species arranged here evidently are related closely to *Coelochilus*, from which, however, they may be distinguished by the lateral sepals which are connate to beyond the middle. As I have pointed out already in the division of the genus, adhesion of the lateral sepals often occurs in *Eu-Bulbophyllum*, but a real cohesion of these segments is only known in our Territory in the sub-genus *Bisepalum*. For this reason I consider the separation of *Trachychilus* and *Coelochilus* as thoroughly justified.

The species in question are epiphytes of the hills and mist-forests. Some, such as *B. Novae-Hiberniae* Schltr. and *B. humile* Schltr., seem to occur only in the mist-forests of the mountains, while *B. breve* Schltr. and *B. collinum* Schltr. rise from about 300 m altitude to the lower limit of the mist-forest, thus showing that they prefer more warmth.

37. *B. humile* Schltr., sp. nov.

Epiphyticum, caespitificum, usque ad 17 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis valde approximatis cylindraceo-conicis, unifoliatis, 1.5–2 cm altis, infra medium 3.5–5.5 mm diametientibus; folio erecto, oblique ligulato, acuto, basi subpetiolato-angustato, glabro, 8–13 cm longo, medio fere 1.3–2 cm lato; pedunculo valde abbreviato, vaginis obecto, unifloro; bractea ovato-lanceolata acuta, ovario brevior; flore erecto, pseudobulbum haud superante; sepalis anguste oblongis apiculatis, glabris, c. 0.8 cm longis, lateralibus obliquis usque infra apicem connatis; petalis oblique falcatis, ovato-lanceolatis, subacutis, infra medium margine utrinque unidentatis, c. 1.5 mm longis; labello immobili, anguste oblongo-ligulato, obtuso, basi cuneato, ima basi concavo-auriculato, superne minute papilloso, 7 mm longo; columna apoda, petala superante, brachiis brevibus, quadratis, minute incis; anthera rhombeo-cucullata, umbonata, glabra; ovario cum pedicello brevi glabro, c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17848, flowering in June 1908.

This is a close relative of *B. Novae-Hiberniae* Schltr. from which it is distinguished by the shape of the lip and its more robust growth. The flowers are whitish, striated with red and with a red lip.

38. *B. Novae-Hiberniae* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 211.

Neu-Mecklenburg: On trees in the mountain forests of Punam in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14641, flowering in July 1902.

A very characteristic species of the islands of the Bismarck Archipelago. So far as is known up to the present, it is related closely only to *B. humile* Schltr. The sepals are whitish, striated with violet, the labellum brownish.

39. *B. breve* Schltr., sp. nov.

Epiphyticum, breviter decumbens, usque ad 10 cm altum; rhizomate decumbente, brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideo-conicis, apicem versus attenuatis, unifoliatis, 0.8–1.2 cm altis, infra medium 4–7 mm diametientibus; folio erecto, ligulato, apiculato vel brevissime exciso, basi attenuato, glabro, 5.5–7 cm longo, medio fere 0.6–1 cm lato; pedunculo perbrevis, vaginulis

paucis abscondito, unifloro; bractea ovata, apiculata, ovario bene brevior; flore erecto, parvulo, pseudobulbo brevior; sepalis oblongis, apiculatis, glabris, 7.5 mm longis, lateralibus obliquis, usque infra apicem arcte connatis; petalis e basi breviter cuneata oblique quadratis, obtusissimis, glabris, vix 1 mm longitudine excedentibus; labello immobili, circuito oblanceolato-elliptico, obtuso, superne minute papilloso, basi concavo-auriculato, 6.5 mm longo; columna subapoda leviter curvata, brachiis brevibus antice dilatatis et oblique praemorsis, margine irregulariter inciso-serratis, petala subduplo superante; ovario subsessili, cylindrico, glabro, 0.4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River] (Minjem District), alt. c. 300 m—R. Schlechter no. 16563, flowering in Sept. 1907.

Among the species described previously, I know no others with which to compare this one, at least in the flower-structure, but it certainly is related closely to the following ones. I will return to the differences later. The flowers are dark red.

40. *B. collinum* Schltr., sp. nov.

Epiphyticum, breviter decumbens, 7–11 cm altum; rhizomate brevi, decumbente; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideo-conicis, unifoliatis, apicem versus attenuatis, 1–1.7 cm altis, infra medium 0.5–0.8 cm diametentibus; folio erecto, anguste lineari, acuto vel apiculato, basi attenuato, glabro, 5–9 cm longo, 0.7–1.1 cm lato; pedunculo valde abbreviato, vaginis paucis abscondito, unifloro; bractea ovato-cucullata, ovario bene brevior; flore erecto, parvulo, pseudobulborum dimidium vix excedente; sepalis oblongis, apiculatis, glabris, 6.5 mm longis, lateralibus obliquis, usque infra apicem connatis; petalis oblique ellipticis, obtusiusculis, margine irregularibus, glabris, 1 mm longis; labello immobili, oblanceolato-elliptico, obtusiusculo, basi concavo-auriculato, superne minutissime et dense papilloso-punctato, subtus bicarinato, medio sulcato, 0.5 cm longo; columna apoda, leviter curvata, brachiis antice dilatatis, oblique truncatis, irregulariter incis; anthera obcordato-cucullata, altiumbonata, glabra; ovario breviter pedicellato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Dscheregi (Waria District), alt. c. 400 m—R. Schlechter no. 17437 (TYPE), flowering in Mar. 1908; on trees in the forests of the Maboro [Range], alt. c. 900 m—R. Schlechter no. 19527, flowering in May 1909; on trees in the forests on the Govidjoa [Creek] (Waria District), alt. c. 800 m—R. Schlechter no. 19788, flowering in June 1909.

I have remarked already above that this species is related closely to *B. breve*. It differs from the latter in its narrower and smaller obtuse petals and the narrower labellum, provided below with two inflated keels. The flowers are striped with red, and the lip is dark red.

§ 4. *Manobulbon*

The sub-genus *Harpobrachium*, which is related closely to *Eu-Bulbophyllum*, is represented in the Territory by *Manobulbon* and the two sections which follow, although the formation of the stelidia of the column reminds one of some forms of *Hapalochilus*. In the latter, however, the column-foot is absent, whereas in the section under consideration it is always very much developed, as in the case of *Eu-Bulbophyllum*.

This section may be distinguished easily from *Uncifera* and *Diceras* by its habit, since all the species belonging to it possess a characteristic, widely creeping rhizome on which the pseudobulbs develop at considerable intervals from each other. Besides this, many of the species have a tendency to produce inflorescences on the rhizome at some distance from the pseudobulbs. The inflorescences are generally racemose, but in some species which undoubtedly belong here, constant single-flowered inflorescences also occur, which goes to prove that too much importance should not be attached to the inflorescence. It is difficult to state the number of species from adjacent regions because J. J. Smith recently has published a series of imperfect preliminary descriptions from which it is impossible to state even approximately, the relationship in this enormous genus.

These provisional descriptions by J.J. Smith (to whom I, in 1910, lent all my drawings so that he might copy them) evidently were made after the author had received similar material from Dutch New Guinea, so that he might anticipate me in the matter of publication. Consequently, I can only recognise their position in the genus in cases where he has stated the relationship of the species in the section. It is possible that *B. digitatum* J.J. Sm. belongs here, but the description is insufficient for critical purposes: *B. remotum* J.J. Sm. and *B. Dekockii* J.J. Sm. may, likewise, belong to this section.

From British Papua it is evident that no species of the section have been described.

The species which occur in German New Guinea are, with few exceptions, epiphytes of the mist-forests, where they are found usually embedded between moss on the trunks and branches of trees. Large areas often are occupied by their rhizomes which are sometimes several metres long. A few species, such as *B. pallidiflavum* Schltr. and *B. uduense* Schltr., are found in the forests of the hills on trees comparatively free from moss. The species are related closely and can be distinguished only by a strict analysis.

41. *B. microcharis* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 209.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14472, flowering in Apr. 1902.

Previously, I characterised this charming little species as belonging to the section *Monanthaparva*, but now believe that it belongs here, since the structure of the column entirely agrees with that of the other species of the section. The red colour of the flowers is certainly uncommon, but occurs also in *B. cylindrobulbon* Schltr.

42. *B. laxum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 205.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16651, flowering in Oct. 1907; on trees alongside the creeks in the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 13942, flowering in Jan. 1902.

This species, likewise, belongs here without doubt. It is by no means rare in the mist-forests of the central parts of Kaiser-Wilhelms-Land. The flowers are white.

43. *B. trichopus* Schltr., sp. nov.

Epiphyticum, pusillum, gracillimum, perlonge repens; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2–6 cm distantibus conico-subcylindraceis, unifoliatis, 0.7–1.5 cm altis, medio fere 2–3.5 mm diametientibus; folio erecto, lineari vel lineari-ligulato, obtuso, nunc cum apiculo minuto, 2–7.5 cm longo, medio fere 3–6 mm lato; pedunculis singulis, erectis, setiformibus, unifloris, vaginulis paucis distantibus obsessis, 1.3–2.5 cm altis; bractea elliptico-cucullata, ovario aequilonga; flore in sectione inter minores, glabro; sepalis oblongis, apiculatis, 0.6 cm longis, lateralibus obliquis; petalis oblique obovatis, obtusis, glabris, 2.5 mm longis; labello valde curvato, oblongo, valde obtuso, superne leviter curvato, petalis aequilongo; columna perbrevis, brachiis falcato-decurvis, margine superiore bilobulatis, pede perlongo; anthera cordato-cucullata, magnumbonata, glabra; ovario sessili, cylindrico, glabro, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19870, flowering in June 1909.

A close relative of *B. laxum* but differing in the larger flowers, more spatulate petals, blunt labellum and the stelidia of the column. The flowers are yellowish white.

44. *B. manobulbum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 207.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, above Bolobo, alt. c. 1000 m—R. Schlechter no. 16536, flowering in Sept. 1907; on trees in the forests

of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 19005, flowering in Dec. 1908; on trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 15743 [Ed.—no. is invalid], flowering in Jan. 1902.

Frequently this species has a single-flowered and, just as frequently, a two-flowered inflorescence. It grows under conditions somewhat similar to those of *B. laxum*, with which I have also found it often intermingled. The flowers are pale yellow, the labellum purple towards the base.

45. *B. Govidjoae* Schltr., sp. nov.

Epiphyticum, longe repens, gracillimum; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 6–12 cm distantibus, cylindraneo-ovoideis, unifoliatis, 5–9 mm altis, infra medium 2.5–4 mm diametientibus; folio erecto vel erecto-patente, lineari-ligulato, obtusiusculo, basi angustato, glabro, 2.5–4 cm longo, medio fere 2.5–4 mm lato; scapo setiformi, erecto, usque ad 4 cm longo, vaginulis paucis distantibus obsesso, laxe 2–3-floro; bracteis ellipticis, ovario subduplo brevioribus; floribus in sectione vix inter mediocres, glabris; sepalis oblongo-lanceolatis, subacutis, glabris, 8 mm longis, lateralibus paulo obliquis et latioribus; petalis oblique lanceolatis, acutis, 5 mm longis; labello valde curvato, oblongo-ligulato, apiculato, petalis aequilongo; columna perbrevis, brachiis falcato-decurvis, margine superiore minute et obtuse bidentatis, pede satis longo; ovario breviter pedicellato, clavato, glabro, 4–5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19749, flowering in June 1909.

Unquestionably, this species stands close to *B. manobulbum* but has smaller pseudobulbs and leaves, as well as longer and more slender inflorescences. It is related closely to *B. imitans* Schltr., described below. The flowers are yellow-white, the labellum red on the inside at the base, with a golden yellow apex.

46. *B. imitans* Schltr., sp. nov.

Epiphyticum, longe repens, gracillimum, *B. Govidjoae* Schltr. simillimum; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 4–10 cm distantibus, angustius ovoideis, unifoliatis, 5–7 mm altis, infra medium 2.5–4 mm diametientibus; folio erecto vel suberecto, lineari, obtuso, basi attenuato, glabro, 1.5–3.5 cm longo, medio fere 2–3.5 cm lato; scapis setiformibus, erectis, vaginulis paucis distantibus obsessis, laxe 2–3-floris, usque ad 4 cm altis; bracteis ovatis, acutis, ovario duplo fere brevioribus; floribus in sectione vix inter mediocres, glabris; sepalis lanceolatis, subacutis, 9 mm longis, lateralibus obliquis; petalis oblique ellipticis, subacutis, c. 3.5 mm longis; labello curvato circuitu oblongo-quadrato, medio fere pandurato-contracto, apice breviter apiculato, petalis fere aequilongo; columna perbrevis, brachiis obtusis falcato-decurvis, margine superiore breviter unidentatis, pede bene evoluta; anthera cordato-cucullata, magniumbonata, glabra; ovario pedicellato, clavato, glabro, c. 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1300 m—R. Schlechter no. 19771, flowering in June 1909.

From the description it may be seen readily that this species very closely approaches *B. Govidjoae*. Nevertheless, I feel compelled, however, to regard it as a separate species, since the petals are shorter and of a different shape; the labellum is very different and, likewise, the steldia of the column are aberrant. The flowers are uniformly white-yellow.

47. *B. pallidiflavum* Schltr., sp. nov.

Epiphyticum, perlonge repens, gracile; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 7–20 cm distantibus, anguste conico-cylindraceutis, unifoliatis, 2–3 cm altis, 4–5.5 mm diametientibus; folio erecto, ligulato, obtusiusculo, basi subpetiolato-angustato, glabro, 5–8 cm longo, medio fere 1–1.5 cm lato; scapis gracilibus, tenuibus, dimidio superiore laxe 3–5-floris, vaginulis paucis dissitis donatis; bracteis late ovatis, apiculatis, glabris, ovario sessili aequilongis vel paulo longioribus; floribus in sectione mediocribus, secundis, glabris; sepalis lanceolatis, acutis, 9 mm longis, lateralibus obliquis; petalis late et oblique ellipticis, obtusiusculis, 4 mm longis; labello curvato,

ovato-ligulato, minute et obtusiuscule apiculato, dimidio anteriore leviter angustato, basi leviter bicalloso; petalis aequilongo; columna perbrevis stelidiis falcato-decurvis, obtusis, margine superiore obscure et obtuse unidentatis, pede curvato bene evoluto; anthera reniformi-cucullata, altiumbonata, glabra; ovario sessili, cylindrico, glabro, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Kelel, in the Minjem Valley, alt. c. 300 m—R. Schlechter no. 16475, flowering in Sept. [Ed.—possibly Aug.] 1907.

One of the few species occurring below the mist-forest regions. It is related closely to the following species. The flowers are whitish yellow.

48. *B. uduense* Schltr., sp. nov.

Epiphyticum, longe repens, gracile; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 8–15 cm distantibus, cylindraceutis, unifoliatis, 2.5–4 cm altis, medio fere 3–5 mm diametientibus; folio erecto, ligulato vel oblongo-ligulato, obtuso, basi attenuato, 7–15 cm longo, medio fere 1.2–2.3 cm lato; scapis tenuibus, gracillimis, erectis, dimidio inferiore vaginulis paucis obsessis, dimidio superiore laxe 5–8-floris, usque ad 12 cm longis; bracteis ellipticis, acuminatis, ovario sessili vulgo paulo longioribus; floribus secundis, in sectione mediocribus, glabris; sepalis lanceolatis, acutis, 9 mm longis, lateralibus obliquis; petalis oblique ellipticis, obtusiusculis, 3.5 mm longis; labello curvato, subpandurato-oblongo, obtuse apiculato, basi leviter 2-callosa, petalis aequilongo; columna perbrevis, brachiis obtusis falcato-decurvis, margine superiore sublobatis, pede incurvo medio incrassato; anthera rotundato-cucullata, glabra; ovario sessili, glabro, cylindrico, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the hill-forests near Udu on the Waria [River], alt. c. 500 m—R. Schlechter no. 19904, flowering in June 1909.

From the closely related *B. pallidiflavum* Schltr., this species is distinguished by its larger and stouter pseudobulbs and leaves, by the shape of the petals, by the labellum and the arms of the column. The flowers are white-yellow.

49. *B. Kempterianum* Schltr., sp. nov.

Epiphyticum, perlonge repens, gracile; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 7–10 cm distantibus, cylindraceutis, unifoliatis, 2.5–3.7 cm altis, 3–5 mm diametientibus; folio erecto, ligulato, obtuso, basi attenuato, 6–11 cm longo, medio fere 1.1–2.4 cm lato; racemis gracilibus, erectis, subaxe 10–15-floris, 10–15 cm altis, pedunculo vaginulis distantibus obsoletis, racemo ipso fere aequilongo; bracteis ellipticis, ovario pedicellato multo brevioribus; floribus in sectione vix inter mediocres, incurvulis, glabris; sepalis oblongo-ligulatis, minute apiculatis, glabris, 7 mm longis, lateralibus obliquis; petalis oblique ovalibus, subobtusis, 2.75 mm longis; labello curvato, oblongo, supra medium paulo constricto, obtuso, basi leviter bicordato, petalis aequilongo; columna perbrevis, brachiis falcato-decurvis, obtusis, margine superiore basi lobulo obtuso donatis, pede incurvo, dimidio anteriore attenuato; anthera rotundato-cucullata, apiculata, glabra, umbonata; ovario graciliter pedicellato, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 19037, flowering in Dec. 1908.

This, and the following species, may be recognised by their long-stalked flowers. The former has smaller flowers than the latter. The colour of the flowers is pale yellow.

50. *B. ferruginescens* Schltr., sp. nov.

Epiphyticum, perlonge repens, gracile; rhizomate filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 8–15 cm distantibus, cylindraceutis, unifoliatis, 3–4 cm altis, medio 3–5 mm diametientibus; folio erecto vel suberecto, ligulato, obtusiusculo, basi subpetiolato-attenuato, glabro, 9–14.5 cm longo, medio fere 1.4–2.5 cm lato; scapis gracilibus, erectis, vaginulis paucis distantibus obsessis, 9–13 cm altis, laxius 4–10 floris; bracteis ovatis, acutis, ovario pedicellato multo brevioribus; floribus in sectione mediocribus, glabris; sepalis oblongis, apiculatis, 9 mm longis, lateralibus obliquis; petalis oblique rhombo-ellipticis, acutis, 3.5 mm longis; labello curvato, oblongo-ligulato, obtuso, basi paulo dilatato, c. 4 mm longo; columna perbrevis, brachiis falcato-decurvis, obtusis margine superiore breviter 2-dentatis, pede incurvo, medio incrassato; anthera rotundato-cucullata, magnium-bonata, glabra; ovario graciliter pedicellato, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17352, flowering in Feb. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18989, flowering in Dec. 1908; on trees

in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19119, flowering in Jan. 1909.

This species stands about midway between *B. Kempterianum* and *B. cylindrobulbum*. It approaches the latter more closely, but it has shorter peduncles and a different flower colouring. The flowers are pale yellow; the petals spotted with red at the apices; the lip tinged on the upper surface with violet.

51. *B. cylindrobulbum* Schltr., in K. Schum. et Laut., Nachtr. (1905). p. 200.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 13999, flowering in Jan. 1902.

Undoubtedly, a very close relative of *B. ferruginescens*, but with broader petals and a more fiddle-shaped lip. The flowers are dark carmine-red.

52. *B. perlongum* Schltr., sp. nov.

Epiphyticum, perlonge repens, perlaxum; rhizomate filiformi, flexuoso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 15–20 cm distantibus, cylindraceis, unifoliatis, 4–5 cm longis, medio 4–6 mm diametentibus; folio erecto vel suberecto, oblique ligulato, obtusiusculo, basi subpetiolato-angustato, glabro, 12–17 cm longo, medio fere 2.2–3 cm lato; scapis gracillimis, erectis, c. 26 cm altis, vaginulis paucis acutis distantibus obsessis, dimidio superiore laxe 6–8-floris; bracteis ovato-lanceolatis, acuminatis, ovario pedicellato multo brevioribus; floribus in sectione magnis, secundis, glabris; sepalis oblongo-lanceolatis, acutis, 1.8 cm longis, lateralibus obliquis; petalis oblique ovato-ellipticis, acutis, 5 mm longis; labello curvato, circuito oblongo, obtusissimo, marginibus leviter recurvo, dimidio inferiore paulo angustato, basi callo parvulo hippocrepiformi donato, 7.5 mm longo; columna perbrevis, brachiis falcato-decurvis obtusis, pede elongato incurvulo; anthera rhomboideo-cucullata, obtuse, rostrata, umbonata, glabra; ovario gracillime pedicellato, glabro, c. 2–2.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18701, flowering in Nov. 1908.

Among the species of the section, this is the largest. In the structure of the lip it stands moderately isolated. The flowers are yellowish with red veins and petals red towards the tip.

§ 5. *Uncifera*

I have interpreted this section so that it includes those species which are grouped around *B. rostratum* J.J. Sm. and the two species mentioned here. J.J. Smith also refers his *B. remotum* to this section, but as I have explained already, I prefer to separate *Manobulbon* on account of its very different habit and all the more so because there is a third section, *Diceras*, which is removed still further on account of its floral characters. J.J. Smith asserts that, by *Uncifera*, he understands species with racemose inflorescences, but this does not pertain to *Manobulbon* as I have already shown. In *Diceras* the inflorescence is also always single-flowered.

I doubt whether *B. rostratum* J.J. Sm. from Dutch New Guinea really is different specifically from *B. ochroleucum* Schltr., but, unfortunately, I cannot express a definite opinion since I have not seen any material of the former.

The two species known from the Territory, up to the present, are inhabitants of the mist-forests, and it would appear that they are distributed rather widely in the hills. They always grow together on tall trees in exposed places and in large individual numbers.

53. *B. ramosum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p.214.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20282, flowering in Sept. 1909; on trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 19185, flowering in Jan. 1909; on trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 14043,

flowering in Jan. 1902; on trees in the forests on the upper Waube Creek (Waria District), alt. c. 700 m—R. Schlechter no. 19448, flowering in May 1909.

This species, like the following one, is somewhat variable but may be recognised always by the narrow leaves and the strikingly truncate petals. It is distributed throughout the whole of Kaiser-Wilhelms-Land. The flowers are pale yellow.

54. *B. ochroleucum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 212.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 18094, flowering in Aug. 1908; on trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 14047, flowering in Jan. 1902; no. 18884, flowering in Nov. 1908; in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19822, flowering in June 1909.

My view that *B. rostratum* J.J. Sm. will have to be united with this species already has been expressed above. The species is rather variable, both in the size of the flowers as well as in the breadth of the petals. The flowers are pale yellow, occasionally almost white.

§ 6. *Diceras*

Only reluctantly do I establish a new section on the basis of a single species, but in this case I cannot do otherwise. In habit it shows a certain uniformity with species of *Uncifera*, from which, however, it shows a remarkable deviation in the structure of the lip; this organ being furnished with two outgrowths resembling the horns of a chamois. A further reason for its separation from that section is found in the peduncles, which are always single-flowered. *B. diceras* Schltr., the only known representative of the section up to the present, is an inhabitant of the mist-forests of the Torricelli Range, where it is found hanging from the branches of trees in more-or-less long and often ball-like clusters.

55. *B. diceras* Schltr., sp. nov.

Epiphyticum, patulum, ramosum, usque ad 45 cm longum; rhizomate cauliformi, plus minus flexuoso, vaginato; radicibus filiformibus, flexuosis, glabris; pseudobulbis 3–5 cm distantibus, cylindraceo-ovoideis, unifoliatis, 1–1.3 cm altis, infra medium 4–6 mm diametientibus; folio lineari-ligulato, obtuso vel minute apiculato, glabro, 5–7 cm longo, medio fere 4–8 mm lato; pedunculis valde abbreviatis, unifloris, vaginulis obtectis, c. 4 mm longis; bractea vaginulis simili, ovario multo brevior; flore in subgenere inter minores, glabro; sepalis ovatis, apiculatis, c. 6 mm longis, lateralibus obliquis, margine inferiore paulo dilatatis; petalis oblique ovalibus, subacutis, 4 mm longis; labello circuito oblongo, minute apiculato, supra medium trilobulato-inciso, basi cornubus 2 apice hamatis c. 2 mm altis ornato, 5 mm longo, medio 2.75 mm lato; columna perbrevis, brachiis decurvis, antice truncatis, margine superiore leviter 3-dentatis; anthera rotundato-cucullata, apiculata, umbonata, glabra; ovario sessili, cylindrico, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20326, flowering in Sept. 1909.

It is necessary to describe the species further here, since it is characterised adequately by being the only one in the section. The flowers are white, with red longitudinal stripes, the labellum dark cherry-red with two white horns.

§ 7. *Hyalosema*

With this section begins the large multi-form series of the sub-genus *Eu-Bulbophyllum*. I established this section in the year 1911 when I described my Celebes orchids, because I formed the opinion that these peculiar plants were entirely different from the species of *Sestochilus* with which they had been included up to that time. This opinion, it appears, has since been accepted generally as correct. I am now quite convinced that these plants

form in themselves a well-defined section, which in one aspect shows a certain relationship to *Ephippium*.

At present, ten species of the section are known, the majority of which are natives of Papuasias. Of these, *B. grandiflorum* Bl., *B. arfakianum* Krzl. and *B. fritillariiflorum* J.J. Sm. have been described from Dutch New Guinea, while *B. longisepalum* Rolfe, *B. Micholitzii* Rolfe, *B. Cominsii* Rolfe have very probably to be allocated to British Papua, and two species, *B. Leysianum* Burb. (*B. ornithorhynchum* J.J. Sm.) and *B. Minahassae* Schltr. occur outside Papuasias in Java and the Celebes respectively.

From our own Territory the following enumerated species must be considered. Of these, two have not been described previously. It would appear that the species of this section avoid the colder climates of the mist-forests, rising only to the lower limits of the latter. They are found chiefly in the forests of the hilly country on trees which are fairly free of moss. This indicates that they belong to that class of epiphyte where a regular drying of the roots is essential to the existence of the plant.

56. *B. grandiflorum* Bl., in Rumphia IV (1850), p. 42, t. 195, fig. 3.

Kaiser-Wilhelms-Land: On trees in the forests of the Gati Mountain, in the Minjem Valley, alt. c. 500 m—R. Schlechter no. 17183, flowering in Jan. 1908; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19317, flowering in Apr. 1909.

This species, which was described originally by Blume from Dutch New Guinea, is distributed widely in our Territory, but invariably occurs only as isolated specimens. It may be confused with *B. longisepalum* Rolfe, since it is related closely to this species. The flowers are reddish white, paler inside with paler translucent spots.

57. *B. Cominsii* Rolfe, in Kew Bull. (1895), p. 138.

Solomon Islands: Florida—Comins no. 289.

This species, which possesses rather small flowers for the section, also comes from the German Solomons.

58. *B. trachyanthum* Krzl., in Österr. Bot. Zeitschr. (1894), p. 336.

Neu-Mecklenburg: Near Port Praslin and Port Carteret—W. Micholitz, flowering in Jan. 1894.

This species is distinguished by the shape of the sepals and petals. It is a close relative, or possibly identical with, *B. fritillariiflorum* J.J. Sm.

59. *B. singulare* Schltr., sp. nov.

Epiphyticum, validum, habitu *B. grandifloro* Bl. simillimum; rhizomate crassiusculo, decumbente; radicibus filiformibus, flexuosis, glabris; pseudobulbis c. 3 cm distantibus, anguste conicis, 4-angulatis, unifoliatis, 3.5–5 cm altis, infra medium 5–7 mm diametentibus; folio erecto, obovato-oblongo, obtusissimo, basi subpetiolato-angustato, glabro, carnosulo, 11–18 cm longo, supra medium 3–4 cm lato; scapis erectis, strictis, unifloris, vagnis paucis arcte amplexentibus distantibus obsessis, 15–20 cm altis; bractea cucullata, apiculata, ovario multo brevior; flore erecto, in genere inter maximos; sepalis intermedio e basi cuneata ligulato, obtuso, c. 11 cm longo, medio 1.5 cm lato, lateralibus falcato-ligulatis, obtusiusculis, 7.5 cm longis, infra medium 1 cm latis; petalis e basi oblique triangula aristato-acuminatissimis, arista inclusa c. 7 mm longis; labello e basi quadrata minute puberula oblongo-ligulato, obtuso, valde curvato, dimidio inferiore margine dense et breviter ciliolato, subtus alticarinato, c. 7 mm longo; columna crassiuscula, brachiis brevibus rhombeis cum angulis obtusis,

pede valde incurvo; anthera oblongoideo-cucullata, dorso biumbonata, glabra; ovario cum pedicello cylindrico, glabro, c. 5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 300 m—R. Schlechter no. 19309, flowering in Apr. 1909.

A very bizarre species, which is related closely to *B. Micholitzii* Rolfe, but is distinguished by the almost linear dorsal sepal and the petals. The flowers are slightly reddish, the dorsal sepal with longitudinal white spots, the lateral sepals tinged with white towards the front, the petals, the labellum and the column yellowish.

60. *B. biantennatum* Schltr., sp. nov.

Epiphyticum, decumbens, validum, 15–20 cm altum; rhizomate crasso, subflexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2.5–4 cm distantibus, anguste conicis, quadrangulis, unifoliatis, 2.5–3.2 cm altis, infra medium 0.7–1 cm diametentibus; folio erecto anguste obovato-oblongo, obtuso, basi subpetiolato-angustato, 6.5–9 cm longo, medio fere 1.8–2.3 cm lato; scapis erectis, unifloris, basi paucivaginat, 9–12 cm altis; bractea cucullato-amplexante, ovario multo brevior; flore erecto, in sectione mediocri; sepalis lanceolatis, obtusiusculis, glabris, 7 cm longis, intermedio apicem versus extus carinato, lateralibus subfalcato-obliquis dimidio superiore margine interiore cohaerentibus; petalis falcato-obliquis, e basi lanceolato-triangulari in aristam brevem antenniformem productis, 6 mm longis; labello curvato, e basi quadrata linguiformi, obtuso, subtus alticarinato, superne medio pilis rufis strigoso, c. 4.5 mm longo; columna crassiuscula, brachiis brevibus bilobulatis, pede incurvo; ovario cum pedicello cylindrico glabro, c. 5 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Dschischungari (Waria District), alt. c. 600 m—R. Schlechter no. 19645, flowering in May 1909.

An interesting species intermediate between *B. singulare* Schltr. and *B. Leysianum* Burb. Unfortunately, I only found a single specimen which was past flowering. The flowers were brownish green with paler spots and yellowish lip and column.

61. *B. arfakianum* Krzl., in Engl. Bot. Jahrb. XXXIV (1904), p. 250.

Kaiser-Wilhelms-Land: On trees in the forests on the Djemur [River], not far from Paub, in the Eitape District, alt. c. 50 m—R. Schlechter no. 20009, flowering in Sept. 1909; on tall trees in the gallery-forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18343, flowering in Oct. 1908.

Undoubtedly, this is the plant discovered by Beccari on the Arfak Mountains (probably at the foot of them). It is recognised easily by the short flower stems and the elongated blunt petals bent inwards at the apices. The flowers are green, dotted brown, the sepals with roundish translucent spots, the petals thickly dotted with red, and red apices.

§ 8. *Sestochilus*

Already, I have emphasised frequently that I arrange under this heading only the normal single-flowered species of this extensive section, in this way excluding *Pahudia*. Thus, the boundaries of the section are defined more sharply, because species of the section *Pahudia* also show certain deviations in the floral structure.

Species of *Sestochilus* also occur outside of New Guinea as far as India in the west, being found sporadically in the intervening regions.

In addition to the species referred to here, there also have been published *B. macranthoides* Krzl., *B. Gerlandianum* Krzl. and *B. tolloneniferum* J.J. Sm., all three originating in Dutch New Guinea. *B. praestans* Krzl., a native of the south Celebes, has been recorded also from our Territory.

Of the six species mentioned from German New Guinea, only two are inhabitants of the mist-forest regions, viz. *B. truncicola* Schltr. and *B. guttatum* Schltr. The rest of the species are found in the forests of the hilly country, sometimes even in close proximity to the sea-shore, e.g. *B. Hahlianum* Schltr. All seem to prefer thick tree-

trunks, especially on the banks of creeks, and very occasionally I have seen them on the horizontal branches of trees.

62. *B. Weneri* Schltr., sp. nov.

Epiphyticum, validum, decumbens; rhizomate crasso, polyrhizo, vaginis mox in fibris solutis oblecto; radicibus filiformibus, flexuosis, glabris; pseudobulbis 8–10 cm distantibus, cylindraceis, unifoliatis, 2.5–3.2 cm altis, supra basin 0.8–1.2 cm diametientibus; folio erecto, oblongo-ligulato, obtuso, basi subpetiolato-attenuato, glabro, 22–33 cm longo, medio fere 4–5 cm lato; pedunculis, abbreviatis, unifloris, vaginulis paucis obsessis, c. 2 cm altis; bractea cucullata, ovario longipedicellato multoties brevior; flore erecto in sectione magno, glabro; sepalis patentibus e basi latiore lanceolatis, acutis, glabris, c. 2.8 cm longis, lateralibus subfalcatis, basi margine inferiore dilatatis; petalis anguste falcato-lanceolatis, acutis, c. 2.4 cm longis; labello curvato, e basi quadrata anguste linguiformi, carnosus, c. 1.8 cm longo; columna crassiuscula, stelidiis porrectis brevibus dentiformibus, acutis, pede elongato, incurvo; ovario cum pedicello gracili glabro, 8–9 cm longo.

Kaiser-Wilhelms-Land: On trees at the Minjem Gorge, alt. c. 100 m—R. Schlechter no. 17827, flowering in June 1908; on trees in the forest near Damum, alt. c. 350 m—E. Werner, R. Schlechter no. 16135 (TYPE), flowering in May 1907; on trees in the forests at the foot of the Bismarck Range, alt. c. 300 m—R. Schlechter no. 18653, flowering in Nov. 1908.

This species may be distinguished from the two which follow by the much elongated labellum and the distinct stelidia of the column. The flowers are yellowish with the sepals and petals dotted with red.

63. *B. grandifolium* Schltr., sp. nov.

Epiphyticum, validum, decumbens; rhizomate crasso, vaginis mox in fibris solutis oblecto, polyrhizo; radicibus filiformibus, flexuosis, glabris; pseudobulbis 7–12 cm distantibus, cylindraceis, 1.5–3 cm altis, basi 0.7–1 cm diametientibus; folio oblongo, obtuso, basi subpetiolato-angustato, glabro, 21–30 cm longo, medio fere 4–8 cm lato; pedunculo abbreviato, unifloro, paucivaginato, c. 1.5 cm alto; bractea cucullata, ovario pedicellato multo brevior; flore in sectione magno, glabro; sepalis patentibus, lanceolatis subacuminatis, c. 4 cm longis, lateralibus falcatis; petalis falcato-lanceolatis, acuminatis, sepalis paulo brevioribus; labello curvato e basi late rhombeo-quadrata, dimidio anteriore anguste linguiformi, obtuso, leviter sulcato, subtus carinato, c. 1.1 cm longo; columna crassa, marginata, brachiis aliformibus quadratis; anthera quadrato-cucullata, umbonata, glabra; ovario pedicellato glabro, c. 6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests not far from Udu, on the Waria [River], alt. c. 200 m—R. Schlechter no. 17455, flowering in Mar. 1908; on trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 300 m—R. Schlechter no. 19313, flowering in Apr. 1909; on trees on the upper Waube Creek (Waria District), alt. c. 500 m—R. Schlechter no. 19443 (TYPE), flowering in May 1909.

This species is related closely to *B. Weneri* but is distinguished by its larger flowers, the short labellum, and the column. The flowers are yellowish, the sepals and petals spotted with red on the inside.

64. *B. truncicola* Schltr., sp. nov.

Epiphyticum, validum, longe repens; rhizomate subvalido, flexuoso, vaginis mox in fibris solutis oblecto; radicibus filiformibus, flexuosis; pseudobulbis 15–17 cm distantibus, cylindraceis, unifoliatis, 1–2 cm altis, c. 0.6–0.8 cm diametientibus; folio erecto, lorato, obtuso, basi subpetiolato-attenuato, glabro, 25–28 cm longo, medio 2.7–3.5 cm lato; pedunculo abbreviato, pauci vaginato, unifloro, vix 2 cm longo; bractea cucullata, ovario pedicellato multo brevior; flore in sectione magno, glabro; sepalis patentibus ovato-lanceolatis, subacuminatis, 3 cm longis, lateralibus falcatis; petalis oblique lanceolato-ligulatis, acuminatis, sepalis paulo brevioribus; labello e basi oblongo-quadrata supra medium anguste ligulato, obtuso, leviter sulcato, subtus alticarinato, 8 mm longo; columna crassiuscula, marginata, ebrachiata; anthera quadrato-cucullata, glabra; ovario cum pedicello glabro, c. 5 cm longo.

Kaiser-Wilhelms-Land: On thick tree-trunks in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17359, flowering in Feb. 1908.

Is distinguished from the two preceding species by its very slender rhizome, narrower leaves, the short labellum and the column. The flowers are a very pale yellow with the sepals and petals spotted red on the inside.

65. *B. Hahlianum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 204.

Neu-Pommern: On trees in the beach swamps, between Massawa and Cape Lambert—R. Schlechter no. 13714, flowering in Nov. 1901.

It is noteworthy in the section since its lateral sepals are adherent by their lower margins in the front for two-thirds. The labellum is strikingly small. The glossy flowers are cream-coloured with a brownish tinge.

66. *B. tortum* Schltr., sp. nov.

Epiphyticum, validum, decumbens; rhizomate crasso, vaginis mox in fibros solutis oblecto, polyrhizo; pseudobulbis 5–7 cm distantibus, cylindraceutis, unifoliatis, 2.5–3 cm altis, basi 0.5–0.7 cm diametentibus; folio erecto, lorato, obtuso, basi subpetiolato-angustato, glabro, 20–27 cm longo, medio fere 3–5.5 cm lato; pedunculo abbreviato, paucivaginato, unifloro, 1–1.5 cm longo; bractea cucullata, ovario pedicellato multo brevior; flore in sectione mediocri, glabro; sepalis patentibus, oblongis, obtusis, c. 2.5 cm longis, lateralibus dimidio superiore introrsum tortis, basi margine inferiore paulo ampliatis; petalis oblongis, obtusis, 2 cm longis; labello curvato, oblongo, obtuso, dimidio anteriore paulo angustato, subtus carinato, c. 1.2 cm longo; columna crassiuscula apice leviter lobato-marginata, pede incurvo; anthera galeato-cucullata, antice truncata, glabra; ovario cum pedicello glabro, c. 8 cm longo.

Kaiser-Wilhelms-Land: On trees in the gallery-forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18454, flowering in Oct. 1908; on trees in the forests at the mouth of the Waria [River], R. Schlechter no. 19941, flowering in July 1909.

The species is characterised excellently by the lateral sepals twisted inwards and by the blunt flowers. The flowers are white-yellowish, spotted inside with red, the anther yellow.

67. *B. guttatum* Schltr., sp. nov.

Epiphyticum, perlonge repens; rhizomate valde elongato, subflexuoso, polyrhizo; radicibus filiformibus, flexuosis, glabris; pseudobulbis 16–20 cm distantibus, cylindraceutis, unifoliatis, 2–3 cm altis, basi 3–4 mm diametentibus; folio erecto, elliptico-ligulato, breviter abuminato, basi in petiolum 2–3 cm longum attenuato, glabro, petiolo incluso 16–25 cm longo, medio laminae 4–7 cm lato; pedunculo abbreviato, vaginis paucis obscondito, 0.6–1 cm longo; bractea cucullata, apiculata, ovario pedicellato bene brevior; flore erecto, in sectione vix mediocri; sepalis oblongis, apiculatis, glabris, 1.8 cm longis, lateralibus falcatis, basi margine inferiore ampliatis; petalis oblique ellipticis, breviter subaristato-acuminatis, glabris, 1.2 cm longis; labello curvato, circuitu ovato-ligulato, obtuso, marginibus leviter recurvo, basi fasciis 2 papillarum barbato, medio leviter bicarinato, subtus laticarinato, c. 1.3 cm longo; columna crassiuscula, brevi, brachiis oblique triangulis antice truncatis, brevibus, pede perlongo incurvo; ovario pedicellato clavato, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20234, flowering in Sept. 1909.

Of all the species of this section in the Territory, this is the most slender. The flowers are of more delicate texture than in the other species, and the labellum is broader with two papillary bands. The greenish flowers are spotted with red, and the labellum is cherry-red.

§ 9. *Pahudia*

J.J. Smith has objected recently to the retention of this section and asserts that it coincides with *Sestochilus*. I have explained frequently that I do not agree with him and retain the section for the better delimitation of *Sestochilus*. The entire structure of those species which I have arranged under *Pahudia* is quite different from that which prevails in *Sestochilus*, both in regard to the pseudobulbs, the inflorescences and the texture of the flowers. I include here some Indo-Malayan species, some from the

Moluccas and lastly the one here described. At present the whole section possibly may not contain more than eight species, of which the best known are *B. Pahudi* Bl., *B. uniflorum* Hassk., *B. virescens* J.J. Sm., *B. Binnendykii* Teijsm. and *B. Ericsonii* Krzl. *B. Ericsonii* Krzl. usually is regarded as a Papuan species, but up to the present its habitat has not been ascertained.

B. ornatum Schltr. is the first-recorded species of the section from German New Guinea and grows on large trees in the mist-forests of the mountains. It requires considerable moisture in the atmosphere and some degree of cold for its development and well-being.

68. *B. ornatum* Schltr., sp. nov.

Epiphyticum, validum, 25–35 cm altum; rhizomate decumbente plus minusve flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 5–8 cm distantibus, ovoideis, leviter angulatis, unifoliatis, 3.3–4 cm altis, infra medium 1.2–1.6 cm diametientibus; folio erecto, elliptico-ligulato, breviter acuminato, basi petiolato-attenuato, glabro, 22–28 cm longo, medio fere 4.5–5.5 cm lato; scapo erecto, vaginis paucis cucullatis dissitis donato, 10–15 cm longo, apice subumbellatim 2–5-floro; bracteis ovatis, acuminatis, ovario brevioribus; floribus in sectione inter majores, erecto-patentibus; sepalis intermedio ovali, breviter acuminato, 2.7 cm longo, glabro, lateralibus oblique ovato-lanceolatis caudato-acuminatis, glabris, c. 7 cm longis; petalis oblique ellipticis, obtusis, margine dense ciliatis, 1.2 cm longis; labello carnosulo, ovato-cordato obtuso apicem versus papilloso-verruculoso, c. 1 cm longo; columna brevi, crassiuscula, brachiis lanceolato-subulatis, brevibus, basi lobulo falcato-decurvo obtuso auctis, pede incurvo longo; anthera umbonata, quadrato-cucullata, glabra; ovario breviter pedicellato, glabro, c. 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17885 [Ed.—no. incorrect, possibly 17585], flowering in Apr. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19028, flowering in Dec. 1908.

A magnificent plant which is well worthy of introduction into European glasshouses. It is the only species of this section in our Territory. The flowers are pale yellow, spotted red on the inside, the labellum very thickly dotted with red; the column yellow with a red foot.

§ 10. *Lepidorrhiza*

This small section includes, at present, the following species: *B. amplebracteatum* Teijsm. et Binnend., *B. klabatense* Schltr., *B. orthoglossum* Krzl. from the Celebes and Moluccas, *B. tridentatum* Rolfe from British Papua and *B. pachyanthum* from New Caledonia. I here describe three more species which are the first recorded from German New Guinea.

The section is defined sharply since the individual species strikingly resemble each other in habit as well as in the structure of the flowers.

Here the plants are found only as strongly growing mist-forest epiphytes probably under similar conditions to those which I have described for *Pahudia*. The other species also grow under similar climatic conditions in the neighbouring regions.

69. *B. odontoglossum* Schltr., sp. nov.

Epiphyticum, validum, usque ad 45 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, lepidoto-asperatis; pseudobulbis ovoideis, unifoliatis, 4–5 cm altis, infra medium 1.5–2 cm diametientibus; folio erecto, elliptico-ligulato, obtuso, basi petiolato, petiolo 3.5–5 cm longo incluso 20–25 cm longo, medio fere 5–5.5 cm lato; scapo erecto, tereti, vaginis paucis dissitis donato, apice 2–3-floro, usque ad 40 cm alto; bracteis ellipticis cucullatis, ovario pedicellato bene brevioribus; floribus erectis, magnis, glabris; sepalis lanceolatis, caudato-acuminatis, intermedio 5 cm longo, lateralibus obliquis, extus carinatis, 8.5 cm longis; petalis oblique oblongis, acuminatis, 2 cm longis; labello carnosulo, lanceolato-linguiformi obtusiusculo, superne dentibus triangulari irregulariter ornato, basi medio bicostato, petalis aequilongo; columna crassa brevi, brachiis porrectis subulatis, utrinque sublobulatis; anthera galeato-cucullata, antice emarginata, glabra; ovario cum pedicello glabro, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19127, flowering in Jan. 1909.

This species is distinguished by the broad teeth of the labellum and the arms of the column. It stands next to *B. klabatense* Schltr. from the Celebes. The flowers are yellowish, the sepals dotted red near the base, the lip with red verrucose teeth.

70. *B. exasperatum* Schltr., sp. nov.

Epiphyticum, validum, usque ad 35 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, lepidoto-asperatis; pseudobulbis anguste ovoideis, unifoliatis, 2.5–4 cm altis, infra medium 0.8–1 cm diametientibus; folio erecto, oblongo-ligulato, subacuto, basi in petiolum 3–5 cm longum angustato, petiolo incluso 15–20 cm longo, medio fere 2.8–4 cm lato; scapo erecto, vaginulis paucis dissitis donato, c. 3-floro, usque ad 35 cm alto; bracteis ellipticis, ovario pedicellato duplo brevioribus; floribus erectis, magnis, glabris; sepalis lanceolatis, elongato-acuminatis, intermedio 5 cm longo, lateralibus obliquis, angustioribus, extus alticarinatis, c. 7 cm longis; petalis oblique lanceolato-triangulis subacutis, c. 1.5 cm longis; labello carnosio, lanceolato-linguiformi, obtusiusculo, superne dentibus minutis subulatis exasperato, medio dimidio inferiore tenuiter bicostato, c. 1.5 cm longo; columna brevi, brachiis subulatis, utrinque lobulo obtuso donatis, pede incurvo; anthera galeata, antice emarginata, glabra; ovario pedicellato glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20236, flowering in Sept. 1909.

The smallest of the three species in the section. Evidently it is related closely to *B. tridentatum* Rolfe, but is distinguished by its weaker growth and the toothed labellum. The flowers are pale yellow, the lip reddish on the upper side.

71. *B. oobulbum* Schltr., sp. nov.

Epiphyticum, validum, usque ad 45 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, lepidotis; pseudobulbis ovoideis, unifoliatis, 4–5 cm altis; infra medium 2–2.5 cm diametientibus; folio erecto, elliptico-ligulato, subacuto, basi sensim in petiolum brevem attenuato, glabro, 25–33 cm longo, medio fere 5–6.5 cm lato; scapo erecto, vaginis paucis dissitis donato, laxo 3–7-floro, usque ad 45 cm alto; bracteis ellipticis, ovario pedicellato plus duplo brevioribus; floribus suberectis, magnis, glabris; sepalo intermedio ovato-lanceolato, acuminato, 4 cm longo, lateralibus obliquis, lanceolatis, elongatis, extus alticarinatis, c. 6 cm longis; petalis oblique oblongis acutis, 1.5 cm longis; labello carnosio, curvato, lanceolato-linguiformi, obtusiusculo, superne medio et apicem versus sparsim verruculoso, dimidio inferiore bicostato, c. 1.6 cm longo; columna brevi, crassiuscula, brachiis subulatis, antice basi lobulo obtuso, postice dente obtuso donatis, pede incurvo; anthera galeata, glabra; ovario pedicellato glabro, 3.5 cm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17192 (TYPE), flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19016, flowering in Dec. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18176, flowering in Sept. 1908.

This species stands closest to *B. tridentatum* Rolfe, but may be distinguished from the latter by its warty lip. The flowers are yellow with red spots.

§ 11. *Brachyostele*

The species which I have made the Type of this remarkable section resembles only *B. Beccarii* Rehb. f. in habit, but is very different from that species in its floral structure and in that respect comes close to *Lepidorrhiza*, although the flowers are dissimilar and of thinner texture. The inflorescence is an erect raceme of large flowers in which the petals are as well developed as those of the previous sections. The column especially is characteristic and possesses, in addition to the stelia, two short, erect fleshy arms below the middle. It is the only species of the section described here. It climbs on trees exactly like *B. Beccarii* Rehb. f. and develops its inflorescence annually. Its flowers spread such a penetrating stench that the flies from the whole neighbourhood gather around them. I made an attempt to keep some of the inflorescences in my tent, but

soon had to give them up, not only on account of the unbearable smell, but also because the blow-flies came in swarms.

Up to the present, the plant is known to me only from the drier hill-forests on the Waria [River].

72. *B. foetidum* Schltr., sp. nov.

Epiphyticum, in truncis aborum scandens; rhizomate elongato vaginis lucidis brunneis mox decadentibus oblecto, c. 1.5–2.5 cm diametro; radicibus filiformibus, flexuosis, glabris; pseudobulbis 15–20 cm distantibus, oblongoideo-cylindraceis, 4–6 cm altis, 2–2.5 cm diametentibus, unifoliatis; folio erecto, elliptico, breviter et obtusiuscule acuminato, glabro, basi angustato, 35–45 cm longo, medio fere 12–15 cm lato; scapis erectis, vaginis alte amplexentibus 4–5 obsessis, 10–15 cm altis, subdense 8–15-floris; bracteis patentibus, ellipticis acuminatis, ovario pedicellato bene brevioribus; floribus patentibus, in genere satis magnis, glabris, foetidis; sepalis oblongis, minute apiculatis, 2.4 cm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis oblique elliptico-lanceolatis, subaristato-acuminatis, glabris, 2.2 cm longis; labello crasse carnosio, ovoideo-ligulato, obtusissimo, superne leviter bicostato; 1.1 cm longo; columna crassa, stricta, labello paulo brevior, stelidiis brevibus, subulatis, acutissimis, brachiis 2 infra medium brevibus adscendentibus obtusis aucta, pede longo, incurvulo; anthera late rhomboideo-cucullata, glabra; ovario pedicellato cylindrico, glabro, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19371, flowering in May 1909.

Further discussion is hardly necessary concerning this species, which stands entirely isolated. However, I will still emphasize the fact that there scarcely can be any doubt since this appears to be one of the few orchids which is dependent on blow-flies for fertilization. The flowers are yellow-green, densely dotted with red on the outside, sepals and petals red-veined inside; labellum marbled red, column yellow marbled red in front.

§ 12. *Stictosepalum*

Here, I again find it necessary to establish another monotypic section. The plant which forms the Type stands absolutely isolated, as in the previous case. From the column one might infer a rather close relationship to *Lepidorrhiza* and I accept this inference. In other respects the shape of the flowers is too distinctive to arrange it there without confusing what is now a very well-defined section. The roots, of course, also have the peculiar scale-covering, but the pseudobulbs are very much reduced. The flowers develop simultaneously and not at intervals as in the case of *Lepidorrhiza*. They are also different in shape, viz. the sepals are not elongated and the lateral ones are connate below, except at the apices, and can be separated only with difficulty. The colour is also striking. The beautiful *B. stictosepalum* Schltr., which belongs to this section, is a typical mist-forest epiphyte, which at present is known to me only from the Maboro Range where it is by no means uncommon in places. These species are among the most beautiful and attractive in the genus, so far as the Territory is concerned. The colouring of the flowers reminds one of some of the species of *Fritillaria*, but is brighter.

Since the flowers keep for a long time and are in long-stemmed racemes, this species would be well worthy of cultivation.

73. *B. stictosepalum* Schltr., sp. nov.

Epiphyticum, validiusculum, 35–45 cm altum; rhizomate abbreviato; radicibus filiformibus, flexuosis, squamuloso-asperatis; pseudobulbis cylindraceis, parvulis, unifoliatis, 1–2 cm altis, 0.3–0.5 cm diametentibus; folio erecto, elliptico-lanceolato, apiculato vel acuto, basi sensim in petiolum 7–10 cm longum attenuato, glabro, petiolo incluso 30–42 cm longo, medio fere 4.5–5.5 cm lato; scapo erecto, vaginulis paucis distantibus obsesso, subaxe 5–10-floro, usque ad 30 cm longo; bracteis ellipticis, apiculatis, glabris, ovario pedicellato pluries brevioribus; floribus speciosis, magnis, glabris; sepalis ovato-oblongis, subacutis, 2.7 cm longis; lateralibus obliquis, usque infra apicem margine inferiore

cohaerentibus; petalis oblique latiovatis, acutis, 6.5 mm longis; labello carnoso, curvato, oblongo-linguiformi, apiculato, margine minute crenulato-dentato, superne dimidio inferiore leviter bicostrato, 0.8 cm longo; columna crassa, brevi, steliis subulatis basi utrinque unidentatis; anthera quadrato-cucullata, glabra; ovario graciliter pedicellato, glabro, c. 4.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19495, flowering in May 1909.

Already, I have characterised this species closely and on account of its relationship, compared it to the section *Lepidorhiza*. The flowers are brownish yellow, with a red network of veins.

§ 13. *Pachyanthe*

I have, here, united two sections which are distinguished by the fact that the fleshy flowers show no visible mentum owing to the column-foot being upturned greatly. In habit, they resemble species of the section *Hymenobracteae*, i.e., they have two, very large, thick pseudobulbs on which a rather thick leaf stands. The flowers are arranged in loose, few-flowered racemes. The undivided tongue-shaped labellum is covered with warts. The two species inhabit the branches of tall trees in the mist-forests of the mountains, where they grow sporadically.

74. *B. verruciferum* Schltr., sp. nov.

Epiphyticum, erectum, 25–33 cm altum; rhizomate decumbente, plus minusve abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis, 1.5–2 cm distantibus, cylindraceis, unifoliatis, 2.5–4.5 cm altis, c. 2.5–3.5 mm diametentibus; folio erecto, anguste ligulato, acuto, basi sensim in petiolum 3.5–5 cm longum angustato, glabro, petiolo incluso 15–23 cm longo, medio fere 1.2–1.5 cm lato; scapo erecto, graciliore, vaginis paucis distantibus obsessis, laxe 4–6-floro; bracteis tenuibus cucullatis, apiculatis, ovario brevioribus; floribus succedaneis, mediocribus, glabris; sepalis anguste lanceolatis, acutis, extus carinatis, intermedio 2 cm longo, lateralibus obliquis, 2.7 cm longis; petalis oblique ovato-lanceolatis, acuminatis, 3.5 mm longis; labello carnosulo, e basi angustiore linguiformi, obtusiusculo, superne e basi lineis 2 verrucarum in medio confluentibus ornato, verrucis sparsis medianis antipositis, c. 1.3 cm longo; columna crassa brevi, brachiis brevibus, acutis, pede ascendente; anthera ovato-cucullata, umbonata, glabra; ovario subsessili, glabro, cylindrico, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17034, flowering in Dec. 1907.

A very distinct species which cannot be confused with the others. The variety *carinatisepalum* may prove to be, itself, a distinct species, a possibility I do not think can be excluded entirely. The flowers are yellow-green with white petals and column.

var. *carinatisepalum* Schltr., var. nov.

Differt a forma typica, carinis sepalorum majoribus et florum colore.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20077, flowering in Sept. 1909.

This variety possibly may prove later to be a species. In the lip there appears to be a certain degree of variation from the Type. The cleistogamous flowers are green on the outside, brownish violet-veined inside with a brown lip.

75. *B. sarcodanthum* Schltr., sp. nov.

Epiphyticum, humile, 7–10 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, ovoideis, unifoliatis, 1–1.5 cm altis, infra medium 0.7–1 cm diametentibus; folio erecto, oblongo-elliptico, oblique apiculato, basi in petiolum 0.5–1.5 cm longum attenuato, glabro, petiolo incluso 3.5–8.5 cm longo, lamina medio 1–2.7 cm lata; scapis erectis brevibus, vaginulis paucis, distantibus obsessis, laxe 2–3-floris, usque ad 7 cm altis; bracteis elliptico-cucullatis, breviter acuminatis, ovario plus duplo brevioribus; floribus in sectione parvis, erecto-patentibus, glabris; sepalis lanceolato-ellipticis, acuminatis, extus carinatis, 1.7 cm longis, lateralibus obliquis; petalis oblique lanceolatis, acutis, 7 mm longis; labello carnosulo, ovato-lanceolato, linguiformi, obtuso, marginibus recurvo, toto superne dentibus conicis numerosis ornato, basi angustato, incrassatione ovata basi bicristata donato, 1.2 cm longo; columna brevi, brachiis

lanceolato-falcatis, acutis, adscendentibus, pede adscendente; anthera ovoideo-lanceolata, cucullata, glabra; ovario subsessili cylindraceo, glabro, 0.9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19671, flowering in June 1909.

In habit this species reminds one strongly of *B. garupinum* Schltr., belonging to the section *Hymenobracteae*. It is distinguished readily from *B. verruciferum* Schltr. by the much shorter inflorescence. The flowers are yellow-green with red-brown markings.

§ 14. *Hymenobracteae*

At present I know four species of this section, viz. the three referred to here and *B. infundibuliforme* J.J. Sm. from Ambon. The latter is recorded also by J.J. Smith from Dutch New Guinea, but I think it very probable that the New Guinea plant is different specifically and may be identical with *B. garupinum* Schltr., described here.

This small group is recognised easily by its habit and floral structure. The pseudobulbs are much reduced and bear a more-or-less distinctly petiolate leaf. The few-flowered racemes are short with thin bracts and reversed flowers and have a distinct mentum. The flat labellum is provided with a thickened mid-rib at the base and is not of a very fleshy texture. The column is short and bears short arms.

For our Territory we have to consider three species which usually grow along creeks and river-courses on overhanging trees in the hill-country, and always occur in colonies, very often in such numbers that several hundred specimens may be taken from one tree.

76. *B. garupinum* Schltr., sp. nov.

Epiphyticum, humile, 8–12 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis valde reductis, ovoideis vel globosis, unifoliatis, 2.5–3.5 mm altis; folio erecto, oblanceolato-spathulato, obtuso, basi in petiolum distinctum 1.5–4 cm longum attenuato, glabro, carnosulo, petiolo incluso 8–12 cm longo, lamina medio fere 1–1.8 cm lata; scapis erecto-patentibus, vaginulis paucis obsessis, distiche 2–4 floris, 2–5 cm longis; bracteis elliptico-cucullatis, dorso carinatis, ovario brevioribus; floribus mediocribus, inversis, glabris; sepalis oblongis, acutis, extus nervo medio carinatis, 1.1 cm longis, lateralibus obliquis, basi margine anteriore ampliata cum pede columnae mentum obtusum 0.7 cm longum formantibus; petalis oblique lanceolato-ligulatis, acutis, 6 mm longis; labello curvato, anguste elliptico-ligulato, subacuto, basi cuneato, marginibus medio recurvo, infra medium sublobulato, basi carina sensim evanescente ornato, explanato 1.4 cm longo, infra medium 4.5 mm lato; columna brevi, crassiuscula, brachiis subfalcato-triangulis, acutis, filamento aequilongis, pede elongato; anthera galeato-cucullata, antice subexiciso-truncata, glabra; ovario cum pedicello brevi, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], not far from Paub, in the Eitape District, alt. c. 150 m—R. Schlechter no. 20350, flowering in Sept. 1909.

I regard it as probable that this is the species J.J. Smith believed to be identical with *B. infundibuliforme* J.J. Sm. from Ambon. I think the two are different specifically. The species is a close relative of *B. hymenobracteum* Schltr., but has broader leaves. The flowers are whitish, red-spotted with yellow keels at the base of the lip.

77. *B. hymenobracteum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 204.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Torricelli Range, alt. c. 100 m—R. Schlechter no. 14584, flowering in Apr. 1902; on trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17717, flowering in May 1908.

This species stands midway between *B. garupinum* and *B. aemulum* Schltr. The leaves are blunt, as in *B. garupinum*, but the colour of the flowers is similar to that of *B.*

aemulum Schltr. In the separate floral segments it very strongly resembles the other species of the section. The flowers are pure white with a yellow anther.

78. *B. aemulum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 195.

B. dubium J.J. Sm., in Bull. Dep. Agric. Ind. Néerl. XXI (1909), p. 36; in Nova Guinea VIII (1910)[1909], p. 139, t. XLVI, 54.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], not far from Paub, in the Eitape District, alt. c. 150 m—R. Schlechter no. 20367, flowering in Sept. 1909; on trees in the forests of the Minjem Valley, near Wobbe, alt. c. 200 m—R. Schlechter no. 16455, flowering in Sept. [Ed.—probably Aug.], 1907; on trees in the forests of the Bismarck Range, alt. c. 500 m—R. Schlechter no. 14056, flowering in Jan. 1902; on trees in the forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 19295, flowering in Apr. 1909; on trees in the forests near Pema, on the Waria [River], alt. c. 170 m—R. Schlechter no. 17401, flowering in Mar. 1908.

I have no doubt that *B. dubium* J.J. Sm. is identical with this species and must therefore be absorbed [as a synonym]. The plant is distributed widely over the whole of our Territory, and is found everywhere at an altitude of about 100 to 500 m. The location of the Type was given erroneously as from the Bismarck Range at 1500 m, but the plant was collected at that time at c. 500 m. The flowers are white with a few red lines and a yellowish keel on the labellum.

§ 15. *Dialeipanthé*

H.N. Ridley chose an adjectival name for this section. I have replaced it by a substantive one, *Dialeipanthé*. The section which was, until recently, represented by only a few species, has experienced an unexpected development in New Guinea, as the number of species now has increased considerably. In our German Territory alone, I have been able to establish ten different species, while six have been recorded recently from Dutch New Guinea, viz. *B. spathilingue* J.J. Sm., *B. thrixspermiflorum* J.J. Sm., *B. digoelense* J.J. Sm., *B. papilio* J.J. Sm., *B. crocodilus* J.J. Sm. and *B. thrixspermoides* J.J. Sm.

The distribution area stretches from the Malay Peninsula, where *B. stella* Ridl. and *B. cleistogamum* Ridl. represent the most western species, over the Greater Sunda Islands (especially Borneo), the Moluccas, New Guinea, to the Viti [Fiji] and Samoan Islands where the most eastern representatives, *B. longiscapum* Rolfe and *B. praealtum* Krzl., are found.

In our Territory the species are observed principally in the hill-country and mountains, of course, always as epiphytes. Most of them prefer, as a habitat, thick perpendicular tree-trunks covered with only a little moss or quite bare. Very rarely have I found them on horizontal branches of trees.

79. *B. caloglossum* Schltr., sp. nov.

Epiphyticum, elatum, usque ad 50 cm altum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2–3 cm distantibus, ovoideis, unifoliatis, 2–3 cm altis, infra medium 1–1.5 cm diametientibus; folio erecto, ligulato, obtusiusculo, basi petiolato-angustato, glabro, 17–25 cm longo, medio fere 3–4.5 cm lato; scapo erecto-patente, gracili, rigidulo, vaginulis paucis obsessis, usque ad 50 cm alto; racemo dense multifloro, disticho; bracteis ovatis obtusiusculis, ovario pedicellato duplo brevioribus; floribus in sectione permagnis, glabris, succedaneis; sepalis oblongis, obtusis, 4–4.3 cm longis, lateralibus obliquis, basi margine inferiore paulo dilatatis; petalis oblique, oblongo-ligulatis, obtusiusculis, glabris, 0.5 cm longis; labello curvato, e basi angustiore elliptico, obtuso, dimidio inferiore sparsim verruculoso, 4 cm longo, supra medium c. 1.3 cm lato; columna mediocri, brachiis valde abbreviatis, dentiformibus, pede leviter curvato; ovario pedicellato, glabro, c. 2.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c.

1200 m—R. Schlechter no. 19511, flowering in May 1909.

The only close relative of this magnificent plant is *B. papilio* J.J. Sm., from which, however, it differs in the petals and the lip. The dorsal sepal is white, the lateral ones reddish, the labellum red-veined.

80. *B. hamadryas* Schltr., sp. nov.

Epiphyticum, gracile, 20–28 cm altum; rhizomate decumbente, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceutis, 2–3 cm altis, supra basin 3–5 mm diametientibus; folio erecto, anguste lanceolato-ligulato, acuto, basi sensim petiolato-attenuato, glabro, 12–25 cm longo, medio fere 0.8–1.6 cm lato; scapo erectopatente, vaginulis paucis distantibus obsessis, gracili, rigido, 7–15 cm longo; racemo subaxe plurifloro, sensim elongato, bracteis distichis ovatis, apiculatis, ovario pedicellato fere 3-plo brevioribus; floribus in sectione mediocribus, glabris, sepalis patentibus, 2.2 cm longis, intermedio lanceolato, acuminato, lateralibus oblique oblongis breviter acuminatis; petalis lineari-lanceolatis, acutissimis, obliquis, c. 1 cm longis; labello oblongo, subacuto, basi superne sparsim verruculoso, ima basi bicostato, c. 1.8 cm longo, medio 7 mm lato; columna graciliore, recta, brachiis, vix conspicuis dentiformibus, pede curvato; ovario pedicellato glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20287, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17023 (TYPE), flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 18138, flowering in Sept. 1908; on trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18568, flowering in Nov. 1908.

An extremely characteristic species which stands rather isolated and is distinguished by its flower colouring as well as by its short inflorescences. The flowers are yellowish white, red-dotted at the base of the sepals and petals and the lip is golden yellow, red-spotted at the base.

var. *orientale* Schltr., var. nov.

Differt a forma typica floribus rubro-striatis, labello angustiore, acuto, columna paulo crassiore.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19590, flowering in May 1909.

I do not exclude the possibility that this plant is a separate species, but cannot make up my mind at present. The sepals and petals are yellow, red-striated, the labellum golden yellow with small red warts at the base.

81. *B. rigidipes* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 215.

Epiphyticum, elegans, usque ad 45 cm altum; rhizomate decumbente; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraceuto-conicis, unifoliatis, 3–4 cm altis, supra basin 5–8 mm diametientibus; folio anguste elliptico-ligulato, acuminato, basi in petiolum 2.5–4 cm longum attenuatis, glabris, petiolo incluso 10–20 cm longo, lamina medio fere 2–3 cm lata; scapis gracillimis, erectis, rigidulis, vaginis paucis distantibus obsessis, usque ad 45 cm longis; racemo disticho, densius multifloro, sensim elongato; bracteis ovatis, acuminatis, lateraliter compressis, ovario pedicellato fere 4-plo brevioribus; floribus succedaneis, in genere inter majores, glabris, sepalis lanceolatis, longiacuminatis, 2.8 cm longis, lateralibus obliquis; petalis e basi ovali apice trilobulatis, 0.8 cm longis; lobulis lateralibus brevibus paucidentatis, intermedio aristiformi, multo longiore; labello late ovali, apiculato, basi muriculato, crista duplici V-formiter divergente ornato, 1.4 cm longo, medio, 0.8 cm lato; columna graciliore, apice subbialata, alis brevibus, antice truncatis; ovario pedicellato glabro, c. 1.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 14362, flowering in Apr. 1902; no. 20095, flowering in Sept. 1909.

I have described this plant again here since I now possess considerably better material, so that it is possible for me to supply a better diagnosis of the species. In consequence of the shape of the lip, the plant occupies a rather solitary position in the

group. The flowers are whitish, red-striated; the petals dark red; the labellum brown-red; the column yellow.

82. *B. acuminatum* Schltr., sp. nov.

Epiphyticum, pro sectione humile, 17–20 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, 1.2–1.5 cm altis, supra basin 6–8 mm diametientibus; folio erecto, elliptico vel anguste elliptico-ligulato, subacuto, basi in petiolum 2.5–3.5 cm longum angustato, 6–10 cm longo, medio fere 1.3–3.1 cm lato; scapo e basi adscendente erecto, rigido, vaginulis paucis distantibus obsesso, usque ad 20 cm alto; racemo subdense plurifloro; bracteis compressis, apiculatis, dorso alticarinatis, ovario pedicellato 3-plo brevioribus; floribus in sectione mediocribus, glabris; sepalis lanceolatis, acuminatis, 1.7 cm longis, lateralibus obliquis, intermedio paulo latioribus; petalis oblique oblongo-ligulatis, apiculatis, infra apicem utrinque subdentatis, 6 mm longis; labello circuitu oblongo-lanceolato, dimidio anteriore marginibus recurvis acuminato, medio subcrenulato, carinis 2 e margine basali medio approximatis ornato, 1.4 cm longo; columna mediocri, brachiis brevibus, falcato-dentiformibus, pede incurvo; anthera reniformi-cucullata, umbonata, glabra; ovario pedicellato, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19669, flowering in June 1909.

It is recognised easily by its relatively short flowers and compact habit. It is also well characterised by the shape of the lip. The flowers are pale reddish.

83. *B. tenuipes* Schltr., sp. nov.

Epiphyticum, gracile, usque ad 35 cm altum; rhizomate decumbente, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2.5–4 cm distantibus, conicis vel conico-cylindraceis, glabris, 1.5–2.5 cm altis, supra basin 3–5 mm diametientibus, unifoliatis; folio erecto, lanceolato-ligulato, acuto, basi in petiolum 1–1.5 cm longum attenuato, glabro, 8–12 cm longo, lamina medio 1.5–2 cm lata; scapis tenuibus, gracillimis, vaginulis paucis distantibus ornatis, usque ad 35 cm longis; racemo disticho densius multifloro, sensim elongato, usque ad 6 cm longo; bracteis lateraliter compressis acuminatis, triangulis, ovario pedicellato 3–4 plo brevioribus; floribus succedaneis in sectione mediocribus, glabris; sepalis lanceolatis, acuminatissimis, 2.5 cm longis, lateralibus obliquis, margine inferiore basi paulo dilatatis; petalis e basi oblique ovali apice trilobulatis, 5 mm longis, lobulis lateralibus dentiformibus acutis nunc incis, intermedio multo longiore aristiformi; labello circuitu oblongo, elongato-acuminato, margine crenulato-inciso, basi margine utrinque lobulo parvulo falcato obtuso donato, medio basi costa duplici donato, cristis 2 e marginibus juxta basin medio confluentibus aucto, 1.6 cm longo; columna graciliore, brachiis abbreviatis, triangulis, acutis, pede incurvulo; anthera reniformi-cucullata, umbonata, glabra; ovario pedicellato gracili, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20064, no. 20220, flowering in Sept. 1909.

Is recognised very easily by the shape of the labellum. It is distinguished also by the very thin, wiry peduncle and its rather small leaves. The sepals are white with red stripes, the petals and labellum violet, the column white.

84. *B. distichum* Schltr., sp. nov.

Epiphyticum, gracile, usque ad 65 cm altum; rhizomate decumbente; radicibus filiformibus, flexuosis, glabris; pseudobulbis conicis, unifoliatis, 3–4 cm distantibus, 2–3 cm altis, supra basin 0.7–1 cm diametientibus; folio erecto, elliptico-ligulato, apiculato, basi in petiolum 2–3 cm longum attenuato, glabro, 12–15 cm longo, lamina medio 2.7–3.5 cm lata; scapis erectis, gracilibus, rigidis, vaginulis paucis distantibus obsessis, usque ad 65 cm longis; racemo disticho, dense multifloro, usque ad 15 cm longo; bracteis compressis, triangulis, acuminatis, ovario pedicellato duplo brevioribus; floribus in sectione mediocribus, glabris; sepalis lanceolatis, acuminatis, 2 cm longis, lateralibus obliquis, basi margine inferiore dilatatis; petalis e basi oblique quadrata, trilobulatis, 4 mm longis, lobulis lateralibus dentiformibus, acutis, intermedio aristiformi multo longiore; labello lanceolato, subulato-acuminato, margine crenato-altidentato, basi margine utrinque lobulo parvulo triangulo-falcato acuto ornato, basi bilamellato, sepalis subaequilongis; columna breviuscula, brachiis abbreviatis, triangulis, acutis; anthera cucullata, glabra, antice truncata; ovario pedicellato glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19367, flowering in May 1909.

Likewise, an excellently characterised species which can be recognised at once

always by the labellum and the rather large bracts. The flowers are a muddy-pink colour, the dorsal sepal white towards the apex, the column white with a yellow anther.

85. *B. digoelense* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XXXIX (1910), p. 5; in Nova Guinea VIII (1912) [1911], p. 592, t. CIVB.

Kaiser-Wilhelms-Land: On tall trees in the forests of [Mount] Gomadjidji (Goromia), on the Waria [River], alt. c. 400 m—R. Schlechter no. 17389, flowering in Mar. 1908; on trees in the forests near Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter no. 19259, flowering in Apr. 1909.

My drawings agree too well with the illustration of the Type for any other plant to come into possible consideration, but in my specimens the pseudobulbs stand usually 2–4 cm from one another. The species is a close relative of *B. distichum* Schltr. The flowers are whitish with dark wine-red longitudinal stripes and a brown-red labellum.

86. *B. pictum* Schltr., sp. nov.

Epiphyticum, gracile, 20–30 cm altum; rhizomate decumbente, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis vel ovoideo-conicis unifoliatis, 2–3 cm distantibus, 1–1.5 cm altis, supra basin 3–7 mm diametientibus; folio erecto, ligulato, acuto, basi in petiolum 1.5–2.5 cm longum attenuato, glabro, petiolo incluso 7–12 cm longo, lamina medio 1.1–1.7 cm lata; scapo gracillimo, erecto, rigido, vaginulis paucis distantibus obsessis, usque ad 30 cm longo; racemo disticho, subdense multifloro, sensim elongato, glabro, usque ad 7 cm longo; bracteis lateraliter compressis, triangulis, acuminatis, ovario pedicellato duplo fere brevioribus; floribus in sectione inter minores, glabris; sepalis patentibus anguste lanceolatis, elongato-acuminatis, 2.1 cm longis, lateralibus obliquis; petalis e basi suborbiculari dimidio superiore paucidentatis, in aristam productis, 3.5 cm longis, obliquis; labello e basi cuneata anguste lanceolato, producto-acuminato, margine crenulato-inciso, medio basi costato cum cristis 2 brevibus lateralibus, 1.5 cm longo; columna graciliore, brachiis brevibus aliformi-triangulis, apiculatis, margine superiore subdentatis, pede brevi; anthera obreniformi-cucullata, umbonata, glabra; ovario pedicellato glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19538, flowering in May 1909.

The species stands closest to *B. elasmatopus* Schltr., but is much daintier in habit and shows important differences in the individual floral segments, especially in the petals and the lip. The sepals are white, striated red at the base; the petals are marked with red; the labellum tinged reddish, yellow at the base.

87. *B. elasmatopus* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 201.

Kaiser-Wilhelms—Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20087, flowering in Sept. 1909; on trees in the forests of Kelel, on the Minjem [River], alt. c. 300 m—R. Schlechter no. 16462, flowering in Sept. [Ed.—probably Aug.] 1907; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17716, flowering in May 1908; on trees in the forests of the Finisterre Range, above Meireka, alt. c. 400 m—R. Schlechter no. 17942, flowering in July 1908; on trees alongside the creeks in the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 14074, flowering in Jan. 1902.

This species is distributed widely in the Protectorate. It rises up from about 200–300 m altitude to the lower boundary of the mist-forest, but only occurs as single specimens. Already I have made comments above about its relationship with *B. pictum*. The flowers are red with darker stripes.

88. *B. serra* Schltr., sp. nov.

Epiphyticum, elatum, usque ad 70 cm altum; rhizomate decumbente, brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1–1.5 cm distantibus, cylindraceutis, 3.5–4 cm altis, 3–4.5 mm supra basin diametientibus, unifoliatis; folio erecto, elliptico-ligulato, acuminato, basi sensim in petiolum c.

5 cm longum attenuato, glabro, petiolo incluso 25–30 cm longo, lamina medio 4–5 cm lata; scapo gracillimo, rigido, vaginulis paucis distantibus obsessis, usque ad 70 cm alto; racemo disticho serraeformi, subdense multifloro, sensim elongato, usque ad 20 cm longo; bracteis lateraliter compressis, falcato-triangularibus, ovario pedicellato 3–4-plo brevioribus; floribus in sectione inter majores, glabris; sepalis lanceolatis, elongato-acuminatis, 6 cm longis, lateralibus obliquis, basi margine inferiore paulo ampliatis; petalis oblique latiovatis, valde acuminatis, 5 mm longis; labello circuitu lineari-lanceolato, elongato-acuminato, sepalis aequilongo, marginibus leviter subundulato-crenulato, supra basin utrinque lobulo obtuso brevi donato; columna mediocri, steliis parvulis triangularibus acutis, pede incurvulo; anthera reniformi-cucullata, umbonata, glabra; ovario pedicellato, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], at the foot of the Torricelli Range, alt. c. 150 m—R. Schlechter no. 20362, flowering in Sept. 1909.

This species is well distinguished by its very long sepals and the equally long narrow labellum. In the regular arrangement of the bracts, the fully developed inflorescences have the appearance of a double-sided saw. The flowers are white, striated with red at the base, with a dark red lip and yellow column.

§ 16. *Macrobulbon*

As far as can be seen at present, this section is monotypic. It is distinguished by its huge pseudobulbs which are often as large as a medium-sized apple, and which bear a thick leaf about 60 cm long. The inflorescences are shortened and possess from three to five very large flowers which have a certain similarity to those of *Gramangis stapeliiflora* (T. et B.) Schltr. The lateral sepals are united by their lower margins, the petals are fairly large, the labellum short and thick, the column with upright three-cornered arms. The only species, *B. macrobulbum* J.J. Sm., is an epiphyte on thick tree-trunks in the forests of the hills at c. 300 m altitude and reaching to the lower limits of the mist-forest zone.

89. *B. macrobulbum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XXXIX (1910), p. 4; in Nova Guinea VIII (1912) [1911], p. 579, t. XCVIIIb.

Kaiser-Wilhelms-Land: On trees in the forests near the Djamu Gorge, alt. c. 400 m—R. Schlechter no. 16817, flowering in Nov. 1907; on trees in the forests of Toliba. alt. c. 300 m—R. Schlechter no. 18970, flowering in Dec. 1908.

The flowers are yellow-green, markedly spotted and dotted inside with violet; the labellum violet.

§ 17. *Peltopus*

With *Peltopus* there begins a long series of sections which always have single-flowered inflorescences.

Peltopus contains, at present, the five species treated below, and they are all distinguished by the column being peltately widened in front, and fitting into a concavity at the base of the lip so as to enable the latter to turn back inwards and upwards.

All species agree well in habit and possess elongated sepals and a short column with short, obliquely truncate stelia. They are all epiphytes on tall trees of the mist-forest formation and are thus fond of a rather cool climate.

90. *B. planilabre* Schltr., sp. nov.

Epiphyticum, gracile, 15–17 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1.5–3 cm altis, supra basin 6–8 mm diametentibus; folio erecto, oblongo-ligulato, apiculato, basi sensim in petiolum brevem attenuato, glabro, 10–15.5 cm longo, medio fere 1.5–2.7 cm lato; scapis gracillimis, filiformibus, erectis, vaginulis paucis distantibus obsessis, unifloris, 10–12 cm longis; bractea parvula, apiculata, ovario multoties brevior; flore in genere mediocri, pulchello, glabro; sepalis lanceolatis, elongatis, elongato acuminatissimis, 5 cm longis, lateralibus obliquis, petalis oblique oblongis, obtusiusculis, 2.5 mm longis; labello circuitu oblongo, obtuso, superne plano, basi excavatione suborbiculari donato, medio margine utrinque

lobiformi-constrictio, 1.2 cm longo, infra medium 6 mm lato; columna brevi, brachiis linearibus oblique truncatis parvulis, pede recto apice peltiformi-dilatato; anthera rotundato-cucullata apiculata, umbonata, glabra; ovario gracillime pedicellato, glabro, c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1400 m—R. Schlechter no. 18585, flowering in Nov. 1908.

The differences between this species and the next, a close relative, I will discuss more fully in the description of the latter. The flowers are golden yellow with white petals and the lip tinged with violet-brown in the middle.

91. *B. peltopus* Schltr., sp. nov.

Epiphyticum, gracile, 15–20 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1.5–2.5 cm altis, supra basin 5–7 mm diametientibus; folio erecto, oblongo-ligulato, acuto vel apiculato, basi in petiolum brevem attenuato, glabro, 6–13 cm longo, medio fere 1.2–2.3 cm lato, pedunculis filiformibus, erecto-patentibus, vaginulis paucis distantibus obsessis unifloris, 10–15 cm longis; bractea elliptica, apiculata, ovario multoties brevior; flore mediocri, pulchello, glabro; sepalis lanceolatis, elongato-acuminatissimis, c. 4 cm longis, lateralibus obliquis; petalis latius ovatis, obtusis, 2 mm longis; labello circuitu ovali, obtuso, basi contracto, dimidio anteriore leviter angustato, superne plano, basi excavatione quadrata antice excisa ornato, 1.2 cm longo, infra medium 7 mm lato; columna brevi, stelidiis falcato-triangularibus antice oblique truncatis, pede recto antice peltiformi-incrassato, anthera rotundato-cucullata, glabra, apiculata; ovario cum pedicello gracillimo c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19709, flowering in June 1909.

As already mentioned above, this species is related very closely to *B. planilabre*, Schltr., but differs in its smaller flowers, broader petals; in the lip which is not constricted laterally in a lobe-shaped manner in the middle, and in the broader stelidia. The flowers are pale yellow; the labellum golden yellow, red-brown in the middle.

92. *B. minutipetalum* Schltr., sp. nov.

Epiphyticum, humile, c. 15 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis subcylindraceis, unifoliatis, 3–4 cm altis, supra basin 3–4 mm diametientibus; folio erecto, ligulato, acuto, basi subpetiolato-angustato, glabro, 10–14 cm longo, medio fere 1–2 cm lato; pedunculis brevibus, vaginulis paucis obsessis, unifloris, c. 1.5 cm longis; bractea cucullata, acuminata, ovario pedicellato multoties brevior; flori mediocri, erecto, pulchello; sepalis e basi ovata elongato-acuminatissimis, medio margine minute ciliolatis, 2.8 cm longis, lateralibus obliquis; petalis minutis, oblique semirhombeis, 0.75 mm altis, 1.5 mm basi latis; labello carnosulo, circuitu quadrato, medio genuflexo, obtusissimo, superne glabro, medio sulcato, subtus minutissime papilloso-punctato, basi excavatione quadrata donato, c. 4 mm longo et lato; columna brevi, brachiis triangularibus acutis, pede recto, apice peltiformi-incrassato; anthera reniformi-cucullata, umbonata, glabra; ovario cum pedicello gracillimo c. 1.6 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 18536, flowering in Oct. 1908.

Although indisputably and distinctly related to both the preceding and the next following species, this one is distinguished excellently by the lip.

The flowers are white with a pale brown apex to the labellum.

93. *B. rhodoleucum* Schltr., sp. nov.

Epiphyticum, humile, 16–20 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 2.5–3.5 cm altis, supra basin 0.8–1.2 cm diametientibus; folio erecto, elliptico, breviter acuminato, basi attenuato, 10–17 cm longo, medio fere 3–5.5 cm lato; pedunculis aggregatis, brevibus, paucivaginulatis, unifloris, tenuibus, 2.5–3.5 cm longis; bractea cucullata, apiculata, ovario multoties brevior; flore pro sectione magno, erecto; sepalis ovatis, acuminatissimis, glabris, 4 cm longis, lateralibus obliquis; petalis oblique triangularibus, obtusiusculis, 1.7 mm altis; labello curvato, ovato, subacuto, superne leviter ruguloso, margine minute ciliolato, basi concavo, 1.5 cm longo, infra medium 8 mm lato; columna brevi, brachiis oblique quadratis antice oblique truncatis, parvulis, pede recto, antice rotundato-dilatato; ovario cum pedicello gracillimo glabro, 2–2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18745, flowering in Nov. 1908.

Among the species of the section this one is distinguished by the large flowers which are produced very plentifully. Further, its labellum is also very characteristic. The flowers are white with a red lip.

94. *B. brachypetalum* Schltr., sp. nov.

Epiphyticum, gracile, c. 10 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1.5–2 cm altis, supra basin 3–4 mm diametientibus; folio erecto, ligulato, acuto, basi sensim subpetiolato-attenuato, glabro, 4–5 cm longo, medio fere 3–5.5 mm lato; pedunculo filiformi, gracillimo, unifloro, vaginulis paucis distantibus obsesso, c. 6 cm longo; bractea parvula, ovario multoties brevior; flore in sectione parvulo, erecto-patente; sepalis lanceolatis, elongato-acuminatissimis, extus glabris, intus minute pilosulis, 2.6 cm longis, lateralibus obliquis; petalis minutissimis, brevissimis, subinconspicuis, vix 0.5 mm altis, basi vix 1 mm latis; labello ovato, subacuto, basi truncato cum excavatione, margine et subtus minutissime ciliolato, supra basin superne auriculis 2 triangulis brevibus instructo, 6 mm longo; columna brevi, brachiis oblique truncatis subobsoletis, pede recto apice peltato-dilatato; anthera rotundato-cucullata, umbonata, papillosa; ovario cum pedicello gracillimo glabro, 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19063, flowering in Jan. 1909.

This is the smallest species in the section, and is distinguished easily by the labellum and the flowers, which are hairy on the inside. The flowers are whitish with a muddy violet-red lip.

§ 18. *Schistopetalum*

The species which belong here are of a strikingly uniform habit, with a creeping rhizome on which are found, at brief intervals, short, more-or-less angular pseudobulbs bearing a longish leaf. The short inflorescences are single-flowered, with flowers generally resembling those of the section *Peltopus*, but with larger petals split (with one exception) into five to nine segments at the top. The labellum has two roundish auricles at the base, and the column has long subulate steldia and a rather long foot.

Most of the species are epiphytes of the mist-forest, but *B. fissipetalum* Schltr. occurs in the forests of the lowlands. All of them grow on tree-trunks which are almost free of moss, and they are in the habit of creeping downwards.

95. *B. schistopetalum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 216.

Neu-Mecklenburg: On trees in the mountain forests near Punam, in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14674, flowering in July 1902.

Closely related to the following species. I will comment below concerning the differences between the two species. The flowers are purple on the outside, spotted yellow inside.

96. *B. Chimaera* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 15 cm longum; rhizomate flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1–1.5 cm distantibus, ovoideis, 4-angulatis, unifoliatis, 1–1.3 cm altis, infra medium 0.6–1 cm diametientibus; folio oblongo vel elliptico, apiculato, glabro, 5–10 cm longo, medio fere 1.5–3 cm lato; pedunculis brevibus, paucivaginulatis, unifloris, 1–1.5 cm longis; bractea parvula, ovario multoties brevior; flore mediocri, erecto-patente; sepalis e basi ovata elongato-acuminatissimis, intermedio 1.5 cm longo, lateralibus obliquis 1.8 cm longis; petalis e basi perlate et oblique cuneata usque ad tertiam partem basilarem in fila 9 flexuosa fissis, c. 3 mm longis; labello e basi angusta biauriculata glabra ovato, obtuso, superne medio glabro, caeterum minute puberulo, basi inter auriculas bicostato, 6 mm longo; columna brevi, crassiuscula, steldiis longis subulatis, pede incurvulo; anthera umbonata, oblongo-cordata, glabra; ovario cum pedicello gracili glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18284, flowering in Sept. 1908.

This species is a close relative of *B. schistopetalum* Schltr., but has larger pseudobulbs, a larger differently coloured flower, different petals and a broader lip. The flowers are golden yellow, dotted red inside, with an orange-yellow labellum thickly dotted with red, and white, red-spotted petals.

97. *B. filamentosum* Schltr., sp. nov.

Epiphyticum, decumbens; rhizomate flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis subglobosis, obscure 4-angulatis, unifoliatis, 4–6 mm altis et diametientibus; folio oblongo vel elliptico-ligulato, acuto vel subacuminato, glabro, 4.5–9 cm longo, 1.5–2.7 cm medio fere lato; pedunculo, brevi, paucivaginulato, unifloro, 1.5–2 cm lato; bractea parvula, ovario multo brevior; flore in sectione magno, erecto-patente; sepalis e basi ovato-lanceolata elongato-acuminatissimis, glabris, 6 cm longis, lateralibus obliquis; petalis e basi oblique ovata, aristato-productis, 2.25 mm longis; labello e basi angusta biauriculata lanceolato, subacuto, in tertia parte basali leviter constricto, superne filamentoso, subacuto, 1.3 cm longo, infra medium 3.5 mm lato; columna brevi, stelidiis longis, subulatis, pede incurvulo, incrassatulo; ovario pedicellato glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Mimi, in the Waria Valley, alt. c. 700 m—R. Schlechter no. 19893, flowering in June 1909.

From the other species of the section this one may be recognised by the petals which are not split. The flowers are yellow, thickly dotted red, especially on the inside.

98. *B. fissipetalum* Schltr., sp. nov.

Epiphyticum, decumbens, parvulum; rhizomate flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis ellipsoideis vel subglobosis, 2.5–3.5 mm longis, medio 2–3 mm diametientibus, unifoliatis; folio cortici incumbente, elliptico, subacuto vel obtusiuscule apiculato, glabro, 1.5–2.5 cm longo, medio 0.8–1.3 cm lato; pedunculo perbrevis, vaginulis abscondito, unifloro, 2–3 mm longo; bractea parvula ovario plus duplo brevior; flore parvulo, in sectione minimo; sepalis oblongis, subacutis, glabris, 4.5 mm longis; petalis e basi ovata usque infra medium in fila 5–6 fissis, obliquis, 1.5 mm longis; labello medio genuflexo, circuitu subreniformi, antice obtuse latiapiculato, medio incrassatione glabra basi alte bicurvi donato, caeterum minute papilloso-puberulo, c. 2 mm longo et lato; columna brevi, stelidiis longis subulatis; pede incurvulo; anthera quadrato-cucullata, umbonata, glabra; ovario sessili, cylindrico, 2 mm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests near Peso, not far from Itape, alt. c. 40 m—R. Schlechter no. 19978, flowering in Aug. 1909.

This species is much smaller than all the rest of the section, and does not have elongated sepals. The flowers are white, red-spotted, the labellum dark red.

§ 19. *Brachypus*

I have included here a special group of species, distinguished by their crowded, single-leaved pseudobulbs and their numerous, much shortened, single-flowered inflorescences. They agree fairly well in habit, but there are certain differences in the formation of the stelidia which may render a further division necessary later on.

As far as it has been possible for me to investigate the very scanty descriptions of the species recorded from other portions of New Guinea, it would appear as if only the three following species from Dutch New Guinea should be included in this section, viz. *B. latibrachiatum* J.J. Sm., *B. Versteegii* J.J. Sm. and *B. floribundum* J.J. Sm. Nearly all of the species of the section enumerated here belong to the mist-forests of the mountains and only *B. maxillarioides* Schltr. and *B. rhomboglossum* Schltr. are to be found in the hill-country on trees growing along the creeks.

99. *B. maxillarioides* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 208.

Kaiser-Wilhelms-Land: On trees on the banks of the Schumann River, alt. c. 200 m—R. Schlechter no. 13819, flowering in Dec. 1901; on trees alongside the creeks

at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18663, flowering in Nov. 1908.

I do not believe I will be astray if I place this species here. It is related closely to *B. cerinum* Schltr., described below.

100. *B. cerinum* Schltr., sp. nov.

Epiphyticum, pro sectione validum, 20–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste ovoideis vel ovoideo-cylindraceis, unifoliatis, 2.5–3.5 cm altis, infra medium 1–1.3 cm diametentibus; folio erecto, anguste elliptico, acuminato, basi in petiolum 3.5–5 cm longum angustato, glabro, petiolo incluso 15–28 cm longo, lamina medio fere 3.2–6 cm lata; pedunculis vulgo aggregatis, valde abbreviatis, vaginulis paucis absconditis, unifloris, 1.2–1.7 cm longis; bractea vaginis simili, cucullata, ovario distincte brevior; flore in sectione inter majores, glabro; sepalis oblongo-lanceolatis, obtusiusculis, 2.1 cm longis, lateralibus obliquis, basi margine inferiore paulo ampliatis; petalis oblique lanceolato-ligulatis, apiculatis, 7.5 mm longis; labello circuito latiovato-cordato, obtuso, carnosio, superne leviter bicarinato, 7 mm longo; columna brevi, crassiuscula, steliis lanceolatis subacutis, mediocribus, pede incurvo; anthera oblongoideo-cucullata, magnimbonata, glabra; ovario subsessili, cylindrico, glabro, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17669, flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18249, flowering in Sept. 1908.

It is well distinguished from *B. maxillarioides* Schltr. by the smaller flowers with blunt sepals and by the narrower pseudobulbs. The flowers are yellowish white, the sepals dotted-brown on the inside near the base; the lip pale brown, thickly dotted in the middle with violet.

101. *B. iboense* Schltr., sp. nov.

Epiphyticum, humile, 22–38 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, minute puberulis; pseudobulbis anguste conico-ovoides, unifoliatis, 1.5–2.5 cm altis, infra medium 0.7–1.1 cm diametentibus; folio erecto, elliptico-ligulato, acuminato, basi in petiolum brevem angustato, glabro, petiolo incluso 17–30 cm longo, medio fere 3–4.6 cm lato; pedunculis brevibus, aggregatis, unifloris, paucivaginat, 2.5–3 cm longis; bractea ovato-lanceolata, acuminata, ovario multo brevior; flore in sectione inter minores, glabro; sepalis ligulatis, subacutis, 1.3 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, subacutis, 5 mm longis; labello curvato, carnosio, rhomboideo, obtuso, petalis aequilongo; columna brevi, brachiis lanceolatis, subacutis, satis longis, pede incurvulo; anthera ovato-cucullata, magnimbonata, glabra; ovario cum pedicello gracillimo glabro, 2–2.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000–1200 m—R. Schlechter no. 17091, flowering in Dec. 1907; no. 18973, flowering in Dec. 1908.

This species is a close relative of *B. Versteegii* J.J. Sm. from Dutch New Guinea, but is distinguished by its narrower leaves, larger flowers, narrower petals and a very sharp, rather obscurely tri-lobed labellum. The flowers are white, dotted red inside, apices of sepals yellowish, labellum yellow.

102. *B. phaeoglossum* Schltr., sp. nov.

Epiphyticum, humile, 20–30 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideo-conicis, unifoliatis, 2–3.5 cm altis, infra medium 1–1.5 cm diametentibus; folio elliptico-ligulato, acuminato, basi sensim in petiolum brevem attenuato, glabro, 20–26 cm longo, medio fere 2.5–4 cm lato; pedunculis brevibus, aggregatis, unifloris, paucivaginat, 1.5–2 cm altis; bractea cucullata, apiculata, ovario multo brevior; flore erecto, in sectione inter minores; sepalis ovatis, obtusis, stellato-punctatis, 8 mm longis, intermedio margine minute papilloso-ciliolato, lateralibus basi margine inferiore paulo dilatatis; petalis oblique lineari-ligulatis, obtusis, glabris, 3.5 mm longis; labello curvato, carnosio, ovato-linguiformi, obtuso, subtus minutissime papilloso, 5 mm longo; columna brevi, glabra, brachiis lanceolato-triangulis, obtusiusculis, pede incurvo; anthera oblongoideo-cucullata, glabra; ovario cum pedicello gracillimo 2–2.3 cm longo, glabro.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18782, flowering in Nov. 1902. [Ed.—probably 1908.]

In habit, this species shows a great similarity to *B. iboense* Schltr., but its flowers are entirely different. The flowers are green, dotted thickly with violet, with a brown, lightly violet-spotted labellum.

103. *B. rhomboglossum* Schltr., sp. nov.

Epiphyticum, parvulum, c. 18 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1–2 cm altis, infra medium 5–7.5 mm diametientibus; folio erecto, ligulato, acuto, basi subpetiolato-angustato, glabro, 10–16 cm longo, lamina medio 1.6–2.4 cm lata; pedunculis abbreviatis, paucivaginatiss, unifloris, vix 1 cm altis; bractea elliptica, acuta, ovario multo brevior; flore erecto, in sectione inter minores, glabro; sepalis anguste ellipticis, acutis, c. 1 cm longis, lateralibus obliquis, margine anteriore paululo dilatatis; petalis oblique lineari-ligulatis, subacutis, 4 mm longis; labello anguste rhombeo, obtusiusculo, glabro, petalis fere aequilongo; columna brevi, bracteis triangulis, acuminatis, margine superiore medio paulo dilatatis; anthera galeato-cucullata, glabra; ovario cum pedicello 1 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River] at the foot of the Torricelli Range, alt. c. 150 m—R. Schlechter no. 20364, flowering in Sept. 1909.

This species is most closely related to *B. iboense*, from which it is distinguished easily by its much shorter-stemmed, golden yellow flowers.

104. *B. apiculatum* Schltr., sp. nov.

Epiphyticum, parvulum, 9–18 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 0.8–2.5 cm altis, infra medium 4–7 mm diametientibus; folio elliptico vel elliptico-ligulato, acuminato, basi cuneato, glabro, 7–14 cm longo, medio fere 2–3.5 cm lato; pedunculis valde abbreviatis, paucivaginatiss, c. 5 mm altis, unifloris; bractea vaginis simili, ovario multo brevior; flore erecto, in sectione inter minores, glabro; sepalis oblongis, apiculatis, 1 cm longis, lateralibus obliquis; petalis obliquis, suborbicularibus, apiculatis, 3 mm longis; labello curvato, crasse carnosio, ovato-oblongoideo, obtuso, petalis vix longiore; columna brevi, brachiis linearibus obtusis, pede incurvulo; anthera oblongoideo-ligulata, obtusa, glabra; ovario cum pedicello glabro, 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19484, flowering in May 1909.

This and the next species are close relatives of *B. latibrachiatum* J.J. Sm. from Dutch New Guinea, but are distinguished by their almost circular-shaped petals. The flowers are yellow-green, brown-striped and with white, red-spotted petals and labellum.

105. *B. lineolatum* Schltr., sp. nov.

Epiphyticum, humile, 18–28 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraceo-conicis, unifoliatis, 2–3 cm altis, supra basin 5–7 mm diametientibus; folio erecto, elliptico-ligulato, acuminato, basi cuneato, glabro, 14–22 cm longo, medio fere 1.9–3.8 cm lato; pedunculo valde abbreviato, vaginis paucis oblecto, 3–5 mm alto, unifloro; bractea ovata, acuminata, ovario multo brevior; flore in sectione mediocri, glabro; sepalis oblongis, apiculatis, 1.4 cm longis, lateralibus obliquis; petalis oblique suborbiculari-rhombeis, obtusis, 4.5 mm longis; labello curvato, crassius carnosio, oblongoideo, obtusissimo, petalis vix longiore; columna brevi, brachiis linearibus obtusis, pede leviter incurvo; anthera ovato-cucullata, glabra; ovario cum pedicello brevi cylindrico, glabro, 9 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 16659, flowering in Oct. 1907.

This species is a close relative of the preceding one, but has larger and differently coloured flowers, more rhomboidal blunt petals and a broader, blunter labellum. The flowers are brown-red, with darker stripes.

106. *B. blepharopetalum* Schltr., sp. nov.

Epiphyticum, humile, 17–22 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, 2–2.5 cm altis, supra basin 5–8 mm diametro;

folio erecto, elliptico-ligulato, acuminato, basi subpetiolato-angustato, glabro, 14–20 cm longo, medio fere 2.8–4 cm lato; pedunculo valde abbreviato, vaginis paucis abscondito, c. 5 mm longo, unifloro, bractea ovato-lanceolata, acuminata, ovario multo brevior; flore erecto-patente, in sectione mediocri; sepalis ovalibus, apiculatis, intus sparsim puberulis, 1.6 cm longis, lateralibus obliquis; petalis suborbicularibus, apiculatis, obliquis, margine minute ciliolatis, 3.5 mm longis, supra basin 4.5 mm latis; labello curvato; carnosio, oblongo-linguiforme, obtuso, subtus basi minutissime papilloso, petalis aequilongo; columna perbrevis, brachiis lineari-falcatis, obtusis, magnis, pede incurvulo; anthera oblongoideo-cucullata, glabra, magniumbonata; ovario cum pedicello glabro, 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20050, flowering in Sept. 1909.

This is also a close relative of *B. acuminatum* Schltr., but is recognised easily by the very broad, short and densely ciliated petals, and the sepals hairy on the inside. The flowers are larger than in the last two species. The colour of the flowers is yellowish with brown stripes.

§ 20. *Papulipetalum*

I am not quite satisfied with the delimitation of this section. The typical species possess characteristics by which the section may be recognised immediately, viz. the reduced pseudobulbs bearing long-stemmed and mostly narrow leaves; the shape of the flower with its strikingly short dorsal sepal; the petals covered with warts or papillae at the apices and always more-or-less tongue-shaped; the short labellum. However, in the latter species described, these characteristics gradually become obliterated. The pseudobulbs become larger; the dorsal sepal attains the length of the lateral ones, thereby creating an approach to *Micromonanthe*, and some species show affinities with *Ehippium*. However, I thought it advisable to separate this section, so as not to enlarge the other sections unnecessarily. All the species have a strikingly long and slender-pedicelled ovary.

Among the species which have been described from other parts of New Guinea, *B. Lorentzianum* J.J. Sm. and *B. longipedicellatum* J.J. Sm. are the only ones I would care to place here. It is possible that some of the other species recently published by J.J. Smith as belonging to *Monanthaparva* ultimately may be transferred to this section. The species treated here are partly inhabitants of the forests of the hills above about 300 m altitude and partly of the mist-forests. Like species of the section *Brachypus*, they grow by preference on perpendicular tree-trunks which are almost free from moss.

107. *B. sauguetiense* Schltr., sp. nov.

Epiphyticum, 10–14 cm altum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, unifoliatis, ovoideo-conicis, 5–7 mm altis, supra basin 3–4.5 mm diametientibus; folio erecto, oblique lineari-ligulato, acuto, basi petiolato-attenuato, glabro, 7–13 cm longo, lamina medio 5–8 mm lata; pedunculo singulo, abbreviato, unifloro, vaginulis paucis basi obsesso, c. 7 mm longo; bractea parvula, pedicello perlongo multo brevior; flore erecto, mediocri; sepalis ligulatis, obtusiusculis, intermedio extus apicem versus papilloso, 9 mm longo, lateralibus obliquis, c. 1.1 cm longis; petalis oblique ligulato-lanceolatis, obtusiusculis, margine anteriore supra basin subangulatis, 2 mm longis, margine apicem versus irregularibus; labello curvato carnosulo, ovato, obtuso, dimidio anteriore paulo angustato, dimidio inferiore superne obtuse bicostato, c. 3 mm longo; columna semitereti glabra, brachiis oblique lanceolatis, obtusiusculis, satis magnis; anthera oblongoideo-cucullata, cordata, magniumbonata, glabra; ovario cum pedicello perlongo glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 2300 m [Ed.—probably 300 m]—R. Schlechter no. 18865, flowering in Nov. 1908.

This species, otherwise endowed with the characteristic features of the section, differs from all the others by its completely glabrous petals and by its dorsal sepal which is papillose towards the apex on the outside. The flowers are whitish; the sepals

red-striped; the petals with a red stripe and red spot; the lip red-spotted, and the column green.

108. *B. roseopunctatum* Schltr., sp. nov.

Epiphyticum, 8–10 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, conico-cylindraceis, unifoliatis, 3–4 mm altis, supra basin 2–2.5 mm diametro; folio erecto, oblongo-ligulato, obtuso, basi in petiolum sensim angustato, glabro, petiolo incluso 6–10 cm longo, lamina medio 1.2–2 cm lata; pedunculo abbreviato, basi vaginulis paucis obsesso, unifloro, c. 1 cm longo; bractea parvula, ovario longipedicellato multoties brevior; flore erecto, mediocri; sepalo intermedio ovato-lanceolato, acuto, glabro, 1.3 cm longo, lateralibus oblique oblongis, obtusis, glabris, 1.5 cm longis; petalis oblique oblongo-ligulatis, obtusis, apicem versus intus et margine minute papilloso-verruculosis, 3 mm longis; labello curvato, carnosus, brevi, circuito ovato-oblongo, obtuso, basi cordato, dimidio inferiore obtuse bicostato, glabro, columnae brachia paulo tantum excedente, 3.5 mm longo; columna brevi, brachia linearia, acutiuscula, mediocria; anthera oblongoideo-galeata, glabra; ovario cum pedicello gracillimo glabro, c. 5.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the range-forests of Albo, in the Minjem District, alt. c. 400 m—R. Schlechter no. 16291, flowering in July 1907.

A charming little species which is distinguished by its very short labellum and the very blunt lateral sepals. The flowers are white on the outside, dotted pale red on the inside.

109. *B. brachychilum* Schltr., sp. nov.

Epiphyticum, 12–15 cm altum; rhizomate brevi, vaginis mox fissis obtecto; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1.2–1.6 cm altis, infra medium 5–6 mm diametentibus; folio erecto, anguste ligulato, minute apiculato, basi in petiolum sensim angustato, glabro, 10–15 cm longo, medio fere 0.8–1.4 cm lato; pedunculo abbreviato, unifloro, vaginis paucis obtecto, c. 1 cm longo; bractea parvula pedicello perlongo permulto brevior; flore in sectione inter majores, erecto; sepalis anguste ellipticis, obtusiusculis, intermedio margine minute ciliato, c. 1 cm longo, lateralibus obliquis, glabris, 1.6 cm longis; petalis oblique oblongo-ligulatis, obtusiusculis, apicem versus verruculoso-papillosis, 2 mm longis; labello curvato, carnosus, circuito ovato, obtuso, superne praesertim basi costis 2 obtusis subverruculosis donato, 2.5 mm longo; columna mediocri, glabra, steliidiis linearibus obtusiusculis, satis longis, anthera oblongoideo-cucullata, glabra, umbone latiovato, donata; ovario cum pedicello perlongo glabro, c. 9 cm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna on the Waria [River], alt. c. 350 m—R. Schlechter no. 19321, flowering in Apr. 1909.

This plant is related closely to the two previous species, but may be recognised easily by its ciliated dorsal sepal and petals. The flowers are yellowish, violet-green inside, the labellum and petals pink with darker spots.

110. *B. rhodostictum* Schltr., sp. nov.

Epiphyticum, parvulum, 11–16 cm altum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis angustissime cylindraceis, unifoliatis, 1–1.3 cm altis, petiolo vix crassioribus; folio erecto, anguste ligulato, minute apiculato, in petiolum satis longum basi attenuato, petiolo incluso 7–15 cm longo, lamina medio 1–1.6 cm lata; pedunculo brevi, unifloro, vaginulis paucis obsesso, 1.5–2.5 cm longo; bractea parvula, pedicello multoties brevior; flore erecto, in sectione mediocri; sepalis oblongis, minute apiculatis, glabris, intermedio 1 cm longo, lateralibus falcato-obliquis 1.4 cm longis; petalis oblique ligulatis, obtusis, supra basin paulo dilatatis, apice papulis magnis margine ciliatis, 3.5 mm longis; labello carnosulo, orato-linguiformi, glabro, dimidio inferiore superne obtuse bicostato; anthera oblongoideo-cucullata, glabra; ovario cum pedicello glabro, 3.5–4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19380, flowering in May 1909.

Externally, very much like *B. brachychilum* Schltr., but is well distinguished by its very characteristic petals. The flowers are pale reddish; the sepals are spotted brown-red in the middle externally; the petals yellowish with red spots and papillae; the labellum whitish, spotted with pink.

111. *B. papulipetalum* Schltr., sp. nov.

Epiphyticum, pusillum, 6–9 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, adscendentibus, 5–8 mm longis, supra basin 2–4 mm diametro, unifoliatis; folio erecto, lineari, minute apiculato, basi sensim in petiolum attenuato, 5–7.5 cm longo, lamina medio 3–4.5 mm lata; pedunculo brevi, paucivaginulato, unifloro, c. 1.5 cm longo; bractea parvula, pedicello multoties brevior; flore erecto, in sectione mediocri; sepalis lanceolatis, glabris, intermedio subacuto 9 mm longo, lateralibus obliquis, subacutis, 11 mm longis; petalis oblique lineari-ligulatis, obtusis, apice papulis pluribus subulatis ornatis, 2.5 mm longis; labello curvato, ovato, obtuso, dimidio anteriore attenuato, petalis aequilongo, carnosus, glabro; columna mediocri, glabra, brachiis apiculiformibus, parvulis; anthera oblongoideo-cucullata, glabra; ovario cum pedicello longo glabro, 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 800 m—R. Schlechter no. 17321, flowering in Feb. 1908.

Amongst the species of the section, this one is distinguished by its small, narrow leaves and the petals. The flowers are white; the dorsal sepal spotted brown; the petals violet with a yellow centre; the lip spotted violet.

112. *B. brevilabium* Schltr., sp. nov.

Epiphyticum, 15–25 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1.3–3.5 cm altis, infra medium 4.5–6.5 mm diametro; folio erecto, oblique ligulato, subacuto vel minute apiculato, basi sensim in petiolum attenuato, 10–20 cm longo, lamina medio 1.5–2.2 cm lata; pedunculo brevi, paucivaginulato, unifloro, 1.5–2.5 cm longo; bractea parvula pedicello perlongo multoties brevior; flore erecto in sectione inter majores; sepalis intermedio oblongo-lanceolato, acuto, 1.1 cm longo; glabro, lateralibus oblique oblongis, obtusiusculis, glabris, 1.4 cm longis; petalis oblique oblongis, obtusiusculis, supra basin margine utrinque obtusangulis, dimidio superiore margine papulis minutis ciliolatis, 4 mm longis; labello carnosus arcuatus, e basi late rhomboidea antice paulo angustatus, obtusus, petalis aequilongo, quam columna distincte brevior; columna mediocri, glabra, brachiis subulatis, obtusiusculis; ovario longipedicellato, glabro, c. 3.5 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20138, flowering in Sept. 1909.

It is well characterised by its robust growth and the petals. The flowers are yellow, thickly dotted with brown, the petals pale with violet spots; the labellum white, spotted violet.

113. *B. falcifolium* Schltr., sp. nov.

Epiphyticum, c. 24 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis e basi crassiore angustissime cylindraceis, unifoliatis, 2–3 cm altis, petiolo vix crassioribus; folio erecto, falcato, acuto, glabro, basi petiolato-attenuato, 16–21 cm longo, 8–1 cm lato; pedunculo abbreviato, paucivaginulato, c. 1 cm longo; bractea parvula pedicello perlongo multoties brevior; flore mediocri, erecto; sepalis oblongis, glabris, intermedio acuto, 9 mm longo, lateralibus obliquis, obtusiusculis, 11 mm longis; petalis oblique oblongis, obtusiusculis, supra basin margine anteriore obtusangulis, apicem versus margine irregularibus, 2.5 mm longis; labello curvato, carnosus, circuitu ovato, obtusus, dimidio anteriore sublobato-attenuato, 3 mm longo; columna mediocri, brachiis obtusis, pede incurvo; anthera ovato-cucullata, glabra, obtusa; ovario cum pedicello glabro, c. 4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17165, flowering in Jan. 1908.

It reminds one, in many respects, of *B. sauguetiense* Schltr., but is more robust and has a glabrous dorsal sepal. The flowers are yellowish, with fine red veins on the sepals and a green lip and column.

114. *B. heterosepalum* Schltr., sp. nov.

Epiphyticum, 11–13 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 6–9 mm altis, infra medium 2–3 mm diametro; folio erecto, ligulato, minute apiculato, basi petiolato-attenuato, glabro, 8–11 cm longo, lamina medio 0.7–1.2 cm lata; pedunculo abbreviato, paucivaginulato, unifloro, 1–1.5 cm longo; bractea parvula, ovario

longipedicellato multoties brevior; flore erecto in sectione inter minores; sepalo intermedio lanceolato, subacuto, margine papuloso-ciliolato, 8 mm longo, lateralibus oblique oblongis, obtusis, glabris, 1.1 cm longis; petalis subfalcato-obliquis, oblongo-ligulatis, obtusiusculis, dimidio superiore papilloso-puberulis, 2.5 mm longis; labello curvato, carnosulo, e basi concava quadrato, cuspidato-acuminato, petalis vix longiore, columna fere aequilongo; columna mediocri, brachiis linearibus obtusis, pede incurvo; ovario cum pedicello glabro, 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Garup at the foot of the Torricelli Range, alt. c. 150 m—R. Schlechter no. 20352, flowering in Sept. 1909.

In the structure of the lip, this species stands almost isolated, but in habit and in the general floral structure it agrees well with the other species of the section. The flowers are white with a red lip.

115. *B. hians* Schltr., sp. nov.

Epiphyticum, 13–25 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1–1.5 cm distantibus, anguste conicis, unifoliatis, 1–1.5 cm altis, supra basin 4–6 mm distantibus; folio erecto, elliptico-ligulato, apiculato, basi in petiolum 5–8 cm longum attenuato, folio incluso 10–25 cm longo, lamina medio fere 1.6–2.7 cm lata; pedunculo brevi, paucivaginato, usque ad 3.5 cm longo, unifloro; bractea parvula, pedicello perlongo multoties brevior; flore erecto, in sectione magno; sepalis oblongis, intus papilloso-pilosis, intermedio sublanceolato, 1.8 cm longo, lateralibus obliquis, apiculatis, 2.2 cm longis; petalis oblique ovato-ligulatis, obtusiusculis, dimidio superiore muriculato-papulosis, 4.25 mm longis; labello incurvulo, carnosulo, ovato, obtuso, basin versus bicostato, glabro, vix petalis aequilongo; columna mediocri, glabra, brachiis subulatis, obtusiusculis, labelli apicem subattingentibus; anthera oblongoideo-cucullata, glabra; ovario cum pedicello perlongo glabro, 6–9 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300–1800 m—R. Schlechter no. 18571, flowering in Nov. 1908.

It is distinguished by the hair-covered papillae covering the sepals internally, and the dorsal and lateral sepals spreading apart like two lips. The greenish flowers are thickly spotted internally with brown, the column is green.

var. *alticola* Schltr., var. nov.

Differt a forma typica foliis manifeste latioribus, usque ad 4 cm latis.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18764, flowering in Nov. 1909. [Ed.—probably 1908.]

This variety is distinguished from the Type-form merely by the distinctly broader leaf lamina and might be regarded as the high altitude form.

116. *B. umbraticola* Schltr., sp. nov.

Epiphyticum, parvulum, 6–9 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 0.7–1.7 cm altis, infra medium 3–4.5 mm diametro; folio erecto, anguste ligulato, minute apiculato, basi in petiolum sensim attenuato, glabro, 5–8 cm longo, lamina medio vel supra medium 4.5–7 mm lata; pedunculo abbreviato, paucivaginulato, unifloro, 1–1.5 cm longo; bractea parvula, pedicello longo multoties brevior; flore erecto, in sectione inter minores; sepalo intermedio elliptico-lanceolato, acuto, glabro, 1.1 cm longo, lateralibus oblique oblongis obtusiusculis, glabris, 1.4 cm longis; petalis oblongo-ligulatis, obtusiusculis, apicem versus medio marginibusque papulis obsesso, 3.5 mm longis; labello leviter curvato, carnosulo, oblongoideo-ovato, obtuso, glabro, medio basi leviter tricostrato, 3.5 mm longo, columnam paulo excedente; columna mediocri, brachiis lanceolato-triangulis, obtusiusculis, margine superiore minute unidentatis; ovario cum pedicello gracillimo c. 4 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19806, flowering in June 1909.

A small species of the section which is distinguished by the colour of the flowers, by the petals and the slightly concave labellum with three crests at the base. The flowers are whitish with red veins and yellowish tips to the sepals.

117. *B. dschischungarens* Schltr., sp. nov.

Epiphyticum, parvulum, c. 9 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste ovoideo-conicis, unifoliatis, 1–1.3 cm altis, infra medium 3–4.5 mm diametro; folio erecto, ligulato, minute apiculato, glabro, basi sensim in petiolum attenuato, petiolo incluso 5.5–7 cm longo, lamina medio 5–7 mm lata; pedunculo breviusculo, paucivaginulato, unifloro, 1.3–1.8 cm longo, bractea parvula, pedicello gracili multoties brevior; flore erecto, in sectione inter minores; sepalis oblongo-lanceolatis, obtusiusculis, glabris, c. 9 mm longis, lateralibus obliquis, basi margine anteriore paululo ampliatis; petalis oblique ovato-lanceolatis, obtusis, supra basin margine anteriore paululo ampliatis, apice sparsim papulis subulatis ornatis, 2.5 mm longis; labello oblongo-ligulato, obtuso, subtus sulcato, 5 mm longo, glabro; columna mediocri, brachiis subulatis, columna ipsa subaequilongis, pede incurvulo; anthera quadrato-oblongoidea, cucullata, glabra, antice truncata; ovario cum pedicello glabro c. 3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1000 m—R. Schlechter no. 19603, flowering in May 1909.

A well-defined, small species which resembles *B. papulipetalum* Schltr. very much in habit, but differs considerably in the structure of the flowers. With this begin the somewhat aberrant species of the section. The species described here is characterised by sepals of equal length. The colour of the flowers is reddish white.

118. *B. dischorens* Schltr., sp. nov.

Epiphyticum, 10–20 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideo-conicis, unifoliatis, 1–2 cm altis, infra medium 5–8 mm diametentibus; folio erecto, lineari-ligulato, acuto, basi in petiolum 1.4–4 cm longum attenuato, petiolo incluso 8–18 cm longo, lamina medio 0.8–1.5 cm lata; pedunculo paucivaginulato, unifloro, 3–4 cm longo; bractea parvula pedicello gracillimo multoties brevior; flore in sectione mediocri, erecto; sepalis oblongis, obtusiusculis, glabris, 1.2 cm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, margine recurvulis, papuloso-ciliolatis, 2.5 mm longis; labello carnosulo, oblongo, obtuso, basi superne per medium sulcato, 7 mm longo; columna brevi, brachiis oblique triangulis subulato-apiculatis, satis magnis, pede incurvulo; anthera quadrato-oblongoidea antice leviter emarginata, glabra; ovario cum pedicello perlongo glabro, 4–5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19684, flowering in June 1909.

One of the somewhat aberrant species which are distinguished by sepals of equal length and more robust development of the pseudobulbs. As in the other species, the shape of the petals is especially characteristic. The flowers are white, thickly streaked with red, the petals spotted dark red, the labellum yellowish and lightly spotted red.

119. *B. acropogon* Schltr., sp. nov.

Epiphyticum, humile, 12–19 cm altum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, 1–2 cm altis, infra medium 6–9 mm diametentibus; folio erecto elliptico, acuminato, glabro, basi abruptius in petiolum 2.5–6.5 cm longum attenuato, lamina 6–11 cm longa, medio fere 1.8–4 cm lata; pedunculis paucivaginulatis, unifloris, 2–2.5 cm longis; bractea parvula cucullata, apiculata, pedicello multoties brevior; flore erecto, in sectione mediocri; sepalis oblongis, obtusiusculis, 1.2 cm longis, lateralibus obliquis, margine inferiore basin versus paululo dilatatis; petalis obliquis e basi subtriangula ligulatis, obtusis, margine anteriore dense et breviter ciliolatis, apice barbatulis, 3.75 mm longis; labello oblongo-ligulato, obtuso, dimidio inferiore superne marginibus incrassato et minutissime papilloso-puberulo, 8 mm longo; columna mediocri, brachiis parvulis falcato-subulatis, lobulo altero denticulato dorso auctis; anthera trapezoideo-cucullata, antice leviter emarginata, umbonata, glabra; ovario cum pedicello glabro, 3.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18561, flowering in Oct. 1908.

It is well distinguished by the long petioles, broad leaves and the petals. The flowers are yellow, with brown-striped sepals, brown-spotted petals and a golden yellow, brown-spotted lip.

120. *B. muriceum* Schltr., sp. nov.

Epiphyticum, 12–16 cm altum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifloris, 1–2 cm altis, infra medium 0.6–1 cm latis; folio erecto, ligulato, minute apiculato, glabro, basi sensim petiolato-attenuato, 9–18 cm longo, medio fere 0.8–1.7 cm lato; pedunculis paucivaginulatis, unifloris, c. 2 cm longis; bractea parvula, ovario gracili multoties brevior; flore in sectione parvulo, erecto; sepalis ovato-oblongis, subacutis, glabris, 8.5 mm longis, lateralibus obliquis, basi margine anteriore paulo ampliatis; petalis oblique ovatis margine et apicem versus intus papulis subulatis muriceis, 3 mm longis; labello carnosulo, oblongo, obtuso, dimidio inferiore medio sulcato, glabro, c. 6 mm longo; columna brevi, brachiis e basi quadrata dorso subbulbata subulatis, acutis, satis magnis; anthera oblongoideo-quadrata, antice leviter excisa, glabra; ovario cum pedicello gracili 2.3–2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19736, flowering in June 1909.

This species, as well as *B. acropogon* Schltr. and *B. dischorensis* Schltr., show remarkable agreement in habit, likewise in the floral characters, particularly in the lip, column and anther, so that later on they may be detached as a separate section. The flowers of this species are yellowish, with sepals striped red on the inside, the petals spotted dark red, the lip golden yellow spotted with brown and the anther dark red.

§ 21. *Ephippium*

It is very difficult to assign definite delimitations to this section, although it comprises species, the relationships of which can hardly be doubted. In the unequal length of the sepals and petals, there is an approach to *Papulipetalum*, while on the other hand, particularly in the short-lipped forms, there appears to be a relationship with *Hyalosema*, and lastly there is an evident relationship in some species with *Micromonanthe*. Most species have in common a creeping rhizome, but even here deviations occur, and these in species which are otherwise quite typical for the section. Three species belonging to this group are known to me from adjacent regions, and these do not appear to occur in German New Guinea, viz. *B. falciferum* J.J. Sm., *B. contortisepalum* J.J. Sm. and *B. obovatifolium* J.J. Sm., all from Dutch New Guinea. From the same part of the island I also know of *B. masdevalliaceum* Krzl. and *B. nasica* Schltr., the latter which I will treat in more detail later on. The species are distributed evenly in our Territory as epiphytes of the mountain and hill-country forests and only a few are confined to the mist-forest formations.

121. *B. masdevalliaceum* Krzl., in Engl. Bot. Jahrb. XXXIV (1904), p. 251.

Kaiser-Wilhelms-Land: On trees in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17920, flowering in July 1908; on trees in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18395, flowering in Oct. 1908; on trees in the forests near Jaduna on the Waria [River], alt. c. 150–400 m—R. Schlechter no. 19275, flowering in Apr. 1909; no. 19365, flowering in May 1909; on trees in the forests of the Maboro Range (Waria District), alt. c. 500 m—R. Schlechter no. 19683, flowering in June 1909.

It is altogether distinct and not, as J.J. Smith presumes, a robust growing variety of *B. Blumei* (Lindl.) J.J. Sm. The flowers are reddish brown with yellow tips; the dorsal sepal is densely ciliated white.

122. *B. nasica* Schltr., sp. nov. [Ed.—stat. et nom. nov.]

B. Blumei (Lindl.) J.J. Sm. var. *pumilum* J.J. Sm., in Nova Guinea VIII (1910) [1909], p. 90, t. XXX, Fig. 97.

Kaiser-Wilhelms-Land: On trees in the mountains on the Waria [River], near

Jaduna, alt. c. 200 m—R. Schlechter no. 19236, flowering in Apr. 1909; on trees on the Waria [River], near Pema, alt. c. 170 m—R. Schlechter no. 17390, flowering in Mar. 1908.

It is specifically, totally different from the Javanese *B. Blumei* (Lindl.) J.J. Sm., of which J.J. Smith described it as a variety. The dimensions of the whole plant are much smaller, the pseudobulbs are arranged rather closely and the colour of the flowers is variable. Also the individual segments, on careful comparison, by no means agree. The flowers are scarlet to deep rose-red, with almost orange-yellow tips to the lateral sepals and dark-red-spotted petals.

123. *B. longirostre* Schltr., sp. nov.

Epiphyticum, parvulum 8–10 cm altum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis oblongoideo-ovoideis, unifoliatis, obtuse 4-angulatis, 1–1.5 cm altis, infra medium 4–5 mm diametientibus; folio erecto-patente ligulato, minute apiculato, basi attenuato, glabro, 4–7.5 cm longo, medio fere 5.5–7 cm lato; scapis gracillimis, filiformibus, paucivaginulatis, unifloris, c. 6 cm longis; bractea parvula pedicello multoties brevior; flore in sectione inter minores, illis *B. nasica* Schltr. simili sed paulo majore; sepalo intermedio lanceolato, acuminatissimo, minute et dense ciliolato, 1.3 cm longo, lateralibus falcatis, ovato-lanceolatis, caudato-productis, apice antenniformi-subclavatis, glabris, 2.3 cm longis; petalis falcato-oblongis, aristato-acuminatis, margine minute et inaequaliter serrulatis, 6 mm longis; labello e basi quadrato-rhombea curvata in rostrum subulatum infra apicem paululo dilatatum producto, 9 mm longo, glabro, basi obtuse bicostato; columna brevi, glabra, brachiis subulatis pro affinitate breviusculis, pede incurvo; anthera oblongoideo-cucullata, antice dilatata, glabra; ovario pedicellato glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20123, flowering in Sept. 1909.

Closely related to *B. nasica* Schltr., but is distinguished by the more elongated tips of the lateral sepals, the petals elongated into a bristle-like point and also by the anther. The leaves are also broader than in *B. nasica* Schltr. The flowers are dark purple-red.

124. *B. ornithoglossum* Schltr., sp. nov.

Epiphyticum, decumbens; rhizomate decumbente, radicante; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1–1.5 cm distantibus, oblongoideo-cylindraceutis, obtuse 4-angulatis, unifoliatis, 1–1.4 cm altis, infra medium 4–5 mm diametientibus; folio erecto, ligulato, obtuso vel minute apiculato, basi angustato, glabro, 3.5–6 cm longo, medio fere 0.8–1 cm lato; pedunculis gracillimis, filiformibus, paucivaginulatis, unifloris, c. 5 cm longis; bractea parvula, pedicello gracili multoties brevior; flore in sectione mediocri, erecto; sepalis oblongo-ligulatis, subacutis, glabris, 1.8 cm longis, lateralibus obliquis; petalis subfalcatis, oblongo-ligulatis, subacutis, glabris, margine anteriore supra basin paululo dilatatis, 4 mm longis; labello e basi suborbiculari-elliptica cordata in rostrum subulatum, obtusum producto, 7 mm longo, subtus supra basin lateribus minutissime papilloso; columna brevi, brachiis subulatis, pede incurvo; anthera obovato-cucullata, antice papilloso-puberula, glabra; ovario cum pedicello gracili glabro, c. 2.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the hill-forests near Pema on the Waria [River], alt. c. 400 m—R. Schlechter no. 19905, flowering in June 1909.

This rather pretty species stands almost isolated in the section amongst those with a narrow lip because the sepals are fairly sub-equal. The flowers are a pale brown-yellow, closely striped brown.

125. *B. appressum* Schltr., sp. nov.

Epiphyticum, humile, cortici appressum; rhizomate elongato; radicibus filiformibus, flexuosis, glabris; pseudobulbis depressis, oblongis, unifoliatis, 1.5–2 cm distantibus, 5–7 mm longis, 3–5 mm latis; folio cortici plus minus appresso, elliptico vel obovato, obtuso, glabro, 1.2–1.8 cm longo, medio vel supra medium 0.7–1 cm lato; pedunculis gracilibus, filiformibus, paucivaginulatis, unifloris, 3–4.5 cm longis; bractea parvula, ovario pedicellato multoties brevior; flore erecto, in sectione mediocri; sepalis oblongo-ligulatis, obtusis, intermedio 1.1 cm longo, lateralibus duplo fere longioribus; petalis ligulatis, apice tricuspidatis, 2.25 mm longis, cuspidate intermedio, subulato lateralibus duplo longiore; labello carnosulo, e basi ovali-curvata margine minute crenulato-serrulata in rostrum longum subulatum

apicem versus paululo dilatatum obtusum producto, c. 9 mm longo, glabro; columna brevi, brachiis subulatis, pede incurvulo; ovario cum pedicello perlongo glabro, 3–4 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the mountain forests near Jaduna on the Waria [River] [Ed.—no alt. cited]—R. Schlechter no. 19250, flowering in Apr. 1909.

A very characteristic species which is distinguished easily from the others by its appearance, but in other respects it may be recognised easily by its petals. The flowers are yellow, thickly brown-spotted.

126. *B. streptosepalum* Schltr., sp. nov.

Epiphyticum, gracile; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1–2.2 cm distantibus, ovoideis, unifoliatis, obtuse 4-angulatis, 0.7–1.3 cm altis, infra medium 4–5 mm diametro; folio erecto, elliptico vel elliptico-ligulato, obtuso, basi angustato, glabro, 1.7–6 cm longo, medio fere 1–1.7 cm lato; pedunculis gracillimis, filiformibus, paucivaginulatis, unifloris, 10–12 cm longis; bractea parvula, pedicello multoties brevior; flore erecto, in sectione inter majores; sepalis intermedio lanceolato, apicem versus lateraliter compresso, glabro, c. 1 cm longo, lateralibus falcatis, e basi oblique lanceolata caudato-elongatis, dimidio anteriore contortis, 6–6.5 cm longis; petalis oblique lineari-lanceolatis, acutis, infra apicem margine utrinque dente brevi donatis, glabris, 3.5 mm longis; labello curvato carnosulo, ovali-linguiformi, obtuso, margine usque ad apicem minute et breviter ciliolato, c. 2 mm longo; columna brevi glabra, brachiis brevibus triangulis, pede incurvulo; ovario cum pedicello gracili, glabro, 1.5–2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20203, flowering in Sept. 1909; on trees in the forests at the mouth of the Waria [River]—R. Schlechter no. 19953, flowering in July 1909; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 200–350 m—R. Schlechter no. 19245, no. 19326 (TYPE), flowering in Apr. 1909.

Evidently it is related to *B. contortisepalum* J.J. Sm. but is distinguished by its smaller flowers and much narrower petals. The flowers are white, veined and striped with black-violet.

127. *B. potamophila* Schltr., sp. nov.

Epiphyticum, gracile; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis approximatis, anguste conicis, obtuse 3–4-angulatis, unifoliatis; 1–1.5 cm altis, infra basin 2.5–4 mm latis; folio erecto, lineari-ligulato, apiculato, glabro, 4–7 cm longo, 5–7 mm lato; pedunculo filiformi, paucivaginulato, unifloro, 3–4 cm longo; bractea parvula pedicello perlongo multoties brevior; flore erecto, in sectione mediocri; sepalis intermedio lanceolato, acuminato, 1.7 cm longo, lateralibus falcatis, lanceolato-ligulatis, acutis, c. 2.5 cm longis; petalis oblongo-lanceolatis, acuminatis, glabris, 2.5 mm altis; labello curvato, carnosulo, ligulato, obtuso, subtus carinato; columna brevi, brachiis triangulo-subulatis, pede incurvo; ovario cum pedicello gracillimo, glabro, usque ad 12 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19764, flowering in June 1909.

This is, evidently, a relative of *B. falciferum* J.J. Sm. but with quite different petals. The flowers are snow-white with a red-striped dorsal sepal.

128. *B. harposepalum* Schltr., sp. nov.

Epiphyticum, decumbens; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraceis, unifoliatis, 0.6–1 cm altis, 1.5–2 mm diametentibus; folio erecto, obovato vel obovato-ligulato, obtuso, basi subpetiolato-angustato, glabro, 6–12 cm longo, supra medium 2–3.2 cm lato; pedunculis gracilibus, paucivaginulatis, 4–6 cm longis; bractea parvula ovario pedicellato multoties brevior; flore erecto, in sectione mediocri; sepalis intermedio lanceolato, apicem versus conduplicato-compresso, cariniformi, obtusiusculo, 1.5 cm longo, lateralibus falcatis, lanceolatis, apice elongato acuminatis, dimidio anteriore arctissime conglutinatis, glabris, 3.2–3.7 cm longis obtusiusculis; petalis oblique oblongis, breviter acuminatis, glabris, 3.5 mm longis; labello curvato, carnosulo, ovato-linguiformi, obtuso, glabro, petalis fere aequilongo; columna brevi, brachiis triangulis, acutis, pede incurvo; anthera umbonata, oblongoideo-cucullata, glabra; ovario cum pedicello glabro, c. 2–2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18486, flowering in Oct. 1908; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 200–300 m—R. Schlechter no. 19260, no. 19290, flowering in Apr. 1909.

Doubtless a close relative of *B. restrepia* Ridl. It is well distinguished from the latter by the floral characters. The flowers are brightly coloured, the dorsal sepal yellow, the laterals red with yellow tips, the petals and labellum pale yellow, the latter streaked with brown.

129. *B. urosepalum* Schltr., sp. nov.

Epiphyticum, decumbens; rhizomate elongato; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2.5–3 cm distantibus, subcylindraceis, unifoliatis, 2.5–3.8 cm altis, supra basin 3–4 mm diametro; folio suberecto, ligulato, obtuso, basi attenuato, glabro, 9–13 cm longo, 1.3–1.8 cm lato; pedunculis erectis, gracilibus, paucivaginulatis, unifloris, 8–9 cm altis; bractea vaginante apiculata, ovario pedicellato multo brevior; flore in sectione magno, erecto; sepalis lanceolatis caudato-elongatis, obtusiusculis, extus minute papilloso-puberulis, 4.8 cm longis, lateralibus falcatis; petalis e basi oblique triangula setiformi-elongatis, subfalcatis, 6 mm longis; labello e basi quadrata medio pilosula dimidio anteriore paulo angustato obtuso, curvato, carnosulo, 4.5 mm longo; columna mediocri, brachiis brevibus acutis, pede incurvo; anthera oblongoideo-cucullata, magniumbonata, glabra; ovario cum pedicello, glabro, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 400 m—R. Schlechter no. 19346, flowering in May 1909.

A rather isolated and rare species which does not seem to be a relative of any of those described here. The flowers are brownish with yellowish tips to the lateral sepals.

130. *B. adenambon* Schltr., sp. nov.

Epiphyticum, repens; rhizomate elongato, ramoso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis conico-ovoideis, unifoliatis, 1.5–2 cm altis, 5–7 mm diametro, 2–2.5 cm distantibus; folio erecto, ligulato, minute apiculato, basi attenuato, 5–6 cm longo, medio 1–1.3 cm lato; pedunculis filiformibus, paucivaginulatis, unifloris, 9–12 cm longis; bractea parvula, ovario pedicellato multoties brevior; flore erecto, in sectione inter majores; sepalis oblongo-ligulatis, acutis, glabris, intermedio 3 cm longo, lateralibus obliquis 3.5 cm longis; petalis oblique rhombeo-falcatis, obtusis, margine papulis glanduliformibus ornatis, margine anteriore lobatis, 3.5 mm longis; labello ligulato, obtuso, medio leviter constricto, basi bicostrato, rugulis transversis, sparsis donato, glabro, c. 7 mm longo; columna brevi, brachiis subulatis, satis longis; anthera ovato-cucullata, glabra; ovario cum pedicello glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel in the Minjem Valley, alt. c. 300 m—R. Schlechter no. 16410, flowering in Aug. 1907.

This species is common in the central parts of Kaiser-Wilhelms-Land. It has rather striking flowers and may be recognised by its peculiar petals. Evidently it closely approaches the following species. The flowers are yellow with red stripes; the dorsal sepal is almost white; the petals white with a red eye; the labellum dark red.

131. *B. trichambon* Schltr., sp. nov.

Epiphyticum, repens; rhizomate elongato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, obtuse 4-angulatis, 1.5–2 cm altis, infra medium 5–8 mm diametentibus; folio erecto vel suberecto, ligulato, minute apiculato, basi angustato, glabro, 6–11 cm longo, margine fere 0.8–1.4 cm lato; pedunculo filiformi, erecto, unifloro, paucivaginulato, 11–14 cm longo; bractea parvula, ovario pedicellato multo brevior; flore erecto in sectione inter majores; sepalis elliptico-ligulatis, acutis, c. 3 cm longis, intermedio margine utrinque dense ciliolato, lateralibus obliquis, margine inferiore undulato tantum minute ciliolatis, petalis falcato-oblongis, obtusis, margine posteriore medio paululo ampliatis, c. 5 mm longis; labello e basi latirhombea curvata oblongo-ligulato, obtuso, glabro, basi superne sulcato, 7.5 mm longo; columna brevi, glabra, brachiis triangulo-subulatis, brevibus, pede incurvo; anthera rotundato-cucullata, apiculata, glabra; ovario cum pedicello gracili, glabro, c. 2.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c.

450 m—R. Schlechter no. 16430, flowering in Aug. 1907; on trees in the forests at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18512, flowering in Oct. 1908.

Undoubtedly is related to *B. adenambon* Schltr., but is well distinguished by the shape of the floral parts. The flowers are red, darker striped, with dark-red-spotted petals.

132. *B. tentaculatum* Schltr., sp. nov.

Epiphyticum, gracile; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis 5–7 mm distantibus, ovoideis, unifoliatis, obtuse 4-angulatis, c. 7 mm altis, infra medium 3.5–4.5 mm diametentibus; folio erecto-patente, ovali, obtuso, cum apiculo, glabro, 1.7–3.5 cm longo, medio fere 1.2–1.7 cm lato; scapo filiformi, erecto, unifloro, paucivaginulato, c. 5 cm longo; bractea parvula, ovario longipedicellato multoties brevior; flore erecto, in sectione mediocri; sepalis lanceolatis, acuminatis, c. 2.5 cm longis, glabris, lateralibus obliquis; petalis anguste lanceolatis, in aristam tentaculatam productis, sepalis fere 4-plo brevioribus; labello e basi concavo-auriculata ovato-dilatato, acuminato, marginibus recurvis minute ciliolato, caeterum glabro, sepalis fere 3-plo brevior; columna brevi, brachiis longis subulatis, pede incurvulo; ovario cum pedicello gracillimo, glabro, c. 4.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Eitape, alt. c. 30 m—R. Schlechter no. 19963, flowering in Aug. 1909.

Unfortunately, I have not been able to find the only flower of this species which I had in my possession, and I therefore had to describe it entirely from my sketches, so that perhaps some further corrections may become necessary. The flowers are yellow, red-striped, the labellum violet-pink with a white centre and tip.

§ 22. *Micromonanthe*

Although the species of this section at first appear very distinct, it is by no means as sharply defined as I could wish, particularly so in relation to *Papulipetalum* and *Ephippium*, since some of the species may be regarded as transitional to these sections. Likewise, to extend the limits of the section further than I have done is inexpedient since the boundaries would become more obscure and still less would be achieved.

The section approaches Ridley's *Monanthaparva*, but is not so wide in concept and in our Territory contains caespitose species only with a much-shortened rhizome and therefore very crowded pseudobulbs.

From the other parts of Papuasias a great number of species has been described which are stated by their authors to belong here. Since many of them are unknown to me, I have to be reserved somewhat in my remarks since some may have to be referred to other sections.

From British Papua the following are known at present: *B. Forbesii* Schltr. (*B. cornutum* Ridl., nec Rchb.f.) and *B. kermesinum* Ridl. From Dutch New Guinea the number is considerably greater, viz. *B. futile* J.J. Sm., *B. neo-guineense* J.J. Sm., *B. spathipetalum* J.J. Sm., *B. quadrangulare* J.J. Sm., *B. zebrinum* J.J. Sm., *B. aspersum* J.J. Sm., *B. arsoanum* J.J. Sm., *B. undatilabre* J.J. Sm. and *B. elodeiflorum* J.J. Sm.

The species in our German Territory are, with few exceptions, epiphytes of the mist-forests; only a few come from the forests of the hill-country and are found mostly on trees along the creeks, e.g. *B. melinanthum* Schltr., *B. chrysotes* Schltr. and, on the lower borders of the mist-forest, *B. mimiense* Schltr. descends to about 400 m altitude.

133. *B. glanduliferum* Schltr., sp. nov.

Epiphyticum, 15–18 cm altum; rhizomate valde abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis cylindraceis, unifoliatis, 2.5–4 cm altis, medio fere 4–6.5 mm diametro; folio erecto, oblongo-ligulato, obtuso, basi angustato, glabro, 6.5–14 cm longo, medio fere 1.8–2.6 cm lato; pedunculo brevi, paucivaginulato, unifloro, vix 1 cm longo; bractea parvula, ovario longipedicellato multoties brevior; flore pro sectione magno, erecto; sepalis ovato-lanceolatis, acutis,

1.5 cm longis, glabris, lateralibus falcato-obliquis; petalis oblique ovatis, obtusis, dimidio superiore minutissime papilloso-puberulis, 4.25 mm longis; labello carnosus ovato-linguiformis, obtusus, basi margine utrinque carina glanduloso-ciliolata ornatus, petalis fere aequilongis; columna brevis, brachiis subulatis acutis, pede incurvulo; anthera quadrato-cucullata, obtusissima, glabra; ovario cum pedicello gracillimo, 3–3.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16916, flowering in Nov. 1907.

Among the species in the Territory this is the largest in the section. It is related distinctly to *Papulipetalum*, but I think it is more correct to classify it here since the pseudobulbs are developed so strongly. The flowers are pale yellowish, violet-pink-striped, the petals dark red, the labellum brownish with violet ridges.

134. *B. chrysotes* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraceo-conicis, unifoliatis, 0.7–1 cm altis, infra medium 2.5–4 mm diametro; folio erecto, lineariligulato, acuto, basi angustato, glabro, 1.8–5 cm longo, medio fere 3–6.5 mm lato; pedunculo gracili paucivaginulato, 2–3 cm longo, unifloro; bractea parvula, ovario pedicellato multo brevior; flore erecto, in sectione mediocri; sepalis oblongis, apiculatis, intermedio margine ciliolato, 7 mm longo, lateralibus glabris, obliquis, 8.5 mm longis; petalis oblique oblongis, obtusiusculis, margine anteriore supra basin obtusangulis, margine et apicem versus minute papilloso, 3.5 mm longis; labello carnosus, curvatus, rhomboideo, obtusus, glabro, superne bicostatus, 1.75 mm longo, columnam haud excedens; columna semitereti, glabra, brachiis subulatis, pede incurvulo; ovario cum pedicello glabro, 7–8 mm longo.

Kaiser-Wilhelms-Land: On trees alongside the creeks at the foot of the Bismarck Range, near the Saugueti Base, alt. c. 250 m—R. Schlechter no. 18460, flowering in Oct. 1908.

A very distinctive species which approaches *Ephippium* in its ciliated dorsal sepal. The flowers are golden yellow, the dorsal sepal pale brown-streaked, the petals and labellum spotted and striped with violet-black.

135. *B. rivulare* Schltr., sp. nov.

Epiphyticum, parvulum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis oblique ovoideis, unifoliatis, 4–6 mm altis, infra medium 3–4 mm diametentibus; folio erecto, ligulato, obtusus, basi attenuatus, glabro, 1.2–2.3 cm longo, medio fere 4–6 mm lato; pedunculo filiformi, paucivaginulato, unifloro; bractea parvula, ovario pedicellato multo brevior; flore erecto, in sectione mediocri; sepalis anguste lanceolatis, acutis, glabris, intermedio 1.2 cm longo, lateralibus obliquis, c. 1.35 cm longis; petalis late ovatis, apice in lobulum semiorbicularem, verruculosum terminatis, glabris, 3 mm longis; labello curvatus, carnosus, ovato-linguiformis, obtusus, petalis aequilongis; columna brevis, brachiis triangulis, acutis, sublobulatis; anthera reniformi-cordata, umbonata, glabra; ovario cum pedicello gracili glabro, 1.5–2 cm longo.

Kaiser-Wilhelms-Land: On trees in the Dischore Range on the Govidjoa Creek (Waria District), alt. c. 1300 m—R. Schlechter no. 19778, flowering in June 1909.

This evidently rare species is recognised easily and well characterised by the peculiar petals which are provided with a small warty lobe at the tip. The flowers are whitish, the dorsal sepal entire, the lateral sepals only dotted with red at the base, the petals with two rows of red spots, the labellum dotted red, the column golden yellow.

136. *B. ciliipetalum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste ovoideis, unifoliatis, c. 1 cm altis, supra basin 4–5 mm diametro; folio erecto, anguste lineari, acuto, glabro, 10–12 cm longo, medio fere 3 mm lato; pedunculo gracili, filiformi, paucivaginulato, unifloro 3–3.5 cm longo; bractea parvula, ovario pedicellato multo brevior; flore erecto in sectione mediocri; sepalis lanceolatis, acutis, glabris, 1.35 cm longis, lateralibus obliquis; petalis oblique lanceolato-linearibus, acutis, margine dimidio superiore papillis subulatis ciliatis, 4 mm longis; labello carnosulo, anguste lanceolato, acuto, glabro, sepalis subaequilongis; columna brevis, brachiis falcato-subulatis, pede incurvulo; anthera galeato-cucullata, umbonata, glabra; ovario cum pedicello gracili, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19705, flowering in June 1909.

Unfortunately, I possess only a single small plant of this well-defined species which is well separated from the rest of the section by its narrow leaves and petals. The flowers are whitish yellow, sepals with red longitudinal veins, the labellum pink.

137. *B. exilipes* Schltr., sp. nov.

Epiphyticum, gracillimum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste conicis, unifoliatis, 1–2 cm altis, supra basin 3–5 mm diametentibus; folio erecto, elliptico-lanceolato, acuto, basi subpetiolato-attenuato, glabro, 4–7 cm longo; medio fere 0.8–1.5 cm lato; pedunculo setiformi, unifloro, paucivaginulato, 5–7 cm longo; bractea parvula ovario gracillime pedicellato multoties brevior; flore in sectione mediocri, erecto; sepalis lanceolatis, caudato-acuminatis, margine minute ciliatis, caeterum glabris, 1 cm longis, lateralibus obliquis, margine inferiore tantum ciliatis; petalis obliquis, e basi late obovata dimidio superiore abrupte attenuatis, et in lobum oblongum obtusum ciliatum productis, vix 3 mm longis; labello curvato carnosus, circuitu lanceolato, caudato-acuminato, subtus dimidio inferiore dense et minute puberulo, 7 mm longo; columna brevi, glabra, brachiis subulatis, pede incurvulo; anthera galeato-cucullata, papilloso-puberula, basi cordata; ovario cum pedicello gracillimo glabro, 1.3–1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19482, flowering in May 1909.

One of the most slender species I have examined up to the present. The peduncle and pedicel are remarkably thin and hair-like. The shape of the petals, likewise, is very characteristic. The flowers are red, the labellum brownish with a yellow tip, the petals dark-red with brown spots.

138. *B. triaristella* Schltr., sp. nov.

Epiphyticum pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceutis, unifoliatis, 3–5 mm altis, infra medium 2–3 mm diametentibus; folio erecto, lineari-ligulato, minute apiculato, basin versus sensim attenuato, glabro, 1.5–3.5 cm longo, medio fere 2.5–3.5 mm lato; pedunculo filiformi, erecto, paucivaginulato, unifloro, 2.5–3.5 cm longo; bractea minuta, ovario pedicellato multoties brevior; flore in sectione inter majores, erecto; sepalis lanceolatis, aristato-acuminatissimis, extus glabris, intus sparsim pilosulis, 1.8 cm longis, lateralibus obliquis; petalis latissime et oblique reniformibus, obtusissimis, glabris, 0.75 mm longis, basi 1.25 mm latis; labello carnosulo, basi incrassato puberulo, circuitu anguste lanceolato, elongato-acuminato, margine minutissime ciliolato, 5 mm longo; columna brevi, brachiis abbreviatis, apiculiformibus, pede incurvo; anthera reniformi-cucullata, umbonata, glabra; ovario cum pedicello gracili glabro, c. 7.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18586, flowering in Nov. 1908.

A very easily recognised species which is distinguished by the very wide reniform petals and the sepals hairy on the inside. The pallid yellowish flowers are striped with red.

139. *B. odontopetalum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis subglobosis, unifoliatis, 3–4 mm altis; folio erecto, oblongo-ligulato, obtuso vel minute apiculato, glabro, 1–1.3 cm longo, medio fere 3.5–4 mm lato; pedunculo filiformi, unifloro, paucivaginulato, c. 2 cm longo; bractea parvula, ovario pedicellato multoties brevior; flore erecto, in sectione mediocri; sepalis anguste lanceolatis, elongato-acuminatis, glabris, 1.5 cm longis, lateralibus obliquis; petalis oblique oblongis, margine serrato-dentatis, glabris, 2 mm longis; labello carnosulo, ligulato, obtuso, basi auriculata excavato cum callo minuto, dimidio inferiore muriculado-asperato, 4 mm longo; columna perbrevis, brachiis falcatis subacutis, pede incurvulo; anthera oblongoideo-cucullata, glabra, umbonata; ovario cum pedicello gracillimo, glabro, 0.8 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19124, flowering in Jan. 1909.

Like almost all the previous species of this section, it has its chief character in the shape of the petals; nevertheless the lip and column are also very characteristic. The

flowers are yellow, striped with red-brown; the labellum brownish with white denticulations and a yellow callus at the base.

140. *B. paululum* Schltr., sp. nov.

Epiphyticum paululum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, 4–7 mm altis, infra medium 2.5–3.5 mm diametro; folio erecto, oblongo-ligulato, obtuso, 0.7–1.3 cm longo, medio fere 3–4 mm lato; pedunculo paucivaginulato, unifloro, filiformi, 2–3.5 cm longo; bractea parvula ovario pedicellato multoties brevior; flore erecto, in sectione vix inter mediocres; sepalis lanceolatis, caudato-acuminatis, 8 mm longis intermedio margine ciliolato, lateralibus obliquis, glabris; petalis ellipticis, obtusis, margine subdentato-irregularibus, 1.75 mm longis; labello elliptico, obtuso, carnosulo, superne medio et margine praesertim subtus dense verruculoso-papilloso, 3.25 mm longo; columna brevi, glabra, brachiis triangulis acuminatis, pede incurvo; anthera cordato-cucullata, umbonata, glabra; ovario cum pedicello gracili glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari, alt. c. 1200 m—R. Schlechter no. 19585, flowering in May 1909.

The distinctive character of the species is the labellum which is decorated densely on the upper surface in the middle and the margins with warty papillae. The flowers are white, striped with dark purple, the petals with dark purple median stripes, the lip dark purple.

141. *B. mimiense* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate decumbente, brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis oblique ovoideis, unifoliatis, 5–8 mm altis, infra medium 3–5 mm diametentibus; folio erecto, ligulato, obtusiusculo vel minute apiculato, basi attenuato, glabro, 2–4 cm longo, medio fere 3–6 mm lato; pedunculo setiformi, unifloro, paucivaginulato, usque ad 4.5 cm longo; bractea minuta, ovario pedicellato multoties brevior; flore erecto in sectione inter minores; sepalis lanceolatis, acuminatis, glabris, 4 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, glabris, 1.25 mm longis; labello carnosulo, anguste lanceolato-linguiformi, producto, obtusiusculo, glabro, 2.75 mm longo; columna brevi, glabra, brachiis subulatis, pede incurvulo; anthera reniformi-cucullata, umbonata, glabra; ovario cum pedicello setiformi glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19356, flowering in May 1909; on trees in the forests of [Mount] Mimi (Waria District), alt. c. 600 m—R. Schlechter no. 17434, flowering in Mar. 1908; on trees in the forests of the Dischore Range above Dschischungari (Waria District), alt. c. 900 m—R. Schlechter no. 19843, flowering in June 1909.

Approaches *B. Hellwigii* Krzl., the smallest species of the section in our Territory. It is recognised easily by the narrow, glabrous labellum. The flowers are yellowish, striped with brown-red, the petals whitish, the labellum greenish.

142. *B. ischnopus* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 205.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1000 m—R. Schlechter no. 14343, flowering in Apr. 1902; no. 20062, flowering in Sept. 1909.

This species is distinguished readily by its narrow leaves and dainty growth. It is a close relative of *B. melinanthum* Schltr., but has larger flowers. The flowers are dark violet-red or yellowish with a violet-red base.

var. *rhodoneuron* Schltr., var. nov.

Differt a forma typica florum colore, sepalis majis caudato-elongatis.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 17098, flowering in Dec. 1907.

The variety has longer extended sepals and therefore longer-pointed flower buds than the Type-form. The flowers are yellow, striped with red, the labellum dark red, the column yellow.

143. *B. melinanthum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 208.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], at the foot of the Torricelli Range, alt. c. 50–100 m—R. Schlechter no. 14577, flowering in Apr. 1902; no. 20015, flowering in Sept. 1909.

This species is a close relative of *B. ischnopus* Schltr., but has broader leaves, much smaller flowers and a blunter labellum. The flowers are golden yellow to orange-yellow.

144. *B. Hellwigianum* Krzl., in Engl. Bot. Jahrb. XVI (1893), p. 17.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1700 m—Hellwig no. 302, flowering in Oct. 1888.

The foregoing specimen does not appear to have flowers fully developed. The species is related evidently to *B. melinanthum* Schltr., but is distinguished well by the smaller dimensions and shape of the floral parts. According to Kränzlin, the flowers are said to be greenish.

145. *B. quadrichaete* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis oblongoideis, unifoliatis, 1.5–2 mm altis; folio erecto, ligulato, obtusiusculo, basin versus sensim paulo attenuato, glabro, 0.7–2 cm longo, medio fere 2.5–3.5 mm lato; pedunculis setiformibus, paucivaginulatis, unifloris, 1.5–2.5 cm longis; bractea minuta, ovario pedicellato multoties brevior; flore erecto, in sectione inter minores; sepalis e basi ovata aristato-acuminatissimis, glabris, 4.5 mm longis, lateralibus obliquis, intermedio paulo latioribus; petalis oblique lanceolato-ligulatis, obtusis, subfalcatis, glabris, 1.75 mm longis; labello e basi quadrata aristato-elongato, curvato, carnosulo, sepalis subaequilongo; columna brevi, glabra, brachiis subulatis, pede incurvo; anthera galeato-cucullata, umbonata, glabra; ovario cum pedicello gracillimo 6–7 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20078, flowering in Sept. 1908 [Ed.—probably 1909]; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17963 (TYPE), flowering in July 1908; on trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1300 m—R. Schlechter no. 19780, flowering in June 1909.

From the other species described above, this one is distinguished very well by the floral segments. The flowers are pale yellow, striped with brown, the petals a purple-red-brown, the lip pale brown.

146. *B. bismarckense* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 197.

Kaiser-Wilhelms-Land: On trees along the creeks in the Bismarck Range, alt. c. 800 m—R. Schlechter no. 14084, flowering in Jan. 1902.

I did not find this species again on my last journey. It is similar in habit to *B. ischnopus* Schltr., but differs entirely in the flowers. I have noted the flower colouring: dorsal sepal brownish, lateral sepals yellowish.

147. *B. discolor* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraco-conicis, obliquis, unifoliatis, 5–7.5 mm longis, infra medium c. 3 mm diametientibus; folio erecto, oblanceolato-ligulato, obtusiusculo, basi sensim attenuato, glabro, 1.2–2.5 cm longo, supra medium 4–6 mm lato; pedunculo setiformi, paucivaginulato, unifloro, 2–2.8 cm longo; bractea parvula, ovario pedicellato multoties brevior; flore, erecto in sectione inter minores, glabro; sepalis ovalibus, intermedio acuminato, 6 mm longo, lateralibus obliquis, aristato-apiculatis, 6.5 mm longis; petalis oblique oblongo-quadratis, obtusissimis, glabris, 1.75 mm longis; labello carnosulo, ovato, apiculato, superne basi medio excavato, subtus basi incrassato, c. 2 mm longo; columna perbrevis, crassiuscula, brachiis brevibus triangulis, acuminatis, pede incurvulo, callo erecto infra apicem ornato; ovario cum pedicello gracili, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20248, flowering in Sept. 1909.

The species occurs only very sparsely and is not a close relative of any other member of the section, but is placed more conveniently here than elsewhere in the section. The bi-coloured flowers are violet-pink with a snow-white dorsal sepal.

§ 23. *Nematorhizis*

In this small section I place a number of long-creeping species which were designated formerly as belonging to *Monanthaparva*. All are distinguished by a strikingly thin thread-like rhizome on which the single-leaved pseudobulbs are at considerable intervals. In structure the flowers resemble those of section *Micromonanth*, but they have less elongated sepals and the stamens of the column are much shortened, often being reduced to small points. The species usually grow on trunks of trees, more rarely on the thicker branches and in consequence of their elongated rhizomes grow to a height of several metres before the lower end begins to die off. In our Territory, I know only two species which occur on trees in the forests of the hills, viz. *B. lonchophyllum* Schltr. and *B. cyclophyllum* Schltr., the remaining species known at present are entirely typical mist-forest epiphytes.

From the adjacent parts of Papuasias I know of no other species belonging here.

148. *B. lonchophyllum* Schltr., sp. nov.

Epiphyticum, perlonge repens; rhizomate elongatissimo, filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 10–17 cm distantibus, cylindraceis, unifoliatis, 1.3–1.6 cm longis; 2.5–3.5 mm diametentibus; folio erecto, elliptico-ligulato, acuminato, basi cuneato, glabro, 6.5–10 cm longo, medio fere 1.8–2.2 cm lato; pedunculo filiformi, erecto, unifloro, paucivaginulato, c. 3 cm longo; bractea parvula ovario multoties brevior; flore erecto, in sectione satis magno, glabro; sepalis lanceolatis, acutis, 1.2 cm longis, lateralibus obliquis; petalis oblique obovato-oblongis, minutissime apiculatis, apice subverruculosis, glabris, 3 mm longis; labello leviter curvato, carnoso, oblongo-linguiformi, obtuso, 6 mm longo; columna brevi, glabra, brachiis brevibus apiculatis, pede incurvulo; anthera reniformi-cucullata, umbonata, glabra; ovario breviter pedicellato glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests on the Djamu [River], alt. c. 400 m—R. Schlechter no. 17346, flowering in Feb. 1908.

From the other species of the section, this one is distinguished by its long cylindrical pseudobulbs and large leaves. The flowers are white with pink-striped sepals and petals, the lip golden yellow.

149. *B. oreocharis* Schltr., sp. nov.

Epiphyticum, perlonge repens; rhizomate valde elongato, filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, 2.5–3.5 cm distantibus, subglobosis, 1.5–2 mm diametentibus, unifoliatis; folio erecto, elliptico, obtuso vel minute apiculato, basi in petiolum perbreve attenuato, glabro, 1–1.8 cm longo, medio fere 4–8 mm lato; pedunculo filiformi, erecto, unifloro, paucivaginulato, 2–3.5 cm longo; bractea parvula, ovario pedicellato multoties brevior; flore in sectione mediocri, glabro; sepalis ovalibus, acuminatis, c. 7 mm longis, lateralibus falcato-obliquis; petalis late et oblique ellipticis, obtusiusculis, 2.75 mm longis; labello e basi minute biauriculato oblongo-linguiformi, obtuso, carnosulo, sepalis fere aequilongo; columna brevi, brachiis rhombeis, oblique truncatis, pede incurvo, basi callo obliquo aucto; anthera late rhomboideo-cucullata, umbonata, glabra; ovario cum pedicello gracili glabro, c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18010, flowering in July 1908.

Closely related to *B. microsphaerum* Schltr., but differs considerably in the flowers and is, furthermore, distinguished by the very small pseudobulbs. The flowers are dark carmine-red.

150. *B. microsphaerum* Schltr., sp. nov.

Epiphyticum, longe repens, pusillum; rhizomate valde elongato, filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2–2.5 cm distantibus, vulgo globosis, nunc ovatis, 2–3 mm diametentibus, unifoliatis; folio erecto, ligulato vel elliptico-ligulato, apiculato, basi subpetiolato-attenuato, glabro, 0.6–1.5 cm longo, medio fere 2.5–4 mm lato; pedunculo filiformi,

erecto, unifloro, paucivaginulato, 0.7–1 cm longo; bractea parvula ovario pedicellato multoties brevior; flore in sectione vix inter mediocres, glabro; sepalis ellipticis, subacutis vel apiculatis, 7 mm longis, lateralibus obliquis; petalis oblique suborbicularibus, minute apiculatis, 3 mm longis; labello curvato, carnosulo, late elliptico, antice sublobulato-apiculato, basi superne foveolato, petalis vix aequilongo; columna brevi, brachiis abbreviatis, antice truncatis, margine superiore subdentatis, pede incurvo; anthera obreniformi-cucullata, umbonata, glabra; ovario cum pedicello brevi glabro, c. 3 mm longo.

Kaiser-Wilhelms Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18758, flowering in Nov. 1908.

Appears to be related closely to *B. nematorhizis* Schltr., but in the latter the pseudobulbs are appreciably larger and the leaves longer. Both species are well distinguished by their flowers which, in this case, are yellowish, usually flushed with red.

151. *B. nematorhizis* Schltr., sp. nov.

Epiphyticum, longe repens, pusillum; rhizomate valde elongato, filiformi, flexuoso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 4.5–7 cm distantibus, ovoideis, unifoliatis, 5 mm altis, infra medium 3 mm diametentibus; folio erecto, anguste oblongo-ligulato, obtuso, basi attenuato, glabro, 1.4–2.7 cm longo, medio fere 3.5–7 mm lato; pedunculis setiformibus, unifloris, paucivaginulatis, 1.7–2.5 cm longis; bractea parvula, ovario pedicellato multoties brevior; flore in sectione inter minores, glabro; sepalis ovalibus, minute apiculatis, c. 4 mm longis; lateralibus obliquis intermedio paululo longioribus et latioribus; petalis oblique obovatis, obtuse apiculatis, 2.5 mm longis; labello quadrato-ovali obtusissimo, basi subauriculato, petalis subaequilongo, leviter curvato, carnosulo; columna brevi, brachiis subobsoletis, sublobulatis, pede incurvulo; anthera reniformi-cucullata, umbonata, glabra; ovario cum pedicello gracili glabro, 6–8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19683, flowering in June 1907. [Ed.—probably 1909.]

An extremely graceful little species which is a relative of *B. microsphaerum* Schltr. and *B. lemnifolium* Schltr., but possesses larger pseudobulbs and leaves than these species and, moreover, is well distinguished by the flower, particularly in the lip. The flowers are whitish with a red lip.

152. *B. cyclophyllum* Schltr., sp. nov.

Epiphyticum, pusillum, perlonge repens; rhizomate valde elongato, filiformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis 1.5–3 cm distantibus, parvulis, subglobosis, 1.5–2 mm diametentibus; folio erecto, suborbiculari vel perlate, elliptico, obtuso, basi breviter subpetiolato-attenuato, 1–2 cm longo, medio fere 0.8–1.3 cm lato; pedunculo setiformi, unifloro, paucivaginulato, 1.5–2.5 cm longo; bractea parvula, ovario multo brevior; flore in sectione inter mediocres, glabro; sepalis e basi ovali caudato-attenuatis, 9 mm longis; petalis oblique ellipticis, obtusis, 2.25 mm longis; labello carnosulo, curvato, elliptico, obtuso, tertia parte anteriore paulo attenuato, petalis fere aequilongo; columna perbrevis, glabra; brachiis falcato-oblongis, obtusis, pede incurvo; anthera oblongoideo-cucullata, umbonata, glabra; ovario pedicellato glabro, 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 700 m—R. Schlechter no. 17324, flowering in Feb. 1908.

Not unlike *B. oreocharis* Schltr. in habit, but has more elongated caudate sepals. The shape of the petals and labellum is also different. The flowers are yellowish with yellow tips to the sepals and a dark red lip with a yellow apex.

153. *B. lemnifolium* Schltr., sp. nov.

Epiphyticum, perpusillum, longe repens; rhizomate filiformi, valde elongato; radicibus, filiformibus, flexuosis, glabris; pseudobulbis 1–2.5 cm distantibus, subglobosis, unifoliatis, 0.5–1 mm diametentibus; folio erecto, orbiculari, obtusissimo vel minutissime apiculato, 3–5 mm longo et lato; pedunculis setiformibus, unifloris, paucivaginulatis, c. 1 cm longis; bractea parvula, cucullata, ovario sessili duplo brevior; flore in genere inter minimos, glabro; sepalis ovatis, obtusis, 2 mm longis, lateralibus obliquis; petalis suborbicularibus, obtusis, obliquis, vix 0.75 mm longis; labello carnosulo, leviter curvato, oblongo, obtuso, basi medio leviter foveolato, 1 mm longo, columna perbrevis, glabra,

brachiis oblique triangulis, obtusiusculis, pede incurvulo; anthera galeato-cucullata, umbonata, glabra; ovario sessili, cylindraceo, glabro, 0.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18029, flowering in July 1908.

Not only is this species the smallest in the section, but also probably the smallest in the genus for the Territory. It is probably related most closely to *B. cyclophyllum* Schltr., but only a miniature edition of this species. The leaves remind one of certain *Lemna* species. The flowers are greenish yellow.

§ 24. *Scyphosepalum*

I have united in this section two or three closely related species of which only *B. nuruanum* Schltr. has been reported from New Guinea. The second species is the Javanese *B. membranaceum* Teijsm. et Binnend., and the third, Samoan, has not yet been described. In habit they resemble species of the last section, from which, however, they are distinguished by their lateral sepals being connate to the apices so forming a boat-like structure in which lies the small moveable lip. The column-arms are rather short and more-or-less truncate. The column itself is very short and provided with a fairly long foot. *B. nuruanum* Schltr., the first-known species of the section from New Guinea, grows on thick moss-free tree-trunks with slightly cracked bark. I have found the species from the coastal beaches up to the hill-country at an altitude of about 450 m. It therefore requires a warmer climate.

154. *B. nuruanum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 212.

Kaiser-Wilhelms-Land: On trees in the forests near Peso, not far from Eitape, alt. c. 100 m—R. Schlechter no. 19988, flowering Aug. 1909; on trees on the banks of the Nuru [River], alt. c. 100 m—R. Schlechter no. 13800, flowering in Dec. 1901; on trees in the forests near Damum, alt. c. 450 m—R. Schlechter no. 16975, flowering in Dec. 1907; on trees in the forests above Meireka, at the foot of the Finisterre Range, alt. c. 250 m—R. Schlechter no. 18047, flowering in July 1908; on thick tree-trunks near Finschhafen, alt. c. 10 m—R. Schlechter no. 17481, flowering in Mar. 1908; on trees in the forests of [Mount] Gomadjidji (Waria District), alt. c. 450 m—R. Schlechter no. 19923, flowering in June 1909.

Since I now possess very abundant material of this species, I rectify my first description by stating that the leaves are usually more elliptical and broader than originally stated, and the pseudobulbs are more conically ovate. The species is a close relative of *B. membranaceum* Teijsm. et Binnend. from Java. The flowers are pale brown-red; the lateral sepals red on the inside, the petals yellowish; the lip dark red, sometimes with a yellow tip.

§ 25. *Polyblepharon*

A short time ago (Fedde, Repertor. X (1911), p. 177), when I established this section, it was my intention to include in it the very numerous species which are grouped closely around *B. polyblepharon* Schltr., *B. purpurascens* Bail., *B. recurviflorum* J.J. Sm. and *B. aberrans* Schltr. In the division of my New Guinea Bulbophylla, I now see that it is not possible to separate other forms, which, at first, I regarded as well-defined sections. I have tried in every way to divide further the section *Polyblepharon*, which has grown to unexpected dimensions, but have always met with fresh difficulties, since certain characters, taken partly from the habit of the plant and partly from the flowers and at the beginning quite sufficiently defined for certain relationship groups, unexpectedly disappeared in one or another species, or re-appeared again in another where they might be least expected.

The lip, especially, seems to be adapted for further division of the section, but even here so many unexpected gradual or sudden transformations occur that all combinations fail. Most of the species have two auricles at the base of the lip and in front of them a callus, but with the later species there are some where the auricles only (without a callus) are present, while others again have a labellum which gradually narrows, and with a basal callus. Nevertheless, in these cases the relationship between two such differently constituted species is without doubt. It is very similar in regard to the formation of the lateral lobes. With very few exceptions all the species have a definitely ciliated lip, which is very characteristic for the species concerned, yet even here some exceptions occur where the labellum is bare. It would really be an interesting subject for a botanist to work out the pedigree of this *Bulbophyllum* section which probably could be done from the remaining species, in which *B. navicula* Schltr. and *B. denticulatum* Schltr. must be regarded as the most simple forms from which, after all, the development of a highly complicated species, such as *B. plumula* Schltr., *B. polyblepharon* Schltr. and others, could, by a study of the material in hand, be proved to be derived, since the space at my disposal in the preparation of such work, and also my time, are too short for such special study. I hope to deal with it on some other occasion.

The most western species of the section is *B. tortuosum* Lindl. [from Java], with which *B. indragirens* Schltr. is identical. Further species are found in the Moluccas and the Celebes until the section reaches its highest development in Papuasia. The most eastern representative, *B. purpurascens* Bail., is found in Queensland.

Although, up to the present, no species have been recorded from British Papua, seven or eight which may possibly belong here have recently been described from Dutch New Guinea, viz. *B. dischidiifolium* J.J. Sm., *B. lineariflorum* J.J. Sm., *B. ulcerosum* J.J. Sm., *B. gautierense* J.J. Sm., *B. linearilabium* J.J. Sm. and *B. pseudoserrulatum* J.J. Sm. Whether *B. posticum* J.J. Sm. should be added I cannot at present decide since a 'provisional description' of a species of the genus without reference to its relationship is too superficial, and in its similarity might apply to many species belonging to very different sections.

The numerous species reported from German New Guinea occur under the most different conditions, so that it is impossible to deal with them in detail here. These will be found from the localities of the individual species. Concerning the sequence of the descriptions, I may state briefly that the long-stemmed species with auricles at the base of the labellum come first, while those with almost stemless flowers and with the most simple labellum shapes conclude the section.

155. *B. plumula* Schltr., sp. nov.

Epiphyticum, gracile; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideo-pyramidalis, 4-angulatis, unifoliatis, 0.8–1.5 cm altis, supra basin 5–7 mm diametientibus; folio erecto, ligulato, obtusiusculo vel minute apiculato, glabro, 3–5.5 cm longo, medio fere 0.5–1 cm lato; scapo setiformi, gracillimo, paucivaginulato, unifloro, 6–10 cm longo; bractea cucullata, ovario paulo brevior; flore in sectione inter majores, inverso; sepalis lanceolato-ligulatis, acutis, margine minute ciliolatis, 1.6 cm longis, lateralibus obliquis, usque infra apicem arcuato coalitis; petalis oblique latioribus, apiculo obtuso incurvo donatis, juxta apicem margine interiore barbellatis, c. 2 mm longis; labello anguste lineari, basi breviter biauriculato, juxta basin utrinque lobulo minuto ovato-falcato obtuso donato, medio leviter attenuato, obtuso, tertia parte basali excepta margine dense longiciliato-plumuliformi, 1.3 cm longo; columna perbrevis, brachiis subulatis, margine utrinque minute unidentatis, pede pro sectione brevi, sed distincto, apice in labelli unguem attenuato; ovario sessili cylindrico, glabro, vix 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17775, flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 17950, flowering in July 1908;

on trees in the forests of the Dischore Range, alt. c. 1000 m—R. Schlechter no. 19677, flowering in June 1909.

The Type of this interesting species is the specimen from the Kani Range. The form from the Dischore Range differs slightly with slightly smaller pseudobulbs. The species is distinguished readily from related species by the feather-like labellum, as well as by the large pseudobulbs which otherwise are reduced greatly in size in this section. The flowers are dark purple.

156. *B. polyblepharon* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 214.

Kaiser-Wilhelms-Land: On trees in the forests of Umbili, in the Minjem Valley, alt. c. 400 m—R. Schlechter no. 16384, flowering in Aug. 1907; on trees in the forests on the Schumann River, alt. c. 300 m—R. Schlechter no. 13820 (TYPE), flowering in Dec. 1901; on trees in the forests above Toliba, alt. c. 600 m—R. Schlechter no. 18957, flowering in Dec. 1908.

Recurrently, I have found this species, characterised by its wide, close papillose-haired petals, growing also in the central area of Kaiser-Wilhelms-Land. The flowers are violet-brown with almost black petals and labellum.

157. *B. ptilotes* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis oblongoideis unifoliatis, oblanceolato-ligulatis, subacutis vel apiculatis, basin versus sensim petiolato-attenuatis, glabris, 1.5–3.5 cm longis, 4–6 mm supra medium latis; pedunculis setiformibus, erectis, unifloris, paucivaginulatis, 4–5 cm longis; bractea cucullata, ovario sessili plus duplo brevior; flore inverso, illo *B. polyblepharon* Schltr. subaequimagno; sepalis lanceolatis, obtusiusculis, c. 1 cm longis, lateralibus obliquis, intermedio angustioribus, usque ad apicem arcte coalitis; petalis oblique ovato lanceolatis, subacutis, utrinque dense et minute papilloso-puberulis, 2.25 mm longis; labello e basi lanceolata subulato-producto, 6 mm longo, basi breviter biauriculato, superne callo lanceolato ornato, margine utrinque pilis longis patentibus plumoso-ciliato, basin versus ciliis apice leviter tentaculato-incrassatis; columna perbrevis, brachiis falcato-subulatis, bene longis, pede abbreviato; ovario cylindrico, sessili, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, above Boroai, alt. c. 1000 m—R. Schlechter no. 18281, flowering in Sept. 1908.

Closely related to *B. polyblepharon* Schltr., but distinguished readily by the lip, which narrows appreciably towards the front, with long hairs which are closely swollen towards the tips, particularly those close to the column. The flowers are dark purple, the petals with a greenish tip.

158. *B. punamense* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, subglobosis, unifoliatis, vix 1.5 mm diametentibus; folio erecto, ligulato, obtuso, basi sensim paulo attenuato, 2.5–5.5 cm longo, medio fere 0.5–1 cm lato; pedunculo filiformi, erecto, paucivaginulato, unifloro, 3–4 cm longo; flore inverso, in sectione vix inter majores; sepalis lanceolatis, acutis, glabris, 1.2 cm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique-lanceolatis, acutis, utrinque minute et dense papilloso-puberulis, 3 mm longis; labello e basi biauriculato lineari, subulato-producto, supra basin callo decurrente donato, margine longiciliato, ciliis inferioribus apice subincrassatis, c. 8 mm longo; columna perbrevis glabra, brachiis anguste falcato-linearibus, pede brevis; ovario cylindraceo, sessili, c. 3 mm longo.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 550 m—R. Schlechter no. 14657, flowering in July 1902.

The species is intermediate between *B. ptilotes* Schltr. and *B. arachnoideum* Schltr., but has much smaller pseudobulbs and a narrower labellum than either. Previously, I considered it identical with *B. polyblepharon* Schltr. but I am now convinced that it differs in having a much narrower labellum. The flowers are dark purple-red.

159. *B. arachnoideum* Schltr., sp. nov.

Epiphyticum pusillum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis adscendentibus oblongoideo-conicis, unifoliatis, 6–8 mm longis, 2–3 mm infra medium latis; folio erecto, oblanceolato-ligulato, subapiculato, basi sensim paulo angustato, glabro, 3–4 cm longo, supra medium 5–7 mm lato; pedunculo filiformi, paucivaginulato, unifloro, c. 5 cm longo; flore inverso, in sectione mediocri; sepalis ligulatis, subacutis, glabris, 1.1 cm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique ovato-lanceolatis, obtusiuscule acuminatis, minute et dense papilloso-puberulis, 2.5 mm longis; labello e basi minute biauriculata dilatato, triangulo, subulato-producto, callo lineari decurrente supra basin ornato, ciliis longis plumoso-ciliato, 8 mm longo; columna perbrevis, brachiis falcato-subulatis, longis, pede pro sectione satis longo; ovario cylindrico sessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the primary forests of Kelel, alt. c. 200 m—R. Schlechter no. 16416, flowering in Aug. 1907.

Characterised by the more creeping habit with pseudobulbs appressed in their lower half to the rhizome, and by the trilobate labellum with short hairs. The flowers are dark purple.

160. *B. blephariglossum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceutis, unifoliatis, c. 5 mm altis, 2–3 mm diametro; folio erecto, oblanceolato, apiculato, basi petiolato-angustato, glabro, 4–6 cm longo, medio vel supra medium 5–7 mm lato; pedunculo setiformi, paucivaginulato, unifloro, 5.5–7 cm longo; bractea cucullata ovario subduplo brevior; flore inverso, in sectione magno; sepalis lanceolatis longiacuminatis, glabris, c. 2.4 cm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique ovatis, subacutis, dimidio superiore minute papilloso-puberulis, c. 3.5 mm longis; labello e basi minute auriculata, anguste lanceolato, subulato-producto, supra basin callo obtuso decurrente ornato, 1.3 cm longo, margine pro affinitate brevius ciliato, ciliis inferioribus apice subcapitatis; columna perbrevis, brachiis hamato-subulatis, longis; anthera galeato-cucullata, minutissime papillosa; ovario cylindrico, glabro, sessili, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, on the Minjem [River], alt. c. 500 m—R. Schlechter no. 16279, flowering in July 1907.

The largest-flowered species in this group. Well characterised by the long-pointed sepals and the long labellum with shorter hairs. The flowers are dark red.

Two single plants, specimen no's 19767 and 19794, collected on the Govidjoa [Creek] probably belong here also.

161. *B. xanthotes* Schltr., sp. nov.

Epiphyticum, gracile; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceutis, unifoliatis, 5–7 mm longis, c. 2–3 mm diametro; folio erecto, oblanceolato-ligulato, apiculato, basi sensim petiolato-angustato, glabro, 2.5–6 cm longo, supra medium 0.5–1 cm lato; pedunculo setiformi, paucivaginulato, unifloro, c. 7 cm longo; bractea cucullata, ovario fere 3-plo brevior; flore inverso, in sectione inter majores; sepalis lanceolatis, acuminatis, 1.7 cm longis, intermedio margine sparsim ciliolato, lateralibus obliquis, glabris, usque infra apicem margine arcte coalitis; petalis oblique latioribus, subacutis, utrinque dense puberulis, 3.5 mm longis; labello e basi minute biauriculata lanceolato acuto, nervo medio carinato, margine longe et dense plumuliformi-ciliato, 5.5 cm longo; columna perbrevis, brachiis rhombeo-falcatis, antice apiculatis, cum dente parvulo posteriore; anthera galeato-cucullata, glabra; ovario cylindraceuto, sessili, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range above Dschischungari, alt. c. 900 m—R. Schlechter no. 19831, flowering in June 1909.

This unique species is well characterised by the colour of the flowers and by the labellum. The flowers are golden yellow.

162. *B. tentaculatum* Schltr., sp. nov. [Ed.—*tentaculiferum*].

Epiphyticum, erectum vel patulum, usque ad 20 cm longum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis rhizomati subparallelis, unifoliatis, subcylindraceutis, 5–7 mm longis; folio erecto-patente, ligulato, apiculato, basi angustato, 1.5–5 cm longo, 3.5–7 mm

lato; pedunculis setiformibus, unifloris, paucivaginulatis, 4–6 cm longis; bractea cucullata, ovario pluris brevior; flore inverso, in sectione mediocri; sepalis lanceolatis, acutis, glabris, 1 cm longis, lateralibus angustioribus usque ad apicem margine arcte coalitis; petalis e basi oblique lanceolata caudatis, apice tentaculato incrassatis, margine anteriore minute ciliolatis, sepalis aequilongis; labello e basi minute biauriculata cruciata trilobato, lobis lateralibus subquadratis, parvulis, intermedio subulato, margine ciliis longis plumoso, apice tentaculato-incrassatulo, labello toto c. 7.5 mm longo, callo parvulo rotundato supra basin; columna perbrevis, brachiis subulato-lanceolatis, pede incurvulo; anthera cucullata, glabra; ovario cylindrico, glabro, sessili, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18717, flowering in Nov. 1908.

Easily recognised by the erect growth as well as by the tentacle-like petals. The flowers are whitish, violet-greenish inside.

163. *B. elegantius* Schltr., sp. nov.

Epiphyticum, perpusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ellipsoideis, parvulis unifoliatis, 1.75–2.25 mm altis; folio erecto, oblongo-ligulato vel ligulato, minute apiculato, basi subpetiolato-attenuato, glabro, 0.7–1.3 cm longo, medio fere 2–3.5 mm lato; pedunculo setiformi, paucivaginulato, unifloro, c. 2.5–3 cm longo; bractea parvula, ovario fere 3-plo brevior; flore inverso, in sectione vix mediocri; sepalis lanceolatis, acuminatis, glabris, 1 cm longis, lateralibus obliquis, usque ad apicem margine arcte coalitis; petalis oblique ovatis, margine irregulariter paucidentatis, apice in caudam vel setam productis, 6 mm longis; labello juxta basin auriculis 2 patentibus rotundatis donato, deinde unguiformi attenuato, lamina anguste lanceolata acuta cum nervo medio incrassato, marginibus setis longis patentibus plumuliformi-ciliatis, labello toto 7 mm longo; columna brevi, brachiis subfalcato-lanceolatis, margine posteriore subdentatis, pede incurvo; anthera galeato-cucullata, glabra; ovario cylindraceo, sessili glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19700, flowering in June 1909.

A delightful small species which, by the structure of the labellum and its habit, cannot be confused with any other. The flowers are pink, the labellum green.

164. *B. nigrilabium* Schltr., sp. nov.

Epiphyticum, perpusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, ovoideis vel suborbicularibus, 1.75–2 mm altis; unifoliatis; folio erecto, anguste elliptico-ligulato, acuto, basi sensim angustato, 0.7–1.4 cm longo, 2.75–5 mm lato; pedunculo setiformi, unifloro, paucivaginato, 1.6 cm longo; bractea cucullata, ovario fere aequilonga; flore in sectione parvulo, elegantulo, inverso; sepalis lanceolatis obtusiusculis, 4 mm longis, glabris, lateralibus obliquis, usque ad apicem margine arcte coalitis; petalis e basi ovato-lanceolata subulato-caudatis, dimidio inferiore ciliatis, 2.75 mm longis; labello juxta basin lobulis vel auriculis 2 falcato-rotundatis donato, lamina (vel lobo intermedio) lineari apice verruca obtusa globosa terminata, margine setulis brevibus apice incrassatis biseriatis utrinque ornata, labello toto 3.5 mm longo; columna perbrevis, brachiis linearibus subacutis, strictis, satis longis, pede bene evoluto, recto; anthera altigaleata, glabra; ovario sessili, cylindrico, glabro, 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Torricelli Range, on the Garup [River], alt. c. 150 m—R. Schlechter no. 20351, flowering in Sept. 1909.

An exceptionally elegant small plant so characteristic in habit and floral structure that it cannot be confused with any other previously described species. The flowers are pale wine-red, yellowish at the base and the labellum black-violet.

165. *B. kenejianum* Schltr., sp. nov.

Epiphyticum, decumbens, perpusillum; rhizomate elongato; radicibus filiformibus, flexuosis, glabris; pseudobulbis incumbentibus, minutis, unifoliatis, ovoideo-cylindraceis, 1.5–2 mm longis; folio erecto-patente, elliptico, obtuso vel minute apiculato, basi cuneato, carnosulo, 0.6–1 cm longo, medio fere 4–6 mm lato; pedunculo erecto, setiformi, paucivaginulato, unifloro, c. 1.5 cm longo; bractea cucullata, ovario sessili aequilonga; flore in sectione vix inter mediocres, inverso; sepalis lanceolatis, obtusiusculis, glabris, 4.5 mm longis; petalis oblique latiovatis, apiculatis, glabris, margine hinc et inde subdentatis, 1.5 mm longis; labello e basi minute biauriculata anguste oblongo-ligulato, apiculato,

infra medium paulo constricto, dimidio superiore margine leviter undulato et setis longis patentibus apice incrassatis plumuliformi-ciliato, superne supra basin callo reniformi ornato, longitudinaliter obtusicarinato, 4 mm longo; columna perbrevis, brachiis falcato-ligulatis, subacutis, pede crassiusculo; ovario sessili, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the gallery-forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18343, flowering in Oct. 1908; on trees on the Schibruba [Creek] near Toliba, alt. c. 350 m—R. Schlechter no. 18964, flowering in Dec. 1908.

This species is the start of a series of small creeping forms. The petals and the lip of the above are very characteristic. The flowers are violet-purple, yellow towards the base, the petals yellow with a green tip; the labellum hairy with a violet-brown margin and with hairs.

166. *B. montanum* Schltr., sp. nov.

Epiphyticum, perpusillum, longe repens; rhizomate filiformi, flexuoso, elongato; radicibus filiformibus, flexuosis, glabris; pseudobulbis 0.7–1.3 cm distantibus, oblique ovoideis, unifoliatis, 3–4 mm altis; folio erecto, lineari-ligulato, obtusiusculo, basi attenuato, glabro, 0.7–2 cm longo, medio fere 2–3 mm lato; pedunculis setiformibus, paucivaginulatis, unifloris, 2–2.5 cm longis; bractea cucullata, parvula, ovario pluries brevior; flore inverso, in sectione inter minores; sepalis oblongo-ligulatis, obtusis, 5 mm longis, lateralibus obliquis, usque infra apicem arcte coalitis, glabris; petalis oblique lanceolatis, valde acuminatis, margine ciliolatis, 4 mm longis; labello e basi minute biauriculata oblongo-ligulato, tertia parte basali paululo constricto cum incrassatione quadrata, dense et perbrevis setulis capitulatis ciliolato, 4.25 mm longo; columna perbrevis, glabra, brachiis subulatis acutis, pede pro sectione longo; anthera galeato-cucullata, papillosa; ovario sessili, cylindrico, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20298, flowering in Sept. 1908. [Ed.—probably 1909.]

The habit is similar to that of species in the section *Nematorhizis*. It is closest to the species following. The flowers are yellowish with a violet-pink lip.

167. *B. dryadum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate decumbente, laxo pseudobulbis obsesso; radicibus filiformibus, flexuosis, glabris; pseudobulbis 3–5 mm distantibus, incumbentibus, oblongoideis, unifoliatis, 2–3 mm longis, medio fere 1–2 mm latis; folio erecto, ovali, apiculato, basi attenuato, 4.5–7 mm longo, medio fere 3–5 mm lato; pedunculo tenui, erecto, paucivaginulato, unifloro, c. 6 mm longo; bractea cucullata, apiculata, ovario sessili aequilonga; flore in sectione inter minores, inverso; sepalis lanceolato-ligulatis, subacutis, glabris, c. 1 cm longis, lateralibus obliquis, usque ad apicem margine arcte coalitis; petalis oblique oblongis, apiculatis, glabris, 4 mm longis; labello e basi minute biauriculata supra basin lobulato-dilatato cum lobulis auriculiformibus obtusis divaricantibus, lamina ligulata, obtusiuscula, margine pilis brevibus 2-seriatis dense et breviter ciliolata, toto 0.8 cm longo; columna brevi, crassiuscula, brachiis subulatis, brevibus, pede satis evoluto; ovario sessili, glabro, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19651, flowering in June 1909.

This delightful small species is intermediate in habit between *B. montanum* Schltr. and the species following. The flowers resemble those of *B. dichaeoides* Schltr., but it can be distinguished readily. The flowers are reddish with an almost black lip.

168. *B. dichaeoides* Schltr., sp. nov.

Epiphyticum, repens, pusillum, usque ad 20 cm longum; rhizomate elongato, densius pseudobulbis obsesso; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, rhizomati arcte adnatis, vix 2 mm longis, unifoliatis; foliis erecto-patentibus, ellipticis, obtusis vel minute apiculatis, carnosius, 0.8–1 cm longis, medio fere 5–6 mm latis; scapis setiformibus, paucivaginulatis, unifloris, usque ad 1.5 cm longis; bractea cucullata, ovario sessili brevior, flore inverso in sectione inter minores; sepalis oblongis, subacutis, glabris, 6 mm longis, lateralibus obliquis, usque infra apicem arcte coalitis; petalis oblique ovatis, breviter aristato-acuminatis, margine sparsim denticulatis, 4 mm longis; labello e basi minute auriculata supra basin sublobulato-dilatato, lamina anguste oblonga, margine dense pilis brevissimis capitatis ciliolata, nervo medio carinato basi incallum parvulum terminato, labello toto

5 mm longo; columna perbrevis, brachiis oblique apiculatis, pede incurvulo; anthera cucullata, glabra; ovario sessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the mouth of the Waria [River]—R. Schlechter no. 19959, flowering in July 1909.

This and the following species are very close in habit, but are well characterised by the floral features. They all grow always on strong trees with somewhat cracked bark. The flowers are dark-violet-red.

169. *B. adenoblepharon* Schltr., sp. nov.

Epiphyticum, pusillum, repens, usque ad 15 cm longum; rhizomate elongato, dense pseudobulbis obsesso; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis cum rhizomate arcte connatis, unifoliatis, 1–1.5 mm longis; folio erecto-patente, elliptico, subacuto vel minute apiculato, basi cuneato, carnosio, glabro, 0.5–1 cm longo, medio fere 3–5 mm lato; scapis setiformibus, paucivaginulatis, unifloris, erectis, 0.7–1 cm longis; bractea cucullata, ovario sessili paulo brevior; flore inverso, in sectione inter minores; sepalis anguste ligulatis, obtusiusculis, glabris, 5.5 mm longis, lateralibus obliquis, usque ad apicem margine arcte coalitis; petalis oblique ovato-lanceolatis, acuminatis, margine subdentato-irregularibus, glabris, 3.75 mm longis; labello e basi minute auriculata ligulato, obtuso, basin versus paululo angustato, basi ipsa sursum leviter dilatato, nervo medio carinulato, margine glandulis minute stipitatis dense ciliolato, 5 mm longo; columna perbrevis, crassa, brachiis lanceolatis, acutis, pede incurvulo; anthera glabra; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Keel (Minjem Valley), alt. c. 200–250 m—R. Schlechter no. 16513, flowering in Sept. 1907; no. 16792, flowering in Nov. 1907.

Probably closely related to *B. dichaeoides* Schltr., described above, but readily differentiated by the floral structure, especially the labellum. The flowers are dark red.

170. *B. microblepharon* Schltr., sp. nov.

Epiphyticum, pusillum, repens, usque ad 15 cm longum; rhizomate elongato, dense pseudobulbis obsesso; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis unifoliatis, cum rhizomate arcte connatis, 1–1.5 mm longis; foliis erecto-patentibus, ovalibus, obtusis vel minute apiculatis, carnosius, 4–7 mm longis, medio fere 2.5–4 mm latis; pedunculis brevibus paucivaginulatis, unifloris, erectis, c. 4 mm longis; bractea cucullata, ovario aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, acutis, glabris, 4 mm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique lanceolato-ovatis, obtusiusculis, glabris, 2 mm longis; labello e basi minute biauriculato, lineari-ligulato, acuto, supra basin in lobulos 2 divergentes obtusos dilatato et callis 2 parvulis ornato, dimidio anteriore setulis tenuissimis brevibus ciliolato, 3 mm longo; columna perbrevis, brachiis lanceolato-triangularibus, obtusiusculis, pede brevi incurvulo; anthera cucullata, glabra; ovario sessili, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17263, flowering in Jan. 1908.

Very similar in habit to the above-described *B. dichaeoides* Schltr. and *B. adenoblepharon* Schltr., but smaller and with quite a different lip. The flowers are red, with darker sepals and petals.

171. *B. serpens* Schltr., sp. nov.

Epiphyticum, pusillum, serpens, usque ad 20 cm longum; rhizomate elongato, dense pseudobulbis obsesso; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, unifoliatis, cum rhizomate arcte connatis, c. 1–1.5 mm longis; foliis erecto-patentibus, ovalibus vel obovato-ovalibus, minute apiculatis, carnosius, glabris, 5–7 mm longis, medio fere 3–4 mm latis; pedunculis erectis, paucivaginulatis, unifloris, c. 4 mm longis; bractea cucullata, ovario aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, subacutis, glabris, 8 mm longis; lateralibus obliquis, usque infra apicem arcte coalitis; petalis oblique ovatis, breviter aristato-acuminatis, margine subdentato-irregularibus, c. 2 mm longis, glabris; labello e basi minute biauriculato anguste lineari, acutissimo, supra basin margine utrinque lobuliformi-dilatato, basi callo in carinam decurrente ornato, tertia parte basali excepta marginibus satis longe ciliolato, 5.25 mm longo; columna perbrevis, brachiis subulatis, subacutis, pede crassiusculo incurvulo; anthera cucullata, glabra; ovario sessili, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, above the Saugueti Base, alt. c. 450 m—R. Schlechter no. 18477, flowering in Oct. 1908.

This species terminates the group of creeping species with rudimentary pseudobulbs. This plant is distinguished readily from its relatives by its floral structure. The flowers are violet-red with darker petals and labellum.

172. *B. cadetioides* Schltr., sp. nov.

Epiphyticum, parvulum, caespitificum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraceo-oblongoideis, unifoliatis, 2.5–3.5 mm longis, medio fere usque ad 2 mm diametentibus; folio erecto, oblongo, minutissime apiculato, basi breviter petioliformi-contracto, 1–1.5 cm longo, medio fere 3–5 mm lato; pedunculo erecto, paucivaginulato, unifloro, c. 1 cm longo; bractea cucullata, ovario subaequilonga; flore inverso, in sectione inter majores; sepalis lanceolatis, acutis, glabris, 1.7 cm longis, lateralibus obliquis, usque ad apicem fere margine arcte coalitis; petalis oblique lati-ovatis, breviter acuminatis, utrinque dense et minute papilloso-puberulis, 5 mm longis; labello e basi margine utrinque in lobulum oblique quadratum parvulum dilatato, lineari-subulato, marginibus longius plumuliformi-ciliato, ciliis patentibus, inferioribus apice minute capitellatis, supra basin medio incrassato cum carinula mediana, labello toto 1 cm longo; columna perbrevis, brachiis falcatis filiformi-subulatis longis, pede brevi; anthera galeato-cucullata, glabra, ovario sessili, glabro, vix 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19642, flowering in May 1909.

This species is possibly closer to the first one in the section, but has the shorter inflorescences of the species in this part, although in contrast it has hairy petals, by which it is fairly isolated. In habit it bears a strong resemblance to *Cadetia wariana* Schltr. and the other species of the section *Sarco-Cadetia*. The flowers are very dark-violet-red.

173. *B. scopula* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis parvulis, oblongoideis, unifoliatis, 2–3.5 mm altis; folio anguste elliptico-ligulato, apiculato, basi sensim subpetiolato-angustato, glabro, 1.5–2.5 cm longo, supra medium 3–5.5 mm lato; inflorescentiis basi pedunculo perbrevis communi scopuliformi-affixis, pedunculis setiformibus, paucivaginulatis, unifloris, c. 8 mm longis; bractea cucullata, ovario sessili fere aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, acutis, glabris, 4 mm longis, lateralibus obliquis, margine interiore usque infra apicem arcte coalitis; petalis oblique lanceolatis, sepalis fere duplo brevioribus, glabris; labello e basi minute biauriculata quadrato, trilobulato, basi callo minuto cordato ornato, lobulis lateralibus minutis oblique oblongis obtusis, intermedio (lamina ipsa) multoties longiore, lineari subacuto, pilis clavatis plumuliformi-ciliato, labello toto 3.25 mm longo; columna perbrevis, brachiis longis oblique lineari-subulatis, pede carnosulo; anthera glabra; ovario sessili glabro, 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 19013, flowering in Dec. 1908.

The inflorescences, which are sympodial, are in a way so unique in the group that I am almost inclined to consider the possibility of an abnormal formation. The species is, otherwise, also well characterised in floral structure. The flowers are red with a darker lip that is white at the base.

174. *B. quinquelobum* Schltr., sp. nov.

Epiphyticum, humile; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, oblongoideo-cylindraceis, unifoliatis, c. 2–3 mm longis; folio erecto-patente vel erecto, elliptico-ligulato, apiculato vel acuto, basi cuneato, glabro, 1.3–2.5 cm longo, medio fere 4–6 mm lato; pedunculis setiformibus, paucivaginulatis, unifloris, c. 1 cm longis, erectis; bractea cucullata, ovario aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, acutis, glabris, 6 mm longis, lateralibus obliquis, usque ad apicem fere margine inferiore arcte coalitis; petalis oblique ovato-ellipticis, acutis, margine minute ciliolatis, 2.75 mm longis; labello auriculis 2 basilaribus inclusis 5 lobulato, lobulis basalibus (auriculis) minutis, oblique oblongis, lobulis lateralibus (mediocribus) oblique rhombeis, parvulis, truncatulis, intermedio (i.e. lamina) multoties longiore, ligulato, obtusiusculo, basin versus minutissime puberulo et margine minutissime et brevissime ciliolato, labello toto 5 mm longo, nervo medio carinulato, supra medium callis 2 oblongis papillosis donato; columna perbrevis, crassiuscula, brachiis brevibus, lanceolatis, obtusiusculis, pede incurvulo; anthera cucullata, glabra; ovario sessili, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20188, flowering in Sept. 1909.

A rare species of which I found only a single specimen. Its closest relative is *B. inversum* Schltr., described below. The flowers are wine-red.

var. *lancilabium* Schltr., var. nov.

Differt a forma typica petalis margine subdenticulato-irregularibus, labelli lobis lateralibus basi unguiculato-attenuatis et lobo intermedio lanceolato acuto.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 800 m—R. Schlechter no. 17344, flowering in Feb. 1908.

Initially, I considered this species to be specifically different from *B. quinquelobum* Schltr., but I think that it is better regarded as a variety differentiated by the above characteristics. The flowers are rose-red with a darker lip.

175. *B. inversum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, ovoideis, unifoliatis, 2–3 mm altis; folio erecto, elliptico-oblancoolato, apiculato, basin versus subpetiolato-attenuato, glabro, 2.5–6 cm longo, supra medium 4–7 mm lato; pedunculis abbreviatis, paucivaginulatis, unifloris, 4–6 mm longis; bractea cucullata, ovario sessili aequilonga; flore inverso, in sectione vix inter mediocres; sepalis ovato-lanceolatis, acutis, glabris, 7 mm longis, lateralibus obliquis, margine inferiore usque ad apicem arcute coalitis; petalis oblique ellipticis, acutis, margine sparsim et brevissime ciliolatis, 4 mm longis; labello e basi minute biauriculata trilobulato, lobulis lateralibus divergentibus parvulis, oblique quadratis, truncatis, intermedio (lamina ipsa) multoties longiore, lanceolato-ligulato, subacuto, margine densius ciliolato, labello toto 5 mm longo, supra basin callo parvulo donato; columna brevi, brachiis lanceolatis, margine posteriore obtuse unidentatis, pede crassiusculo; anthera cucullata, glabra; ovario sessili, glabro, 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, above Bolobo, alt. c. 1000 m—R. Schlechter no. 16538, flowering in Sept. 1907.

In the central area of Kaiser-Wilhelms-Land, this species is not infrequent in the mist-forests of the mountains. It is probably closest to *B. quinquelobum* Schltr., but has narrower and longer leaves, larger flowers and a labellum of a different shape. The flowers are dark-purple-red.

176. *B. heteroblepharon* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, parvulis, unifoliatis, 1.5–2.5 mm longis; folio erecto elliptico-lanceolato, acuto, basin versus subpetiolato-angustato, glabro, 1.5–2.5 cm longo, medio 3.5–5.5 mm lato; pedunculis setiformibus, paucivaginulatis, unifloris, 2.5 mm longis; bractea cucullata, ovario aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, subacutis, glabris, 5 mm longis, lateralibus obliquis, usque infra apicem arcute coalitis; petalis oblique ovato-lanceolatis, obtusiuscule acuminatis, utrinque minute papilloso-puberulis, 1.75 mm longis; labello e basi minute rhomboideo-auriculata anguste lanceolato, subacuto, costa foveolata per medium longitudinaliter ornato, margine ciliis biseriatis ciliato, c. 4 mm longo, ciliis seriei inferioris tenuissimis patentibus, longis, ciliis seriei superioris glanduliformi-clavatis valde abbreviatis; columna perbrevis, glabra, brachiis rhombo-linearibus, oblique apiculatis, pede crassiusculo; anthera cucullata, glabra; ovario sessili, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, above Meireka, alt. c. 700 m—R. Schlechter no. 17956, flowering in July 1908.

A very interesting species distinguished from all the others in the section by the peculiar-haired lip. The flowers are pale violet with whitish petals and an almost black lip.

177. *B. rarum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, parvulis, unifoliatis, 2–2.5 mm altis; folio-erecto, elliptico-ligulato, minute

apiculato, basi cuneato-attenuato, glabro, c. 2 cm longo, medio fere c. 6.5 mm lato; pedunculis abbreviatis, paucivaginulatis, unifloris, c. 7 mm longis; bractea parvula cucullata ovario brevior; flore inverso, in sectione mediocri; sepalis lanceolatis, acutis, glabris, 9 mm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique lanceolatis, acuminatis, 5.5 mm longis, glabris; labello e basi minute biauriculata anguste lanceolato, acuto, nervo medio incrassato, marginibus minutissime et dense ciliolato, 4 mm longo; columna perbrevis, glabra, brachiis amplis oblique lanceolatis, acutis, pede brevi; anthera cucullata, glabra; ovario sessili, c. 2 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20107, flowering in Sept. 1909.

In habit and shape of the lip, this species resembles *B. heteroblepharon* Schltr., but the petals and the hairs on the lip are quite different, quite apart from the larger flowers. The flowers are a muddy wine-red colour.

178. *B. lichenoides* Schltr., sp. nov.

Epiphyticum, perpusillum, cortici appressum; rhizomate brevi, radicibus filiformibus, flexuosis, glabris; pseudobulbis vix conspicuis, cylindraceis, unifoliatis; folio patente, oblongo, obtusiusculo, 4–8 mm longo, medio fere 2–3 mm lato; pedunculis erectis, paucivaginulatis, unifloris, c. 3 mm altis; bractea apiculata, ovario aequilonga; flore in sectione minuto, inverso; sepalis lanceolatis, glabris, vix 2 mm excedentibus, lateralibus obtusiusculis, usque ad apicem connatis; petalis oblique lanceolatis, valde acutis, glabris; 1.5 mm longis; labello e basi minute auriculata oblongo-ligulato, obtuso, 1.75 mm longo, apice superne callo verruculoso donato, e basi usque ad apicem superne linea media incrassata ornato, margine dense ciliis longis patentibus apice capitellatis ornato; columna brevi, brachiis triangulis subacutis, pede perbrevis; anthera late conico-cucullata, glabra; ovario cylindrico sessili, glabro, 0.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20325, flowering in Sept. 1909.

The species with probably the smallest flowers in the section. It is so delicate in the whole manner of growth that it could almost be considered a lichen instead of an orchid. The flowers are either violet-red or violet-brown, with a dark purple lip.

179. *B. endotrachys* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, anguste ovoideis, 2–2.5 mm altis, unifoliatis; folio erecto, oblanceolato-ligulato, apiculato, basin versus sensim attenuato, glabro, 1.5–4.5 cm longo, supra medium 2–6 mm lato; pedunculis abbreviatis, paucivaginulatis, unifloris, c. 5 mm longis; bractea cucullata, ovario aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, acutis, 7 mm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique lanceolatis, acuminatis, glabris, 3.5 mm longis; labello e basi minute auriculata anguste lanceolato, acuto, marginibus recurvulo, nervo medio superne carinato-incrassato, lamina superne et margine dense asperato-papillosa, toto 4.25 mm longo; columna perbrevis, brachiis subfalcatis, obtusiusculis, parvulis, pede incurvulo; anthera galeata, glabra; ovario sessili, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20172, flowering in Sept. 1909.

A close relative of *B. rarum* Schltr., but readily distinguished from it and the other species in the section by the lip. The flowers are rose-red with yellow sepal-tips.

180. *B. ciliolatum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, 4–7 mm altis; folio erecto, ligulato, minute apiculato, basin versus sensim angustato, glabro, 3–6 cm longo, medio fere 3.5–7 mm lato; pedunculis abbreviatis, paucivaginulatis, unifloris, 5–7 mm altis; bractea cucullata, ovario fere aequilonga; flore inverso, in sectione inter minores; sepalis lanceolato-ligulatis, obtusiusculis, glabris, 5.5 mm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique oblongis, obtusis, minute et sparsim ciliolatis, 2 mm longis; labello e basi perbrevis biauriculata rhomboidea anguste lanceolato, subacuto, nervo medio superne carinato-incrassato, marginibus setulis patentibus ciliolato, 4 mm longo; columna perbrevis, glabra, brachiis lanceolato-triangulis, subacutis, pede brevi; anthera cucullata, glabra; ovario sessili, cylindrico, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), [Ed.—no altitude cited]—R. Schlechter no. 19759, flowering in June 1909.

An interesting small species closest in habit to *B. maboroense* Schltr. described below, but well characterised by the flowers. The flowers are violet-red with a darker lip.

181. *B. maboroense* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste ovoideis, unifoliatis, 4–7 mm altis; folio erecto, ligulato, acuto, basin versus sensim paulo angustato, glabro, vulgo plus minus obliquo, 3.5–8 cm longo, medio fere 4–9 mm lato; pedunculis abbreviatis, paucivaginulatis, unifloris, c. 4 mm altis; bractea cucullata, ovario aequilonga; flore inverso, in sectione inter minores; sepalis lanceolatis, acutis, glabris, 5.5 mm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique lanceolatis, valde acutis, glabris, margine sparsim et minute ciliolatis, 3.5 mm longis; labello e basi minute biauriculata, oblongo-ligulato, obtuso, infra medium callo anulari donato, dimidio superiore medio leviter carinato-incrassato, marginibus densius ciliolato, toto c. 3.25 mm longo; columna brevi, glabra, brachiis lanceolato-subulatis acutissimis, amplis, pede brevi; anthera cucullata, glabra; ovario sessili, glabro, c. 1–1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19549, flowering in May 1909.

As already mentioned above, the species is similar in habit to the previous one, but with a broader labellum and more pointed lancet-like petals. The flowers are purple-red.

182. *B. fuscatum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis parvulis, ovoideis, unifoliatis, 1.5–2.5 mm altis; folio erecto, oblanceolato-ligulato, apiculato, basin versus sensim subpetiolato-attenuato, glabro, 2.3–3.5 cm longo, supra medium 3–5 mm lato; pedunculis setiformibus, erectis, paucivaginulatis, unifloris, usque 2 cm longis; bractea cucullata, ovario breviori; flore inverso, in sectione inter minores; sepalis lanceolatis, acutis, glabris, 5–6 mm longis, lateralibus obliquis, usque ad apicem arcte coalitis; petalis oblique lanceolatis, acuminatis, margine sparsim et brevissime ciliolatis, 3–3.5 mm longis; labello e basi minute biauriculata anguste oblongo-ligulato, obtuso, superne nervo medio carinato-incrassato, subtus subinconspicue papilloso, margine setulis clavatis brevissimis dense ciliolato, petalis aequilongo; columna brevi, glabra, brachiis lanceolato-subulatis, amplis, pede brevi; anthera cucullata glabra; ovario sessili, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, in the Minjem Valley, alt. c. 500 m—R. Schlechter no. 16373, flowering in Aug. 1907; on trees in the forest near Damum, alt. c. 350 m—R. Schlechter no. 16136, flowering in May 1907; on trees in the forests on the Wabe [River], alt. c. 100 m—R. Schlechter no. 18082, flowering in July 1908; on trees in the forests on the Maijen [River], alt. c. 70 m—R. Schlechter no. 17935, flowering in July 1908.

This species apparently is distributed widely in the central area of Kaiser-Wilhelms-Land, but is found usually only as single specimens. In floral structure it is apparently closest to *B. maboroense* Schltr., but with different leaves and longer pedicels. The flowers are violet-brown with darker petals and labellum.

183. *B. triandrum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis cylindraceis, unifoliatis, vix 2 mm altis; folio erecto, obovato-spathulato, obtuso vel minute apiculato, basin versus sensim subpetiolato-angustato, glabro, 1.7–3 cm longo, supra medium 0.8–1.2 cm lato; pedunculis erectis, filiformibus, paucivaginulatis, unifloris, 1.5–2 cm altis; bractea cucullata, ovario subaequilonga; flore in sectione inter minores, inverso; sepalis oblongis, subacutis, glabris, 5 mm longis, lateralibus obliquis, usque infra apicem arcte coalitis; petalis ovato-lanceolatis, acutis, glabris, sepalis paulo brevioribus; labello e basi minute biauriculata oblongo-ligulato, obtuso, supra basin paululo dilatato, 3.75 mm longo, superne supra basin tricalloso, callo intermedio in nervum medium carinatum decurrente, marginibus tertia parte basali excepta dense et

breviter ciliolato; columna crassiuscula, brevi, vulgo triandra, pede brevi; antheris cucullatis, dorso verruculosus; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of Kelel, on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16517 (TYPE), flowering in Sept. 1907; on trees on [Mount] Dscheregi, on the Waria [River], alt. c. 400 m—R. Schlechter no. 17435, flowering in Mar. 1908.

This is one of the few *Orchidaceae* which nearly always develops three fertile anthers. Despite repeated searching, very seldom have I found flowers with a single anther. The species is related closely to *B. fuscatum* Schltr., but is distinguished easily by the more spatula-shaped leaves, the larger petals and the labellum. The flowers are a muddy violet-brown with a white column and white anthers.

184. *B. verruculatum* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, cylindraceis, unifoliatis, c. 1.5 mm altis; folio erecto, oblanceolato-elliptico, minute apiculato, basin versus sensim angustato, glabro, 1.5–4.5 cm longo, supra medium 5–9 mm lato; pedunculis erectis, filiformibus, paucivaginulatis, unifloris, c. 1–1.7 cm altis; bractea cucullata ovarium aequante; flore inverso, in sectione inter minores; sepalis oblongis, obtusiusculis, margine minute ciliolatis, intermedio 4.5 mm longo, lateralibus obliquis, usque ad apicem arcte coalitis, 3 mm longis; petalis subfalcatis, ovato-lanceolatis, acuminatis, margine minute ciliolatis, 3 mm longis; labello e basi minute biauriculata oblongo-quadrata in tertia parte basali trilobato, 3 mm longo, lobis lateralibus parvulis, intermedio multoties majore oblongo obtuso, margine densius ciliolato, apice marginibus incurvis dense verruculato, nervo medio e basi labelli carinato incrassato; columna brevi, glabra, brachiis falcato-lanceolatis, acutis, amplis, pede vix incurvulo; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19802, flowering in June 1909.

Readily distinguished from its related species by the shape of the lip. It can be considered as closest to the following two species. The flowers are dark purple, the lip white at the base, and with white lateral lobes.

185. *B. rhopaloblepharon* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, cylindraceis, c. 2 mm altis, unifoliatis; folio erecto, elliptico, minute apiculato, glabro, 1.3–2.7 cm longo, medio fere 0.6–0.9 cm lato; pedunculis setiformibus, erectis, paucivaginulatis, unifloris, c. 1.5 cm longis; bractea cucullata, ovario paulo brevior; flore inverso, in sectione mediocri; sepalis lanceolatis, acutis, glabris, 9 mm longis, lateralibus obliquis, usque ad apicem fere margine inferiore arcte coalitis; petalis oblique lanceolatis, acutis, margine dense ciliatis, 4.5 mm longis; labello e basi minute biauriculata trilobato, lobis lateralibus oblique dolabriformibus, parvulis, patentibus, intermedio multoties longiore e basi unguiculato-attenuata elliptico-ligulato, obtusiusculo, setulis clavatis dense plumiformi ciliolato, labello toto 6 mm longo, superne medio longitudinaliter costato; columna perbrevis, glabra, brachiis lineari-subulatis, magnis, pede carnosulo brevi; anthera cucullata, glabra; ovario sessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River] at the foot of the Torricelli Range, alt. c. 150 m—R. Schlechter no. 20353, flowering in Sept. 1909.

The species is related closely to the following, *B. unguilabium* Schltr., but has smaller flowers and a short-spurred middle lobe of the labellum with club-shaped hairs. The flowers are rose-red, with a black-violet lip.

186. *B. unguilabium* Schltr., sp. nov.

Epiphyticum, pusillum; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis minutis, cylindraceis, unifoliatis, 1.5–2 mm altis; folio erecto, elliptico vel saepius late elliptico, obtuso vel minute apiculato, basi cuneato, glabro, 1.7–4.5 cm longo, medio fere 1–2.2 cm lato; pedunculo abbreviato, paucivaginulato, unifloro, c. 5–7 mm longo; bractea cucullata, ovario fere aequilonga; flore inverso, in sectione inter majores; sepalis lanceolatis, acutis, glabris, 1.1 cm longis,

lateralibus obliquis, margine inferiore usque infra apicem arcte coalitis; petalis ovalibus, breviter acuminatis, margine dense et brevissime ciliolatis, 8.5 mm longis; labello e basi minute biauriculata trilobato, lobis lateralibus parvulis leviter divergentibus semioblongis, obtusis, intermedio (i.e. lamina ipsa) e ungue longo lineari in laminam anguste lanceolatam acuminatam marginibus dense plumuliformi-longiciliatam producto, labello toto 8 mm longo, lamina medio longitudinaliter costata; columna brevi, brachiis lineari-falcatis subacutis, pede incurvulo apice calloso-incrassato; anthera cucullata, glabra; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20139, flowering in Sept. 1909.

One of the most peculiar and interesting species of the section, related to *B. rhopaloblepharon* Schltr., but, as already mentioned above, well separated specifically. The flowers are dark purple.

187. *B. blepharicardium* Schltr., sp. nov.

Epiphyticum, parvulum; rhizomate abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis vel ovoideo-cylindraceis, 2.5–4 mm altis, 1.5–2.5 mm diametentibus, unifoliatis; folio erecto, oblanceolato, apiculato, 1.7–4 cm longo, supra medium 0.5–1.1 cm lato; pedunculis valde abbreviatis, vaginis obtectis, pseudobulbo brevioribus, unifloris; bractea elliptica ovario aequilonga; flore in sectione inter minores, inverso; sepalis oblongis, acutis, 3 mm longis, intermedio margine minute ciliato, lateralibus naviculiformi-cohaerentibus, margine extus minute papilloso-puberulis; petalis minutis, oblique oblongis, acutis, glabris, 0.75 mm longis, labello minute unguiculato, basi sagittato, usque supra medium lineari, deinde subito in laminam ovato-cordatam, obtuse acuminatam, margine ciliatam dilatato, 1.5 mm longo; columna brevi, brachiis genuflexo-subulatis, pede magno, crasso; anthera cucullata, glabra; ovario cylindraco, sessili, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20153, flowering in Sept. 1909.

This species, which has a characteristic lip structure, is closest to the two previous ones, but in its flowers is more similar to the following ones. The flowers are dark carmine-red, the petals striped red, half the lip is white with a red disc.

188. *B. cryptanthum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 199.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700–900 m—R. Schlechter no. 14320, flowering in Apr. 1902; no. 20283, flowering in Sept. 1909.

This species is the start of a new series of forms with the same habit, but which are very well distinguished by the flowers and especially by the labellum. The series is characterised by the boat-shaped attached lateral sepals, and by the shape of the lip. The flowers of the above are red, with the lateral sepals pale at the front.

189. *B. dichilus* Schltr., sp. nov.

Epiphyticum, parvulum; rhizomate abbreviato; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis ovoideo-conicis, unifoliatis, 5–7 mm altis, infra medium 3–4 mm diametro; folio erecto, oblanceolato-oblongo, apiculato, 7–9 cm longo, supra medium 1.4–1.8 cm lato; pedunculis valde abbreviatis, vaginis obtectis, unifloris, 2–3.5 mm longis; bractea apiculata, ovario aequilonga; flore inverso in sectione inter minores; sepalis oblongis, breviter acuminatis, glabris, 5 mm longis, lateralibus obliquis, naviculiformi-cohaerentibus; petalis oblique latiovatis, cuspidato-acuminatis, glabris, cohaerentibus; petalis oblique ovato-lanceolatis, acutis, 0.75 mm longis; labello e basi breviter unguiculata biauriculata cuneato-obovato, obtusissimo, 1.5 mm longo, marginibus basi excepta minutissime ciliolatis, supra basin linea trapezoidea incrassata donato; columna brevi, brachiis triangulis, obtusis, pede subrecto; anthera galeato-cucullata, glabra; ovario cylindrico, glabro, 0.75 mm longo.

Kaiser-Wilhelms-land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16552, flowering in Sept. 1907.

This species is differentiated from the two previous ones above by the shorter growth, smaller flowers with blunter sepals and the very blunt, differently shaped lip. The flowers are dark purple, with the sepals paler in the middle.

190. *B. amblyanthum* Schltr., sp. nov.

Epiphyticum, humile; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, c. 1 cm altis, infra medium 3–4 mm diametro; folio oblongo-ligulato, obtusiusculo, basi sensim angustato, 3.5–7.5 cm longo, medio fere 1–1.5 cm lato; pedunculis valde abbreviatis, vaginis obtectis, unifloris; bractea apiculata, ovarium paulo superante; flore in sectione inter minores, erecto; sepalis oblongis, obtusis, glabris, 3.25 mm longis, lateralibus usque infra apicem naviculiformi-cohaentibus, petalis oblique ovato-lanceolatis, acutis 0.75 mm longis labello e basi breviter unguiculata biauriculata cuneato-obovato, obtusissimo, 1.5 mm longo, marginibus basi excepto minutissime ciliolatis, supra basin linea trapezoidea incrassata donato; columna brevi, brachiis triangulis, obtusis, pede subrecto; anthera galeato-cucullata, glabra; ovario cylindrico, glabro, c. 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16552, flowering in Sept. 1907.

[Ed.—note that material source and number is the same for species no's 189 and 190, and the species notes are identical.]

191. *B. eciliatum* Schltr., sp. nov.

Epiphyticum, humile; rhizomate valde abbreviato; radicibus filiformibus, flexuosis, glabris; pseudobulbis ovoideis, unifoliatis, 6–8 mm altis, infra medium 3–4 mm diametentibus; folio oblongo-ligulato, subacuto, basi cuneato, 7.5–9.5 cm longo, medio fere 1.5–1.9 cm lato; pedunculis valde abbreviatis, vaginis obtectis, unifloris; bractea apiculata, ovario aequilonga; flore erecto, in sectione inter minores; sepalis oblongis, apiculatis, glabris, 5 mm longis, lateralibus usque ad apicem naviculiformi-cohaerentibus; petalis late ellipticis, breviter acuminatis, vix 1 mm longis; labello e basi brevissime unguiculata auriculata ovali, obtuso, marginibus recurvis eciliato, glabro, 2.75 mm longo; columna perbrevis, brachiis falcato-subulatis, pede bene evoluto; anthera cucullata, glabra; ovario cylindrico sessili, c. 1 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, near Dschischungari, alt. c. 1200 m—R. Schlechter no. 19594, flowering in May 1909.

Likewise, related to *B. cryptanthum* Schltr., but distinguished from it and the preceding two species by the hairless, different-shaped labellum. The flowers are dark purple with white stripes and with a dark purple lip.

192. *B. incumbens* Schltr., sp. nov.

Epiphyticum, cortici incumbens, parvulum; rhizomate decumbente; radicibus filiformibus, glabris; pseudobulbis 5–7 mm distantibus, incumbentibus, oblique ovoideis, unifoliatis, c. 5 mm altis; folio patente, elliptico, apiculato, 1.7–2.3 cm longo, medio 0.8–1.2 cm lato; pedunculo valde abbreviato, vaginis obecto, unifloro; bractea ovario aequilonga; flore in sectione inter minores, inverso; sepalis lanceolatis, acuminatis, glabris, 4 mm longis, lateralibus usque ad apicem naviculiformi-cohaerentibus; petalis oblique lanceolatis, acuminatis, glabris, 7.5 mm longis; labello e basi minute unguiculata minute biauriculata rhombeo-elliptico, obtusissimo, margine dimidio inferiore minutissime et brevissime ciliolato, 1.75 mm longo; columna brevi, brachiis triangulis, acutis, pede perbrevis; ovario cylindrico, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On tree-trunks in the forests on the Wakeak [Creek] at the foot of the Finisterre Range, alt. c. 500 m—R. Schlechter no. 18116, flowering in Aug. 1908.

This, and the following species, have the boat-shaped, joined lateral sepals of the previous form-groups, but with stronger developed pseudobulbs standing further apart. The flowers are red, white towards the base.

193. *B. bicaudatum* Schltr., sp. nov.

Epiphyticum, humile; rhizomate brevi; radicibus filiformibus, glabris; pseudobulbis ovoideis, unifoliatis, 5–8 mm distantibus, 0.8–1 cm altis, infra medium 3–4 mm diametro; folio elliptico apiculato, 2.5–3 cm longo, medio fere 1–1.3 cm lato; pedunculo valde abbreviato, vaginis obecto, unifloro; bractea ovarium paulo superante; flore in sectione vix mediocri, erecto-patente; sepalis ovalibus, intermedio apiculato, glabro, 5 mm longo, lateralibus naviculari-cohaerentibus, apice in caudam 7 mm longam productis, omnino 1.2 cm longis; petalis oblique suborbicularibus, obtusissimis, dimidio superiore sparsim ciliolatis, c. 1 mm longis; labello e basi cuneata elliptico, obtuso, basi

apiceque excepto margine ciliis clavatis ornato, 2.5 mm longo; columna perbrevis, brachiis rhombeis apiculatis, pede crasso, magno; ovario sessili, glabro, cylindrico, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19122, flowering in Jan. 1909.

This conspicuous species is related to *B. inauditum* Schltr., described below, but has much shorter sepal-tails than it, and differs otherwise in the floral structure. The flowers are rose-red.

194. *B. inauditum* Schltr., sp. nov.

Epiphyticum, humile; rhizomate brevi; pseudobulbis 3–5 mm distantibus, ovoideo-cylindraxis, 1–1.7 cm altis; folio erecto, lanceolato-elliptico, acuto, 3.5–5.5 cm longo, infra medium 0.8–1.5 cm lato; pedunculis abbreviatis, vaginis obtectis, unifloris; bractea ovarium aequante; flore in sectione mediocri, extus minutissime papilloso; sepalis oblongis, intermedio obtuso, margine minutissime ciliolato, c. 6 mm longo, lateralibus e basi naviculiformi-cohaerente in caudas 2 perlongas filiformes apice clavato-incrassatulas productis, c. 13 cm longis; petalis minutis, quadrato-suborbicularibus, obtusissimis, glabris; labello e basi cuneata ovato-lanceolato, obtuso, margine minute et dense ciliolato, 2.25 mm longo; columna perbrevis, brachiis rhombeis acuminatis, pede incrassato, magno; anthera cucullata, glabra; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18574, flowering in Nov. 1908.

This species is probably the most peculiar *Bulbophyllum* so far known. The two 13 cm long tails of the flowers hang down lax and sway in the wind. The flowers are rose-red, whitish towards the base; the two tails are white with a yellow tip; the labellum yellow with a red margin.

195. *B. unicaudatum* Schltr., sp. nov.

Epiphyticum, parvulum; rhizomate brevi; radicibus filiformibus, flexuosis, glabris; pseudobulbis 5–9 mm distantibus, ovoideis, unifoliatis, 4–8 mm altis, infra medium 2–5 mm diametro; folio erecto, oblongo, apiculato, basi attenuato, 1–2.5 cm longo, medio 3.5–7 mm lato; pedunculo valde abbreviato, vaginis oblecto, unifloro; bractea apiculata ovarium aequante; flore in sectione inter minores; sepalis oblongis, 3 mm longis, intermedio apice in caudam reflexam, 1 cm longam producta, glabro, lateralibus naviculiformi-cohaerentibus, margine subinconspicue ciliolatis, apice appendice minuto ovoideo ornatis; petalis oblique oblongis, apiculatis, vix 1 mm longis; labello e basi angustata sensim dilatato, obtuso, supra medium paululo angustato, dimidio superiore margine ciliato, basi gibbo minuto donato, petalis paulo longiore; columna brevi, brachiis oblique oblongis, apiculatis; anthera cucullata glabra; ovario cylindrico, glabro, 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17964, flowering in June 1908. [Ed.—probably July.]

This species which, without doubt, is related to the two above is characterised especially by the peculiar flower formation. The flowers are scarlet-red, becoming white at the base.

var. *xanthosphaerum* var. nov.

Differt a forma typica pseudobulbis magis distantibus petalis oblongo-ligulatis, labello supra medium haud constricto, longius ciliato, anthera brevior.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20249, flowering in Sept. 1909.

If the differences from the Type-form prove to be consistent, this variety might later on be considered an individual species. The flowers are dark red, the two egg-shaped appendages at the tip of the lateral sepals are yellow.

196. *B. oblanceolatum* Schltr., sp. nov. [Ed.—epithet misspelt in original text.]

Epiphyticum, pusillum, repens; rhizomate sensim elongato; radicibus filiformibus, glabris; pseudobulbis densis, rhizomati incumbentibus, unifoliatis, oblongoideis, 2.5–3.5 mm longis; folio patente, cortici incumbente, ovali, obtuso vel apiculato, 5–8 mm longo, medio 3–4.5 mm lato; pedunculis brevissimis, vaginis paucis oblectis, unifloris, vix 2 mm longis; bractea apiculata, ovarium

paulo superante; flore in sectione minuto; sepalis ovato-lanceolatis, acuminatis, glabris, 2.75 mm longis, lateralibus usque infra apicem naviculiformi-cohaerentibus; petalis oblique lanceolatis, acutis, quam sepala fere 3–4-plo brevioribus; labello oblanceolato-spathulato, obtuso, setulis reversis medio longioribus margine ciliolato, petalis paululo longiore; columna brevi, brachiis falcato-subulatis, bene longis, pede recto satis longo; anthera cucullata, glabra; ovario sessili, cylindrico, glabro, 0.75 mm longo.

Kaiser-Wilhelms-Land: On tree-trunks at the Minjem Gorge, alt. c. 100 m—R. Schlechter no. 17829, flowering in June 1908.

A fairly isolated species which, in a way, forms a transition between the last and next form-group. The species is smaller in size than the species of both form-groups. In habit it inclines towards the species of the *B. serpens* Schltr. relationship, but the lip structure indicates a relationship with the other species. The flowers are rose-red with red stripes.

197. *B. loxophyllum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis erectis, rhizomati parallelis, unifoliatis, subcylindraceis, 5–7 mm longis, infra medium 2–3 mm diametientibus; folio erecto, obliquo, ligulato, apiculato, 2–3.5 cm longo, medio 5–8 mm lato; pedunculis brevissimis, vaginis 2 obtectis, unifloris; bractea lanceolata, ovarium excedente; flore in sectione inter minores; sepalo intermedio ovato, breviter acuminato, dense ciliato, vix 3 mm longo, lateralibus oblongis, obtusiusculis, usque ad tertiam partem apicalem naviculiformi-cohaerentibus, subcucullatis, glabris, 5 mm longis; petalis suborbiculari-ovatis, subacutis, glabris, minutis; labello rhombeo-ovato, acuminato, marginibus minute et dense ciliolato, vix 2 mm longo; columna brevi, brachiis subfalcatis, apiculatis, amplis, pede porrecto, amplo; anthera cucullata, glabra; ovario vix 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna on the Waria [River], alt. c. 300 m—R. Schlechter no. 19276, flowering in Apr. 1909.

This is the first of the species in the section forming a stem-like rhizome similar in habit to many *Dendrobium* species. Initially, I thought of considering them as a separate section, but the flower structure shows so many similarities with the other *Polyblepharon* species that it is difficult to regard them separately. The flowers of the above species are rose-red with translucent white petals.

198. *B. Finisterrae* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis subcylindraceis, rhizomati subparallelis, unifoliatis, 0.5–1 cm longis, vix 2–3 mm diametientibus; folio erecto-patente, ovato vel elliptico, apiculato, 1.5–3 cm longo, medio vel infra medium 0.8–1.4 cm lato; pedunculis subnullis, vaginis obtectis, unifloris; bractea apiculata, ovarium superante; flore in sectione inter minores; sepalo intermedio late ovali, 2.5 mm longo, subinconspicue et sparsim ciliolato, lateralibus oblongis, dimidio inferiore naviculiformi-cohaerentibus, dimidio anteriore oblongis, obtusiusculis, 4 mm longis; petalis minutis, oblique latiovalibus, apiculatis, 0.5 mm vix excedentibus; labello e basi subunguiculata elliptico, obtusiusculo, setulis reversis ciliato, 1.25 mm longo; columna brevi, brachiis amplis oblique lanceolatis, acutis, pede incrassatulo, bene evoluto; ovario sessili, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19107, flowering in Jan. 1909.

This species shows certain similarities to the following *Hybochilus* section, but in floral characteristics is typical of species in the *Polyblepharon* section. In structure it is very similar to the species following. The flowers are golden yellow.

199. *B. renipetalum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis subcylindraceis, rhizomati subparallelis, unifoliatis, 1.3–2 cm longis, infra medium 3–5 mm diametro; folio erecto-patente, elliptico-ligulato, apiculato, 7.5–8.5 cm longo, medio fere 1.4–1.7 cm lato; pedunculis brevissimis, vaginulis obtectis, unifloris; bractea cucullata, ovarium paulo excedente; flore in sectione inter minores; sepalo intermedio suborbiculari, margine minute ciliato,

obtusissimo, 3.25 mm longo, lateralibus oblique oblongis, obtusis, usque infra apicem naviculiformi-cohaerentibus; margine ciliatis, intermedio aequilongis; petalis subreniformibus, leviter retusis, margine superiore minute ciliatis, 0.75 mm longis, 1 mm latis; labello e basi cuneata elliptico, obtusissimo, margine ciliis patentibus, apicem versus sensim brevissimis ornato, 2.5 mm longo; columna perbrevis, brachiis oblique rhombeis, apiculatis, satis longis, pede medio incrassato, recto; ovario cylindraco, glabro, c. 2.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18511, flowering in Oct. 1908.

The flower of this species is closest in appearance to that of *B. Finisterrae* Schltr. described above, but the pseudobulbs and leaves are different. The flowers are pale pink, with a darker dorsal sepal, the petals are white and the labellum a dark carmine-red with a white centre and white spots.

200. *B. oligochaete* Schltr., sp. nov.

Epiphyticum, humile, c. 10 cm longum, erectum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis rhizomati appressis, conico-cylindracois, unifoliatis, 7–10 mm longis, infra medium c. 2–2.5 mm diametro; folio erecto-patente, elliptico, acuto, 1.8–2 cm longo, 0.8–1 cm lato; pedunculis brevissimis vaginis 2 absconditis, unifloris; bractea cucullata, acuminata, ovarium paulo superante; flore in sectione inter minores; sepalo intermedio late ovali, obtusissimo, glabro, 5 mm longo, lateralibus oblique oblongis, obtusis, usque infra apicem naviculiformi-cohaerentibus; intermedio aequilongis; petalis oblique subreniformibus, subretusis, margine minute ciliatis, vix 1 mm longis; labello cuneato-elliptico, supra medium marginibus recurvis paulo angustato, obtuso, setis paucis recurvis margine dimidio inferiore ciliato, 2.5 mm longo; columna brevi, brachiis oblique rhombeis, apiculatis, pede recto, satis longo; anthera cordata, umbonata, glabra; ovario sessili, cylindraco, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19125, flowering in Jan. 1909.

Closely related to *B. renipetalum* Schltr., but distinguished readily by much smaller vegetative parts and the shape of the lip. The flowers are yellow, the lateral sepals with red stripes inside and the labellum red-brown with a paler centre.

201. *B. navicula* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, c. 10 cm longum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis cylindraco-conicis, rhizomati appressis, unifoliatis, 5–6 mm longis, infra medium 3–4 mm diametro; folio erecto-patente, elliptico, apiculato, 1.5–2 mm longo, medio fere 5.5–8.5 mm lato; pedunculis brevissimis, unifloris, vaginulis 2 absconditis, bractea cucullata, ovarium aequante; flore in sectione inter minores; sepalo intermedio ovali, obtusiusculo, minute ciliolato, 3 mm longo, lateralibus oblongis, obtusiusculis, glabris, usque ad quartam partem apicalem naviculiformi-cohaerentibus, intermedio aequilongis; petalis suborbiculari-ovalibus, obtusissimis, dimidio superiore ciliolatis, 1 mm longis; labello elliptico, obtuso, basin versus subunguiculato-angustato, margine setulis recurvulis dense ciliolato, 1.25 mm longo; columna brevi, brachiis adscendentibus falcatis, acutis, pede incrassatulo subincurvulo; anthera galeato-cucullata glabro; ovario cylindraco, sessili, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17242, flowering in Jan. 1908.

Closely related to *B. oligochaete* Schltr., but with completely different petals and labellum. The flowers are golden yellow.

202. *B. decumbens* Schltr., sp. nov.

Epiphyticum, decumbens, usque ad 10 cm longum; rhizomate repente, elongato; radicibus filiformibus, flexuosis, glabris; pseudobulbis approximatis, oblique ovoideis, unifoliatis, 4–6 mm altis, infra medium 3–4 mm diametro; folio oblongo, subapiculato, basin versus paulo angustato, 1.8–2.5 cm longo, medio fere 0.6–1.1 cm lato; pedunculo abbreviato, unifloro, 3 mm rarius attingente, vaginulis paucis oblecto; bractea cucullata, apiculata, ovarium paulo superante; flore in sectione inter minores, erecto, inverso; sepalis lanceolatis, acutis, glabris, 4.5 mm longis, lateralibus obliquis, usque infra apicem naviculiformi-cohaerentibus; petalis oblique ovatis, acutis, glabris, 1.5 mm longis; labello e basi ovali antice subtrilobato-contracto in acumen lanceolatum brevissime ciliolatum productum,

2.5 mm longo; columna brevi, brachiis triangulis, antice truncatulis, pede satis longo curvatulo; anthera reniformi-cucullata, glabra; ovario sessili, cylindraceo, glabro, 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Mimi on the Waria [River], alt. c. 700 m—R. Schlechter no. 19468, flowering in May 1909.

The creeping habit of this species isolates it somewhat from its relatives, but the flower structure relegates it to this position. The flowers are rose-red.

203. *B. vaccinioides* Schltr., sp. nov.

Epiphyticum, fruticosum, erectum, parum ramosum, 20–35 cm altum; rhizomate rigidulo, cauliformi, vaginis obsesso, radicibus filiformibus, flexuosis, glabris; pseudobulbis distantibus, rhizomati alte adnatis, cylindraceis, 2.5–4 mm longis, unifoliatis; folio erecto vel erecto-patente, elliptico, apiculato, 1.4–2.2 cm longo, medio 0.6–1 cm lato; pedunculis brevissimis, vaginulis 2 absconditis, unifloris; bractea apiculata, ovarium paululo superante; flore in sectione inter minores, erecto-patente; sepalis oblongis, subacutis, margine minute ciliolatis, 4.5 mm longis, lateralibus obliquis, usque ad apicem naviculiformi-cohaerentibus; petalis e basi oblique ovata, margine subdentata lineari-subulatis, acutis, glabris, 3.5 mm longis; labello e basi brevissime unguiculata minute biauriculata rhomboideo-ligulato, obtuso, dimidio superiore margine minute et dense ciliolato, supra basin callo brevi ornato, 2.75 mm longo; columna perbrevis, brachiis oblongis cuspidatis, pede crassiusculo; ovario cylindraceo glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek], alt. c. 1300 m—R. Schlechter no. 19773, flowering in June 1909.

With this species starts a new form-group, the characteristics being habit and the long extended petals. The two species following also belong in this category. The flowers are brown, the petals white with a red margin, and a central red stripe.

204. *B. myrtillos* Schltr., sp. nov.

Epiphyticum, ramosum, erectum, fruticosum, 20–35 cm altum; radicibus filiformibus, flexuosis, glabris; rhizomate cauliformi, rigidulo, vaginis obsesso; pseudobulbis distantibus, rhizomati adnatis, cylindraceis, 3–4 mm longis, unifoliatis; folio erecto-patente, ligulato vel oblongo, apiculato, 1.7–2.7 cm longo, medio 4–8 mm lato; pedunculis perbrevibus, unifloris, paucivaginulatis; bractea cucullata ovarium vix superante; flore in sectione inter minores; sepalis oblongis, obtusis, glabris, 4 mm longis, lateralibus obliquis usque ad tertiam partem apicalem cohaerentibus; petalis ovato-lanceolatis, margine subdentatis, apice subulato-elongatis, sepalis fere aequilongis; labello e basi anguste cuneata rhombo-semioblongo, obtuso, basi callo brevi exciso ornato, dimidio superiore margine dense ciliolato, 2 mm longo; columna brevi, brachiis falcato-adscendentibus apice breviter cuspidatis, pede recto; anthera galeato-cucullata, glabra; ovario cylindraceo, glabro, vix 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800–2300 m—R. Schlechter no. 18578, no. 18771, flowering in Nov. 1909 [Ed.—probably 1908].

This species is closely related to *B. vaccinioides* Schltr. but is more branched and distinguished readily by the flower characteristics. The flowers are yellow with red-margined petals.

205. *B. microdendron* Schltr., sp. nov.

Epiphyticum, erectum, ramosum, fruticosum, 12–18 cm altum; radicibus filiformibus, flexuosis, glabris; rhizomate cauliformi, rigidulo, vaginis obsesso; pseudobulbis distantibus cum rhizomate arcte connatis 3–4 mm longis, unifoliatis; folio erecto-patente, angustius ligulato, acuto vel apiculato, 1.5–3 cm longo, 2.5–4.5 mm lato; pedunculis brevissimis, vaginulis 2 absconditis, unifloris; bractea cucullata, apiculata, ovarium paulo excedente; sepalis oblongis, obtusiusculis, margine sparsim et breviter ciliatis, 5 mm longis; lateralibus obliquis, usque ad apicem naviculiformi-cohaerentibus; petalis oblique ligulato-oblongis, margine subdentatis, apice subulato-productis, sepalorum longitudine; labello e basi minute biauriculata anguste rhombo, obtuso, supra basi callo brevi retrorso donato, dimidio superiore superne papilloso, margine dense ciliato, 2.25 mm longo; columna brevi, brachiis lineari quadratis oblique cuspidatis, pede recto, carnoso; ovario cylindraceo, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the

Govidjoa [Creek] (Waria District), alt. c. 1300 m—R. Schlechter no. 19776, flowering in June 1909.

This is the smallest of the three species in this small form-group, and is well characterised by the narrow leaves. The flowers are sulphur-yellow, the front of the lip golden yellow.

206. *B. glabrum* Schltr., sp. nov.

Epiphyticum, pensile, ramosum, usque ad 35 cm longum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis distantibus oblique cylindraceis, rhizomati appressis et alte adnatis, c. 1 cm longis, 2–3 mm diametro; folio erecto-patente, oblique ligulato, apiculato, 1.5–3.5 cm longo, 4–7 mm lato; pedunculis brevissimis, unifloris, vaginis paucis absconditis; bractea apiculata, ovarium aequante; flore in sectione inter minores, glabro; sepalis oblongis, obtusis, vix 3 mm longis; lateralibus obliquis, usque ad apicem fere naviculari-cohaerentibus; petalis oblique oblongis, obtusis, apice subexcisis, 1.75 mm longis; labello subrhombeo-ovali, basi cuneato, infra apicem sublobulato-angustato, obtusissimo, 1.75 mm longo; columna perbrevis, brachiis oblongis, obtusis, amplis, pede subrecto, satis longo; anthera cucullata, dorso truncata, glabra; ovario cylindraceo, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Djamu Gorge [Minjem District], alt. c. 400 m—R. Schlechter no. 16687, flowering in Oct. 1907.

This species is probably most closely related to *B. serrulatum* Schltr., but well differentiated by the blunt, shorter sepals and the other flower components. It is one of the few completely glabrous species in the section. The flowers are yellow.

207. *B. serrulatum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 216.

Kaiser-Wilhelms-Land: On shrubs in the forests on the upper Nuru [River], alt. c. 500 m—R. Schlechter no. 14182, flowering in Feb. 1902; on trees in the forests on the Kaulo (Minjem District), alt. c. 300 m—R. Schlechter no. 17190, flowering in Jan. 1908; on trees in the forests on the Waube Creek (Waria District), alt. c. 400 m—R. Schlechter no. 19439, flowering in May 1909.

The sole close relative of this species is *B. glabrum* Schltr., described above, with a completely glabrous lip and much blunter sepals. The flowers are golden yellow.

208. *B. bisepalum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 196.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 14048, flowering in Jan. 1902.

This, and the following species, *B. stenochilum* Schltr., I have placed at the end of the section, since both show a close similarity to *Hybochilus*, particularly in the very narrow lip with a callus at the base. The flowers of the above are dark carmine-red.

209. *B. stenochilum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; radicibus filiformibus, flexuosis, glabris; rhizomate cauliformi cum pseudobulbis arctissime connato; pseudobulbis superpositis, cylindraceis, unifoliatis, 0.7–1.3 cm longis, 2–2.5 mm diametentibus; folio erecte-patente, lanceolato, acuto, 2–4.5 cm longo, infra medium 4.5–8 mm longo; pedunculis subnullis vaginulis absconditis, unifloris; bractea apiculata, ovarium aequante; flore in sectione inter minores, illo *B. bisepali* Schltr. simili; sepalis oblongis, obtusis, glabris, 4 mm longis, lateralibus obliquis, usque ad apicem naviculiformi-cohaerentibus; petalis oblique ovato-lanceolatis, longius falcato-acuminatis, glabris, 1.75 mm longis; labello anguste lineari, obtuso, apice et basi exceptis subtus et margine pilis reversis ciliato, supra basin superne callo parvulo donato, 2.75 mm longo, basi haud dilatato; columna brevi, brachiis falcato-lanceolatis, acutis, pede recto; anthera galeato-cucullata, glabra; ovario cylindraceo, glabro, c. 1.28 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19136, flowering in Jan. 1909.

Initially, I considered this species identical with *B. bisepalum* Schltr., but the leaves are smaller, the sepals blunt, the petals much less elongated and the labellum completely different. The flowers are pale rose-red with white petals.

§ 26. *Hybochilus*

The principal, and, one might almost say, the only characteristic by which the section *Hybochilus* is distinguished from *Polyblepharon*, is found in the free lateral sepals which here are separate from each other right to the base. Most of the Papuan [Papuanian] species are distinguished by the pendant rhizomes which are covered with flat pseudobulbs, but in *B. flexuosum* Schltr. there is a much looser growth [of the pseudobulbs] by means of which a transition is made to the creeping western species through such forms as *B. masarangicum* Schltr. (from the Celebes) and *B. acutum* J.J. Sm. [from Java]. Most species here have a very elongated lip and petals, the sepals all acute or very acute. On the upper surface of the lip, near the base, there is nearly always a small tubercle.

From the other parts of Papuasias there is only known to me one species which probably may belong here, viz. *B. imbricans* J.J. Sm. from Dutch New Guinea.

B. nummularioides Schltr. is very common in our Territory, and occurs in the hill-country at an altitude of 200–800 m. The others are entirely inhabitants of the mist-forest, where they hang perpendicularly from the branches of trees and exhibit a perfectly geotropic character.

210. *B. nummularioides* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 40 cm longum; rhizomate cauliformi, dense pseudobulbis obsesso; radicibus filiformibus, glabris; pseudobulbis distichis valde depressis, ovatis vel suborbicularibus, unifoliatis, 3–5 mm longis, 2–5 mm latis, nummulariiformi-approximatis; folio erecto-patente, ovato vel ovato-lanceolato, aristato-apiculato, 0.8–1.5 cm longo, infra medium 3.5–9 mm lato; pedunculis brevissimis vel subnullis, unifloris, vaginis absconditis; bractea cucullata, ovarium aequante; flore in sectione inter minores, erecto-patente; sepalis ovato-lanceolatis, valde acuminatis, 4.25 mm longis, lateralibus obliquis, margine inferiore minutissime ciliolatis; petalis anguste lanceolatis, acuminatissimis, margine sparsim ciliolatis, quam sepala paulo brevioribus; labello e basi subunguiculata anguste rhombico-lanceolato, acuminatissimo, infra medium margine dense ciliolato, 2.75 mm longo, supra basin callo parvulo donato; columna brevi, brachiis breviter subulatis, pede subrecto; anthera cucullata, glabra; ovario cylindraceo, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Kaulo [River] (Minjem District), alt. c. 300 m—R. Schlechter no. 16398, flowering in Aug. 1907; on trees on the Ngoye [Creek] near Ambo, alt. c. 600 m—R. Schlechter no. 18132, flowering in Aug. 1908; on trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 19183, flowering in Jan. 1909; on trees in the forests near the foot of the Bismarck Range, alt. c. 500 m—R. Schlechter no. 18499, flowering in Oct. 1908; on trees in the forests of the Maboro Range, alt. c. 600 m—R. Schlechter no. 19499, flowering in May 1909; on trees in the forests on the Govidjoa [Creek] (Waria District), alt. c. 800 m—R. Schlechter no. 19790, flowering in June 1909.

A most distinctive plant, always easily recognised by the very closely packed flat pseudobulbs arranged in pairs like a chain-of-pearls, and consequently with very close foliage. The flowers are pink with darker petals and labellum.

211. *B. hexurum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 50 cm longum; rhizomate flexuoso, cauliformi; densius pseudobulbis obsesso; radicibus filiformibus, glabris; pseudobulbis c. 5 mm distantibus valde depressis, oblongis, unifoliatis, 3–5 mm longis, 1.5–3 mm latis; folio erecto-patente, ovato, apiculato, 1–2 cm longo, infra medium 0.6–1 cm lato; pedunculis subnullis, vaginis absconditis, unifloris; bractea acuminata, ovario subaequilonga; flore in sectione mediocri, erecto-patente; sepalis lanceolatis, caudato-acuminatis, 6 mm longis, lateralibus obliquis, margine inferiore minute ciliolatis; petalis oblique lanceolatis, caudato-acuminatis, glabris, quam sepala paululo brevioribus, labello breviter unguiculato, e basi rhombico-lanceolata caudato-elongato, margine basi excepta minute ciliolato, supra basin callo parvulo donato, petalis aequilongo; columna brevi, brachiis falcato-lanceolatis, apiculatis, pede subrecto; anthera cucullata, dorso papilloso-puberula, ovario cylindraceo, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19552, flowering in May 1909.

This species is related closely to *B. nummularioides* Schltr., but has less-tightly packed, narrower pseudobulbs; the flowers are larger with longer extended tips, glabrous petals and the labellum is hairy almost to the tip. The flowers are white, the lateral sepals have red longitudinal stripes, and the lip is red with paler margins.

212. *B. flexuosum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 30 cm longum; rhizomate cauliformi, valde flexuoso, laxo pseudobulbis appressis obsesso; radicibus flexuosis, filiformibus, glabris; pseudobulbis depressis, subcylindraceis, rhizomati arcte adnatis, 1.5–2 cm distantibus, 5–7 mm longis, 1.5–2 mm diametro; folio subpatente, elliptico vel lanceolato-elliptico, acuto, 1.3–2.5 cm longo, infra medium 3–8 mm lato; pedunculis perbrevis, vaginis absconditis, unifloris; bractea apiculata ovario brevior; flore in sectione inter minores, erecto-patente; sepalis ovato-lanceolatis, longius acuminatis, 4.5 mm longis, lateralibus falcatis, margine inferiore ciliolatis; petalis oblique lanceolatis, elongato-acuminatissimis, margine sparsim ciliatis, sepalis subaequilongis; labello brevissime unguiculato, rhombo-lanceolato, elongato-acuminatissimo, marginibus recurvulis, dimidio anteriore dense ciliolato, petalis aequilongo; columna brevi, brachiis falcato-subulatis, pede decurvulo cum sepalis lateralibus mentum conicum formante; anthera altigaleato-cucullata dimidio apicali puberula; ovario cylindraceo, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19675, flowering in June 1909.

As mentioned, this species is conspicuous in the section on account of its open growth pattern. The flowers are rose-red, becoming white at the base, and the column is white.

213. *B. amblyacron* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 30 cm longum; rhizomate cauliformi, dense pseudobulbis obsesso; radicibus filiformibus glabris; pseudobulbis rhizomati appressis, ellipticis, valde depressis, unifoliatis, 3.5–4.5 mm longis, 2–3 mm latis; folio erecto-patente, latiovato vel ovato, apiculato, basi nunc subcordato, 0.6–1.5 cm longo, infra medium 0.5–0.8 cm lato; pedunculis valde abbreviatis, subnullis, vaginis acuminatis absconditis, unifloris; bractea cucullata, acuminata, ovarium fere aequante; flore in sectione inter minores, erecto-patente; sepalis oblongis, apicem versus paulo angustatis, obtusis, c. 3 mm longis, lateralibus obliquis, margine inferiore minute papuloso-ciliolatis, petalis oblique oblongis, longius cuspidatis, medio margine ciliolatis; 2.5 mm longis; labello basi breviter unguiculato, rhombo, apicem versus abruptius attenuato, apice ipso oblongoideo-incrassato, obtuso, dimidio superiore marginibus recurvis ciliis brevibus apice glanduliferis ornato, supra basin superne callo parvulo donato, 2.75 mm longo; columna brevi, brachiis falcato-ligulatis, breviter acuminatis, pede brevi, recto; anthera galeato-cucullata, glabra; ovario cylindraceo, glabro, 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20116, flowering in Sept. 1909.

On casual inspection one almost could be inclined to consider this plant as *B. nummularioides* Schltr., but the flower structure definitely militates against this. The flowers are carmine-red, becoming whitish at the base.

214. *B. trachybracteam* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 35 cm longum; rhizomate cauliformi, parum ramoso, tenui; radicibus filiformibus, glabris; pseudobulbis compressis, anguste allipsoideis, rhizomati appressis, 2.5–3.5 mm longis, unifoliatis; folio latiovato vel suborbiculari, apiculato, 0.7–1 cm longo, medio vel infra medium 5–8 mm lato; pedunculis subnullis, unifloris, vaginis papillosis acuminatis absconditis; bractea acuminata, papilloso-asperata, ovarium aequante; flore in sectione vix inter majores, erecto-patente; sepalis ellipticis, acuminatis, glabris, 5.5 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, apiculatis, glabris, 3.5 mm longis; labello ovato-lanceolato, basi marginibus incurvulis subunguiculato-angustato, apice obtuso, ima basi callo subinconspicuo donato, vix 3.5 mm longo, eciliato; columna brevi, brachiis falcato-ligulatis, oblique apiculatis, pede recto, perlongo; anthera galeato-cucullata, glabra; ovario cylindraceo, glabro, longitudine vix 1 mm excedente.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c.

1200 m—R. Schlechter no. 19087, flowering in Jan. 1909.

Easily distinguished from all the other species of the section by the peculiar glandular covering of the bracts which is also seen without difficulty on the rhizome-sheaths and the pedicels. The flowers are dark carmine-red, becoming almost white at the base.

§ 27. *Sphaeracron*

At present, the only species belonging to this section with which I am acquainted are the three described here. In a general way they approach *Hybochilus* from which, however, the flowers are distinguished by the clavate apices of their lateral sepals. The labellum resembles that of the basic form of *Bulbophyllum*, that is to say that it is fleshy and thickened and always without a callus at the base. It is apparent that forms resembling *Hybochilus* in habit are found here also, because *B. sphaeracron* Schltr. creeps like *B. masarangicum* Schltr.; *B. subtrilobatum* Schltr. hangs in fascicles and, lastly *B. rhopalophorum* Schltr. hangs perpendicularly and moves to-and-fro in the slightest wind. In all species the flower-stalk is very much shortened and single-flowered, as in *Hybochilus*. The flowers are more-or-less glabrous and rather small.

No species are known to me from Dutch New Guinea or British Papua which could be included in this section unless possibly *B. pachyacris* J.J. Sm. might be placed here. All three described below occur in the mist-forests of the mountains.

215. *B. sphaeracron* Schltr., sp. nov.

Epiphyticum decumbens, usque ad 30 cm longum; rhizomate elongato, flexuoso, decumbente, laxe pseudobulbis obsesso; radicibus filiformibus, glabris; pseudobulbis minutis, oblique conicis, 1.5 mm altis, unifoliatis; folio erecto, elliptico, apiculato, basi subpetiolato-angustato, 1–2 cm longo, medio fere 4–7 mm lato; pedunculis valde abbreviatis, unifloris, vaginis paucis absconditis; bractea cucullata, apiculata, ovarium aequante; sepalis ovato-lanceolatis, apice globoso-incrassatis, glabris, 4 mm longis, lateralibus obliquis; petalis oblique ovalibus, obtusis, dimidio superiore minutissime ciliolatis, 0.75 mm longis; labello ovato-ligulato, obtusissimo, glabro, leviter carnosulo, c. 1 mm longo; columna brevi, brachiis falcato-lanceolatis acutis, pede leviter incurvulo; anthera cucullata, apiculata, glabra; ovario sessili cylindrico, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1300 m—R. Schlechter no. 19782, flowering in June 1909.

This species is distinguished from the other two in the section by the root-forming, creeping rhizomes. The flowers are red, becoming whitish towards the tip. The sepals have a red swelling at the tip.

216. *B. subtrilobatum* Schltr., sp. nov.

Epiphyticum, patulum, 7–16 cm longum; rhizomate cauliformi subflexuoso; radicibus filiformibus, glabris; pseudobulbis minutis, cylindræis, vix 3 mm longis, unifoliatis; folio erecto-patente, oblongo-ligulato, apiculato, 1.5–2.3 cm longo, medio fere 5–8 mm lato; pedunculis brevissimis, vaginulis paucis absconditis, unifloris; bractea cucullata, truncata, ovario aequilonga; flore erecto-patente, glabro; sepalis oblongis, apice incrassata obtusissimis, 3 mm longis, lateralibus obliquis; petalis oblique ovalibus, obtuse apiculatis, 1.5 mm longis; labello oblongo, subcuneato, quarta parte anteriore marginibus recurvis obtuse subtrilobato, leviter carnosulo, petalis aequilongo; columna perbrevis, brachiis oblique oblongis, obtusis, pede crassiusculo; anthera cucullata, dense papillosa; ovario sessili, cylindrico, c. 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19824, flowering in June 1909.

This species of the section is well characterised by the shape of the lip, whilst the colour of the flowers differs from that of the other species. The flowers are whitish with a golden yellow swelling at the tip of the sepals and with a brown lip.

217. *B. rhopalophorum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 40 cm longum; rhizomate cauliformi, simpliciter; radicibus filiformibus, flexuosis, glabris; pseudobulbis 2–2.5 cm distantibus, minutis cylindraceis, unifoliatis, c. 5 mm longis; folio elliptico, apiculato, carnosulo, 4.5–6.5 cm longo, medio fere 1.5–2 cm lato; pedunculis perbrevibus vel potius subnullis, vaginulis paucis absconditis; bractea cucullata, apiculata, ovario aequilonga; flore glabro, in genere inter minores; sepalis e basi ovato-lanceolata productis, clavato-incrassatulis, 7 mm longis; petalis oblique ovalibus, obtusis, c. 1 mm longis; labello carnosulo, ovato, truncato-obtusissimo, 1.5 mm longo; columna brevi, brachiis triangulo-lanceolatis, subfalcatis, acutis, pede apice incurvulo, brevi; anthera cucullata, glabra; ovario sessili, cylindraceo, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17195, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 18139, flowering in Sept. 1908.

This species is characterised by the long, loosely hanging rhizome, and the shape of the flowers. The flowers are red, with yellowish sepal tips.

§ 28. *Leptopus*

This section has been characterised by me already in some detail on p. 762. The peculiar structure of the stem, owing to the roots running beneath the sheaths of the rhizome, is common to all the species. It has been observed already in some species of the previous sections and reaches its full development in *Rhizocaulon*. The only species of the section known to me are the six mentioned here. Of the many species of the genus recently described from Dutch New Guinea, I know of none which could be placed here.

All the species are found in the mist-forests of the mountains, and all have this peculiarity in that they choose thick tree-trunks for their habitat, from which they hang obliquely. Some species, such as *B. aureobrunneum* Schltr., *B. leptopus* Schltr. and *B. chaunobulbon* Schltr. have a wider distribution, while the rest appear to be very local. In the colouring of the flowers, yellow or red prevails, but *B. chaunobulbon* Schltr., which differs in its shorter flower-stalk, has dark purple flowers.

218. *B. aureobrunneum* Schltr., sp. nov.

Epiphyticum, patulum; usque ad 30 cm longum; rhizomate cauliformi simpliciter, vaginis striatis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, angustis, subcylindraceis, unifoliatis, 1.5–2 cm longis, 1.5–2 mm diametro; folio lineari, valde acuto, 5–8 cm longo, medio fere 4–7 mm lato; pedunculo paucivaginato, glabro, pseudobulbis fere aequilongo, unifloro; bractea parvula, ovario graciliter pedicellato multoties brevior; flore in genere mediocri, glabro; sepalis oblongis, apiculatis, 8 mm longis, lateralibus obliquis; petalis oblique obovato-spathulatis, obtuse apiculatis, 4 mm longis; labello carnosulo subpandurato-ligulato, obtuso, medio superne callo transverso reniformi donato, 5 mm longo; columna brevi, brachiis subulatis, pede vix incurvulo; ovario cum pedicello gracili, glabro, 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20194, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16664 (TYPE), flowering in Oct. 1907; on trees in the forests of the Bismarck Range, alt. c. 1100 m—R. Schlechter no. 18548, flowering in Oct. 1908; on trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19681, flowering in June 1909.

This species differs from the others in the section by its narrow leaves, broader sepals and by the lip. The flowers are brown with yellow stripes.

219. *B. leptopus* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 206.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800–1100 m—R. Schlechter no. 14479, flowering in Apr. 1902; no. 20210, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter

no. 16742, flowering in Oct. 1907; on trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18618, flowering in Nov. 1908.

This species is related most closely to *B. plagiopetalum* Schltr., but has broader leaves, flowers of a different colour and glabrous sepals. The flowers are yellow with dark-red-spotted petals and a brown-yellow lip.

220. *B. plagiopetalum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 20 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati parallelis, subcylindraceis, 1.3–1.6 cm longis, infra medium 2.5–4 mm diametro; folio erecto lineari-ligulato, acuto, 6–10 cm longo, medio fere 6–9 mm lato; pedunculis filiformibus, paucivaginulatis, unifloris, c. 5 cm longis; bractea parvula, apiculata, ovario pedicellato multo brevior; flore illo *B. leptopus* Schltr. simili et fere aequimagno; sepalis oblongo-ligulatis, apiculatis, 9 mm longis, intermedio marginibus minute et dense ciliolato, lateralibus obliquis, margine inferiore tantum ciliolatis; petalis oblique ovatis, subacutis, margine subdenticulatis, 2.75 mm longis; labello carnosulo, e basi incrassata ligulato, obtuso, subtus foveato, 7.5 mm longo; columna brevi, brachiis triangulo-subulatis, pede incurvulo; ovario cum pedicello gracili, 1.2 cm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20079, flowering in Sept. 1909.

The differences between this species and *B. leptopus* Schltr. have been commented upon above. The flowers of this species are dark purple, the petals white with purple spots, the lip golden yellow.

221. *B. tumoriferum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 75 cm longum; rhizomate ramoso, cauliformi; radicibus filiformibus, glabris; pseudobulbis distantibus angustis, cylindraceis, 2–3 cm longis, unifoliatis, 1.5–2 mm diametro; folio lineari-ligulato, acuto, basi paulo attenuato, 9–13 cm longo, medio fere 4–7 mm lato; pedunculis gracilibus paucivaginulatis, unifloris, c. 2 cm longis; bractea cucullata, apiculata, ovario paulo brevior, flore in sectione mediocri, glabro; sepalis lanceolatis, acutis vel subacuminatis, 7 mm longis; petalis oblique lanceolato-ligulatis, acutis, quam sepala paulo brevioribus; labello linguiformi, obtusiusculo, basi curvato; medio tumore obtuso ornato, carnosulo; columna brevi, brachiis subulatis, pede subincurvulo; anthera cucullata, antice subverruculosa; ovario breviter pedicellato, clavato, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18817, flowering in Nov. 1908.

This species is distinguished easily from the others in the section by the branched rhizomes and the long petals. The flowers are reddish outside, whitish inside; the petals have red spots and the lip is yellow.

222. *B. chaunobulbon* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 40 cm longum; rhizomate cauliformi, subsimplici; radicibus filiformibus, glabris; pseudobulbis 2–6 cm distantibus, conico-cylindraceis, unifoliatis, 3–4.5 cm longis, infra medium 4–7 mm diametro; folio lanceolato-ligulato, acuminato, basi attenuato, 8–13 cm longo, medio fere 1.7–2.2 cm lato; pedunculis brevibus, paucivaginulatis, unifloris, c. 8 mm longis; bractea apiculata, ovario pedicellato multo brevior; flore in sectione mediocri; sepalis lanceolatis, obtusiusculis, 9 mm longis, intermedio margine minute et dense ciliolato, lateralibus obliquis, margine inferiore tantum ciliolatis; petalis oblique rhombeo-lanceolatis, subacutis, margine plus minusve irregularibus, 5 mm longis; labello carnosulo, linguiformi, obtuso, basi subcordata minute unguiculato, supra basin utrinque papilloso, superne tricalloso, subtus longitudinaliter foveato, 7 mm longo; columna brevi, brachiis subulatis, pede leviter incurvulo; ovario breviter pedicellato, glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees on the slopes of the Kani Range, alt. c. 700 m—R. Schlechter no. 17863, flowering in June 1908.

This species is distinguished readily from the others by the shorter-stemmed flowers and the lip. The flowers are dark purple with paler, red-spotted petals; the lip is white at the base.

var. *ctenopetalum* Schltr., var. nov.

Differt a forma typica sepalis basin versus angustatis, petalis falcatis margine anteriore pectinato-crenulatis, labello angustiore.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1000 m—R. Schlechter no. 19515, flowering in May 1909.

This variety may be considered a separate species at a later date. The flowers are violet-red.

223. *B. rhodoneuron* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate simplici vel subsimplici, cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis c. 3 cm distantibus, cylindraceis, unifoliatis, c. 5 mm longis, 2 mm diametro; folio lanceolato, acuminato, basi subpetiolato-contracto, 6–8.5 cm longo, infra medium 1–1.8 cm lato; pedunculis paucivaginulatis, unifloris, c. 1 cm longis; bractea cucullata, apiculata, ovario graciliter pedicellato multo brevior; flore mediocri; sepalis ovato-oblongis, acutis, intermedio marginibus minute et dense ciliolato, lateralibus triangulo-obliquis, glabris; petalis oblique rhombeis, dimidio superiore attenuatis, obtusis, margine anteriore medio ciliatis, 1.5 mm longis; labello circuitu rhombeo-ligulato, obtuso, obscure 5-lobato, basi superne obtuse bicostato, 3 mm longo, glabro; columna brevi, brachiis subulatis, satis longis, pede incurvulo; anthera cucullata glabra; ovario graciliter pedicellato, glabro, c. 1.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18728, flowering in Nov. 1908.

This species is well characterised by the short pseudobulbs and the labellum. The flowers are yellowish with red veins.

§ 29. *Rhizocaulon*

Only the two species described here are known to me as belonging to this section, which has been characterised already on p. 762. From *Leptopus*, to which they are most closely related, the species may be distinguished by the large sheaths of the very frail rhizomes; by the thinner broad leaves; the racemose inflorescences with delicate flowers and with long-haired petals. As already mentioned, the stem is so formed that the roots beneath the large sheaths of the rhizome are appressed closely to the latter, so that the roots are only visible at the base of the plant or after the decay of the rhizome when the sheaths have become loosened.

One of the species, *B. djamuense* Schltr., is found often as an epiphyte along the creeks of the hill-country in the central part of Kaiser-Wilhelms-Land, whereas the other species, *B. dictyoneuron* Schltr., is an inhabitant of the mist-forest formations, thus requiring a greater degree of moisture and coolness. Both species hang loosely from the trees and show a distinct geotropic growth.

224. *B. dictyoneuron* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 65 cm longum; rhizomate simplici, vaginis amplis obtecto; radicibus filiformibus, glabris; pseudobulbis 3–4 cm distantibus, oblongoideis, inaequaliter compressis, 1.2–1.7 cm longis, medio fere 5–7 mm latis; folio patente, ovato vel ovato-elliptico, acuminato, basi subcordato, textura tenui, reticulato-nervoso, 8–11 cm longo, infra medium 3.5–5.7 cm lato; pedunculis fasciculatis, paucivaginulatis, unifloris, c. 3–4 cm longis; bractea cucullata, apiculata, ovario pedicellato multo brevior; flore in genere mediocri; sepalis ellipticis, subacutis, extus glabris, intus papilloso-puberulis, 8 mm longis, lateralibus obliquis; petalis late ellipticis, obtusiusculis, margine dense ciliatis, 3 mm longis; labello carnoso, linguiformi, obtuso, basi curvato, subtus puberulo, superne longitudinaliter foveolato, 5.5 mm longo; columna brevi, brachiis longis subulatis, pede incurvulo; anthera cucullata, umbone papilloso donata; ovario pedicellato glabro, 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18580, flowering in Nov. 1908.

The differences between this and the next species are considered further on. The flowers are pale yellow with a slightly darker lip, the petals have a brown-black spot.

225. *B. djamuense* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 90 cm longum; rhizomate tenui, cauliformi, vaginis amplis oblecto, simplici vel subsimplici; radicibus filiformibus, glabris; pseudobulbis 3.5–4.5 cm distantibus, compressis, oblique latilipiticis, unifoliatis, 0.8–1.2 cm longis, medio fere 6–8 mm latis; folio ovato, acuminato, basi subcordato, reticulato-nervoso, textura tenui, 4.5–5.5 cm longo, infra medium 2.3–2.7 cm lato; pedunculis fasciculatis, unifloris, paucivaginulatis, 1.2–1.7 cm longis; bractea parvula, ovario pedicellato multo brevior; flore in sectione parvulo; sepalis ellipticis, acutis, intermedio marginibus ciliato, lateralibus obliquis, glabris; petalis oblique elliptico-lanceolatis, acutis, margine setis longis ciliatis, 2 mm longis; labello carnosulo, lanceolato-ligulato, obtuso, basi truncato, subtus et superne supra medium setis leviter curvatis obsesso, 3.75 mm longo; columna brevi, brachiis e basi rhombea subulatis, pede crassiusculo subrecto; anthera cucullata, glabra; ovario pedicellato, glabro, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 700 m—R. Schlechter no. 17322, flowering in Feb. 1908; on trees on the Ngoye [Creek], near Ambo, in the Finisterre Range, alt. c. 600 m—R. Schlechter no. 18262, flowering in Sept. 1908.

This species is appreciably more slender than *B. dictyoneuron* Schltr. and has thinner, smaller leaves, smaller flowers with narrower petals, and a different labellum. The flowers are pale yellow with red stripes, the lip is violet with a yellow tip.

§ 30. *Fruticicola*

Probably, in no section of the genus does the botanist encounter such great difficulties in the delimitation of the species as in this one. In New Guinea I have examined a rich supply of material of nearly all the species, and have formed the opinion that the colouring of the flowers, the shape of the leaves, together with the habit of the plant, may be regarded as the constant characteristics for the individual species. In this way I have distinguished 25 species in our Territory. Whether these distinctions will remain still is to be proved. I believe that the division will become still more difficult because, no doubt, the number still will increase considerably at a later date, since many have a very local distribution.

The following species from Dutch New Guinea may belong to this section: *B. Planitiae* J.J. Sm., *B. cyclopense* J.J. Sm., *B. goliathense* J.J. Sm. and *B. sawiense* J.J. Sm.

The area of distribution extends from Java, where *B. perductum* J.J. Sm. represents the most western species, to Samoa where *B. Betchei* F.v.M. represents the most eastern.

The section is related most closely to *Epibulbon*, from which, however, it is distinguished easily by its habit. With the exception of the first three species, all show on the reverse surface of the lip definite papillae or covering of hair, by means of which the section is recognised readily.

226. *B. neo-pommeranicum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 210.

Neu-Pommern: On trees on the upper Karo [River], in the Beining Range, alt. c. 300 m—R. Schlechter no. 13699, flowering in Oct. 1901.

In habit this species comes closest to the following one, but has wider petals and a more pointed labellum. The flowers are pale brown with darker longitudinal veins.

227. *B. epapillosum* Schltr., sp. nov.

Epiphyticum, parvulum; c. 7 cm longum; rhizomate cauliformi, vaginis oblecto; radicibus filiformibus, glabris; pseudobulbis rhizomati subparallelis, cylindraceutis, c. 3–4 mm longis, 1–1.5 mm diametro, unifoliatis; folio oblique lineari, apiculato, apicem versus sensim angustato, 3–5 cm longo, medio fere 2–2.5 mm lato; pedunculo abbreviato, unifloro, paucivaginulato; bractea parvula apiculata, ovario bene brevior; flore in sectione inter minores, glabro; sepalis oblongis, acutis, 4.5 mm

longis, lateralibus obliquis, margine anteriore paulo ampliatis; petalis oblique ligulatis, obtusis, 2.25 mm longis; labello crassius carnosus, obtusus, circuito ovali, superne medio longitudinaliter sulcato, epapilloso, 3 mm longo; columna brevi, brachiis subulatis medium labelli vix attingentibus, pede leviter incurvus; anthera cucullata, glabra; ovario breviter pedicellato, glabro, clavato, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17038, flowering in Dec. 1907.

Attention has been drawn already to the differences between this species and *B. neo-pommeranicum* Schltr. The flowers are reddish with darker stripes.

228. *B. erioides* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 201.

Kaiser-Wilhelms-Land: On trees alongside creeks in the Bismarck Range, alt. c. 400 m—R. Schlechter no. 13927, flowering in Jan. 1902.

I did not find this species again on my last journey. Clearly, it is related closely to the following one, but has a glabrous labellum devoid of papillae on the reverse side. The flowers are pale yellow.

229. *B. microbulbon* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 209.

Neu-Mecklenburg: On trees in the mountain forests near Punam, in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14659, flowering in July 1902.

This species, which I had included previously in Ridley's section *Monanthaparva* is now better classified under *Fruticicola* according to the division of the genus given here. It is one of the smallest in the section. The flowers are pale yellow with a dark violet lip.

230. *B. dasyphyllum* Schltr., sp. nov.

Epiphyticum, erectum, 8–17 cm altum; rhizomate cauliformi, vaginis oblecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis, unifoliatis, rhizomati parallelis, approximatis, c. 5 mm longis, 1.25–1.5 mm diametro; folio erecto-patente, lineari-ligulato, oblique apiculato, basi angustato, carnosulo, 2.5–3.5 cm longo, medio fere 3–6 mm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula ovario pluries brevior; flore in sectione inter minores, vulgo cleistogamo; sepalis oblongis, acutis, glabris, 3.5 mm longis, lateralibus obliquis, margine anteriore paulo ampliatis; petalis oblique oblongo-ligulatis, obtusissimis, glabris, 1.5 mm longis; labello oblique oblongo-ligulato, apicem versus sensim paulo angustato, obtuso, subtus brevissime papilloso-puberulo, carnosulo, 2.75 mm longo; columna brevi, brachiis subulatis medium labelli vix attingentibus, pede subrecto, brevi; anthera galeato-cucullata, glabra; ovario breviter pedicellato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17735 (TYPE), flowering in May 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19025, flowering in Dec. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18034, flowering in July 1908.

This species, which is very characteristic in habit, generally forms only cleistogamous flowers. It is related closely to *B. icteranthum* Schltr. described below. The flowers are golden yellow with a violet spot at the tip of the pale yellow petals.

231. *B. icteranthum* Schltr., sp. nov.

Epiphyticum, pusillum, 3–7 cm altum, erectum; rhizomate cauliformi, leviter flexuoso, vaginis oblecto; radicibus filiformibus, glabris; pseudobulbis 5–8 mm distantibus, rhizomate, subparallelis, cylindraceis, 3–5 mm longis, 1–1.5 mm diametro, unifoliatis; folio erecto-patente, oblique lineari-ligulato, acuto vel apiculato, basi angustato, 1.5–2.5 mm longo, medio fere 2.5–4 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea apiculata, ovario subsessili duplo fere brevior; flore in sectione inter minimos; sepalis ovatis, apiculatis, 2.5 mm longis, lateralibus obliquis; petalis oblique lanceolatis, obtusis, glabris, c. 1 mm longis; labello oblongo, obtuso, subtus dense papillis clavatis oblecto, superne foveato, dimidio anteriore sparsim papilloso-punctato 1.5 mm longo; columna brevi, brachiis subulatis, medium labelli paulo superantibus, pede apice incurvulo; anthera oblongoideo-cucullata, glabra; ovario subsessili cylindraceo, glabro, 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1100 m—R. Schlechter no. 19797, flowering in June 1909.

One of the smallest-flowered species of the section. It is related closely to *B. dasyphyllum* Schltr., but has more open foliage, much smaller flowers, narrower petals and a different covering on the underside of the lip. The flowers are yellow.

232. *B. leve* Schltr., sp. nov.

Epiphyticum, parvulum, patulum, c. 10–25 cm longum; rhizomate cauliformi, vaginis obtecto; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati subparallelis, cylindraceis, unifoliatis, 5–7 mm longis, 1.5–2 mm infra medium diametientibus; folio erecto-patente, lineari, acuto vel apiculato, basin versus paulo angustato, 3–6.5 cm longo, medio fere 2–5 mm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula, ovario bene brevior; flore in sectione inter mediocres; sepalis oblongis, apiculatis, glabris, 5.5–6 mm longis, lateralibus obliquis, basin versus margine anteriore paulo dilatatis; petalis oblique oblongis, obtusissimis, 1.75 mm longis; labello e basi paulo latiore oblongo, obtusissimo, subtus ima basi excepta dense papillis subulatis obtusis minutis obtecto, superne leviter sulcato, 3.25 mm longo; columna brevi, brachiis subulatis, medium labelli vix attingentibus; pede incurvulo; anthera late ellipsoideo-cucullata, glabra; ovario breviter pedicellato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel in the Minjem Valley, alt. c. 250 m—R. Schlechter no. 16446, flowering in Aug. 1907; on trees in the forest near Damum, alt. c. 300 m—R. Schlechter no. 16133, flowering in May 1907.

This species is related closely to *B. microtes* Schltr., described below, but has broader petals and a broader labellum. The flowers are yellowish with red stripes inside, the petals with red markings; the lip is red.

233. *B. microtes* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 20 cm longum; rhizomate cauliformi, vaginis obtecto; radicibus filiformibus, glabris; pseudobulbis rhizomati subparallelis, cylindraceis, unifoliatis, 4–6 mm longis, 1.5–2 mm diametro; folio lineari, apiculato, basin versus sensim paulo angustato, 3–7 mm longo, medio fere 2.5–6 mm lato; pedunculis valde abbreviatis, vaginulis paucis obtectis, unifloris; bractea ovario breviter pedicellato multo brevior; flore in sectione inter minores; sepalis ovato-lanceolatis, acutis, 4 mm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusis, glabris, 2 mm longis; labello linguiformi, oblongo, obtuso, basin versus paulo dilatato, carnoso, subtus basi et medio sulcato exceptis papillis brevibus ornato, 2.75 mm longo; columna brevi, brachiis subulatis, medium labelli bene superantibus, pede incurvulo; anthera cucullata, glabra; ovario breviter pedicellato, glabro, 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Kelel, in the Minjem Valley, alt. c. 250 m—R. Schlechter no. 16398, flowering in Aug. 1907.

Without doubt this species is related closely to *B. leve* Schltr., but the flowers are differently coloured; the petals much narrower. The lip also is narrower and the steldia are longer. The flowers are greenish with red-spotted petals and red papillae on the underside of the lip.

234. *B. marginatum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 10–20 cm longum; rhizomate cauliformi, vaginis obtecto; radicibus filiformibus, flexuosis; pseudobulbis rhizomati subparallelis, approximatis, cylindraceis, unifoliatis, c. 5 mm longis, c. 1.5 mm diametro; folio lineari, apiculato, basin versus sensim attenuato, 2.5–4 cm longo, supra medium 2.5–6 mm lato; pedunculo valde abbreviato, vaginis paucis obtecto, unifloro; bractea parvula, ovario multo brevior; flore in sectione inter minores; sepalis ovatis, acutis, glabris, 4 mm longis, lateralibus obliquis; petalis oblique ligulatis, obtusissimis, rubro-marginatis, 1.75 mm longis; labello carnoso, linguiformi, lanceolato, obtuso, subtus basi excepta, dense papillis clavellatis obtecto, 2.5 mm longo, superne medio leviter sulcato; columna perbrevis, brachiis subulatis, medium labelli vix superantibus, pede brevi, apice incurvulo; anthera ellipsoideo-cucullata, glabra; ovario breviter pedicellato, glabro, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Pema, alt. c. 170–400 m—R. Schlechter no. 17397, flowering in Mar. 1908; no. 19426 (TYPE), flowering in May

1909; on trees in the forests of the Govidjoa [Creek] (Waria District), alt. c. 800 m—R. Schlechter no. 19812, flowering in June 1909.

I have been undecided for a long time whether to consider this plant a separate species or a variety of *B. microtes* Schltr. However, the flower colouration is different, the petals broader, and the labellum has different papillae. The flowers are yellowish with red stripes and the petals are red-margined.

235. *B. oreogenum* Schltr., sp. nov.

Epiphyticum, compactum, erectum vel subpatulum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, flexuosis, glabris; pseudobulbis approximatis, cylindraceis, unifoliatis, 4–6 mm longis, 1.5–2 mm diametro; folio lineari vel lineari-ligulato, apiculato, basin versus paulo angustato, 2.5–3.5 cm longo, medio fere 3–6.5 mm lato; pedunculis abbreviatis, vaginis obsessis, unifloris; bractea parvula, ovario pedicellato multo brevior; flore in sectione inter mediocres; sepalis ovato-lanceolatis, acuminatis, 5–6 mm longis, lateralibus obliquis; petalis oblique ligulatis, obtusis, supra basin margine anteriore paulo angulato-dilatatis, glabris, 1.75 mm longis; labello carnoso, linguiformi, anguste oblongo, obtuso, basin versus paulo dilatato, subtus basi excepta papillis subulatis obecto, superne longitudinaliter bicostato, 2.75 m longo; columna brevi, brachiis subulatis, pede breviusculo; anthera cucullata glabra; ovario pedicellato glabro, 7–8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17975 (TYPE), flowering in July 1908; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17362, flowering in Feb. 1908.

This species differs from the previous one in having fairly long, pointed sepals. The flowers are yellowish with red stripes, the lip is dark red.

236. *B. polystictum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 8–15 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, cylindraceis, unifoliatis, c. 5 mm longis, 1.5 mm diametro, rhizomati subparallelis; folio ligulato-lineari, apiculato, basin versus sensim paululo angustato, 3.5–5 cm longo, medio fere 4–6 mm lato, pedunculis abbreviatis, vaginulis paucis obectis, unifloris; bractea parvula, ovario pedicellato multo brevior; flore in sectione inter minores; sepalis ovalibus, breviter acuminatis vel apiculatis, glabris, 3.5 mm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, obtusissimis, 1.5 mm longis; labello oblongo-ligulato, obtuso, basi sublobato-dilatato, subtus pulvino papillarum stipitarum oblongo e basi usque infra apicem obecto, superne basi leviter bicostato, 2.25 mm longo; columna brevi, brachiis subulatis, apice hamatis, pede apice incurvulo; anthera oblongoideo-cucullata, glabra; ovario pedicellato, glabro, 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees of the forests of Kelel, alt. c. 600 m—R. Schlechter no. 16505 (TYPE), flowering in Sept. 1907; on trees in the forests near Pema, on the Waria [River], alt. c. 400 m—R. Schlechter no. 19907, flowering in June 1909.

Compared with all the above species, this one is characterised by the flower colouration, the clearly defined callus on the lip and with hooked steldia at its tip. The flowers have close red spots, the underside of the lip has a cushion of red papillae.

237. *B. pulvinatum* Schltr., sp. nov.

Epiphyticum, erectum, c. 10 cm altum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati parallelis, cylindraceis, unifoliatis, 5–7 mm longis, 1.5–2.25 mm diametro; folio lineari, apiculato, basin versus paulo attenuato, 2.5–4.5 cm longo, medio fere 2.5–4 mm lato; pedunculis abbreviatis, vaginulis paucis obectis, unifloris; bractea parvula, ovario pedicellato multo brevior; flore in sectione mediocri, aureo; sepalis ovato-lanceolatis, acuminatis, glabris, 5.5 mm longis, lateralibus obliquis; petalis oblique ligulatis, obtusis, basi margine anteriore subdilatatis, 2 mm longis; labello oblongo-ligulato, valde obtuso, dimidio inferiore sublobato-dilatato, basi exciso, subtus dimidio inferiore pulvino oblongo papillarum subulatarum donato, 3.25 mm longo; columna perbrevis, brachiis subulatis, medium labelli attingentibus, pede apice incurvulo; anthera cucullata, glabra; ovario cum pedicello glabro, 7 mm longo.

Kaiser-Wilhelms-Land: On trees on the Waria [River] near Gobi, alt. c. 350 m—R.

Schlechter no. 19852, flowering in June 1909; on trees on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19733 (TYPE), flowering in June 1909.

This species is identified easily by the preponderantly cleistogamous flowers which have a small cushion of papillae on the lower half of the underside of the lip. The flowers are golden yellow.

238. *B. curvicaule* Schltr., sp. nov.

Epiphyticum, patulum, curvatum, 15–20 cm longum; rhizomate cauliformi, curvato, vaginis oblecto; radicibus filiformibus, glabris; pseudobulbis approximatis, cylindraceis, unifoliatis, rhizomati subparallelis, 5–9 mm longis; 2.5–3.5 mm diametro; folio ligulato, obtuso vel minute apiculato, basin versus paulo angustato, 4–5.5 cm longo, medio fere 6–8 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea ovario pedicellato bene brevior; flore in sectione mediocri; sepalis oblongis, apiculatis, glabris, 5.5 mm longis, lateralibus obliquis; petalis oblique ligulato-oblongis, obtusissimis, supra basin margine anteriore paululo ampliatis, glabris, 2 mm longis; labello carnosio oblongoideo, valde obtuso, basi truncatulo, superne medio excepto papillis verruciformibus sessilibus plus minus dense oblecto 3 mm longo; columna brevi, brachiis subulatis, medium labelli superantibus; anthera cucullata, glabra; ovario cum pedicello brevi glabro, incurvo, 5 mm longo.

Kaiser-Wilhelms-Land: On trees near the Saugueti Base at the foot of the Bismarck Range, alt. c. 400 m—R. Schlechter no. 18509, flowering in Oct. 1908.

This species is characterised adequately by the short, almost glandular, covering of the thick lip. The flowers are yellowish brown on the outside, red-striped on the inside, the petals are white with carmine-red stripes and the lip is pale violet-pink.

239. *B. nigrescens* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 20 cm longum; rhizomate cauliformi, curvato, vaginis oblecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis, rhizomati subparallelis, unifoliatis, 5–7 mm longis, c. 2 mm diametro; folio oblanceolato, ligulato; minute apiculato, basin versus sensim angustato, 4–7 cm longo, supra medium 0.6–1.1 cm lato, exsiccatione nigricante; pedunculis abbreviatis, paucivaginulatis unifloris; bractea parvula, ovario multo brevior; flore in sectione inter minores; sepalis ovatis, apiculatis, glabris, vix 3 mm longis, lateralibus obliquis; petalis oblique ligulatis, valde obtusis, medio marginibus subserrulato-irregularibus, 1.5 mm longis; labello carnosio, obtuso, basi breviter biauriculato, subtus dense papilloso-puberulo, superne obtuse bicostato cum fovea intermedia, 2.5 mm longo; columna brevi, brachiis subulatis, medium labelli superantibus, pede apice incurvulo; anthera cucullata, glabra; ovario cum pedicello brevi glabro, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17707, flowering in May 1908.

In habit this species comes closest to *B. curvicaule* Schltr. but differs appreciably in the flowers, which are smaller. The flowers are closely red-spotted; the labellum is dark red with a green tip.

240. *B. hystricinum* Schltr., sp. nov.

Epiphyticum, patulum, 10–20 cm longum; rhizomate cauliformi, curvato, vaginis oblecto; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati subparallelis, cylindraceis, c. 5 mm longis, 2.5–3 mm diametro; folio oblongo-ligulato, 2.5–4.5 cm longo, medio fere 0.7–1.4 cm lato; pedunculis abbreviatis, fasciculatis, unifloris, paucivaginulatis; bractea parvula, ovario multo brevior; flore in sectione inter minores; sepalis ovatis, acuminatis, glabris, 3.25 mm longis, lateralibus obliquis; petalis oblique oblongis, subretuso-obtusissimis, medio paululo angustatis, margine minutissime et dense ciliolatis, 1.5 mm longis; labello lanceolato-linguiformi, obtuso, basi retuso, basi apiceque exceptis subtus papillis subulatis acutis dense hystricino, 2 mm longo, columna brevi, brachiis subulatis, medium labelli vix attingentibus, pede apice incurvulo; anthera cucullata, glabra; ovario breviter pedicellato, glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20211, flowering in Sept. 1909.

This is a very interesting species which is closest to the following ones in habit, but

which has closely hirsute petals. The flowers are yellow, the upper half of the petals dark purple, and the lip dark purple with a yellow tip.

241. *B. exiguiflorum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 25 cm longum; rhizomate cauliformi, curvato, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati subparallelis, cylindraceis, unifoliatis, 5–7 mm longis; c. 2 mm diametro; folio oblongo-ligulato, minute apiculato, 4–5 cm longo, medio 1–1.3 cm lato; pedunculis abbreviatis, fasciculatis, unifloris, paucivaginulatis; bractea parvula, ovario pedicellato multoties brevior; flore in sectione inter minores; sepalis late ellipticis, apiculatis, glabris, 2.5 mm longis, lateralibus obliquis; petalis oblique oblongis, truncato-obtusissimis, margine latere utrinque irregulariter paucidentatis, glabris, 1.25 mm longis; labello carnoso, oblongo, valde obtuso, dimidio inferiore sublobato-dilatato, basi cordato, subtus pulvino oblongo papillarum e basi usque infra apicem ornato, 2 mm longo; columna brevi, brachiis subulatis, medium labelli attingentibus, pede incurvulo; ovario graciliter pedicellato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Umbili in the Minjem Valley, alt. c. 400 m—R. Schlechter no. 16429, flowering in Aug. 1907.

One of the smallest-flowered species in the section, characterised by distinct large-dentate petals. The flowers are closely red-spotted with a cherry-red lip.

242. *B. polyphyllum* Schltr., sp. nov.

Epiphyticum, patulum, c. 20 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis bene approximatis, rhizomati subparallelis, unifoliatis, cylindraceis, 5–7 mm longis, 2–3 mm diametro; folio anguste elliptico-ligulato, apiculato, 4.5–5 cm longo, medio fere 0.8–1.1 cm lato; pedunculis fasciculatis, abbreviatis, unifloris, paucivaginulatis; bractea parvula, ovario bene brevior; flore in sectione inter minores; sepalis oblongis, apiculatis, glabris, 3.25 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, valde obtusis, margine subirregularibus; labello carnoso, oblongo-linguiformi, obtuso, dimidio anteriore paulo augustato, basi subcordato, subtus basi et medio exceptis papillis subulatis hystricino, 2 mm longo; columna brevi, brachiis longius subulatis, medium labelli bene excedentibus; anthera quadrato-cucullata, glabra; ovario pedicellato glabro, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20063, flowering in Sept. 1909.

This species is approximately intermediate between *B. exiguiflorum* Schltr. and *B. fruticicola* Schltr. It differs from the former in the petals and from the latter by broader leaves and in the lip. The flowers are whitish with dark red spots, the lip is dark carmine-red.

243. *B. fruticicola* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 202.

B. fruticula J.J. Sm., in Bull. Jard. Bot. Buitenz. ser. II, N. III (1912), p. 23.

Kaiser-Wilhelms-Land: On shrubs and trees in the Torricelli Range, alt. c. 700–800 m—R. Schlechter no. 14415, flowering in Apr. 1912 [Ed.—probably 1902]; no. 20115, flowering in Sept. 1909.

This species is distinguished from its relatives by the close, narrow foliage and is related most closely to *B. polyphyllum* Schltr. The flowers are white with close red spots.

244. *B. fasciculatum* Schltr., sp. nov.

Epiphyticum, patulum, 20–30 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati subparallelis, unifoliatis, 6–8 mm longis, 2–2.5 mm diametro; folio elliptico-ligulato, minute apiculato, 4–5 cm longo, medio fere 1.1–1.4 cm lato; pedunculis abbreviatis, fasciculatis, unifloris, paucivaginulatis; bractea parvula, ovario multo brevior; flore in sectione inter minores; sepalis ellipticis, apiculatis, glabris, 3 mm longis, lateralibus obliquis; petalis oblique oblongis, truncato-obtusissimis, glabris, 1.5 mm longis; labello lanceolato-linguiformi, obtuse, subtus basi apiceque exceptis latere utrinque dense papillis brevibus pulvinato, 2 mm longo; columna brevi, brachiis subulatis medium labelli vix attingentibus, pede apice incurvulo; anthera cucullata, apiculata, glabra; ovario cum pedicello brevi glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c.

1300 m—R. Schlechter no. 19116, flowering in Jan. 1909.

This species is also close to *B. fruticicola* Schltr. but the flowers are of a different colour with much wider petals. Furthermore, the broad leaves are appreciably more robust. The flowers are whitish with dark red stripes; the lip is dark red.

245. *B. chaetostroma* Schltr., sp. nov.

Epiphyticum, patulum, c. 30 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis c. 1 cm distantibus, cylindraceis, unifoliatis, rhizomati subparallelis, 5–7 mm longis, 2.5 mm diametro; folio elliptico, apiculato, basi subpetiolato-angustato, 2.7–3.3 cm longo, medio fere 0.8–1 cm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea apiculata, ovario pluries brevior; flore in sectione vix inter mediocres; sepalis ellipticis, acutis, glabris, 5 mm longis, lateralibus obliquis; petalis oblique ligulatis, obtusis, glabris, 1.5 mm longis; labello carnosio, oblongo, obtuso, basi retuso, superne sulcato, subtus pulvino denso setularum basi apiceque exceptis obecto, 3 mm longo; columna brevi, brachiis subulatis, medium labelli attingentibus, pede incurvulo; anthera cucullata, glabra; ovario cum pedicello glabro, vix 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19634, flowering in May 1909.

This species is characterised by a cushion of tightly packed fine hairs on the underside of the lip. The flowers are black-purple with yellowish sepal tips.

246. *B. maijenense* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 7–13 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis, approximatis, rhizomati subparallelis, 6–9 mm longis, infra medium 3–4 mm diametro; folio oblanceolato-ligulato, minute apiculato, basin versus sensim angustato, 4–6 cm longo, supra medium 0.7–1.2 cm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula, apiculata, ovario multo brevior; flore in sectione inter mediocres; sepalis lanceolato-oblongis, acutis, glabris, 6 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, glabris, 1.75 mm longis; labello carnosio, obovato-oblongo, valde obtuso, basi minute biauriculato, subtus basi apiceque exceptis minutissime papilloso-puberulo, superne dimidio inferiore bicosato, 3 mm longo; columna brevi, brachiis subulatis, acutis, labelli dimidium attingentibus; anthera quadrato-cucullata, glabra; ovario breviter pedicellato glabro, 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17914, flowering in July 1908.

This species is related fairly closely to the following one, but shows distinct differences in both the petals and the lip. The flowers are brown-red with orange-yellow tips and darker stripes inside; the lip is dark red with an orange-yellow tip.

247. *B. hydrophilum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 15–17 cm altum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis vel conico-cylindraceis, 5–7 mm longis, infra medium 2–3.5 mm diametro; folio oblanceolato-ligulato, minute apiculato, basin versus sensim angustato, 5–9 cm longo, supra medium 1–2 cm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula, ovario multo brevior; flore in sectione mediocri; sepalis ovatis, acuminate, glabris, 5.5 mm longis, lateralibus obliquis; petalis oblique ligulatis, obtusis, supra basin margine anteriore paulo dilatatis, 2 mm longis; labello circuitu lanceolato-linguiformi, obtuso, basi truncato, superne foveato, quarta parte apicali minutissime papilloso, subtus basi apiceque exceptis minutissime papilloso-puberulo, 3 mm longo; columna brevi, brachiis subulatis, medium labelli paulo superantibus, pede apice incurvulo; anthera quadrato-cucullata, antice dilatata; ovario cum pedicello brevi 4.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the gallery-forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18327, flowering in Oct. 1908.

Attention already has been given above to the differences between this species and *B. maijenense* Schltr. The flowers are dark red with darker veins; the sepals and labellum with yellow tips.

248. *B. fusciflorum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 30 cm longum; rhizomate cauliformi, leviter flexuoso,

vaginis obecto; radicibus filiformibus, glabris; pseudobulbis 1.5–2 cm distantibus, cylindraceis, rhizomati subparallelis, 0.7–1 cm longis, 2.5–3.5 mm diametro; folio elliptico vel elliptico-ligulato, apiculato, basi petioliformi-attenuato, 6–12 cm longo, lamina medio 1.3–2.5 lata; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula, ovario bene brevior; flore in sectione inter majores; sepalis ovato-lanceolatis, acutis, glabris, 8 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, basi margine anteriore paululo dilatatis, 2 mm longis; labello oblongo, obtuso, basi leviter emarginato, biauriculato, subtus ima basi excepta minutissime papilloso, 3.5 mm longo; columna brevi, brachiis subulatis, labelli medium vix attingentibus, pede incurvulo; anthera quadrato-cucullata, glabra; ovario cum pedicello brevi glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 300 m—R. Schlechter no. 16473, flowering in Sept. [Ed.—probably Aug.] 1907.

In habit this species differs from the two previous ones by its more open growth. The flowers are dark brown-red.

249. *B. dependens* Schltr., sp. nov.

Epiphyticum, perpendiculariter dependens, usque ad 30 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis, approximatis, rhizomati subparallelis, 0.7–1 cm longis, 2.5–3.5 mm diametro; folio lanceolato-ligulato, acuto, 6–12 cm longo, infra medium 0.9–1.4 cm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula, ovario multo brevior; flore in sectione vix mediocri; sepalis ovatis, apiculatis, glabris, 5 mm longis, lateralibus obliquis; petalis oblique oblongo-spathulatis, obtusissimis, margine subdenticulatis, glabris, 1.75 mm longis; labello carnoso, oblongo obtuso, basi breviter biauriculato, dimidio inferiore subtus et lateribus papillis obtusis dense obsesso, superne basi bicostato, 3.5 mm longo; columna brevi, brachiis subulatis, medium labelli excedentibus, pede incurvulo; anthera cucullata, glabra, ovario cum pedicello glabro, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19615, flowering in May 1909; on trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19868, flowering in June 1909.

A very distinctive species both in habit and flower colouration that could hardly be mistaken for another. The flowers are violet, the petals black-violet; the front of the lip is white.

250. *B. flagellare* Schltr., sp. nov.

Epiphyticum, perpendiculariter dependens, usque ad 90 cm longum; rhizomate cauliformi, vaginis obecto; radicibus filiformibus, glabris; pseudobulbis 0.5–1.5 cm distantibus, cylindraceo-conicis, 1.2–1.7 cm longis, infra medium 4–6 mm diametro; folio lineari, acuto, 8–13 cm longo, medio 4–8 mm lato, basin versus sensim paulo angustato; pedunculo valde abbreviato, unifloro, paucivaginulato; bractea apiculato, ovario duplo brevior; flore in sectione inter minores; sepalis ovato-lanceolatis, acuminatis, glabris, 5 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, minute apiculatis, glabris, 1.75 mm longis; labello carnoso, oblongo, obtuso, basi breviter biauriculato, subtus basi et imo apice exceptis minute puberulo, superne sulcato, 3 mm longo; columna brevi, brachiis subulatis, medium labelli bene excedentibus; pede apice incurvulo; anthera galeato-cucullata, glabra; ovario cum pedicello glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests above Bolobo (Minjem District), alt. c. 800 m—R. Schlechter no. 16561, flowering in Sept. 1907; on trees in the forests of the Finisterre Range, above Meireka, alt. c. 600 m—R. Schlechter no. 17953, flowering in July 1908.

This species is also unmistakable in habit and can not be confused with any other in the section. The flowers are pale pink with red-spotted sepals and red-striped petals.

§ 31. *Epibulbon*

It cannot be denied that some species of this section have a strong affinity to *Fruticicola*, but their habits are so conspicuously characteristic that one is never in doubt when species of one or the other section are under examination. Whilst in *Fruticicola* the rhizome always is covered by sheaths, under which the roots creep

along, as in *Rhizocaulon*; in *Epibulbon* the rhizomes, which are only rooted at the base, are nearly glabrous and so intergrown with the pseudobulbs that only the tops of the latter are exposed. The flowers also possess certain rather striking characteristics. They have, for instance, usually long-pointed sepals, a less fleshy and more pointed labellum, which is covered with papillae usually on the upper side (rarely below), and shorter stelia to the column. Moreover, the whole flower is dissimilar to that of *Fruticicola* species, as well as more delicate in texture.

The section is quite evidently a typical Papuan one, for, with the exception of the species mentioned here, I know of only one other which should be included, viz. *B. acutilingue* J.J. Sm. from Dutch New Guinea.

With the exception of *B. helix* Schltr., all species occur as epiphytes of the mist-forests.

251. *B. procerum* Schltr., sp. nov.

Epiphyticum, procerum, erectum vel patulum, usque ad 40 cm longum; rhizomate cauliformi, gracili; radicibus basalibus filiformibus, glabris; pseudobulbis 1–2 cm distantibus, arctissime rhizomati adnatis, apicibus liberis rhizomati subparallelis, cylindraceis, unifoliatis, 3–6 mm longis, 1.5–2 mm diametro; folio lineari-ligulato, apiculato, basin versus sensim paulo angustato, 2–3.5 cm longo, mediofere 2–5 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario bene brevior; flore in sectione mediocri; sepalis ellipticis, acutis, glabris, 5.5 mm longis, lateralibus obliquis; petalis oblique lanceolato-ligulatis, obtusis, glabris, 2.5 mm longis; labello carnosulo, elliptico-lanceolato, obtuso, dimidio anteriore paulo angustato, subtus basi apiceque exceptis, dense papilloso-hispidulo, basi superne sulcato, 3.25 mm longo; columna mediocri, brachiis subulatis, brevibus, medium labelli superantibus, pede apice incurvulo; anthera cucullata, glabra; ovario cum pedicello brevi cylindrico, glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 1200 m—R. Schlechter no. 19589, flowering in May 1909.

This species is isolated somewhat in the section since the flowers almost completely resemble those of the section *Fruticicola*, but its habit indicates its relationship to *Epibulbon*. The flowers are yellowish, red-striped, the lip dark purple and the anther yellow.

252. *B. densifolium* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate cauliformi, cum pseudobulbis arcte connatis; radicibus filiformibus, flexuosis, glabris; pseudobulbis cum rhizomate arctissime connatis, cylindraceis, 6–8 mm longis, apice tantum liberis, unifoliatis; folio ovato-elliptico, oblique apiculato, glabro, 1.5–2 cm longo, infra medium 6–9 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea ovario plus duplo brevior; flore in sectione inter minores; sepalis e basi ovato-lanceolata longe acuminatis, 7.5 mm longis, intermedio marginibus minute ciliolato, lateralibus falcato-obliquis; petalis oblique ovato-lanceolatis, acuminatis, basi margine anteriore paulo dilatatis, glabris, c. 2 mm longis; lacello ovato-lanceolato, acuto, basi subcordato, superne medio sulcato excepto tertia parte basali papilloso, 4 mm longo; columna perbrevis, brachiis quadratis, truncatis, perbrevis, pede crasso brevi; anthera galeato-cucullata, glabra; ovario cum pedicello brevi glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19113, flowering in Jan. 1909.

This species is unique in the section in its very dense foliage; also the column is unusual with the truncated, very short stelia. The flowers are whitish, the sepals with red stripes, the lip red, the anther golden yellow and the column-foot with a red spot.

253. *B. papuliglossum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, usque ad 30 cm longum; rhizomate cauliformi, flexuoso; radicibus filiformibus, glabris; pseudobulbis cylindraceis, superpositis, cum rhizomate arctissime connatis,

1.2–1.5 cm longis, vix 2 mm diametro, unifoliatis; folio lineari-ligulato, acuto, basi sensim paulo angustato, 2.5–4.5 cm longo, medio 3–6 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario multo brevior; flore in sectione inter minores; sepalis ovato-lanceolatis, longius acuminatis, intermedio 7 mm longo, marginibus minute ciliolato, lateralibus obliquis, glabris; petalis oblique oblongo-ligulatis, obtusis, medio leviter constrictis, glabris, 1.5 mm longis; labello lanceolato-linguiformi, obtuso, carnosulo, dimidio inferiore margine dense papillis patentibus ciliato, basi medio minute papilloso cum callo parvulo, 3 mm longo; columna brevi, brachiis brevibus falcato-subulatis, pede subrecto; ovario breviter pedicellato glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, on the Rin-Tejao [River], alt. c. 800 m—R. Schlechter no. 20124, flowering in Sept. 1909.

In habit the species shows a strong resemblance to *B. helix* Schltr., but the individual flower parts are quite different, particularly the lip. The flowers are white, with a violet-red lip.

254. *B. helix* Schltr., sp. nov.

Epiphyticum, gracile, patulum, usque ad 30 cm longum; rhizomate cauliformi, genuflexo-flexuoso; radicibus filiformibus, glabris; pseudobulbis cum rhizomate arctissime connatis, superpositis, c. 2 cm longis, 1.2 mm diametro, unifoliatis; folio lineari vel lineari-ligulato, acuto vel apiculato, basi angustato, 3.5–5.5 cm longo, medio fere 4–5.5 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario multo brevior; flore in sectione inter minores; sepalis ovato-lanceolatis, longius acuminatis, glabris, 6.5 mm longis, lateralibus obliquis; petalis oblique ligulatis, medio paulo constrictis, supra medium paulo dilatatis, apiculatis, glabris, 3 mm longis; labello lanceolato-elliptico, acuto, dimidio inferiore subtus et superne margines versus verruculoso-papilloso, basi superne foveolato, 4.5 mm longo; columna perbrevis, brachiis brevibus falcato-subulatis, pede brevi, crassiusculo; anthera ovato-cucullata, glabra; ovario cum pedicello brevi glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 350 m—R. Schlechter no. 19323, flowering in Apr. 1909.

As already mentioned above, this species resembles *B. papuliglossum* Schltr., but the rhizomes are more twisted and the flowers show marked differences. The flowers are white, the lip pale yellow and the column-foot purple-red.

255. *B. epibulbon* Schltr., sp. nov.

Epiphyticum, usque ad 50 cm longum, patulum; rhizomate cauliformi, flexuoso; radicibus filiformibus, glabris; pseudobulbis cylindraceutis, cum rhizomate arctissime connatis, unifoliatis, 2.5–3.5 cm longis, 2 mm diametro; folio lineari-ligulato, acuto, basi distincte attenuato, 4–7.3 cm longo, medio fere 0.6–1 cm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario duplo fere brevior; flore in sectione inter mediocres; sepalis lanceolatis, longius acuminatis, intermedio marginibus minute ciliolato, 7 mm longo, lateralibus obliquis, glabris, 8 mm longis; petalis oblique oblongo-ligulatis, obtusis, infra medium leviter constrictis, margine minutissime ciliolatis, 2.5 mm longis; labello lanceolato-oblongo, acuto, basi minute biauriculato, subtus lateribus dimidio inferiore minute papilloso, superne supra basin costis 2 minute papillis brevibus ornato; columna brevi, brachiis falcato-subulatis, pede subrecto; anthera reniformi-cucullata, glabra; ovario cum pedicello brevi glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19763, flowering in June 1907. [Ed.—probably 1909.]

In habit this species is closer to the following ones, since all show a strong growth pattern. The flowers are characterised by hirsute petals and by the labellum. The flowers are white, the labellum brown-red with a yellow tip.

256. *B. ellipticum* Schltr., sp. nov.

Epiphyticum, erectum vel suberectum, 15–25 cm altum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis superpositis, cum rhizomate arctissime connatis, c. 2–3 cm longis, 2 mm diametro, unifoliatis; folio ligulato vel anguste elliptico-ligulato, apiculato, basi paululo angustato, 3–4 cm longo, medio fere 5–7 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario multo brevior; flore in sectione mediocri; petalis e basi ovato-lanceolata longe

acuminatis, glabris, intermedio 9 mm longo, lateralibus obliquis, c. 1 cm longis; petalis oblique ovato-oblongis, obtusis, glabris, margine subirregularibus, 2 mm longis; labello elliptico, obtusiusculo, utrinque glabro, basi subexciso, 3.75 mm longo; columna perbrevis, brachiis falcato-subulatis, brevibus, pede incrassato, subrecto; anthera galeato-cucullata, glabra; ovario cum pedicello brevi, c. 7 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20099, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17254, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19170, flowering in Jan. 1909; no. 18241, flowering in Sept. 1908.

This species is the first with a glabrous lip, and is similar to *B. rhodoglossum* Schltr. but differs in the shape and colouration of the lip. The flowers are white, the lip yellow with a red spot at the base.

257. *B. rhodoglossum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis superpositis, cum rhizomate arctissime connatis, unifoliatis, 1–1.5 cm longis, c. 2 mm diametro; folio ligulato, apiculato, basi angustato, 3–5 mm longo, medio 5–8 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; flore in sectione mediocri; sepalis ovato-lanceolatis, acuminatis, glabris, c. 1 cm longis, lateralibus obliquis, intermedio paululo longioribus; petalis oblique obovato-oblongis, obtusis, glabris, 3 mm longis; labello oblongo, obtuso, juxta apicem marginibus recurvulis paululo angustato, glabro, superne breviter bicostato, 4 mm longo; columna brevi, brachiis perbrevis, falcatis, subacutis, pede subrecto; anthera galeato-cucullata, apiculata, glabra; ovario cum pedicello brevi glabro, c. 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17294 (TYPE), flowering in Feb. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19010, flowering in Dec. 1908.

This species is related closely to *B. ellipticum* Schltr., but differs in the petals, the labellum and the column. The flowers are white, the labellum red with a yellow tip.

258. *B. nebularum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis rhizomati arctissime adnatis, unifoliatis, c. 1 cm longis, 2 mm diametro; folio ligulato, obtuso, basin versus paulo angustato, 2.5–6 cm longo, medio fere 5–8 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario multo brevior; flore in sectione inter majores; sepalis ovato-lanceolatis, longe acuminatis, glabris, intermedio 1.2 cm longo, lateralibus 1.3 cm longis; petalis oblique oblongo-ligulatis, obtusis, glabris, 4 mm longis; labello circuitu oblongo, obtuso, medio leviter constricto, 5 mm longo, glabro; columna perbrevis, brachiis perbrevis acutis, cuspidatis, pede incrassatulo leviter incurvo; anthera cucullata, glabra; ovario cum pedicello brevi glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18740, no. 18844, flowering in Nov. 1908.

This species differs from the two previous ones in the broader, blunter leaves, larger flowers, narrower petals and in the shape of the lip. The flowers are white, the petals with a central rose-red streak, and the lip red with a white tip and base.

259. *B. superpositum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 50 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis superpositis cum rhizomate arctissime connatis, 1.5–2 cm longis, 2.5–3 mm diametro, unifoliatis; folio elliptico-ligulato, subacuto, basi subpetiolato-angustato, 5.5–7.5 cm longo, 1.2–1.6 cm lato; pedunculo valde abbreviato, paucivaginulato, unifloro; bractea parvula, ovario multo minore, flore in sectione mediocri; sepalis ovato-lanceolatis, acutis, intermedio 6.5 mm longo, margine sparsim et breviter ciliolato, lateralibus obliquis, margine inferiore tantum ciliolatis; petalis oblique ligulatis, obtusiusculis, margine anteriore basi paulo dilatatis, apicem versus papilloso-puberulis, 3 mm longis; labello oblongo-lanceolato, acuto, superne basin versus verruculoso-papilloso, foveato, 5.5 mm longo;

columna perbrevis, brachiis lanceolato-subulatis, pede brevi, recto; anthera cucullata, glabra; ovario cum pedicello brevi glabro, 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, near Dschischungari, alt. c. 900 m—R. Schlechter no. 19833, flowering in June 1909.

Within the whole section this species is characterised by the non-pointed sepals and clearly papillose hirsute petals. The flowers are greenish white with a muddy reddish lip.

§ 32. *Oxysepalum*

It would appear that this section, which was known originally from the hinterland of India, has reached its maximum development in New Guinea, because some very characteristic forms from there occur and I have several others to add here which constitute quite new form-groups. Including those described here, about a dozen species of the section have been reported from Papuasias. None of these belong to British Papua, but as far as I can ascertain, three species come from Dutch New Guinea, viz. *B. Teysmannii* J.J. Sm., *B. dichotomum* J.J. Sm. and *B. piliferum* J.J. Sm. *B. sessile* (Koen.) J.J. Sm. is also cited from Dutch New Guinea by J.J. Smith, but I am sure that it is an erroneous determination in this instance.

The chief characteristics of the section have been mentioned already, but I would like to stress here that only those species with very shortened, single-flowered inflorescences have been placed here. A part of the section which J.J. Smith is inclined to place here may be admitted more correctly to *Macrouris*.

260. *B. subulifolium* Schltr., sp. nov.

Epiphyticum, parvulum, erectum, 6–8 cm altum; rhizomate cauliformi; radicibus basilaribus, filiformibus, glabris; pseudobulbis rhizomati subparallelis, cylindraceis, 3–4 mm longis, c. 1.5 mm diametro, unifoliatis; folio subulato, carnosulo, 2–3 cm longo, c. 1 mm diametro; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovarium aequilongum amplexante; flore in genere minuto, decurvo; sepalis lanceolatis, acuminatis, glabris, 4 mm longis, lateralibus obliquis; petalis oblique oblongis, minute et obtuse apiculatis, glabris, c. 1.25 mm longis; labello carnosulo, ovato, obtuso, basi retuso, glabro, vix 1.5 mm longo; columna perbrevis, brachiis perbrevibus falcato-triangularis, pede satis longo apice incurvulo; anthera cucullata, glabra; ovario sessili, cylindrico, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18720, flowering in Nov. 1908.

A very interesting small species with awl-shaped leaves similar in the section only to the following one, but with quite different flowers. The flowers are white with a yellow lip.

261. *B. semiteres* Schltr., sp. nov.

Epiphyticum, pusillum, erectum, 5–8 cm altum; rhizomate cauliformi; radicibus filiformibus, glabris, basilaribus; pseudobulbis cylindraceo-conicis, unifoliatis, 4–6 mm longis, infra medium 2–3 mm diametro; folio erecto, lineari, acuto, semitereti, 2–2.7 cm longo, c. 1.5 mm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea ovario duplo brevior; flore in sectione mediocri; sepalis lanceolatis, acuminatis, glabris, 4.5 mm longis, lateralibus falcatis; petalis oblique ovalibus obtusis, 1.75 mm longis; labello curvato, carnosulo, ovali, obtuso, glabro, basi medio gibbo sulcato ornato, 2 mm longo; columna perbrevis, brachiis perbrevibus triangularis, acutis, pede satis longo, incurvo; anthera cucullata, apiculata, glabra; ovario cylindraceo, subsessili, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20061, flowering in Sept. 1909.

This species belongs adjacent to *B. subulifolium* Schltr., but differs in having larger pseudobulbs and different flowers. The flowers are white.

262. *B. tenue* Schltr., sp. nov.

Epiphyticum, tenue, pensile, 10–15 cm longum; rhizomate cauliformi, simplici; radicibus basilaribus,

filiformibus, glabris; pseudobulbis cylindraceis, rhizomati subparallelis, c. 5 mm distantibus, c. 3 mm longis, unifoliatis; folio lanceolato-ligulato, acuto, basi angustato, 1.3–2.5 cm longo, medio fere 2–3.5 mm lato, carnosulo; pedunculis valde abbreviatis, unifloris, paucivaginulatis; bractea acuminata, ovarium aequante; flore in genere minuto, glabro; sepalis anguste lanceolatis, caudato-acuminatissimis, 3.5 mm longis, lateralibus obliquis; petalis minutis, ligulatis, apice inaequaliter bilobulatis, c. 0.5 mm longis; labello anguste oblongo-spathulato, obtuso, glabro, basi emarginato, c. 1.25 mm longo; columna perbrevis, brachiis perbrevibus triangulis, pede satis longo, apice incurvulo; anthera cucullata, glabra; ovario cylindraceo, sessili, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16249, flowering in July 1907.

An especially well characterised species, both in habit and in the narrow, long flowers, which is not uncommon in patches in the central part of Kaiser-Wilhelms-Land. The flowers are orange-yellow.

263. *B. piliferum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 8; in Nova Guinea VIII (1910) [1909], p. 98, t. XXXII, f. 107.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter [Ed.—no number cited], flowering in Oct. 1907.

Unfortunately, my specimens have been mislaid, and I have only a sketch of the floral parts and a dissected flower. Since my sketch agrees very well with that published by J.J. Smith, I have reason to believe that this is *B. piliferum* J.J. Sm., but the identification will not be certain until the remaining parts of the plant become available. The flowers are sulphur-yellow.

264. *B. trichaete* Schltr., sp. nov.

Epiphyticum, patulum, c. 20 cm longum; rhizomate cauliformi, vaginis acuminatis obtecto; radicibus filiformibus, glabris; basilaribus; pseudobulbis minutis cylindraceis, c. 1 cm distantibus; folio anguste lanceolato, cuspidato, crasse carnosulo, 2–2.5 cm longo, medio fere 2.5–3.5 mm lato; pedunculis valde abbreviatis, unifloris, paucivaginulatis; bractea ovario aequilonga; flore in genere minuto; sepalis ovatis, acuminatis, glabris, apice in setam longam productis, seta inclusa 8 mm longis, lateralibus obliquis; petalis oblique ovalibus, apice minute tridentatis, glabris, 2.5 mm longis; labello carnosulo, ovali, obtusissimo, medio subinconspicue constricto, basi minute biauriculato, petalis aequilongo; columna perbrevis, brachiis perbrevibus triangulis, pede incrassato, satis longo, recto; anthera cucullata, glabra, obtuse apiculata; ovario sessili glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19725, flowering in June 1909.

This species is related closely to *B. piliferum* J.J. Sm. but the flowers are considerably larger, the petals not incised at the tips, but three-toothed. The lip is also broader, and there are two small ears at the base. The flowers are sulphur-yellow.

265. *B. pungens* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 30 cm longum; rhizomate cauliformi, ramoso, vaginis apiculatis obtecto; radicibus filiformibus, glabris, basilaribus; pseudobulbis 1–2.5 cm distantibus, cylindraceis, rhizomati subparallelis, c. 5 mm longis 2–2.5 mm diametro; foliis lanceolato-ligulatis, pungenti-acutis, basi subpetiolata-angustatis, crassius carnosulis, 3–6 cm longis medio fere 5–8 mm latis; pedunculis brevissimis, paucivaginulatis, unifloris; bractea cucullata, ovarium duplo superante; flore in genere minuto; sepalis lanceolatis, caudato-acuminatissimis, glabris, 7 mm longis, lateralibus obliquis; petalis oblique ovalibus, obtusissimis, supretusis, glabris, 1.25 mm longis; labello carnosulo, ovato, obtuso, glabro, c. 1 mm longo; columna perbrevis, brachiis triangulis obtusiusculis, pede incurvulo; anthera cucullata glabra; ovario sessili, cylindrico, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16749, no. 16909, flowering in Oct.–Nov. 1907.

This species is identified readily. The foliage is similar to that of *B. trichaete* Schltr., but the sepals are different and the flowers much narrower approximating

towards *B. sessile* (Koen.) J.J. Sm. The flowers are white, occasionally with a yellowish lip.

var. *pachyphyllum* Schltr., var. nov.

Differt a forma typica foliis crassius carnosius, basi brevius angustatis, floribus longius caudato-acuminatissimis et labello longiore.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 16642, flowering in Oct. 1907.

Initially, I considered this plant to be a separate species, but I now regard it as a variety. The flowers are white.

266. *B. flavum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 15 cm longum; rhizomate gracili, flexuoso, vaginis distantibus acuminatis obsesso; radicibus filiformibus, glabris, basilaribus; pseudobulbis minutis, cylindraceis, vix 2 mm longis, unifoliatis; folio ligulato, apiculato, basi leviter angustato, 1–2 cm longo, medio fere 2.5–5 mm lato; pedunculis brevissimis, vaginis paucis obtectis, unifloris; bractea cucullata, ovarium superante; flore in genere minuto, flavo; sepalis lanceolatis, subacutis, glabris, 3 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, glabris, 1.25 mm longis; labello carnosio, curvato, late ovali, valde obtuso, basi superne gibbo sulcato ornato, 1.5 mm longo; columna perbrevis, brachiis brevibus oblique rhombeis, obtusiusculis, pede vix incurvulo; anthera cucullata, glabra; ovario sessili glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19479, flowering in May 1909.

The only species without long-pointed sepals. It differs also in another way, viz. the rhizome-sheaths, located only under the pseudobulbs, give the impression that the stem is developing knots at short intervals. The flowers are yellow.

267. *B. sparsifolium* Schltr., sp. nov.

Epiphyticum, patulum, c. 25 cm longum; rhizomate flexuoso, cauliformi, vaginis apiculatis arcte obtecto; radicibus filiformibus, basilaribus, glabris; pseudobulbis 2–3 cm distantibus, parvulis, cylindraceis, rhizomati appressis, 4–5 mm longis, unifoliatis; folio obovato-elliptico, obtuso, basi sensim petioliformi-angustato, 1.5–2.3 cm longo, lamina medio 6–9 mm lata; pedunculis brevissimis, paucivaginulatis, unifloris; bractea cucullata, ovarium aequante; flore in sectione minuto; sepalis lanceolatis, caudato-acuminatissimis, glabris, vix 5 mm longis, lateralibus obliquis; petalis oblique ovalibus, obtusis, glabris, 1.5 mm longis; labello carnosulo, ovato, obtuso, apice recurvulo, basi subtruncato, glabro, 1.5 mm longo; columna perbrevis, brachiis falcatis, obtusis, perbrevis, pede porrecto, apice incurvulo; anthera cucullata, glabra; ovario cylindrico, sessili, glabro, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20216, flowering in Sept. 1909.

I do not consider it impossible that this is the species which J.J. Smith, in Dutch New Guinea, established as *B. sessile* (Koen.) J.J. Sm. However, the plant differs altogether from the latter. The flowers are white, the lower half of the labellum is yellow.

268. *B. theioglossum* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 30 cm longum; rhizomate cauliformi, ramoso, vaginis imbricantibus dense obtecto; radicibus filiformibus, flexuosis, glabris; pseudobulbis 3–6 cm distantibus, cylindraceis, rhizomati parallelis, c. 5 mm longis, unifoliatis; folio elliptico, apiculato, basi subpetiolato-angustato, carnosulo, 3–5 cm longo, medio fere 0.9–1.2 cm lato; pedunculis brevissimis, unifloris, paucivaginulatis; bractea cucullata, apiculata, ovarium superante; flore in sectione inter majores glabro; sepalis lanceolatis, caudato-acuminatissimis, 1.1 cm longis, lateralibus obliquis; petalis oblique ligulatis, obtusis, marginibus apicem versus subirregularibus, 2 mm longis; labello oblongo, obtuso, medio paulo constricto marginibus medio et apice recurvis; columna perbrevis, brachiis triangulis subacutis, pede incrassatulo, porrecto; anthera cucullata, glabra; ovario sessili, cylindrico, c. 2 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19524, flowering in May 1909.

This species is related to *B. Teysmannii* J.J. Sm., but has smaller leaves and a differently shaped labellum. The flowers are white with a sulphur-yellow lip.

269. *B. kauloense* Schltr., sp. nov.

Epiphyticum, patulum, usque ad 90 cm longum, dichotome ramosum; rhizomate cauliformi, dense vaginis imbricantibus oblecto; radicibus filiformibus, flexuosis, basilaribus; pseudobulbis cylindraceis, rhizomati subparallelis, 1–1.5 cm longis, c. 5 mm diametro, unifoliatis; folio elliptico-ligulato, obtuso vel subapiculato, basi subpetiolato-angustato, 8–10 cm longo, medio 2–2.5 cm lato, carnosulo; pedunculis brevissimis, vaginis paucis oblectis, unifloris; flore in sectione inter majores, glabro; sepalis lanceolatis, caudato-acuminatis, 1 cm longis, lateralibus obliquis; petalis oblique ovalibus, obtusis, imo apice breviter excisis, 2 mm longis; labello carnosulo, triangulo-ovato, obtuso, basi subtruncato, glabro, marginibus medio leviter recurvulis, vix 2 mm longo; columna perbrevis, brachiis triangulis, truncatis, brevibus, pede leviter incurvulo; anthera cucullata, glabra; ovario cylindrico, sessili, c. 4 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 300 m—R. Schlechter no. 16692, flowering in Oct. 1907.

A close relative of *B. Teysmannii* J.J. Sm., but larger and more robust in the vegetative parts and differing in the lip and column. The flowers are pale yellow.

270. *B. dichotomum* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 5; in Nova Guinea VIII (1910) [1909], p. 93, t. XXXI, p. 101.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16716, flowering in Oct. 1907.

My specimens agree very well with the duplicate of the original specimen of Versteeg, kindly given to me by the Buitenzorg Herbarium. However, my investigations of living material show that the labellum is bent backwards at the side edges.

Unfortunately, the altitude of the location in Dutch New Guinea is not given. In our Territory the plant is a pronounced epiphyte of the mist-forest.

§ 33. *Pelma*

A new bitypical genus was established by the French orchidologist, the late A. Finet, in the year 1909 on the basis of a Javanese and a New Caledonian *Bulbophyllum* species, as *Pelma* A. Finet. In a sense it may be regarded as a link between *Dendrobium* Sw. and *Bulbophyllum* Thou. The two species in question were described by J.J. Smith and myself as *B. absconditum* J.J. Sm. and *B. neo-caledonicum* Schltr., from Java and New Caledonia respectively.

The examination by J.J. Smith, as well as by me, made in both cases on living material, had convinced us that a *Bulbophyllum* species was under consideration, a rather complicated one it is true, but certainly not to be regarded as a separate genus. Since then I have had the opportunity in New Guinea to recognise that country as the chief centre of development of the genus and to examine such a number of living species that I no longer have any doubt that *Pelma* should be considered only as a section of *Bulbophyllum* Thou. It was the intention of J.J. Smith to include here only those species with single-flowered inflorescences, but on the basis of the material available to me, it was quite out of the question that the section which I had already given a more significant manuscript name in New Guinea should be given a wider boundary and be connected with quite typical *Bulbophyllum* species other than Finet could envisage, despite his thorough examination.

It is necessary to enumerate here not less than 20 species of the section, but in addition to these, four have been described already, viz. *B. fractiflexum* J.J. Sm., *B. pelma* J.J. Sm., *B. colliferum* J.J. Sm. and *B. subcubicum* J.J. Sm. If we add these to the

two above-mentioned species from Java and New Caledonia, then the section already contains 26 species.

From the series of species belonging to the section as they are described here, it will be seen plainly that the single-flowered inflorescence quite gradually passes into the multi-flowered of the last species and also that the characteristics on which Finet bases his genus become more and more effaced as we pass from species to species, making it quite evident that his genus can be regarded only as a section. Pale green shiny pseudobulbs characterise all species of the section. Many species have, on the inner surface of the sepals, a covering of stalked glands similar to those known in *B. laxiflorum* Lindl.

All species are epiphytes and by far the greater number of them are inhabitants of the mist-forests.

271. *B. stipulaceum* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 217.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16723, flowering in Oct. 1907; on trees in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 13993, flowering in Jan. 1902; on trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19723, flowering in June 1909.

The species is identified readily by the shape of the petals and of the labellum. The flowers are pale yellow.

272. *B. ochrochlamys* Schltr., sp. nov.

Epiphyticum, erectum, pusillum, 5–7 cm altum; rhizomate cauliformi, ramoso, vaginis longe acuminatis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, oblongoideis, unifoliatis, 3–4 mm longis; folio erecto, ligulato, minute apiculato, basi angustato, 9–15 mm longo, medio fere 3–4 mm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea parvula ovarium aequante; flore in sectione inter minutos, glabro; sepalo intermedio late ovali, acuminato, 2 mm longo, lateralibus oblique ellipticis, acuminatis, intermedio aequilongis; petalis oblique ellipticis, obtusiusculis, 0.75 mm longis; labello circuitu triangulo-ovato, obtuso, basi breviter unguiculato, carnoso, supra basin bigibboso, c. 6.5 mm longo; columna brevi, glabra, brachiis triangulis obtusis, brevibus, pede brevi; anthera cucullata, apiculata, glabra; ovario cylindraceo, glabro, sessili, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17300, flowering in Feb. 1908.

On superficial observation the species is remarkably similar to *B. stipulaceum* Schltr., but a closer comparison shows that the flowers, and the petals in particular, diverge considerably. The flowers are whitish.

273. *B. erythrochilum* Schltr., sp. nov.

Epiphyticum, erectum, pusillum, c. 7 cm altum; rhizomate cauliformi, ramoso, vaginis longis acutis obecto; radicibus filiformibus, glabris; pseudobulbis approximatis, oblongoideis, 5–6 mm longis, unifoliatis; folio erecto, ligulato, apiculato, 2–2.7 cm longo, medio fere 3–4 mm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea cucullata, ovario aequilongo; flore in sectione inter minutos, glabro; sepalis lanceolatis, acuminatis, 3 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, quam sepala subtriplo brevioribus; labello carnoso ovali obtusissimo, dimidio inferiore concavo, 1.5 mm longo; columna perbrevis, brachiis abbreviatis, triangulis, truncatis, pede brevi; anthera reniformi-cucullata, glabra; ovario sessili glabro, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17353, flowering in Feb. 1908.

The species shows a strong similarity to the two previous ones, but has well differentiated floral characteristics both in the sepals and petals as well as the labellum. The flowers are white with a cinnabar-red lip.

274. *B. pachytelos* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 213.

Kaiser-Wilhelms-Land: On trees alongside the creeks in the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 15742. [Ed.—number obviously incorrect], flowering in Jan. 1902.

Unfortunately, I have never been able to collect a further specimen of this interesting species. It closely resembles *B. erythrochilum* Schltr., but differs in the lip structure. The flowers are whitish.

275. *B. geminum* Schltr., sp. nov.

Epiphyticum, erectum vel patulum, 7–12 cm longum; rhizomate cauliformi, vaginis acutissimis obtecto; radicibus filiformibus, glabris; pseudobulbis rhizomati subparallelis, oblongoideo-cylindraceutis, unifoliatis, 3–5 mm longis; folio erecto, elliptico-ligulato, apiculato, basi attenuato, 1.2–1.5 cm longo, medio 2.5–4 mm lato; pedunculis valde abbreviatis, unifloris, paucivaginulatis, unifloris; bractea acuta, ovario sessili paulo longiore; flore in sectione inter minutos, glabro; sepalis ovato-lanceolatis, acutis vel acuminatis, 3 mm longis, lateralibus obliquis; petalis oblique ligulatis, subacutis, 1.5 mm longis; labello late oblongo, valde obtuso, carnoso, vix 1.5 mm longitudine excedente; columna brevi, brachiis perbrevis, truncatis, pede incurvulo; anthera cucullata, glabra; ovario cylindraceuto, sessili, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 800 m—R. Schlechter no. 17334, flowering in Feb. 1908.

The flower structure in this species is closest to *B. erythrochilum* Schltr., but it is more slender in habit and resembles *B. neo-caledonicum* Schltr. The flowers are pale yellow.

276. *B. proximum* Schltr., sp. nov.

Epiphyticum, patulum, 5–10 cm longum; rhizomate cauliformi, ramoso, vaginis acutissimis obtecto; radicibus filiformibus, glabris; pseudobulbis approximatis, rhizomati subparallelis, oblongoideis, unifoliatis, 5–6 mm longis; folio erecto, ligulato, apiculato, basi angustato, 1–2 mm longo, medio fere 2.5–3.5 mm lato; pedunculis abbreviatis, unifloris, paucivaginulatis; bractea ovario brevior; flore in sectione minuto, glabro; sepalis ovato-lanceolatis, acutis vel acuminatis, 2.75 mm longis, lateralibus obliquis; petalis oblique ellipticis, acutis, sepalis duplo brevioribus; labello oblongo, apiculato, medio pandurato-constricto, basi superne obscure bigibbo, 1.8 mm longo; columna perbrevis, brachiis dentiformibus, obtusis, pede brevi, incurvulo; anthera cucullata, glabra; ovario sessili, glabro, 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests of Wobbe (Minjem District), alt. c. 500 m—R. Schlechter no. 16379, flowering in Aug. 1907.

This species conspicuously resembles the previously mentioned one, but differs in the shape of the lip, the petals and in the column. The flowers are pale yellow.

277. *B. simile* Schltr., sp. nov.

Epiphyticum, patulum, 8–17 cm longum; rhizomate cauliformi, ramoso, vaginis acutis obtecto; radicibus filiformibus, glabris; pseudobulbis subglobosis, paulo compressis, 2.5–3 mm longis, unifoliatis; folio ligulato vel lineari-ligulato, apiculato, 1–1.5 cm longo, 2–3 mm lato; pedunculo valde abbreviato, unifloro, paucivaginulato; bractea cucullata, ovarium aequante; flore in sectione minuto, glabro; sepalis oblongis obtusis, 1.5 mm longis, lateralibus obliquis; petalis obovato-spathulatis, obtusissimis, 0.8 mm longis; labello late oblongo, obtusissimo, superne leviter sulcato, 1 mm longo; columna brevi, brachiis parvis dentiformibus, acutis, pede brevi incurvulo; anthera cucullata, glabra; ovario sessili, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18770, flowering in Nov. 1908.

Amongst the single-flowered, small species of the section this one is recognised easily by the short, round pseudobulbs and the blunt sepals. The flowers are white, the lip brown turning later to yellow.

278. *B. oliganthum* Schltr., sp. nov.

Epiphyticum, patulum, 8–15 cm longum; rhizomate cauliformi, vaginis subacutis obtecto, parum

ramoso; radicibus filiformibus, glabris; pseudobulbis cylindraceo-conicis, 7–10 mm longis, unifoliatis, rhizomati subparallelis; folio elliptico-ligulato, apiculato, basi cuneato, 1.3–2.2 cm longo, medio fere 3–5 mm lato; inflorescentiis laxae 1–2-floris, breviter pedunculatis 5–9 mm longis; bracteis ovarium aequantibus; floribus in sectione minutis, glabris; sepalis ovato-lanceolatis, acutis vel acuminatis, 3.5 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, 1.75 mm longis; labello subquadrato, obtusissimo, basi breviter excavato, carnosulo, c. 1.75 mm longo; columna brevi, subbrachiata, pede brevi, incurvulo; anthera subgaleato-cucullata, glabra; ovario sessili, cylindrico, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17196, flowering in Jan. 1908.

This is the first of the species in the section with multi-flowered inflorescences. Occasionally, this species shows single-flowered inflorescences which indicates its close relationship with the previously described species.

279. *B. foveatum* Schltr., sp. nov.

Epiphyticum, patulum, parum ramosum, 15–25 cm longum; rhizomate cauliformi, vaginis acutis obecto; radicibus filiformibus, glabris; pseudobulbis conico-cylindraceis, unifoliatis, rhizomati subparallelis, 1–1.3 cm longis, infra medium 2–3 mm diametro; folio elliptico, apiculato, basi cuneato, 2–3.3 cm longo, medio fere 6–8 cm longo; inflorescentiis laxae 2–3-floris, breviter pedunculatis, usque ad 1 cm longis; bracteis flores aequantibus; floribus in sectione minutis, glabris; sepalis oblongis, apiculatis, 2.5 mm longis, lateralibus obliquis, intermedio paulo latioribus; petalis oblique oblongo-ligulatis obtusis, c. 1.35 mm longis; labello carnosulo perlate quadrato-cuneato, truncato, basi breviter unguiculata exciso, medio fovea rotundata ornato, 1.35 mm longo, apice 1.65 mm lato; columna perbrevis, brachiis triangularibus subacutis, pede carnosulo, adscendente; anthera reniformi-cucullata; ovario subsessili, cylindrico, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20187, flowering in Sept. 1909.

This species is characterised by the central round indentation on the lip. In common with all species of the section, the pseudobulbs on the live plant are glossy. The flowers are white with an orange-yellow lip.

280. *B. quadratum* Schltr., sp. nov.

Epiphyticum, patulum, pauciramosum, 15–20 cm longum; rhizomate cauliformi, vaginis acutis obecto; pseudobulbis conico-cylindraceis, 1.5–2 cm longis, infra medium 2.5–3.5 mm diametro, rhizomati subparallelis, unifoliatis; foliis ligulatis, acutis, basi angustatis, 3–6 cm longis, medio fere 5–6.5 mm latis; spicis laxae 3–4-floris, flexuosis, breviter pedunculatis, c. 1 cm longis; bracteis ovarium aequilongis; floribus minutis, glabris; sepalis ovalibus, apiculatis, 2 mm longis, lateralibus obliquis; petalis oblique ligulato-spathulatis, obtusissimis, 1.15 mm longis; labello carnosulo, quadrato, truncato, basi subauriculato, 1.25 mm longo et lato, medio leviter foveato; columna perbrevis, brachiis linearifalcatis, obtusis, pede subgloboso, erecto; anthera late cucullata, glabra; ovario cylindraceo, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests on the Djamu [River], alt. c. 350 m—R. Schlechter no. 17574, flowering in Apr. 1908.

As with the previously described species, this one clearly shows the gradual transition to the last, large species of the section. The shape of the lip and strongly swollen column-foot are very characteristic. The flowers are yellowish white.

281. *B. leptoleucum* Schltr., sp. nov.

Epiphyticum, patulum, subsimplex, 12–20 cm longum; rhizomate cauliformi, vaginis acutis obecto; radicibus filiformibus, flexuosis, glabris; pseudobulbis conico-cylindraceis, unifoliatis, rhizomati subparallelis, 1–1.3 cm longis; folio lineari, apiculato, basi angustato, 2–3 mm lato; inflorescentiis tenuissimis, albis, laxae 2–4-floris, breviter pedunculatis, flexuosis; bracteis ovarium paulo superantibus; floribus minutis, glabris; sepalis lanceolato-ellipticis, acuminatis, 3 mm longis, lateralibus obliquis; petalis oblique ligulatis, obtusiusculis, 1.25 mm longis; labello carnosulo, ovali, obtuso, basi minute bidentato, brevissime unguiculato, petalis aequilongo; columna perbrevis, brachiis dentiformibus, brevissimis, pede adscendente, angusto; anthera cucullata, glabra; ovario cylindrico, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1100 m—R. Schlechter no. 19860, flowering in June 1909.

A very narrow-leaved species in this group, but best included here on account of its inflorescences and close ties with *B. quadratum* Schltr. The flowers, as well as the thin rachis with bracts, are white.

282. *B. niveo-sulphureum* Schltr., sp. nov.

Epiphyticum, patulum; pauciramosum, c. 30 cm longum; rhizomate cauliformi, vaginis subacutis obecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis, unifoliatis, adscendentibus, 3–4 cm longis, infra medium 3–4 mm diametro; folio lanceolato-ligulato, acuto, basi cuneato, 6.5–8 cm longo, infra medium 9–11 mm lato; inflorescentiis sublate 2–4-floris, 1–1.3 cm longis, breviter pedunculatis; bracteis cucullatis, ovarium superantibus; floribus in sectione parvulis, glabris; sepalis ellipticis, acutis, 5 mm longis, lateralibus obliquis; petalis suborbicularibus; 1.25 mm longis; labello carnoso, oblongo, obtusissimo, basi breviter unguiculata subhastato, 1.85 mm longo; columna brevi, brachiis brevissimis, pede leviter incurvulo; anthera cucullata, glabra; ovario cylindrico sessili, c. 1.25 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 400 m—R. Schlechter no. 16970, flowering in Dec. 1907.

Compared with the previous species this one is not difficult to identify by the longer pseudobulbs and the larger flowers. It is a close relative of the following species, but the lip is not papillose. The flowers are snow-white with a sulphur-yellow lip.

283. *B. papulilabium* Schltr., sp. nov.

Epiphyticum, patulum, parum ramosum, c. 30 cm longum; rhizomate cauliformi, vaginis acutatis obecto; radicibus filiformibus, glabris; pseudobulbis subcylindraceis, unifoliatis, rhizomati subparallelis, 2.5–3.5 cm longis, infra medium c. 3 mm diametro; folio ligulato, acuto vel apiculato, basi cuneato, 4.5–8 cm longo, medio fere 5–9 mm lato; inflorescentiis abbreviatis, densius 2–3-floris, per breviter pedunculatis; bracteis ovarium bene superantibus; floribus in sectione parvulis; sepalis ellipticis, obtusiusculis, glabris, 4 mm longis, lateralibus obliquis; petalis suborbicularibus, oblique apiculatis, vix 1 mm longis; labello carnoso, quadrato, obtusissimo, basi brevissime unguiculato, subhastato-retuso, superne dense papulis verruculiformibus obecto, 1.5 mm longo; columna brevi, brachiis abbreviatis obtusis, pede carnosulo, recto; anthera quadrato-cucullata, glabra; ovario cylindraceo, minute subverruculoso, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19447, flowering in May 1909.

Distinguished from *B. niveo-sulphureum* Schltr., described above, by the stronger growth, smaller flowers with blunter petals, the labellum closely papillose on the upper surface and the slightly warty ovary. The flowers are pure white.

284. *B. fractiflexoides* Schltr., sp. nov.

Epiphyticum, patulum; 20–30 cm longum, parum ramosum; rhizomate cauliformi, vaginis acutatis obecto; radicibus filiformibus, glabris; pseudobulbis cylindraceis, rhizomati subparallelis, unifoliatis, 1.4–1.7 cm longis, medio 3–3.5 mm diametro; folio elliptico-ligulato, subapiculato vel acuto, basi attenuato, 3–7 cm longo, medio fere 0.6–1.3 cm lato; inflorescentiis bene abbreviatis, breviter pedunculatis, pro sectione densius 2–3-floris, 5–8 mm longis; bracteis ovarium bene superantibus; floribus in sectione parvulis; sepalis lanceolatis, marginibus incurvis acuminatis, intus margines et apicem versus pilis minutis capitatis ornatis, 4 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusiusculis, glabris, vix 1 mm excedentibus; labello carnoso, ovali, obtusissimo, glabro, basi retusa rotundato-excavato, petalis vix longiore; columna perbrevis, brachiis parvulis oblique rhomboideis, pede correcto; anthera trapezoideo-cucullata, glabra; ovario cylindraceo, brevi, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19688, flowering in June 1909.

Initially, I considered this species as *B. fractiflexum* J.J. Sm. from Dutch New Guinea, but the different altitudes at which the two species were found made me doubtful, and I now consider them specifically different. The inflorescences of *B. fractiflexum* J.J. Sm. are more open and longer and the longer extended sepals are

glabrous on the inside. The shape of the lip and the column also differ somewhat. The flowers are yellowish white.

285. *B. genybrachium* Schltr., sp. nov.

Epiphyticum, patulum, 20–35 cm longum, parum ramosum; rhizomate cauliformi, vaginis acuminatis obecto; radicibus filiformibus, glabris; pseudobulbis conico-cylindraceutis, unifoliatis, rhizomati subparallelis, 2–2.5 cm longis, infra medium 4–5.5 mm diametro; folio lanceolato, acuto vel subacuto, basi contracto, 5.5–8 cm longo, infra medium 1–1.8 cm lato; inflorescentiis gracilibus, breviter pedunculatis, laxe 2–4-floris, usque ad 2 cm longis, flexuosis; bracteis cucullatis, ovarium bene superantibus; floribus in sectione vix mediocribus, glabris; sepalis lanceolatis, caudato-acuminatis, utrinque glabris, c. 6 mm longis, lateralibus obliquis; petalis oblique lanceolatis, acutis, 1.5 mm longis; labello carnoso, quadrato-ovali, obtusissimo, basi biangulato, petalis vix aequilongo; columna perbrevis, brachiis genuflexo-lanceolatis, acutis, parvulis, pede curvatulo bene longo; anthera oblongoideo-cucullata, glabra; ovario cylindraceuto, glabro, 1.75 mm longo.

Kaiser-Wilhelms-Land: On tall primary-forest trees in the forests not far from Wobbe (Minjem District), alt. c. 300 m—R. Schlechter no. 16486, flowering in Sept. 1907.

Compared with all the previously listed species of the section, this one is characterised by the sepal tips which are extended into tails. The column-foot is conspicuously long and the lip very small. The flowers are white with yellow sepal tips.

286. *B. effusum* Schltr., sp. nov.

Epiphyticum, patulum, 15–20 cm longum, parum ramosum; rhizomate cauliformi, vaginis acutis obecto; radicibus filiformibus, glabris; pseudobulbis cylindraceutis, unifoliatis, 1.8–3.5 cm longis, medio 5–7 mm diametro, rhizomati subparallelis; folio lanceolato-ligulato, apiculato, basi attenuato, 5–7 cm longo, medio 1–1.7 cm lato; inflorescentiis effusis, gracilibus, laxe 3–4-floris, pedunculo gracili incluso 2–3 cm longis; bracteis ovarium superantibus; floribus in sectione vix mediocribus; sepalis lanceolatis, caudato-acuminatis, 7 mm longis, intus margines et apicem versus papillis stipitatis, ornatis, lateralibus obliquis, petalis oblique lanceolato-ellipticis acutis, glabris, c. 1 mm longis; labello subquadrato, obtusissimo, basi truncata biangulato, medio longitudinaliter sulcato, petalis aequilongo; columna perbrevis, brachiis parvulis falcatis, subacutis, pede curvato; anthera rhomboideo-cucullata, glabra; ovario cylindrico, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18461, flowering in Oct. 1908.

This species definitely is related closely to *B. genybrachium* Schltr., but has thicker pseudobulbs, more open spreading inflorescences; the sepals covered on the inside with stemmed papillae and a disparately wider labellum. The flowers are white.

287. *B. lamprobulbon* Schltr., sp. nov.

Epiphyticum, patulum, 15–25 cm longum, subsimplex; rhizomate cauliformi; vaginis acutatis obecto; radicibus filiformibus, glabris; pseudobulbis ellipsoideis vel cylindraceuto-ellipsoideis, unifoliatis, 2–2.5 cm longis, 5.5–9 mm diametro; folio elliptico-lanceolato, acutiusculo, basi angustato, 5.5–9 cm longo, infra medium 1–1.5 cm lato; inflorescentiis laxius 3–4-floris, breviter pedunculatis, c. 2 cm longis; bracteis ovarium duplo superantibus; floribus in sectione mediocribus; sepalis lanceolatis, caudato-acuminatis, intus margines et apicem versus papillis stipitatis ornatis, c. 1.2 cm longis; petalis oblique ovato-lanceolatis, acutis, glabris, c. 1.5 mm longis; labello e basi brevissime unguiculato ovali, obtuso, carnoso, basi biangulato, supra basin excavatione triangula ornato, petalis aequilongo; columna perbrevis, brachiis abbreviatis, triangulis, obtusis, pede apice incurvulo; anthera rhomboideo-cucullata, glabra; ovario cylindraceuto, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16681, flowering in Oct. 1907.

This species is related closely also to *B. genybrachium* Schltr., but has thicker pseudobulbs and much larger flowers with differently shaped parts from it and *B. effusum* Schltr. The flower colouration is yellowish white.

288. *B. gorumense* Schltr., sp. nov.

Epiphyticum, patulum, 40–60 cm longum; parum ramosum, rhizomate cauliformi, vaginis imbricantibus acutis brunneo-maculatis obecto; radicibus filiformibus, glabris; pseudobulbis

cylindræis, rhizomati subparallelis, unifoliatis, 1.5–1.7 cm longis, medio fere 3–4 mm diametro; folio elliptico, acuto, basi cuneato, 7–10 cm longo, medio 1.7–2.5 cm lato; inflorescentiis laxè 5–7-floris, gracilibus, breviter pedunculatis, usque ad 4 cm longis; bracteis ovarium aequantibus; floribus in sectione parvulis, glabris; sepalis ovato-lanceolatis, caudato-acuminatis, 5 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, c. 1.75 mm longis; labello carnosò, quadrato, obtusissimo, basi biangulato, supra basin leviter excavato, petalis fere aequilongis; columna brevi, brachiis triangulis rectis, brevibus, pede adscendente, carnosulo; anthera reniformi-cucullata, glabra; ovario cylindrico glabro, c. 2.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, (the natives call it 'Gorum'), alt. c. 2400 m—R. Schlechter no. 18826, flowering in Nov. 1908.

A very characteristic robust species recognised easily by the brown-spotted yellow rhizome-sheaths. The flowers are pale yellow with almost white petals.

289. *B. mischobulbon* Schltr., sp. nov.

Epiphyticum, patulum, simplex vel subsimplex, usque 80 cm longum; rhizomate cauliformi, vaginis subacutis obecto; radicibus filiformibus, glabris; pseudobulbis cylindræis, petioliformibus, unifoliatis, 4–6 cm longis; infra medium 2–3 mm diametro; folio anguste elliptico, acuto, basi cuneato, 8–10 cm longo, medio fere 1.6–2 cm lato; inflorescentiis laxè 2–3-floris, breviter pedunculatis, 1.2–1.7 cm longis; bracteis ovarium superantibus; floribus in sectione vix mediocribus, glabris; sepalis oblongis, subacuminatis, 4 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, c. 2 mm longis; labello carnosò, ovali, obtuso, basi brevissime unguiculata subhastato, medio plica transversa ornato, 2.25 mm longo; columna brevi, brachiis subdenticulatis vix conspicuis, pede apice incurvulo; ovario cylindræo, glabro, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18825, flowering in Nov. 1908.

This species is related closely to *B. xanthochlamys* Schltr., described below, and has the long narrow pseudobulbs in common, but the leaves are narrower. The flowers are pale yellow.

290. *B. xanthochlamys* Schltr., sp. nov.

Epiphyticum, erectum vel validum, 30–50 cm altum; rhizomate cauliformi, vaginis amplis, flavidis, acutis obecto; radicibus filiformibus, flexuosis, glabris; pseudobulbis anguste cylindræis, unifoliatis, 4–5 cm longis, 3 mm diametro; folio elliptico, apiculato, vel subacuto, basi cuneato, 9–11 cm longo, medio fere 2.4–3.2 cm lato; inflorescentiis brevibus, sublaxè 4–6-floris, breviter pedunculatis, 2–3 cm longis; bracteis ovario brevioribus; floribus in sectione parvulis, glabris; sepalis oblongis, apiculatis, 3.5 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, apicem versus paulo dilatatis, 1.75 mm longis; labello carnosò, oblongo, obtuso, superne toris 2 incrassatis obecto, basi leviter excavato, 1.75 mm longo; columna brevi, brachiis abbreviatis dentiformibus, erectis, clinandrio tridentato, pede adscendente carnosulo; anthera rotundato-cucullata, glabra, ovario cylindræo, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 900 m—R. Schlechter no. 19884, flowering in June 1909.

This strongly-growing species is well characterised by the large brown-yellow rhizome-sheaths and by the labellum. The flowers are whitish with an orange-yellow lip.

291. *B. leucothyrsus* Schltr., sp. nov.

Epiphyticum, patulum, simplex, validum, 80–120 cm longum; rhizomate crasso, cauliformi, vaginis brunneis amplis obecto; radicibus filiformibus, glabris; pseudobulbis oblongoideo-cylindræis, unifoliatis rhizomati subparallelis, 2.5–4 cm longis, medio 6–9 mm diametro; folio ligulato-elliptico, apiculato, basi attenuato, glabro, 11–17 cm longo, medio 1.7–3.8 cm lato; spicis sublaxè 10–17-floris, secundis, breviter pedunculatis, 7–9 cm longis; bracteis amplis, ovalibus, niveis, ovarium duplo superantibus; floribus in sectione magnis, niveis; sepalis lanceolato-ligulatis, subacutis, glabris, c. 8 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusis, minutissime papilloso-punctatis, c. 4 mm longis; labello carnosò, quadrato, obtusissimo, basi obtuse 2-angulato, 3 mm longo; columna brevi, brachiis dentiformibus acutis, parvulis, pede incurvulo; anthera cucullata, glabra; ovario cylindræo, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near the Kaulo Base, alt. c. 500 m—R. Schlechter no. 17273, flowering in Feb. 1908.

The strongest growing and largest-flowered species in the section, recognised readily by these characteristics. The flower spikes, as well as the rachis and bracts, are completely white.

§ 34. *Macrouris*

I have arranged here a group of species which, in my opinion, naturally belong together. With one exception it includes only those species which have multi-flowered and extremely slender-stemmed inflorescences, whose numerous delicate flowers always have much elongated sepals. Otherwise, the structure of the flowers is very simple, especially that of the labellum. The column, which is always short, has a well developed foot and short stelidia. Those species first discussed here are loosely pendant, those which follow have creeping rhizomes and, lastly, come those with upright, stiff rhizomes. In comparing these series, one can establish a certain parallel development in habit between them. This section evidently possesses a series of representatives in the floral zones adjacent to Papuasia, for example in the Celebes and the Moluccas. From Dutch New Guinea the following species may be added: *B. breviscapum* J.J. Sm., *B. trifilum* J.J. Sm., *B. cavistigma* J.J. Sm. and *B. fatuum* J.J. Sm.

The species enumerated here from German New Guinea belong, without exception, to the mist-forest zone and as far as can be ascertained up to the present, rise from the lower boundary to an altitude of 2500 m. Thus, all of them require a very moist atmosphere. The flowers, owing to their delicate nature, live only for a few days.

292. *B. glaucum* Schltr., sp. nov.

Epiphyticum, pensile, 15–30 cm longum; rhizomate gracili, flexuoso, simplici; radicibus filiformibus, glabris; pseudobulbis parvulis, 1–1.5 cm distantibus, oblongoideis, 2–2.5 mm longis, unifoliatis; folio late ovali, apiculato, 1–1.5 cm longo, medio fere 0.8–1.2 cm lato; inflorescentiis gracillime pedunculatis, unifloris, pedunculo pauci-vaginulato, c. 1.2 cm longo; bractea parvula, ovario multo brevior; flore in sectione magno, glabro; sepalis lanceolatis, caudato-acuminatissimis, 2.5 cm longis, lateralibus obliquis, margine anteriore basi dilatata cum pede columnae mentum obtusum, 4 mm longum formentibus; petalis oblique oblongis, obtusis, 5 mm longis; labello carnosulo oblongo, obtuso, medio vix constricto, 7 mm longo; columna brevi, brachiis abbreviatis apiculatis, pede curvato, longo; anthera cucullata, glabra; ovario pedicellato glabro, 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20080, flowering in Sept. 1909.

This species can be considered as proof again that, in some cases, the sections of *Bulbophyllum* Thou. can have single, as well as multi-flowered inflorescences. The close relationship between this and the following species hardly can be denied. The flowers are pale pink with a reddish lip.

293. *B. macrourum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 207.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 15744 [Ed.—number obviously incorrect], flowering in Apr. 1902; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17016, flowering in Dec. 1907.

The presently available better specimens, which otherwise agree very well with the Type, show that the petals are slightly broader and the lip blunter than the original, single, faulty specimen indicated. The very short stelidia are bent upwards in sickle-fashion, and are somewhat blunt. The flowers are snow-white.

294. *B. pensile* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 100 cm longum, simplex, vel parum ramosum; rhizomate gracillimo;

radicibus filiformibus, glabris; pseudobulbis 1.5–3.5 cm distantibus, parvulis, ovoideis, 3–4 mm altis, infra medium 1.5–2 mm diametro, unifoliatis; folio ovato vel late ovato, acuto vel breviter acuminato, basi rotundato vel breviter contracto, 1.8–2.7 cm longo, infra medium 1–1.9 cm lato; inflorescentiis gracillimis, laxe 4–7-floris, usque ad 7 cm longis, pedunculo gracillimo, paucivaginulato, setiformi; bracteis parvulis, ovario multo brevioribus; floribus in sectione mediocribus, glabris; sepalis lanceolatis, caudato-acuminatissimis, 1.2 cm longis, lateralibus obliquis; petalis oblique ellipticis, obtusis, 2.75 mm longis; labello carnosulo, oblongo-linguiformi, obtuso, leviter curvato, basi obtuse bicostato, 3.5 mm longo; columna perbrevis, brachiis brevibus triangulis obtusis, pede bene longo, incurvulo, medio incrassato; anthera cucullata, apiculata, glabra; ovario graciliter pedicellato glabro, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1100 m—R. Schlechter no. 19895, flowering in June 1909.

A close relative of *B. macrourum* Schltr. but recognised readily by the appearance of the shorter flowers. The flower colouration is white.

295. *B. dispersum* Schltr., sp. nov.

Epiphyticum, suberectum vel patulum, subsimplex 4–8 cm altum; rhizomate flexuoso, gracili; radicibus filiformibus, glabris; pseudobulbis c. 1 cm distantibus, oblongoideis, unifoliatis, 3–5 mm longis, 1.5–2.5 mm diametro; folio oblongo-ligulato, apiculato, basi angustato, 1.3–2.2 mm longo, medio fere 3–6 mm lato; racemis brevibus 2–3-floris, pedunculo pseudobulbos paulo vel subduplo superante; bracteis lanceolatis, ovarium aequantibus; floribus in sectione mediocribus, glabris; sepalis ovato-lanceolatis, acuminatissimis, 7 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusiusculis, 2.5 mm longis; labello latius ovali, obtusissimo, curvato, c. 2 mm longo; columna perbrevis, brachiis valde abbreviatis, apiculatis, pede bene evoluto, basi incrassato; anthera cucullata, glabra; ovario breviter pedicellato, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17151, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 15244 [Ed.—number obviously incorrect—probably 18244], flowering in Sept. 1908.

This species, which is found only sporadically as a few small plants at a time, is distinguished readily from its closest relatives by its habit. It forms a kind of transition between the hanging and the creeping species. The flowers are white with yellowish sepal tips.

var. *roseans* Schltr., var. nov.

Differt a forma typica floribus paulo majoribus extus pallide roseis, labello medio paulo constricto.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20281, flowering in Sept. 1909.

This plant can be considered a variety of the Type-form.

296. *B. kaniense* Schltr., sp. nov.

Epiphyticum, longo repens, ramosum, usque ad 60 cm longum; rhizomate flexuoso, gracili, elongato, radicante; radicibus filiformibus, glabris; pseudobulbis 1–2 cm distantibus conico-cylindraceis, unifoliatis, 6–8 mm altis, infra medium 2–3 mm diametro; folio lanceolato-ligulato, acuto, basi cuneato, 3.5–5 cm longo, medio fere 5–10 mm lato; racemis breviter pedunculatis, densius 3–5-floris, pseudobulbos paulo tantum excurrentibus; bracteis ovario bene brevioribus; floribus in sectione mediocribus, glabris; sepalis lanceolatis, caudato-acuminatissimis, c. 1.2 cm longis, lateralibus obliquis; petalis oblongis, subapiculatis, 2 mm longis; labello carnosulo, leviter curvato, ovato, obtusissimo, basi cordato, petalis paulo brevioribus; columna perbrevis, brachiis falcato-triangulis, subacutis parvulis, pede incurvulo, basi incrassato; anthera cucullata, apiculata, glabra; ovario breviter pedicellato glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16967, flowering in Dec. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19007, flowering in Dec. 1908.

The first of the creeping species in the section. Fairly closely related to *B. extensum* Schltr., described below. The flowers are white with a yellow lip.

297. *B. extensum* Schltr., sp. nov.

Epiphyticum, longe repens, extensum, usque ad 150 cm longum, parum ramosum; rhizomate filiformi, flexuoso; radicibus filiformibus, glabris; pseudobulbis oblique conico-cylindraceis, unifoliatis, 4–6 cm distantibus, 0.9–1.3 cm altis, infra medium 2.5–3.5 mm diametro; folio lanceolato-elliptico, acuminato, basi sensim paulo angustato, 3.3–6 cm longo, medio vel infra medium 0.7–1.4 cm lato; racemis abbreviatis, breviter pedunculatis, subdense 3–5-floris, c. 2 cm longis; bracteis ovario brevioribus; floribus in sectione mediocribus, glabris; sepalis lanceolatis, caudato-acuminatis, c. 1 cm longis, lateralibus obliquis, basi margine anteriore dilatata mentum obtusum breve formantibus; petalis oblique ovato-lanceolatis, obtusiusculis, 1.5 mm longis; labello linguiformi-ovato, obtuso, leviter curvato; 1.75 mm longo; columna brevi, brachiis triangulis, acutis, brevibus, pede satis longo, incurvulo, basi incrassato; ovario pedicellato, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20299, flowering in Sept. 1909.

Distinguished from the closely related *B. kaniense* Schltr. by the pseudobulbs being spaced further apart, the petals becoming narrower towards the tip and by the shape of the lip and the column. The flowers are white.

298. *B. chaetopus* Schltr., sp. nov.

Epiphyticum, tenellum; procumbens; rhizomate elongato, flexuoso, radicibus filiformibus, glabris; pseudobulbis subglobosis, unifoliatis, 3–4 mm diametro; folio erecto, ovato-elliptico, apiculato, basi contracto, 7–1 cm longo, medio vel infra medium 4.5–8 mm lato; racemo laxo 3–5-floro, gracillime pedunculato, pedunculo setiformi incluso usque ad 8 cm alto; bracteis parvulis, ovario pedicellato multo brevioribus; floribus in sectione inter mediocres, glabris; sepalis ovato-lanceolatis, caudato-acuminatissimis, intermedio c. 1 cm longo, lateralibus obliquis 1.5 cm longis; petalis oblique oblongis, obtusiusculis, 2.5 mm longis; labello oblongo-ligniformi, obtuso, basi curvato, sulcato, 2.5 mm longo; columna brevi, brachiis dentiformibus, parvulis, acutis, pede leviter curvato; anthera cucullata, nasuta, glabra; ovario graciliter pedicellato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19686, flowering in June 1909.

Amongst the creeping species of the section, this one is characterised by the very delicate, long flower-stalks. The flowers are white.

299. *B. oreodoxa* Schltr., sp. nov.

Epiphyticum, pusillum, procumbens; rhizomate elongato, plus minus flexuoso; radicibus filiformibus, glabris; pseudobulbis 1–1.5 cm distantibus, subglobosis vel ovoideis, unifoliatis, 3.5–6 mm altis, infra medium 2–3 mm diametro; folio erecto, oblongo-ligulato, apiculato, basi sensim attenuato, 1–4 cm longo, medio fere 4–8 mm lato; racemis graciliter pedunculatis, sublaxe 3–6-floris, folium vulgo paulo superantibus; bracteis parvulis, ovario bene brevioribus; floribus in sectione mediocribus, glabris; sepalis ovato-lanceolatis, caudato-acuminatissimis, intermedio 6 mm longo, lateralibus obliquis, c. 7 mm longis; petalis oblique ellipticis, obtusiusculis, 1.75 mm longis; labello curvato, oblongo-linguiformi, subacuto, 2 mm longo; columna perbrevis, glabra, brachiis brevibus, triangulis, acutis, pede incurvulo; anthera elliptico-cucullata, glabra, antice acuta; ovario pedicellato, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18270, flowering in Sept. 1908; on trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18532, flowering in Oct. 1908.

A very characteristic species with a fairly compact growth and shorter inflorescences than for both *B. chaetopus* Schltr. and *B. setipes* Schltr. The flowers are yellowish white.

300. *B. setipes* Schltr., sp. nov.

Epiphyticum, parvulum, procumbens; rhizomate flexuoso; radicibus filiformibus, glabris; pseudobulbis, 0.7–1.5 cm distantibus, globosis, unifoliatis, 2–3 mm diametro; folio erecto, elliptico, apiculato, 0.7–1 cm longo, medio fere 3–4 mm lato; racemo gracillimo, pedunculato, laxo paucifloro, pedunculo setiformi incluso usque ad 4 cm longo; bracteis parvulis, ovario bene brevioribus; floribus in sectione parvulis, glabris; sepalo intermedio ovali, apiculato, 3 mm longo, lateralibus oblique oblongis, apiculatis, 3.5 mm longis, basi margine anteriore paulo ampliatis; petalis suborbicularibus, subexcisus,

1.5 mm longis; labello linguiformi-oblongo, obtuso, curvato, c. 2.5 mm longo; columna perbrevis, brachiis oblique triangulis perbrevibus, pede incurvo; anthera galeato-cucullata, glabra; ovario cum pedicello gracili glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2300 m—R. Schlechter no. 18798, flowering in Nov. 1908.

Together with *B. microtatanthum* Schltr., this species is characterised, in the section, by the sepals which are not extended greatly. Otherwise, both species have the characteristics of the section and are therefore included here. The flowers are whitish with red stripes.

301. *B. muscicola* Schltr., sp. nov.

Epiphyticum, perpusillum; rhizomate brevis; radicibus filiformibus, glabris; pseudobulbis ovoideis, unifoliatis, 1.5–2 mm altis; folio erecto, oblongo, apiculato, basi angustato, 4–7 mm longo, medio 1.5–2 mm lato; scapis setiformibus, erectis, apice laxius 2–3-floris, 1.2–2 cm altis; bracteis minutis, ovario pedicellato multo brevioribus; floribus minutis, glabris; sepalis ovalibus, breviter acuminatis, c. 2.25 mm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis oblique ovalibus, obtusis, vix 0.75 mm longitudine superantibus; labello curvato oblongo, obtuso, c. 1 mm longo, dimidio anteriore paulo angustato; columna perbrevis, brachiis perbrevibus late triangulis acutis, pede leviter incurvo; ovario cum pedicello clavato, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20241, flowering in Sept. 1909.

Apart from *B. microtatanthum* Schltr., this is the smallest-flowered species of the section. It is recognised in habit by the small vegetative parts, as well as by the noticeably shortened column. The flowers are white.

302. *B. microtatanthum* Schltr., sp. nov.

Epiphyticum, perpusillum, erectum; rhizomate erecto, brevis; radicibus filiformibus, glabris; pseudobulbis conico-cylindraceis, unifoliatis, suberectis, 3–5 mm longis, 1–2 mm diametro; folio oblongo, minute apiculato, basi attenuato, 5–9 mm longo, medio fere 2–3.5 mm lato; inflorescentiis suberectis, gracillimis, laxe 2–4-floris, pedunculo setiformi incluso usque ad 1.8 cm longis; bracteis minutis, ovario multo brevioribus; floribus in genere minutissimis, glabris; sepalis late oblongis, apiculatis, 1 mm haud excedentibus, lateralibus obliquis, intermedio paulo longioribus; petalis oblique obovato-spathulatis, obtusissimis, quam sepalum intermedium duplo brevioribus, labello e basi late cuneata (vel subunguiculata) suborbiculari, obtusissimo, imo apice recurvulo, medio leviter excavato, quam petala vix longiore; columna perbrevis, brachiis subnullis, pede incurvulo; anthera laticucullata, glabra; ovario subsessili glabro, c. 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 18273, flowering in Sept. 1908.

No species in this section, or indeed in the whole genus, is known with smaller flowers, but in other characteristics it appears to fit into this section. The flowers are violet-green with yellow tips.

303. *B. dendrochiloides* Schltr., sp. nov.

Epiphyticum, decumbens, laxum, usque ad 40 cm longum; rhizomate radicante, elongato, nunc parum ramoso; radicibus filiformibus, glabris; pseudobulbis 1.5–2.5 cm distantibus, conico-cylindraceis, unifoliatis, 0.8–1.3 cm altis, infra medium 2.5–3.5 mm diametro; folio erecto, lineari, obtusiusculo, basi attenuato, 3.5–6.5 cm longo, medio fere 2.5–4.5 mm lato; racemis graciliter pedunculatis, erectis, laxe multifloris, pedunculo incluso usque ad 9 cm longis; bracteis minutis, ovario pedicellato multo brevioribus; floribus in sectione parvulis, glabris; sepalis lanceolatis, acuminatis, c. 3.75 mm longis, lateralibus obliquis; petalis oblique lanceolatis, subacutis, c. 1.5 mm longis; labello circuitu lanceolato, obtusiusculo, dimidio anteriore attenuato, basi breviter retuso; 2 mm longo; columna brevi, brachiis brevissimis paucidentatis, pede apice leviter incurvo; anthera ovato-cucullata, obtusa, glabra; ovario pedicellato, glabro, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18237, flowering in Sept. 1908.

The narrow leaves and multi-flowered inflorescences militate against confusing this species with any other in the section. So far it remains quite isolated. The flowers are yellowish white.

304. *B. desmotrichoides* Schltr., sp. nov.

Epiphyticum, erectum, pro sectione validum, c. 30 cm altum; rhizomate cauliformi, rigido, erecto; radicibus basilaribus, flexuosis, glabris; pseudobulbis cylindraceis, unifoliatis, suberectis, 3–4.5 cm longis, medio fere 6–8 mm diametro; folio suberecto, oblongo, obtusiusculo, basi contracto, 8–10.5 cm longo, medio fere 2–3 cm lato; racemis breviter pedunculatis, dense multifloris, pseudobulbum paulo tantum excedentibus; bracteis minutis, ovario pedicellato multo minoribus; floribus in sectione parvulis, glabris, patentibus; sepalis oblongis, subacutis, 5 mm longis, lateralibus obliquis; petalis subfalcato-ovatis, obtusis vel apiculatis, 2.5 mm longis; labello leviter curvato, carnosulo, circuitu oblongo, obtuso, dimidio superiore paulo angustato, dimidio inferiore marginibus leviter incrassato, c. 2.5 mm longo; columna perbrevis, brachiis abbreviatis late triangulis, acutis, pede leviter incurvo; ovario graciliter pedicellato glabro, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18498 (TYPE), flowering in Oct. 1908; on trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20264, flowering in Sept. 1909.

This species is the only close relative of *B. breviracemosum* J.J. Sm. from Dutch New Guinea, and differs from the latter in the multi-flowered inflorescences. The flowers are whitish.

§ 35. *Ischnopus*

I have not been able to form a decided opinion concerning the geographical distribution of this small group, owing to our limited knowledge of many of the species. It is similar in habit to certain species of *Macrouris*, but it possesses pseudobulbs which are depressed slightly from above, and which are developed at considerable intervals from each other. The racemes also have very long peduncles bearing, usually, red or yellow-coloured flowers, which are of rather firm consistence and which possess a rather complicated form of labellum, which is occasionally hairy.

Besides the species enumerated here, *B. orbiculare* J.J. Sm. from Papuasias and *B. cassideum* J.J. Sm. from Dutch New Guinea, may be considered as belonging to this section. *B. MacGregorii* Schltr., which also occurs in our German Territory, was described originally from British Papua.

Of the four species occurring in our Territory, *B. MacGregorii* Schltr. and *B. graciliscapum* Schltr. are found alongside creeks in the forests of the hill-country, particularly on trunks of trees overhanging the creeks and fairly free from moss; whereas *B. habropus* Schltr. and *B. verrucirhachis* Schltr. are found higher up only in the mist-forest zone of the mountains on tall trees covered with moss.

305. *B. graciliscapum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 203.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Bismarck Range, alt. c. 400 m—R. Schlechter no. 13924, flowering in Jan. 1902.

My specimens of this species are in no way very good, and during my last expedition I was unable to locate it again since I did not have the opportunity of revisiting the relevant part of the Bismarck Range. The flowers are dark carmine-red.

306. *B. MacGregorii* Schltr., in Fedde, Repertor. X (1911), p. 252.

Kaiser-Wilhelms-Land: On tree-trunks in the forests on the upper Djamu [River], alt. c. 300 m—R. Schlechter no. 16794 [Ed.—number incorrect, possibly 18794], flowering in Nov. 1908.

I do not doubt that the species I collected is identical with that collected by W. MacGregor on the Stirling Range in British Papua. At locations along watercourses the plant covers whole tree-trunks with its long-creeping rhizomes. The yellow-green flowers are most attractive.

307. *B. habropus* Schltr., sp. nov.

Epiphyticum, longe repens; rhizomate valde elongato, flexuoso; radicibus filiformibus, glabris; pseudobulbis depresso-conicis, unifoliatis, 3–5 cm distantibus, 3–4 mm altis, basi 3–4 mm diametro; folio erecto, lineari-ligulato vel lineari, apiculato, basi angustato, 3.5–7 cm longo, medio fere 4–8 mm lato; racemo gracillime pedunculato, laxe 6–15-floro, pedunculo usque ad basin verruculoso-muriculato incluso usque ad 25 cm longo; bracteis parvulis, ovario pedicellato multo brevioribus; floribus in sectione vix mediocribus; sepalo intermedio perlate ovali, obtusissimo, glabro, 3.5 mm longo, lateralibus oblique oblongis, obtusis, glabris, 5 mm longis; petalis late obovato-spathulatis, apice leviter excisis, glabris, 2 mm longis; labello carnoso, circuito ovali, obtusissimo, basi truncato, margine densius ciliato, subtus subinconspicue puberulo, superne medio basi sulcato cum costa intermedia, 2.75 mm longo; columna brevi, brachiis valde abbreviatis, crenulatis, pede incurvo, basi dente carnoso ornato; anthera quadrato-cucullata, gibbo donata, glabra; ovario verruculoso, cum pedicello articulo, c. 1.1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20096, flowering in Sept. 1909.

This species and *B. verrucirhachis* Schltr. appear to be related to *B. orbiculare* J.J. Sm., although definitely quite different specifically. It is distinguished readily from *B. verrucirhachis* Schltr. in having peduncles which are warty right to the base and by the smaller flowers. The flowers are cherry-red, the labellum red-green and the column yellow.

308. *B. verrucirhachis* Schltr., sp. nov.

Epiphyticum, longe repens; rhizomate elongato, flexuoso; radicibus filiformibus, glabris; pseudobulbis 1.5–4 cm distantibus, conicis, unifoliatis, 0.6–1 cm altis, basi 3–5 mm diametro; folio erecto, oblique lineari, acuto vel apiculato, basi sensim subpetiolato-angustato, 8–13 cm longo, medio fere 4–7 mm lato; racemo gracillime pedunculato, laxe 6–15-floro, pedunculo glabrato, rhachi verruculoso-muriculato incluso c. 14–30 cm longo; bracteis parvulis, ovario pedicellato multo brevioribus; floribus in sectione mediocribus; sepalo intermedio suborbiculari, apiculato, glabro, 7 mm longo, lateralibus oblique oblongis, apiculatis, glabris, 8 mm longis; petalis late obovatis, subapiculatis, glabris, 2.75 mm longis, obliquis; labello carnoso, circuito obovato, obtusissimo, basi truncato, margine breviter et densius ciliato, superne basi medio foveolato, cum costa intermedia, c. 3 mm longo; columna brevi, brachiis quadratis, obtusissimis, bene abbreviatis, pede incurvo; anthera galeato-cucullata, altitubonata, glabra; ovario cum pedicello gracili articulo, glabro, c. 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18684, (TYPE), flowering in Nov. 1908; on trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19687, flowering in June 1909.

As already mentioned above, this species is related closely to *B. habropus* Schltr. in that the peduncles are covered with warts on the rachis only. The larger flowers also afford good distinguishing characteristics both in the shape of the sepals, petals and in the column. The flowers are usually dark carmine-red, but occasionally yellow-flowered specimens occur.

§ 36. *Aphanobulbon*

I have included in this section those species of the genus which are distinguished by their much-reduced pseudobulbs, the latter sometimes only recognised as flat discs, from the base of which there arises on the rhizome a shaft of several or, usually, many flowers. The leaf is usually tongue-shaped, and always fleshy. In some species a distinct petiole is developed, whereas in others the blade gradually narrows downwards. The distribution of the section is very large, commencing in India the species are found throughout the entire Malayan-Philippine islands region and from Papuasias to New Caledonia, where *B. polypodioides* Schltr. represents the most eastern representative presently known.

The species of the section in part very closely resemble each other, and have, in

consequence, been very much confused, particularly those Javanese species which have been clarified only recently through the work of J.J. Smith.

From Dutch New Guinea *B. unguiculatum* Rchb. f. is recorded by J.J. Smith, but I am of the opinion that in this instance there may have been an erroneous determination, and that the plant referred to is *B. ebulbe* Schltr., which is very similar to *B. unguiculatum* Rchb. f., but which is distributed more widely than the latter, and can be distinguished only after careful comparison.

309. *B. ebulbe* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 200.

Kaiser-Wilhelms-Land: On trees in the forests on the Kaulo [River] (Minjem Valley), alt. c. 300 m—R. Schlechter no. 17015, flowering in Dec. 1907; on trees in the forest near Toliba (Ibo Range), alt. c. 300 m—R. Schlechter no. 18960, flowering in Dec. 1908.

Neu-Mecklenburg: On trees in the mountain forests near Punam, in the Rössel Range, alt. c. 550 m—R. Schlechter no. 14639, flowering in July 1902.

As mentioned above, this species is related closely to *B. unguiculatum* Rchb. f. but I consider it well separated specifically by differences in the column structure. The flowers are white-yellow with a yellow lip.

§ 37. *Globiceps*

This section has a similar distribution to *Aphanobulbon*, but the species are not nearly so numerous. In common with *Aphanobulbon* the pseudobulbs are reduced greatly, but the flowers, on long thin shafts, are compressed into a globular or hemispherical head.

Their distribution stretches from India across the Malayan region and Papuasias as far as New Caledonia, where the most eastern species, *B. atrorubens* Schltr., is found, while *B. piluliferum* King et Pantl. and *B. gracilipes* King et Pantl., as well as *B. purpureum* Thw., may be regarded as the most western representatives.

The single species referred to here, which is the only Papuan species recorded up to the present, is rare and only found sporadically on trees along the river-courses in the hill-country, where it hardly seems to reach the lower boundary of the mist-forest zone.

310. *B. globiceps* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 203.

Kaiser-Wilhelms-Land: On trees in the forests on the southern side of the Torricelli Range, alt. c. 500 m—R. Schlechter no. 14391, flowering in Apr. 1902.

This species can be considered as a close relative of *B. atrorubens* Schltr. from New Caledonia. The flowers are dark purple with paler stripes on the outside.

var. *boloboense* Schltr., var. nov.

Differt a forma typica labello conspicue latiore perlate obovato.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Bolobo, alt. c. 600 m—R. Schlechter no. 16562, flowering in Sept. 1907; on trees on the Schibruba [Creek] near Toliba, alt. c. 300 m—R. Schlechter no. 18956, flowering in Dec. 1908.

This plant is characterised by the appreciably broader labellum, so that I initially considered it as a separate species.

The flowers are dark purple, the sepals are paler, with dark stripes.

§ 38. *Lepanthanthe*

With this section we leave the sub-genus *Eu-Bulbophyllum* and consider *Antennisepalum* which I have divided into the sections *Lepanthanthe* and

Trachyrhachis. *Lepanthanthe* is, as already mentioned, monotypic and can be recognised readily from the other section of the sub-genus, *Trachyrhachis*, by its vegetative characters, as already discussed on page 764.

Its only representative, *B. lepanthiflorum* Schltr. described here for the first time, mainly resembles certain species of *Rhizocaulon* of the subgenus *Eu-Bulbophyllum* already considered. It is by no means rare in the central part of Kaiser-Wilhelms-Land, where it occurs on trees overhanging creeks and rivers in the hill-country. I have observed often specimens of up to 1.5 m hanging perpendicularly.

311. *B. lepanthiflorum* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 150 cm longum, simplex vel rarius parum ramosum; rhizomate cauliformi, vaginis acutis, densissime rufopapillosis oblecto; radicibus filiformibus, glabris; pseudobulbis parvulis, cylindraceis, rhizomati appressis, c. 3 mm longis, c. 2 mm diametro, unifoliatis; folio horizontali, late ovali, acuto vel apiculato, basi subpetiolato-contracto, 4–5.5 cm longo, medio vel infra medium 2.5–3.5 cm lato; racemis fasciculatis, distichis, dense 5–10-floris, pedunculo brevi incluso 2–3 cm longis; bracteis acuminatis, ovario-pedicellato bene brevioribus; floribus parvulis, hyalinis, glabris; sepalis late ovalibus, apice in acumen incurvum productis, intermedio 4 mm longo, lateralibus obliquis c. 3 mm longis; petalis oblique ellipticis, obtusis, vix 1.5 mm longis; labello carnoso, suborbiculari, medio superne excepto sparsim verrucoso, basi callo parvulo donato, juxta basin utrinque lobo falcato-lineari obtuso satis longo aucto, 1.75 mm longo; columna perbrevis, brachiis triangulis obtusis, inaequaliter bifidis, pede incurvulo; anthera ovato-cucullata, obtusa glabra; ovario cum pedicello articulo c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Djamu Gorge, alt. c. 300 m—R. Schlechter no. 16607, flowering in Oct. 1907; on trees in the forests of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 19190, flowering in Jan. 1909.

This species is the only one in the section that has been characterised sufficiently. The two rib-shaped lobes at the base of the labellum are very peculiar. The flowers are pale yellow, the lip dark red.

var. *rivulare* Schltr., var. nov.

Differt a forma typica floribus paulo minoribus petalisque latioribus, suborbicularibus.

Kaiser-Wilhelms-Land: On trees in the forests near Pema on the Waria [River], alt. c. 400 m—R. Schlechter no. 19421, flowering in May 1909; on trees on the Waria [River] near Gobi, alt. c. 300 m—R. Schlechter no. 19562, flowering in May 1909.

The petal width is noticeable in this variety. The flowers are yellowish with a darker lip.

§ 39. *Trachyrhachis*

In the whole genus there is hardly another section whose species are morphologically so extremely interesting as *Trachyrhachis*. Like *Lepanthanthe*, this section appears to be purely Papuan and, with those treated here, includes seven species of which two, viz. *B. bulliferum* J.J. Sm. and *B. toranum* J.J. Sm., are recorded from Dutch New Guinea.

On page 764, I have drawn attention already to the differences which separate it from *Lepanthanthe*.

All the species recorded from our Territory are inhabitants of the mountain-forests, where they are found generally on the tops of the tallest trees in very exposed situations, whereas J.J. Smith states in connection with *B. toranum* J.J. Sm. that it grows at an altitude of only 75 m.

312. *B. barbilabium* Schltr., sp. nov.

Epiphyticum, longe repens; rhizomate elongato, flexuoso; radicibus flexuosis, glabris; pseudobulbis minutis, cylindraceis, unifoliatis, 3 mm altis, c. 2 mm diametro, 2–3.5 cm distantibus; folio erecto, elliptico-spathulato, obtuso, basi sensim subpetiolato-angustato, 3.5–4.5 cm longo, medio fere

0.8–1.3 cm lato; racemis gracillimis, laxe 5–10-floris, folium paulo superantibus, pedunculo tenui incluso usque ad 8 cm longis, pedunculo rhachique genuflexa dense muriculato-asperatis; bracteis parvulis, ovario pedicellato multo brevioribus; floribus parvulis, erecto-patentibus; sepalis oblongis, apiculo decurvo apice globoso-incrassato ornatis, carina pluridentata extus ornatis, intermedio margine dense ciliato, 4 mm longo, lateralibus falcato-obliquis, margine inferiore breviter ciliatis, 3 mm longis; petalis oblongis apice grosse tridentatis, marginibus denticulis lateralibus additis, 1.5 mm longis; labello lanceolato-linguiformi, apice recurvo acuto, basi utrinque lobulo falcato-triungulo apiculato ornato, subtus ima basi papillis subulatis patentibus barbellato, 2.5 mm longo; columna perbrevis, brachiis brevibus, triangulis acutis, pede apice incurvo, medio dentiformi-incrassato; anthera cucullata, apiculata, glabra; ovario pedicellato, articulado, glabro, apice incurvulo, c. 5 mm longo.

Kaiser-Wilhelms-land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20097, flowering in Sept. 1909.

This species is distinguished from all the others in the section by short, sparsely flowered inflorescences with a zig-zag, twisted rachis. The flowers are dark purple.

313. *B. antennatum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 196.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19167, flowering in Jan. 1909; on trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 14042, flowering in Jan. 1902.

This species is distinguished readily from the others by the peculiar narrow petals which are densely haired on the upper side.

The more precise flower colour is red, the petals are white at the base, the lip dark red with little white ears and a white margin, and the column is white with a red foot.

314. *B. trachypus* Schltr., sp. nov.

Epiphyticum, repens; rhizomate elongato, flexuoso; radicibus filiformibus, elongatis, flexuosis, glabris; pseudobulbis 1.5–2 cm distantibus, cylindraceutis, c. 2.5 mm longis, 1.5–2 mm diametro, unifoliatis; folio erecto, elliptico vel elliptico-ligulato, obtuso vel apiculato, basi sensim paulo angustato, 3.5–4.5 cm longo, medio fere 0.9–1.5 cm lato; racemo longipedunculato, dense 8–20-floro, pedunculo dense muricato-asperato incluso usque ad 25 cm longo; bracteis lanceolatis, acuminatis, ovario pedicellato plus duplo brevioribus; floribus in sectione mediocribus, erecto-patentibus; sepalis obovatis, apice antenna distincta antice globoso-incrassata ornatis, intermedio 1 cm longo, margine minute ciliolato, lateralibus apice incurvis, obliquis, 7 mm longis; petalis oblique oblongis, obtusis, margine irregularibus, 3.5 mm longis, glabris; labello circuito ovato, obtuso, dimidio anteriore angustato, superne basi foveato cum costa intermedia, marginibus dense ciliato, 1.5 mm longo; columna perbrevis, brachiis quadratis, infra medium bifidis, cum segmento inferiore lineari, pede incurvo; anthera cucullata, costato-umbonata, glabra; ovario pedicellato, articulado, glabro, apice incurvo, 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18573, flowering in Nov. 1908.

As with all the other species, this one is characterised well by the flower features. The lip, as well as the column, distinguishes it from the others. *B. bulliferum* J.J. Sm. can be considered perhaps as the closest relative. The flowers are yellow-green with a pink tinge.

315. *B. barbellatum* Schltr., sp. nov.

Epiphyticum, repens; rhizomate elongato, flexuoso; radicibus filiformibus, glabris; pseudobulbis 2–3 cm distantibus, cylindraceutis, 2.5–3 mm longis, c. 2 mm diametro, unifoliatis; folio erecto, oblongo-ligulato, apiculato, basin versus sensim paulo angustato, 3–5 cm longo, medio fere 0.5–1.3 cm lato; racemo erecto, rigido, laxe multifloro, elongato, pedunculo gracili rigido incluso usque ad 35 cm longo, rhachi tantum sparsim asperato; bracteis parvulis acutis, ovario pedicellato bene brevioribus; floribus in sectione mediocribus; sepalis ovalibus, apice antenna brevi incurva clavata ornatis, 3.25 mm longis, extus costa, verrucosa donatis, intermedio marginibus dense barbellato-ciliato, lateralibus margine anteriore tantum barbellato-ciliatis, obliquis; petalis oblique ovalibus obtusis, marginibus dense barbellato-ciliatis, 2 mm longis; labello carnosulo, e basi trilobato, 2.5 mm longo, lobis lateralibus parvulis falcato-lanceolatis, acutis, intermedio quadrato-oblongo, obtusissimo, labello superne basi foveato, bicostato, subtus basi papillis subulatis barbellato; columna perbrevis, brachiis bifidis cum

segmentis linearibus, pede incurvo, medio dente carnoso ornato; anthera cucullata, apiculata, glabra; ovario cum pedicello gracili articulado, glabro, c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18510, flowering in Oct. 1908.

In the section, this species is recognised easily by the rigid, wiry inflorescences and bearded-haired sepals and petals. The flowers are dark red with a pale yellow lip.

316. *B. erinaceum* Schltr., sp. nov.

Epiphyticum, breviter repens; rhizomate sensim elongato; radicibus filiformibus, glabris; pseudobulbis 0.5–1 cm distantibus, cylindraceis, 2.5–3 mm altis, 2–2.5 mm diametro, unifoliatis; folio erecto, ligulato, acuto vel apiculato, basi sensim attenuato, 3.5–5 cm longo, medio fere 4–8 mm lato; racemis erectis, gracillimis, subdense multifloris, elongatis, pedunculo gracili incluso usque ad 30 cm longis, rhachi bracteis et pedicellis erinaceo-asperatis; bracteis lanceolatis, acuminatis, ovario pedicellato brevioribus; floribus in sectione mediocribus, erecto-patentibus, sepalis extus medio erinaceis, apice antenna brevi antice globoso-incrassata incurva ornatis, intermedio perlate ovali, 3.5 mm longo, lateralibus ovalibus, obliquis, subaequilongis; petalis e ungue brevi lineari subito in laminam reniformem obtusissimam margine ciliatam dilatatis, 1.75 mm longis; labello carnosulo, e basi trilobato, 2.25 mm longo, glabro, basi superne medio breviter costato, lobis lateralibus parvulis, falcato-lanceolatis, acuminatis, lobo medio oblongo, obtuso subtu carina antice in apiculum quadratum terminata donato; columna brevi, brachiis bifidis cum segmentis linearibus, inferiore falcato-decurvo paulo longiore; anthera ovato-cucullata, carinato-umbonata, glabra; ovario cum pedicello erinaceo-asperato, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20235, flowering in Sept. 1909.

An extremely unusual plant which can be recognised at first sight by the peculiar soft spiky covering of the whole inflorescence and also by the shape of the petals. The flowers are black-violet.

§ 40. *Polyrhopalon*

As already explained on page 764 I am of the opinion that *Epicrianthes* should be considered as a separate sub-genus of *Bulbophyllum* Thou. and so have designated the only section belonging here as *Polyrhopalon*.

Until recently *Epicrianthes* was regarded as monotypic, because only a single species, *B. epicrianthes* Hook. f. from the Malay Peninsula and the Sunda Islands, was known. In the year 1906 I described a second species, *B. hexarhopalon* Schltr. from New Caledonia. This discovery was all the more striking because one was accustomed to consider this group as typically Sundanese, although this riddle was quickly resolved, since I was fortunate enough to discover no less than six species in New Guinea during my last expedition there. Thus, it was proved that the distribution centre of the group is in reality in Papuasias. In the meantime, J.J. Smith has published recently a new species, *B. conchophyllum* J.J. Sm. from Dutch New Guinea, so that the number of species has risen suddenly to nine, of which no less than seven are endemic to Papua.

Of the species occurring in our Territory, only one, *B. psilorhopalon* Schltr., is found outside the mist-forest zone. It grows on the trees in the hill-forests of the Waria Valley. All the rest are purely mist-forest epiphytes and they appear to prefer such habitats as ensure them a regular damp atmosphere.

317. *B. decarhopalon* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 70 cm longum, simplex; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis c. 2 cm distantibus, cylindraceis, unifoliatis, c. 1 cm longis, c. 4 mm diametentibus; folio ovato-lanceolato, subacuto, basi breviter contracto, 4.5–6 cm longo, infra medium 1.3–1.8 cm lato; pedunculis fasciculatis, succedaneis, unifloris, paucivaginulatis, brevibus; bractea ovario bene brevior; flore in sectione mediocri; sepalis ovatis, subacutis, glabris, 5.5 mm longis, lateralibus obliquis; petalis transversis, antice breviter angulatis, antice et postice uninbrachiatis,

brachiis appendicibus 3 subulatis acutis distincte stipitatis minutissime papillosis ornatis, appendicibus 4 similibus in medio interpositis, petalis basi c. 1.5 mm latis cum appendicibus explanatis c. 4 mm longis; labello carnoso, lateraliter paulo compresso, oblongo, obtuso, dimidio anteriore sparsim verruculoso, basi cordato, superne dimidio inferiore bicostato, 2 mm longo; columna brevi, crassiuscula, brachiis abbreviatis, semiorbicularibus, pede incurvulo; ovario breviter pedicellato, subclavato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17760, flowering in May 1908.

The species of the section are, in general, recognised by the number of petal appendages; in this case there are ten such appendages. The flowers are pale yellow with red markings on the inside, the petals are reddish with black-green appendages.

318. *B. chlororhopalon* Schltr., sp. nov.

Epiphyticum, pensile, simplex, 50–70 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis 1.5–2 cm distantibus, ovoideo-cylindraceis, unifoliatis, 0.8–1.2 cm longis, infra medium 4–6 mm diametientibus; folio elliptico vel late elliptico, acuto, basi breviter contracto, 4–5.5 cm longo, medio 2–3.5 mm lato; pedunculis fasciculatis, succedaneis, paucivaginulatis, unifloris, brevibus; bractea ovario bene brevior; flore in sectione mediocri; sepalis lanceolatis, acutis, glabris, marginibus incurvulis, 7 mm longis, lateralibus obliquis; petalis bicurvis, cruribus ligulatis, anteriore appendicibus 4 subulatis, acutis papillosis, tenuiter stipitatis ornato, posteriore appendicibus 5 aequalibus donato, appendice mediana inter crures petalorum parvula longius stipita, appendice undecima aliis aequali anteposita, petalis appendicibus explanatis c. 5 mm longis; labello carnoso obtusissimo, superne antice verruculoso, basi auriculis 2 amplis margine incrassatis cordato, 2.5 mm longo; columna crassa, brevi, brachiis valde abbreviatis, triangulis, pede incurvulo; anthera quadrato-cucullata, umbonata, glabra; ovario breviter pedicellato, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20111, flowering in Sept. 1909.

This interesting species is characterised sufficiently, as all the others, by the petals. It is related most closely to *B. psilorhopalon* Schltr., described below, as well as, apparently, to *B. conchophyllum* J.J. Sm. The flowers are greenish on the outside, closely red-spotted on the inside, the petal appendages are green, the labellum and column golden yellow suffused with brown-red at the base.

319. *B. psilorhopalon* Schltr., sp. nov.

Epiphyticum, pensile, simplex vel subsimplex, usque ad 60 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis cylindraceis, unifoliatis, rhizomati subparallelis, 7–10 mm longis, c. 3 mm diametientibus; folio elliptico, acuto, basi cuneato, 2–4.2 cm longo, medio fere 0.8–1.2 cm lato; pedunculis fasciculatis, succedaneis, brevibus, unifloris, paucivaginulatis; bractea parvula, ovario bene brevior; flore in sectione mediocri; sepalis lanceolatis, subacutis, glabris, c. 5.5 mm longis, lateralibus obliquis; petalis transversis, basi 2.25 mm latis, antice obtusangulis, postice in crus ascendens breve apice ipso appendicibus 5 stipitatis, subulatis, acutis, flexuosis, glabris ornatum productis, medio appendice aequali sexto donatis, ante angulum anteriorem appendicibus 4 aequalibus auctis, petalis cum appendicibus sepalorum longitudinem aequantibus; labello carnoso, oblongoideo, obtuso, e medio usque infra apicem subtus et lateribus papulis magnis globosis ornato, basi auriculis 2 amplis rotundatis aucto, superne costis 2 donato, 2.5 mm longo; columna brevi crassa, brachiis valde abbreviatis, triangulis, subcrenulatis, pede incurvulo; anthera cucullata, apice excisa, umbonata, glabra; ovario breviter pedicellato, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 19378, flowering in May 1908. [Ed.—probably 1909.]

Amongst the others of the region this species is characterised by the glabrous petal appendages which number ten as for *B. decarhopalon* Schltr., but are distributed differently. The large papillae-like growths on the labellum are also very characteristic. The flowers are red, lightly spotted inside; the petals pink with black-brown appendages; the labellum dark red, the column white.

320. *B. heterorhopalon* Schltr., sp. nov.

Epiphyticum, pensile, simplex vel subsimplex, usque ad 50 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis 1.5–4 cm distantibus, cylindraceis unifoliatis, 0.8–1.3 cm longis, c. 3 mm diametro; folio elliptico, minute apiculato, 3–4.5 cm longo, medio fere 1.2–1.8 cm lato; pedunculis succedaneis, abbreviatis, fasciculatis, paucivaginulatis, unifloris; bractea ovario multo brevior; flore in sectione mediocri; sepalis ovato-lanceolatis, acutis, glabris, 8 mm longis, lateralibus obliquis; petalis transversis, basi 2.5 mm latis, antice in lobum oblongum obtusum productis, cruri ante medium appendicibus 5 inaequimagnis pyriformibus vel clavatis dense papillois, distincte stipitatis ornato, postice appendice falcato-lineari apice ante uniformibus incrassato parvulo auctis, appendicibus inclusis medio c. 5 mm longis; labello carnosio ovali, obtusiusculo, marginibus papillis cristallinis erinaceo, basi biauriculato, c. 3 mm longo; columna brevi, crassa, brachiis valde abbreviatis, irregulariter paucidentatis, pede incurvulo; anthera cordato-cucullata, umbonata, antice retusa, bicuspidata, glabra; ovario cum pedicello glabro, c. 0.7 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19483, flowering in May 1909.

This species is unique in its petal structure. It is noteworthy that the appendages are all of a different size and shape. The lip also differs from all of the other species.

321. *B. macrorhopalon* Schltr., sp. nov.

Epiphyticum, validum, pensile, simplex vel parum ramosum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis 4–6 cm distantibus, cylindraceis, basin versus paulo dilatatis, 1.7–2.3 cm longis, supra basin 3.5–5 mm diametro, unifoliatis; foliis ellipticis, acuminatis, 6.5–10 cm longis, medio fere 3–4 cm latis; pedunculis singulis abbreviatis, unifloris, paucivaginulatis; bractea parvula ovario multo brevior; flore in sectione magno; sepalis ovalibus, breviter acuminatis, glabris; c. 9 mm longis, lateralibus obliquis, intermedio paulo angustioribus; petalis e basi oblique ovali alte trifidis, segmentis sensim attenuatis apice appendice cylindracea valde acuminata minute et dense papillosa donatis, appendice intermedia lateralibus majore c. 6.5 mm longa, medio 2.5 mm diametiente, petalis appendicibus inclusis sepala longitudine subaequantibus; labello carnosio, ovali, superne longitudinaliter sulcato, subtus verruculoso, carinis 2 superne ornato, 5 mm longo; columna brevi, crassa, brachiis triangularibus obtusiusculis, pede incurvulo; anthera quadrato-cucullata, umbonata, antice margine incrassata subretusa, glabra; ovario cylindraceo glabro, cum pedicello 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18576, flowering in Nov. 1908.

Together with *B. trirhopalon* Schltr., this species is characterised by its size, as well as by the petals which have only three appendages. The differences between the two species are discussed below. The flowers are green on the outside with red spots on the inside, the petals are white with greenish, violet-spotted appendages.

322. *B. trirhopalon* Schltr., sp. nov.

Epiphyticum, pensile, simplex vel parum ramosum, usque ad 60 cm longum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis 4–5 cm distantibus, cylindraceis, unifoliatis, c. 3 cm longis, infra medium 2.5–3 mm diametro; folio elliptico, acuminato, 9–12 cm longo, medio fere 3–3.7 cm lato; pedunculis valde abbreviatis, unifloris, paucivaginulatis, bractea parvula, ovario bene brevior; flore in sectione magno; sepalo intermedio ovato, acuto, glabro, 1.4 cm longo, concavo, lateralibus deflexis ovalibus, obtusis, glabris, 1.1 cm longis; petalis oblique oblongo-ligulatis, apice appendicibus 3 ovoideis, acuminatissimis, minute papilloso-puberulis, apicem versus pilis patentibus hispidis longe et tenuissime stipitatis ornatis, appendicibus inclusis 1.1 cm longis; labello carnosio, ovoideo, rostrato-acuminato, subtus dense papilloso, superne bicostrato, basi auriculis 2 amplius concavis donato, 7 mm longo; columna crassa, brachiis valde abbreviatis, anguliformibus, pede incurvulo; anthera quadrato-cucullata, antice retusa, magni umbonata, glabra; ovario subsessili cylindraceo, glabro, 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18726, flowering in Nov. 1908.

The largest-flowered species so far known. It is well characterised by the petals with the three peculiar appendages and by the long-pointed labellum. The flowers are green, red-spotted on the inside, the labellum is red.

§ 41. *Cycloglossum*

I have brought together here three species, two of which may perhaps at a later stage be excluded from the section, since originally I regarded *B. cycloglossum* Schltr. as its Type.

It is questionable whether this section really belongs to the sub-genus *Bisepalum*, and I have in fact only placed it here because it has connate sepals, a feature in common with *Hedyothyrsus*, which does not appear to occur in *Eu-Bulbophyllum*.

The first two species are distinguished from *B. cycloglossum* Schltr. by the flowers not being reversed and also by the development of the petals and the column. All three have in common small-sized vegetative parts and single-flowered inflorescences. In contrast to them stands *Hedyothyrsus* with its beautiful racemes and very attractive flowers.

All three species placed here are epiphytes of the mist-forest zone.

323. *B. nemorosum* Schltr., sp. nov.

Epiphyticum, nanum, erectum, 3–6 cm altum; rhizomate cauliformi; radicibus filiformibus, flexuosis, glabris; pseudobulbis approximatis, cylindraceutis, unifoliatis, 2.5–3.5 mm longis; folio erecto vel erecto-patente, lineari-ligulato, apiculato, basin versus sensim paulo angustato, 1.3–2.3 cm longo, medio fere 2–3.5 mm lato; pedunculis perbrevibus, unifloris, paucivaginulatis; bractea ovario bene brevior; flore parvulo, glabro; sepalis oblongis, obtusis, glabris, 2.25 mm longis, lateralibus obliquis, apiculatis, usque infra medium connatis; petalis oblique ligulatis, obtusiusculis, quam sepala fere 3-plo brevioribus; labello oblongo obtusissimo, carnosulo, glabro, 1 mm longo; columna brevi, crassiuscula, brachiis falcatis apiculatis, pede brevi; ovario breviter pedicellato, glabro, cum pedicello 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19698, flowering in June 1909.

My doubts on the relationship of this and the next species to *Cycloglossum* have already been discussed above. I included these two species here only at a later date, since at present I could not find better affiliations to other sections and I wanted to avoid establishing too many small sections. The flowers of this species are pale yellow.

324. *B. nubigenum* Schltr., sp. nov.

Epiphyticum, pusillum, erectum, usque ad 4 cm altum; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis approximatis, cylindraceutis, unifoliatis, rhizomati subparallelis, 3–4 mm longis; folio ligulato, obtusiusculo vel minute apiculato, 1.3–1.5 cm longo, medio fere 2.5–3 cm lato; pedunculis abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario bene brevior; flore parvulo, glabro; sepalis oblongis, obtusiusculis, 3.75 mm longis, lateralibus apiculatis, usque ad quartam partem apicalem connatis; petalis oblique ligulatis, subacutis, 1.5 mm longis; labello oblongo, apicem versus paululo dilatato, obtuso, 2.5 mm longo; columna perbrevis, brachiis rhombeo-subulatis, erectis, parvulis, pede brevi, subrecto; anthera rotundato-cucullata, apiculata, dorso excavata; ovario subsessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18762, flowering in Nov. 1908.

This species is related closely to *B. nemorosum* Schltr. but, apart from the larger flowers, it differs in the taller growth of the lateral sepals, the less blunt labellum, and in the anther. The flowers are sulphur-yellow.

325. *B. cycloglossum* Schltr., sp. nov.

Epiphyticum, pusillum, 1–2 cm altum, repens; rhizomate brevi, dense pseudobulbis obsesso; radicibus filiformibus, glabris; pseudobulbis ovoideis, unifoliatis, 2.5–4 mm altis, infra medium 1.5–2 mm diametro; folio erecto, lineari vel ligulato, apiculato, basin versus sensim angustato, 0.7–1.8 cm longo, medio fere 1.5–2 mm lato; pedunculis brevibus, paucivaginulatis, unifloris, usque ad 1 cm longis; bractea parvula cucullata, ovario pedicellato multo brevior; flore parvulo, inverso; sepalis ovalibus, acuminatis, intus minute papillosis, 5–5.5 mm longis, lateralibus obliquis usque ad tertiam partem apicalem connatis; petalis semiorbicularibus, 0.25 mm vix altis, basi 0.5 mm latis, glabris, subinconspicuis; labello parvulo suborbiculari, apice subretuso, c. 1 mm longo et lato, columna

breviore; columna recta, carnosula, ebrachiata, pede incurvulo; anthera rotundato-galeata, glabra; ovario pedicellato, glabro, pedicello incluso 3–5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2500 m—R. Schlechter no. 18735, flowering in Nov. 1908.

A very peculiar plant which, in the column, differs somewhat from the *Bulbophyllum*-form. The appreciable size reduction of the petals is very noticeable. The flowers are dark carmine-red.

§ 42. *Hedyothyrsus*

I consider this section as the fundamental form of the sub-genus *Bisepalum*, and I emphasise this point so that no confusion may arise over the names I have used, later on when a subsequent further division occurs, which I believe is inevitable. The section appears to contain only species from the Papuan floral zone, and consists at present, as far as I can see, of only the four species enumerated here.

In habit it is very characteristic compared with *Cycloglossum*, since all species have long creeping rhizomes with pseudobulbs far apart; the inflorescences are always racemose, and contain large flowers with a very characteristic expanded dorsal sepal, always shorter than the lateral ones; the latter are not only coherent, a condition typically characteristic of the subgenus, but in this instance they are actually united by their thin margins. For other points I refer to the characterisation as laid down for the section on page 765.

So far as I know at present, the species of the section are mist-forest epiphytes. Like many of the species of the section *Manobulbon*, they prefer to grow on trunks of trees, often covering the bark thickly.

326. *B. callichroma* Schltr., sp. nov.

Epiphyticum, longe repens; rhizomate valde elongato, flexuoso; pseudobulbis subgloboso-conicis, unifoliatis, 6–7 cm distantibus, c. 1.3 cm altis et diametientibus; folio erecto, lanceolato-ligulato, acuminato, basi sensim in petiolum brevem angustato, 10–20 cm longo, medio fere 1.3–2 cm lato; racemis longipedunculatis, laxe 7–15-floris, subsecundis, leviter arcuatis, pedunculo incluso usque ad 35 cm longis; bracteis parvulis, acuminatis, ovario pedicellato multo brevioribus; floribus in sectione mediocribus, glabris; sepalo intermedio late ovali, breviter acuminato, longitudinaliter biumbonato, 1.4 cm longo, lateralibus obliquis, in laminam late ovalem, subacutam 1.6 cm longam connatis; petalis oblique ovatis, obtusissimis, 6 mm longis; labello carnosio, curvato, e basi quadrata dimidio anteriore contracto, oblongo, obtuso, incrassatione V-formi obtusa in basi, explanato c. 3 mm longo; columna perbrevis, brachiis quadratis, antice truncatis, pede incurvo, supra basin dente carnosio falcato ornato; anthera cucullata, apiculata, glabra; ovario pedicellato, glabro, c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 950 m—R. Schlechter no. 18136, flowering in Sept. 1908.

A really pretty-coloured species most closely related to *B. chloranthum* Schltr. The dorsal sepal is white with violet veins and yellow tip; the lateral sepals violet-red, the petals white, and the labellum violet.

327. *B. chloranthum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 197.

Neu-Mecklenburg: On trees in the mountain forests near Punam, in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14642, flowering in July 1902.

This species appears to be restricted to Neu-Mecklenburg. It is related closely to *B. callichroma* Schltr., but has larger flowers of a different colour and a broader labellum. The flowers are yellow-green with a muddy violet lip.

328. *B. calothyrsus* Schltr., sp. nov.

Epiphyticum, longe repens; rhizomate valde elongato, flexuoso; radicibus filiformibus, glabris; pseudobulbis 5–7 cm distantibus, depresso-conicis, unifoliatis, c. 0.8 cm diametro, 1 cm altis; folio erecto, elliptico-lanceolato, subacuto, basi sensim in petiolum angustato, 5.5–11 cm longo, medio fere 1.3–2 cm lato; racemo erecto longipedunculato, laxe 8–15-floro, usque ad 30 cm longo, subsecundo;

bracteis parvulis, lanceolatis, acuminatis, ovario brevioribus; floribus in sectione magnis, glabris; sepalo intermedio ovali, acuminato, dorso biumbonato, medio sulcato, 1.3 cm longo, lateralibus obliquis, in laminam ovalem, apice biapiculatam 1.9 cm longam connatis; petalis suborbicularibus, obtusissimis 3 mm longis; labello carnoso, curvato, e basi quadrata medio leviter pandurato, antice obtusissimo, carina vel incrassatione hippocrepiiformi in dimidio inferiore superne ornato, 2.5 mm longo; columna perbrevis, brachiis quadrato-falcatis, subacutis, pede incurvo, basi dente carnoso, curvato ornato; ovario pedicellato, glabro, c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20137, flowering in Sept. 1909.

This species is intermediate between *B. chloranthum* Schltr. and *B. hedyothyrsus* Schltr. It is characterised by the short, almost circular petals, the lip which is contracted in the middle in the shape of a violin, and by the column. This and the following species are amongst the most graceful ones in the genus. The flowers are violet-red with brown-yellow dorsal sepals.

329. *B. hedyothyrsus* Schltr., sp. nov.

Epiphyticum, longe repens; rhizomate valde elongato, flexuoso; radicibus filiformibus, glabris; pseudobulbis 12–20 cm distantibus, depresso-conicis, unifoliatis, c. 1 cm altis, 1.3 cm diametentibus; folio erecto, elliptico-lanceolato, subacuto, basi sensim in petiolum brevem angustato, 7.5–9 cm longo, medio fere 1.4–1.8 cm lato; racemis speciosis, erectis, longipedunculatis, usque ad 45 cm longis, subsecundis, leviter arcuatis, laxe 10–15-floris; bracteis recurvulis lanceolatis, acuminatis, ovario brevioribus; floribus in sectione permagnis, glabris; sepalo intermedio lanceolato, acuto, biumbonato, medio sulcato, 2 cm longo, lateralibus obliquis, in laminam elliptica biapiculatam 3.7 cm longam connatis; petalis oblique oblongis, obtusis, 5 mm longis; labello carnoso, curvato, e basi quadrata oblongo-angustato, obtuso, marginibus minutissime et dense ciliolato, basi concava callo hippocrepiiformi ornato, 4.5 mm longo; columna perbrevis, brachiis oblique rhombeis, obtusiusculis, pede incurvo, supra basin dente carnoso conico aucto; anthera reniformi-cucullata, glabra, obtuse apiculata; ovario cum pedicello gracili, glabro, 6–7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 18497, flowering in Oct. 1908.

This magnificent plant is one of the most beautiful in the genus. Within the section it is recognised easily by the large flowers and by the short, densely haired labellum. The dorsal sepal and the petals are white-yellow, the lateral sepals and the labellum dark violet.

Supplementary list of species of *Bulbophyllum* Thou.

From Dutch New Guinea the following species are to be mentioned;

B. cuniculiforme J.J. Sm. from the section *Scyphochilus*

B. xanthoacron J.J. Sm. from the section *Coelochilus*

B. geniculiferum J.J. Sm. from the section *Coelochilus*

B. rectilabre J.J. Sm. from the section *Coelochilus*

B. olorum J.J. Sm. from the section *Coelochilus*

B. aristilabre J.J. Sm. from the section *Coelochilus*

To me, so far, the relationship of *B. digitatum* J.J. Sm. is not known but, as far as I can judge from the short description given by the author, it should perhaps be considered as the Type of its own section.

77. *Cirrhopetalum* Lindl.

I have always held the opinion that this genus should be retained within the limits assigned to it by Lindley, although in recent years orchidologists have pleaded for its unification with *Bulbophyllum* Thou. There is no doubt that it is related closely to the latter by certain intermediate forms, though I must confess that I have never been in doubt which species I consider as *Bulbophyllum* and which as *Cirrhopetalum*. In my treatment of the *Glossorrhyncha-Glomera* question, compare pages 341–342, I have

already drawn attention to the unpleasant consequences which may arise if the boundaries of such a huge genus, as are not uncommon in *Orchidaceae*, should be too wide or not defined precisely enough. I am still of the opinion, in spite of the reply of J.J. Smith (Bull. Jar. Bot. Buitenz. 2nd. series, no. VIII.), that genera which are related in the structure of their flowers by certain apparent transitional forms, but are otherwise well-defined by vegetative characters or by habit, are better kept separate, if this occurs in members belonging to really large groups. The generic characters of *Cirrhopetalum* have been obscured still further owing to certain species having been placed under it, when they could quite properly have been regarded as true *Bulbophylla*, e.g. *B. viridiflorum* (Hook. f.) Schltr. and several others.

In our Territory, the number of *Cirrhopetalum* species is quite small. It would appear that the centre of dispersion is to be looked for especially in the hinterland of India. Besides the three species described here, only one other is known to occur in Papuasias at present, viz. *C. robustum* Rolfe (*C. graveolens* Bail.), which has been recorded from British Papua.

Of the three species we are concerned with, *C. pachybulbum* Schltr. is found at the lower border of the mist-forest zone, whilst the other two are epiphytes of the forests of the hill-country. *C. warianum* Schltr., however, penetrates even to the vicinity of the sea-coast.

1. *C. pachybulbum* Schltr., sp. nov.

Epiphyticum, robustum; rhizomate brevi; radicibus flexuosis, glabris; pseudobulbis-approximatis, ovoideis vel late ellipsoideis, crassis, 5–6.5 cm altis, medio vel infra medium 3–4.5 cm diametro, unifoliatis; folio erecto, elliptico, obtuse apiculato, basi sensim in petiolum brevem angustato, c. 50 cm longo, medio 11–12.5 cm lato; pedunculo crassiusculo, erecto, paucivaginato, pseudobulbo paulo brevior, racemo umbelliformi, 4–8-floro; bracteis ovalibus ovario paulo brevioribus; floribus illis *C. robusti* Rolfe similibus, sed minoribus, patentibus; sepalo intermedio ovali, breviter acuminato vel apiculato, 1.2 cm longo, lateralibus ligulatis, obtusiusculis, marginibus exterioribus cohaerentibus, glabris, 3 cm longis; petalis oblique ovalibus, apiculatis, 8 mm longis; labello carnosio, curvato, oblongo, obtuso, superne costis 2 parallelis ornato, 8 mm longo, glabro; columna brevi, brachiis ovato-lanceolatis, acuminatis, pede incurvo; anthera galeato-cucullata, antice excisa, glabra; ovario cum pedicello glabro, c. 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20201, flowering in Sept. 1909.

This species is a close relative of *C. robustum* Rolfe from British Papua, but differs from it in the smaller, differently coloured flowers, in the lip as well as the column stelia. The flowers are green.

2. *C. kenejanum* Schltr., sp. nov.

Epiphyticum decumbens; rhizomate radicante; radicibus filiformibus, glabris; pseudobulbis oblique ovoideis, unifoliatis, 4-angulatis, 1.5–2.3 cm altis infra medium 0.8–1.3 cm diametro; folio erecto, oblongo-ligulato, obtuso, basi sensim in petiolum brevem angustato, 11–18 cm longo, medio fere 2.2–3.6 cm lato; pedunculo erecto, gracili, paucivaginato, usque ad 24 cm alto; racemo umbelliformi, 7–12-floro; bracteis lanceolatis, acuminatis, ovario pedicellato pluries brevioribus; floribus in genere vix inter majores, patentibus; sepalo intermedio orbiculati, apice pauciciliato cum arista terminali antenniformi-incrassatula bene longa, arista inclusa 1.4 cm longo, lateralibus oblique ligulatis, marginibus exterioribus cohaerentibus, subacutis, glabris, 3.3 cm longis; petalis oblique falcato-lanceolatis, ciliis irregularibus subulatis margine ornatis, apice in aristam productis, 9 mm longis; labello curvato, carnosio, e basi quadrata lanceolato-linguiformi, obtuso, dimidio inferiore superne bicostato, glabro, c. 7 mm longo; columna brevi, brachiis e basi oblique rhombea aristatis, falcatis, pede incurvo; anthera galeato-cucullata, antice excisa, glabra; ovario cum pedicello gracili, glabro, c. 1.6 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Wakeak [Creek], alt. c. 400 m—R. Schlechter no. 19042, flowering in Jan. 1909; on trees in the forests on

the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18462 [TYPE], flowering in Oct. 1908.

This species is reminiscent of *C. picturatum* Lindl., but with narrower flower-stalks and, otherwise, also different in the flowers. The flowers are yellowish with close red dots, the lateral sepals are whitish towards the front.

3. *C. warianum* Schltr., sp. nov.

Epiphyticum, gracile; rhizomate radicante; radicibus filiformibus, glabris; pseudobulbis 1–2 cm distantibus, ovoideis, unifoliatis, 4-angulatis, 0.7–1.3 cm altis, infra medium 4–9 mm diametro; folio erecto, elliptico vel elliptico-ligulato, obtuso, basi subpetiolato-angustato, 4–7 cm longo, medio fere 1.4–2.3 cm lato, pedunculo gracillimo paucivaginulato, usque ad 35 cm longo, racemo umbelliformi, 10–20-floro; floribus in sectione inter minores, patentibus; sepalis late ovalibus, acuminatissimis, intermedio in aristam producto, margine longiciliato, 6 mm longo, lateralibus obliquis, glabris, primum marginibus exterioribus cohaerentibus mox liberis, c. 3 cm longis; petalis lanceolatis, falcatis, aristato-acuminatissimis, margine longiciliatis, 5 mm longis; labello carnosio, curvato, ovato-linguiformi, obtuso, antice paulo angustato, sparsim transversim-ruguloso, subtus foveato, 2 mm longo; columna brevi, brachiis dentiformibus abbreviatis, pede incurvo; anthera oblongoideo-cucullata, glabra; ovario cum pedicello gracili, glabro, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Adolphafen, at the mouth of the Waria [River], alt. c. 10 m—R. Schlechter no. 19215, flowering in Apr. 1909.

A very interesting small-flowered species, related to *C. psittacoides* Ridl. The flowers are reddish with a darker dorsal sepal and a whitish lip.

78. *Dactylorhynchus* Schltr.

During my last visit to the Torricelli Range I found a small *Bulbophyllinae*, which caught my attention by the slightly different shape of the flower. A closer examination of the material showed that the structure of the column was quite different from that of *Bulbophyllinae*. I was convinced that it represented the Type of a new genus and therefore named it on the spot where it was found.

Dactylorhynchus Schltr., gen. nov.

Sepala subpatentia, oblonga, glabra. Petala leviter decurva, oblique lanceolata, acuta, glabra quam sepala duplo fere breviora. Labellum planum panduratum, apiculatum, basi excavatum, superne supra basin bicostatum, sepalis aequimagnum. Columna brevi, subteres, rostello dactyliformi, apice incrassatulo, pede incurvo. Stigma orbiculare marginatum. Anthera anguste cucullata, carinata, glabra. Pollinia ut videtur 2, apice cohaerentia. Ovarium breviter pedicellatum clavatum.

Planta parvula, erecta, habitu specierum minorum sectionis *Pelma* in genere *Bulbophyllum* Thou.; pseudobulbis erectis, rhizomati subparallelis, unifoliatis; folio erecto, ligulato, parvulo; pedunculis gracilibus pseudobulbum aequantibus vel paulo superantibus, paucivaginulatis, 1–2-floris; bracteis erecto-patentibus, parvulis; floribus in affinitate inter minores, glabris.

Species singula adhuc nota, montium Papuae incola.

I have drawn attention above to the main differences between this genus and the others in the group. In habit this plant is reminiscent chiefly of a few species of the *Pelma* section of *Bulbophyllum*. The inflorescences are usually single-flowered, but occasionally two flowers are formed. The column is very peculiar in being drawn out to a definite finger-shaped rostellum inclined obliquely upwards and slightly swollen at the front. It appears to me that the narrow anther holds only two broad club-shaped pollinia, which are joined at the front.

The only presently known species of the genus is a rare inhabitant of the mist-forests of the Torricelli Range where it grows on tall, densely moss-covered trees.

1. *D. flavescens* Schltr., sp. nov.

Epiphyticus, erectus vel suberectus, parum ramosus, 12 cm longus; rhizomate cauliformi; radicibus filiformibus, glabris; pseudobulbis rhizomati subparallelis, conico-cylindraceis, unifoliatis, 5–8 mm longis, infra medium c. 3 mm diametro; folio erecto, elliptico-ligulato, apiculato, basi cuneato, 1.3–1.8 cm longo, medio fere 4–5.5 mm lato; pedunculo gracili, filiformi, paucivaginulato, usque ad

1.5 cm longo, unifloro vel laxe 2-floro; bracteis parvulis, ovario bene brevioribus; floribus parvulis, glabris; sepalis oblongis, subacutis, 4 mm longis, lateralibus obliquis, leviter decurvis; petalis decurvulis, oblique lanceolatis, acuminatis, medio paulo dilatatis, 2.5 mm longis; labello e basi concava rotundata, in tertia parte inferiore pandurato-contracto deinde sursum in laminam suborbicularem apiculatam conspicue ampliata, c. 5 mm longo; columna et anthera generis; ovario cum pedicello brevi, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: on trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20098, flowering in Sept. 1909.

Unfortunately I possess only a single specimen with few flowers of this apparently very rare plant. The flowers are pale yellow.

79. *Tapeinoglossum* Schltr.

In the table of Papuan genera of the *Bulbophyllinae* on page 749, the genus *Tapeinoglossum* Schltr. was not mentioned since, only on subsequent investigation did I decide to separate it from *Bulbophyllum* Thou. Its flowers have only one characteristic in common with *Codonosiphon* Schltr., i.e., that the sepals are all connate at the base into a distinct tube. The rest of the floral structure differs so widely from *Codonosiphon* Schltr. that I find it impossible to unite the two genera.

Tapeinoglossum Schltr., gen. nov.

Sepala basi inter se distincte connata, obovata, intermedium lateralibus majus, lateralia usque ad apicem naviculiformi-coalita, intus pilosa. Petala parvula, elliptica, obtusa vel apiculata, glabra. Labellum minutum, carnosum, superne costis 2 barbellatis ornatum. Columna brevi, glabra, brachiis parvulis triangulis, pede incurvo bene evoluto. Anthera cucullata, glabra. Ovarium breviter pedicellatum, glabrum.

Plantae epiphyticae, repentes; rhizomate elongato; radicibus filiformibus, glabris; pseudobulbis bene evolutis vel minutis, unifoliatis; folio lineari-ligulato vel late elliptico; pedunculo erecto brevi, paucivaginulato, unifloro; bractea parvula; flore mediocri, erecto.

Species 2 adhuc notae papuanae.

The genus should be located before *Codonosiphon* Schltr. in the enumeration of the Papuan genera of *Bulbophyllinae* shown on page 749. It differs from the former in the very small mobile labellum and the short thick column with its very elongated base. The first of the species listed here, *T. centrosemiflorum* (J.J. Sm.) Schltr., is known also in Dutch New Guinea. It is distributed as an epiphyte on tree-trunks in the elevated hill-forests, but does not appear to reach above the lower boundary of the mist-forest formation. *T. nannodes* Schltr. appears to be very rare and has been found only once in hill-country on a tree standing isolated at 450 m altitude. Both species are very similar in the flowers.

1. *T. centrosemiflorum* (J.J. Sm.) Schltr. [Ed.—comb. nov.]

Bulbophyllum centrosemiflorum J.J. Sm., in Fedde, Repertor. XI (1912), p. 139.

Kaiser-Wilhelms-Land: On trees in the forests of the Gati Mountain, alt. c. 600 m—R. Schlechter no. 17182, flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 800 m—R. Schlechter no. 18984, flowering in Dec. 1908; on trees in the forests of the Finisterre Range, alt. c. 700–800 m—R. Schlechter no. 17951, flowering in July 1908; no. 19183, flowering in Jan. 1909.

The differences in habit between this species and *T. nannodes* Schltr. are so significant that they hardly can be confused. The flowers are whitish with red veining and marking.

2. *T. nannodes* Schltr. [Ed.—comb. nov.]

Bulbophyllum nannodes Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 210.

Kaiser-Wilhelms-Land: On trees of the hills on the banks of the central Nuru

[River], alt. c. 450 m—R. Schlechter no. 13808, flowering in Dec. 1901.

In its vegetative parts this species is a dwarf compared with *T. centrosemiflorum* (J.J. Sm.) Schltr., but in contrast the flowers are of about equal size. The flowers are yellowish with definite brown-red markings inside, the lip has violet hairs.

80. *Codonosiphon* Schltr.

This genus has been characterised already in the survey of the genera of the group. It comes close to *Tapeinoglossum* Schltr., but differs in the possession of a short rhizome which is covered closely with pseudobulbs; in the shape of the flowers; in the column-foot being united closely with the immovable lip; the length of the sepals and the slender, almost footless column with divided clinandrium and stelidium.

Codonosiphon Schltr., gen. nov.

Sepala oblonga, acuminata, basi tertia parte vel usque supra medium in tubum campanulatum connata, intus papilloso puberula. Petala parvula, obliqua, oblongo-quadrata vel transversa. Labellum immobile, ovatum vel ligulatum rostrato-elongatum, carnosum, sepalis fere aequilongum. Columna gracilis subapoda, clinandrio et brachiis lacerato-dentatis. Anthera cucullata, umbonata, glabra. Ovarium subsessile cylindraceum, glabrum.

Plantae epiphyticae, parvulae; rhizomate abbreviato; radicibus conico-cylindraceis, unifoliatis; folio erecto, ligulato; pedunculis abbreviatis, paucivaginulatis, unifloris; bractea parvula; floribus parvulis.

Species 3 adhuc notae montium insularum Papua et Celebes indigenae.

Enough has been stated above to distinguish this genus from the others in the group. Up to now, three species are known, one of which, viz. *C. codonanthum* Schltr., I published in 1911 (cf. Fedde, Repertor. X (1911), p. 177) as *Bulbophyllum codonanthum* Schltr., from the mountains of Minahassa in the North Celebes. The other two species are described here for the first time. All species are epiphytes of the mist-forest formations and grow there on moss-covered limbs of tall trees.

1. *C. campanulatum* Schltr., sp. nov.

Epiphyticum, caespitificum; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis valde approximatis, cylindraceis, unifoliatis, apicem versus paululo angustatis, 2–2.5 cm altis, infra medium 2.5–3.5 mm diametro; folio erecto, oblique ligulato, acuto, basi cuneato, 10–13 cm longo, medio fere 1.5–1.8 cm lato; pedunculis valde abbreviatis, paucivaginulatis, unifloris; bractea parvula, ovario subsessili bene brevior; flore erecto, parvulo; sepalis oblongis, breviter acuminatis, extus glabris, intus minute papilloso-puberulis, 1 cm longis, usque supra medium in tubum campanulatum connatis, apicibus recurvis; petalis obliquis, transversis, apiculatis, minutis, c. 1.5 mm longis, medio 2.5 mm latis; labello immobili, carnosus, anguste ligulato, obtusiuscule acuminato, papillis acutis muriculato, basi superne concavulo, 7.5 mm longo; columna gracili, subapoda, brachiis quadratis, antice inciso-dentatis; ovario cum pedicello brevi, glabro, 6.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 18109, flowering in Aug. 1908.

A very interesting species distinguished readily from the other two by the sepals which are united to the middle part, by the shape of the petals, and by the labellum. The flowers are dark carmine-red.

2. *C. papuanum* Schltr., sp. nov.

Epiphyticum, parvulum; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis valde approximatis, conico-cylindraceis, unifoliatis, 1–1.5 cm altis, infra medium 4–6 mm diametro; folio erecto, ligulato, acuto vel apiculato, basi cuneato, 4–7.5 cm longo, medio fere 0.8–1.4 cm lato; pedunculis valde abbreviatis, vaginulis paucis obtectis, unifloris; bractea parvula, ovario subsessili paulo brevior; flore parvulo, erecto-patente; sepalis ovatis, acuminatis, intus minute papilloso-puberulis, intermedio cum lateralibus tertia parte basali connato, 8 mm longo, lateralibus obliquis usque ad medium inter se connatis, 8.5 mm longis; petalis oblique oblongo-quadratis, apice truncato-obtusissimis, 3 mm longis; labello immobili, carnosus, ovato, margine crenato-verruculato, basi concavulo, antice in rostrum longum curvatum, apice leviter clavato-incrassatum productus, 8 mm

longo, glabro; columna graciliore, leviter curvata, glabra, brachiis lacerato-dentatis, pede subnullo; ovario subsessili, glabro, c. 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20250, flowering in Sept. 1909; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18008 (TYPE), flowering in July 1908; on trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1100 m—R. Schlechter no. 19792, flowering in June 1909.

This species is related closely to *C. codonanthum* Schltr. from the Celebes, but is specifically different. The flowers are dark red with black-red petals and labellum, the tip of the latter golden yellow.

81. *Monosepalum* Schltr.

This genus constitutes one of the most interesting forms of the group. In the preliminary survey on page 749, I have referred already to, and briefly characterised it. It is very remarkable that no less than three species of the genus are already known, the two described here and *M. muricatum* (J.J. Sm.) Schltr. [cf. p. 749] which should be added here. The peculiar appendages of the petals, which all three species possess, have been compared correctly by J.J. Smith with those in the sub-genus *Epicrianthes* of *Bulbophyllum* Thou., but they are of a different nature from those of *Cirrhopetalum mirum* (J.J. Sm.) Schltr. (*B. mirum* J.J. Sm.).

Monosepalum Schltr., gen. nov.

Sepala angustata usque ad medium vel usque ad apicem fere in laminam navicularem facie apertam connata. Petala flabellata, margine superiore appendicibus 3 inaequalibus clavatis ornata. Labellum breve, crassum, late ellipsoideum, apice in apiculum lobuliformem villosulum vel verrucosum exeuns. Columna brevis, steldiis subulatis, pede incurvulo. Ovarium pedicellatum dense appendicibus carnosulis muricatum.

Plantae epiphyticae, repentes vel patulae; rhizomate plus minus elongato; radicibus filiformibus, glabris; pseudobulbis ovoideis vel subcylindraceis parvulis, unifoliatis; folio elliptico vel suborbiculari, glabro; pedunculis gracilibus, unifloris, vaginulis paucis distantibus obsessis, plus minus muriculatis; bractea parvula, ovario brevior; flore satis specioso magno.

Species 3 adhuc notae montium Papuae incolae.

The three presently known species have such peculiar common characteristics that I did not hesitate to establish the genus, which is characterised by the shape of the peculiar connate sepals, by the petals and by the lip. *M. torricellense* Schltr. is somewhat further removed from the other two species in that the sepals are connate up to their tips and the three appendages on the petals are located very close together. Unfortunately, nothing is known yet of the habit of *M. muricatum* (J.J. Sm.) Schltr.

1. *M. dischorens* Schltr., sp. nov.

Epiphyticum, repens; rhizomate radicante; radicibus filiformibus, glabris; pseudobulbis c. 1 cm distantibus, oblique ovoideis, sulcato-angulatis, unifoliatis, 0.8–1 cm altis, infra medium 5–6.5 mm diametro; folio erecto, elliptico, obtusiusculo, basi subpetiolato-contracto, 4–6 cm longo, medio fere 2.2–2.5 cm lato; pedunculis gracillimis, erectis, omnino dense muriculato-papillosis, usque ad 8 cm longis, vaginulis 2–3 distantibus, glabris obsessis, unifloris; bractea parvula, glabra, ovario pedicellato bene brevior; flore patulo, magno; sepalis lineari-lanceolatis, acutis, glabris, usque supra medium in laminam navicularem antice apertam 5.7 cm longam connatis; petalis oblique flabellato suborbicularibus margine superiore sublobulatis, 2.5 mm altis, 3.5 mm latis, appendicibus 3 clavatis minute papillosis ornatis, appendice anteriore magna crassiuscula, 1 cm longa, intermedia tenui subfiliformi 7 mm longa, posteriore quam intermedia paululo crassiore 8 mm longa; labello crasso, ellipsoideo, glabro, apiculo lobuliformi verrucoso ornato, margine linea verrucarum ornato, verruculis sparsis superne in medio additis, 3.5 mm longo; columna crassa, brachiis brevibus subulatis, pede incurvulo; ovario cum pedicello dense appendicibus reversis muricato, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 17649, [Ed.—no. probably 19649], flowering in June 1909.

Clearly, this species is related closely to *M. muricatum* (J.J. Sm.) Schltr., but has pedicels which are rough down to the base, papillose appendages to the anthers, as well as a different labellum. The flowers are white with red-brown spots.

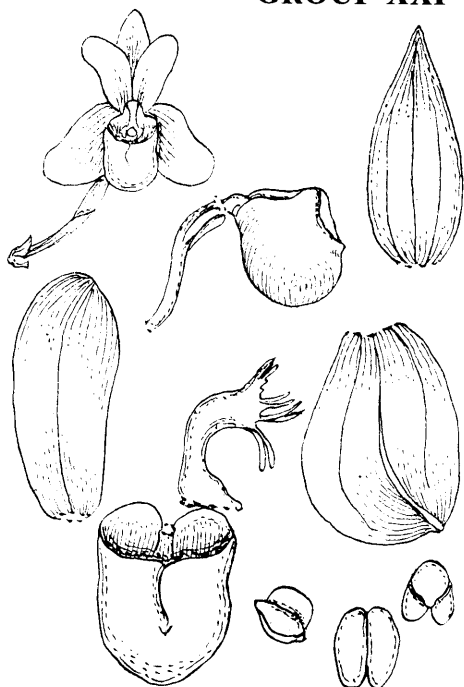
2. *M. torricellense* Schltr., sp. nov.

Epiphyticum, repens, vel patulum, usque ad 70 cm longum; rhizomate valde elongato, radicante; radicibus filiformibus, glabris; pseudobulbis adscendentibus vel rhizomati subparallelis cylindraceis, unifoliatis, 7–10 mm longis, 2–2.5 mm diametro; folio late ovali vel suborbiculari, 2.8–3.7 cm longo, medio fere 2–2.5 cm lato; pedunculo gracili, sparsim muricato, c. 7–10 cm longo, vaginulis paucis glabris distantibus ornato, unifloro; bractea parvula, ovario multo brevior; flore magno, specioso; sepalis usque ad apicem in lamina navicularem lanceolatam apice ipso minute tridentatam 6.5 cm longam connatis; petalis parvulis, dolabrimiformibus, rotundatis, cum angulis lateralibus subrecurvulis, 2 mm altis, 3.5 mm latis, obtuse apiculatis; apice appendicibus 3 clavatis glabris ornatis, appendice anteriore 10 mm longa, media 7 mm longa, posteriore 5 mm longa; labello nondum noto; columna brevi, brachiis brevibus triangulo-subulatis, pede incurvo; ovario cum pedicello dense papillis reversis muricato, 2.5 cm longo.

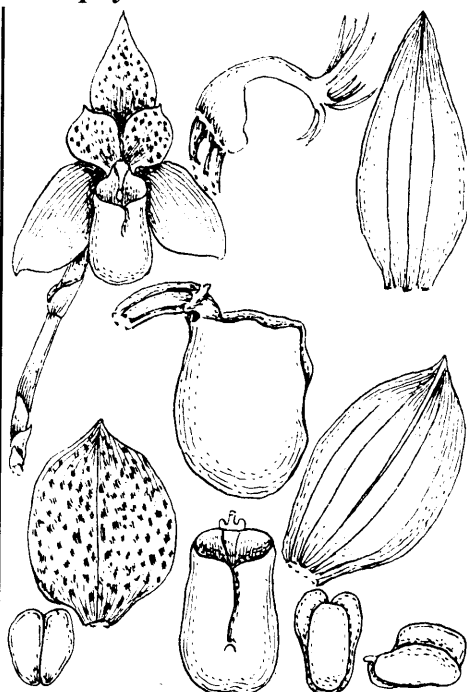
Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20171, flowering in Sept. 1909.

Unfortunately, the labellum was missing on the only flower found, but the species is so distinctive with its petals and the sepals connate to the tips that I did not hesitate to describe it. The flowers are whitish, closely spotted with red.

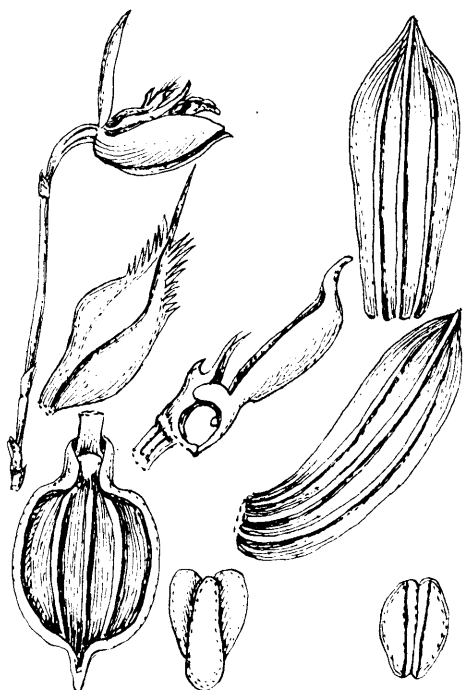
GROUP XXI *Bulbophyllinae*



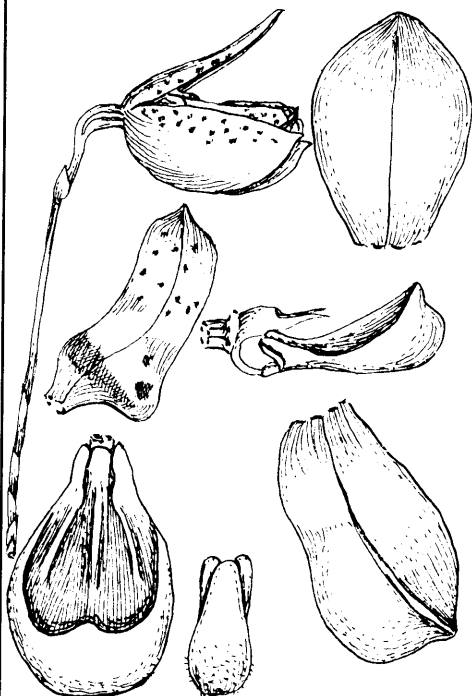
Saccoglossum papuanum Schltr.



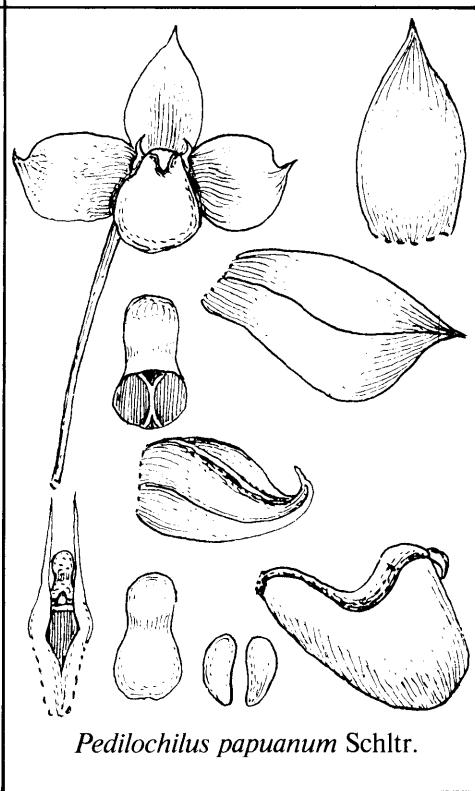
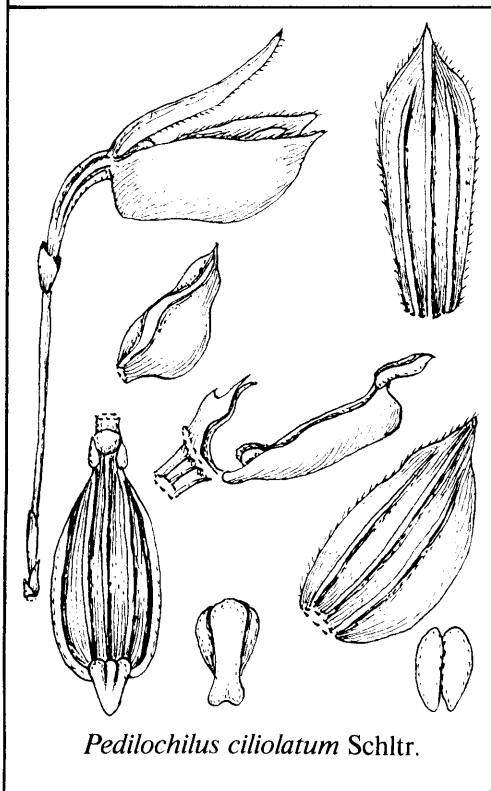
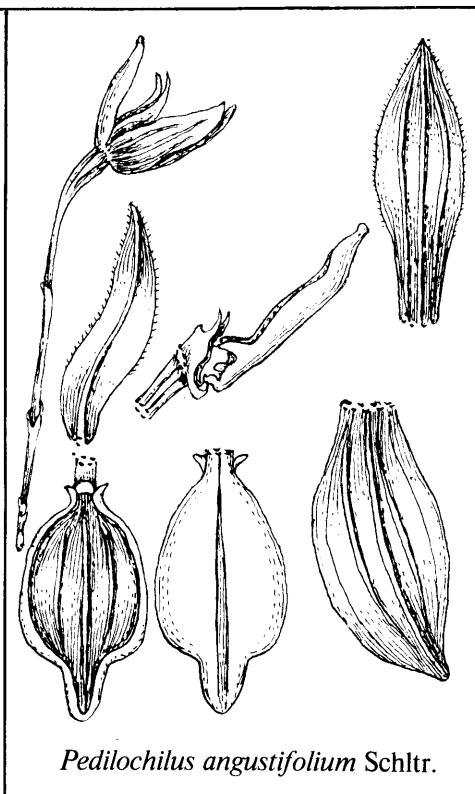
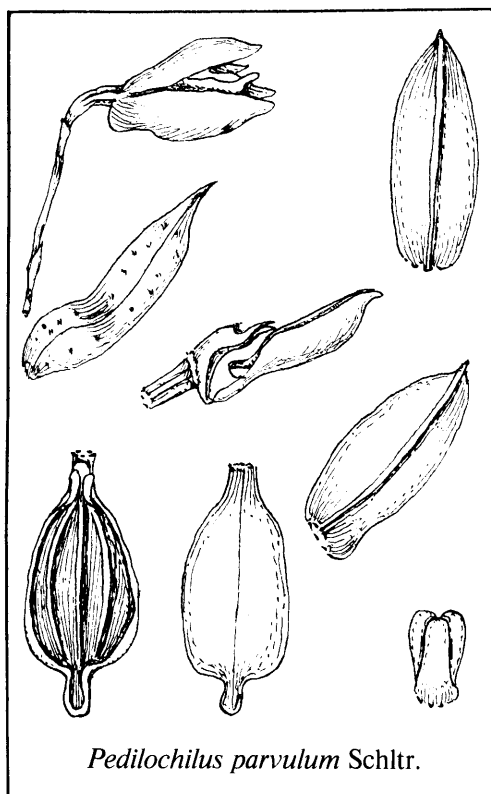
Saccoglossum maculatum Schltr.

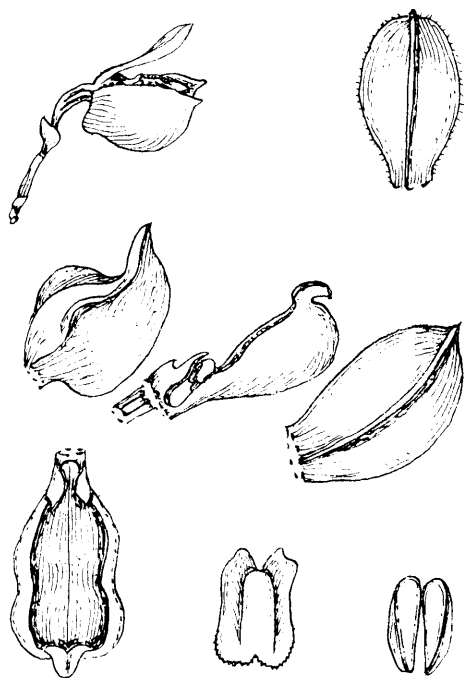


Pedilochilus coiloglossum Schltr.

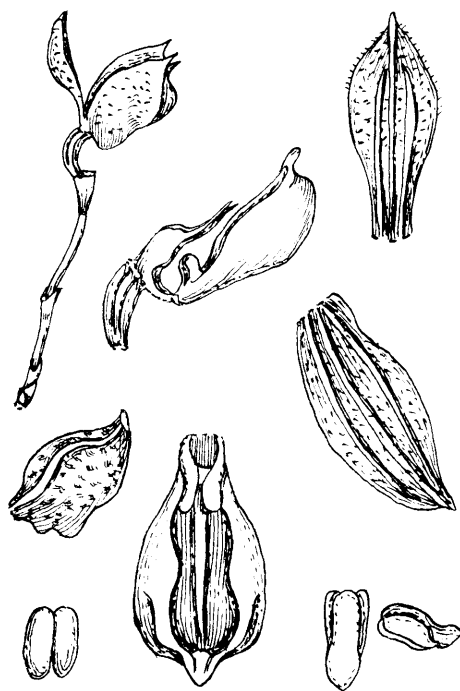


Pedilochilus pusillum Schltr.

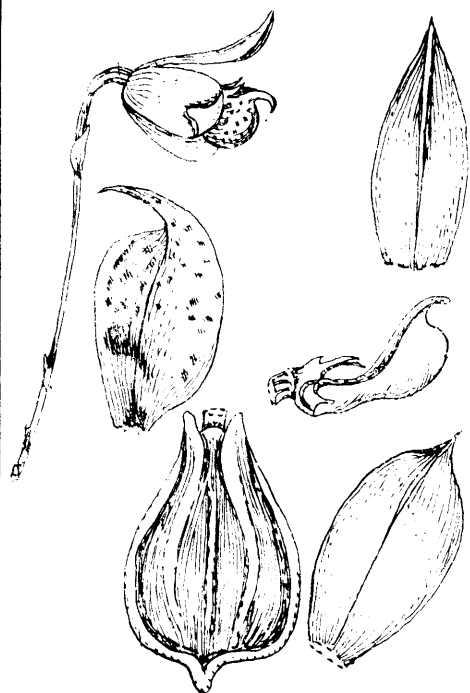




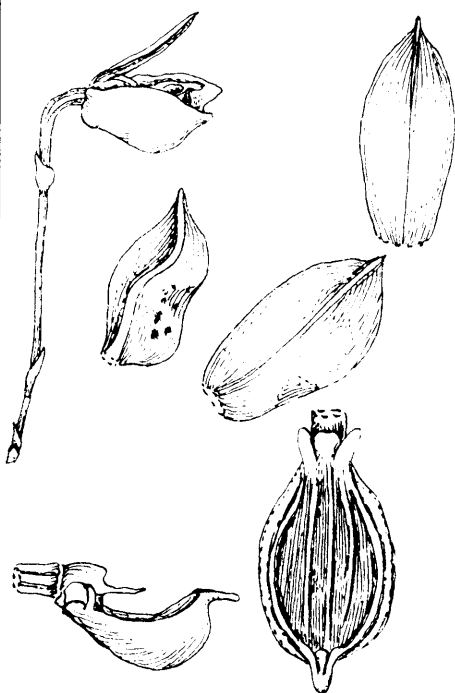
Pedilochilus guttulatum Schltr.



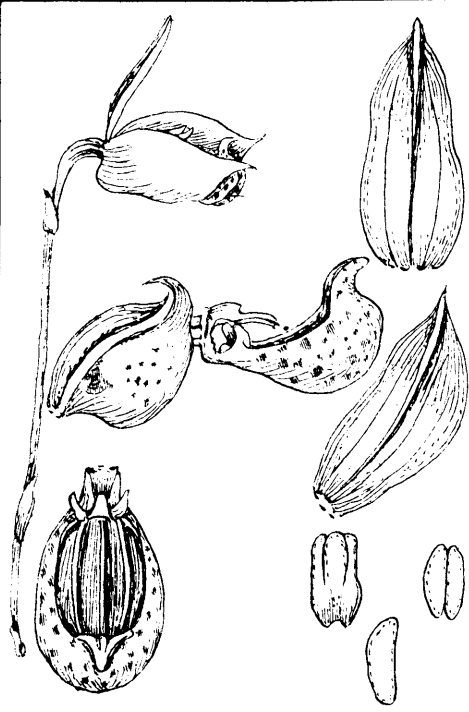
Pedilochilus dischorensense Schltr.



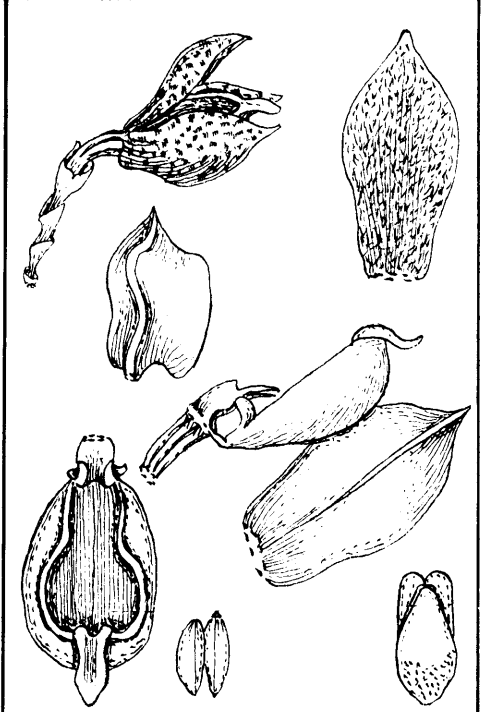
Pedilochilus petiolatum Schltr.



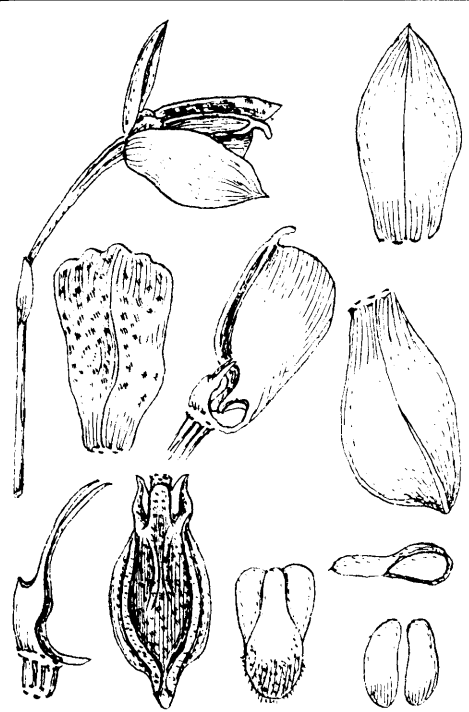
Pedilochus flavum Schltr.



Pedilochilus longipes Schltr.



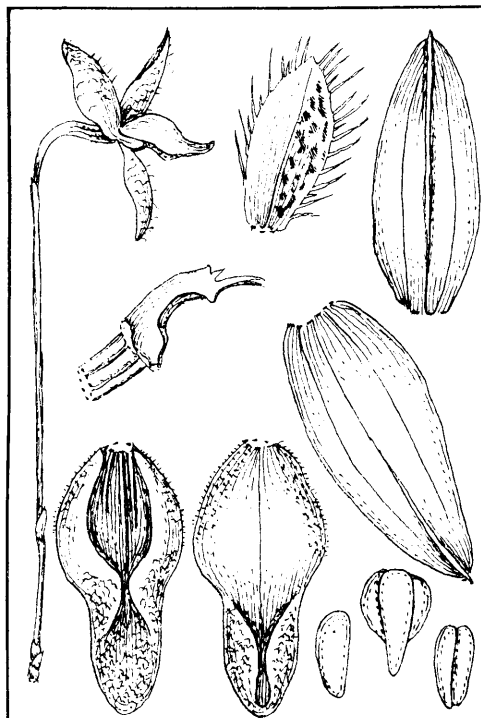
Pedilochilus brachypus Schltr.



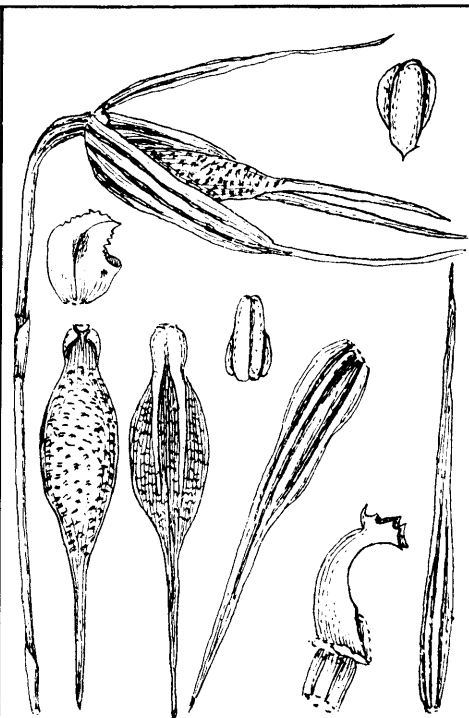
Pedilochilus stictanthum Schltr.



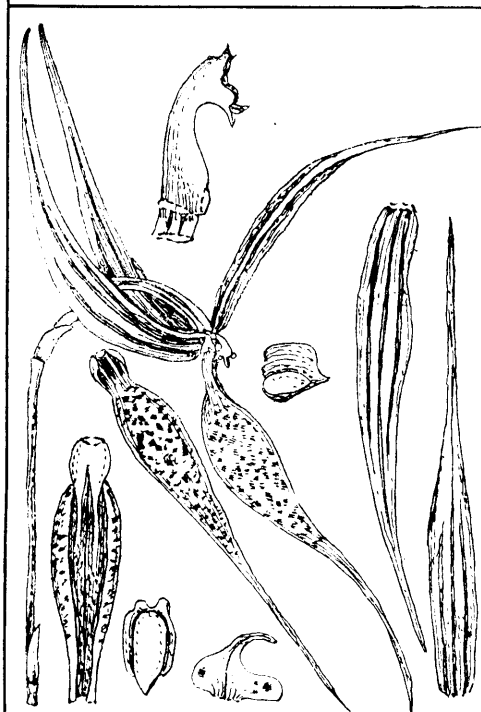
Bulbophyllum cucullatum Schltr.



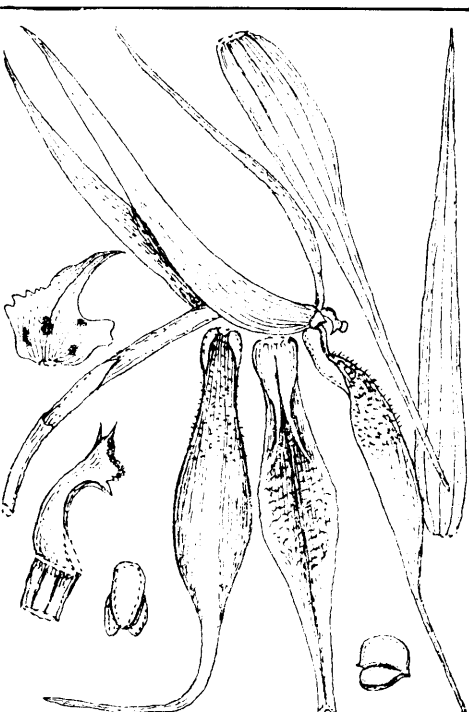
Bulbophyllum scyphochilus Schltr.



Bulbophyllum pulchrum Schltr.



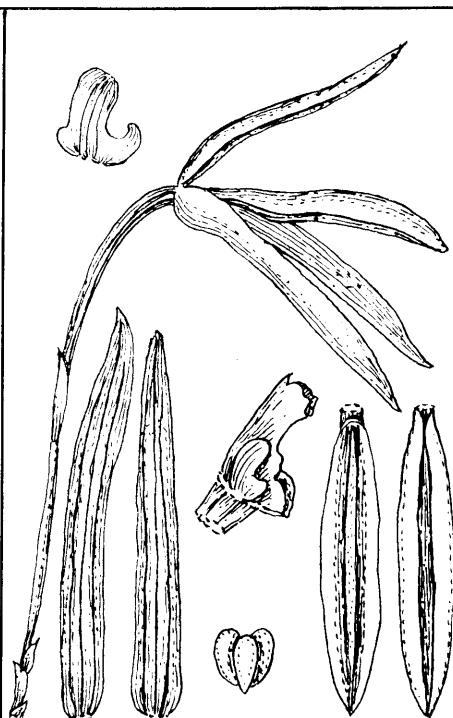
Bulbophyllum nitidum Schltr.



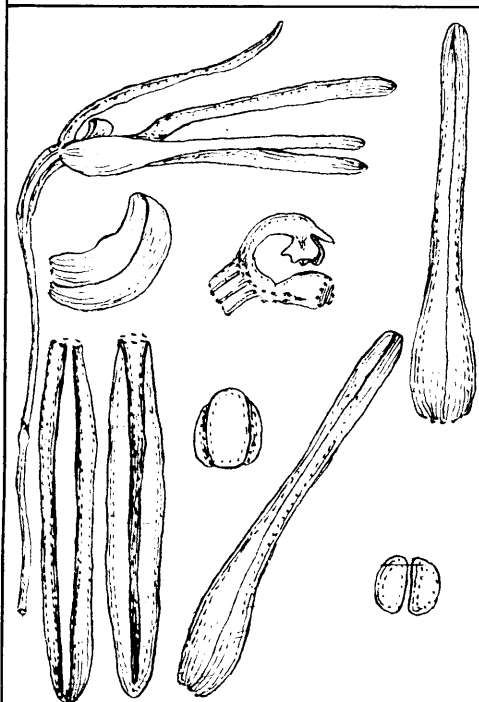
Bulbophyllum formosum Schltr.



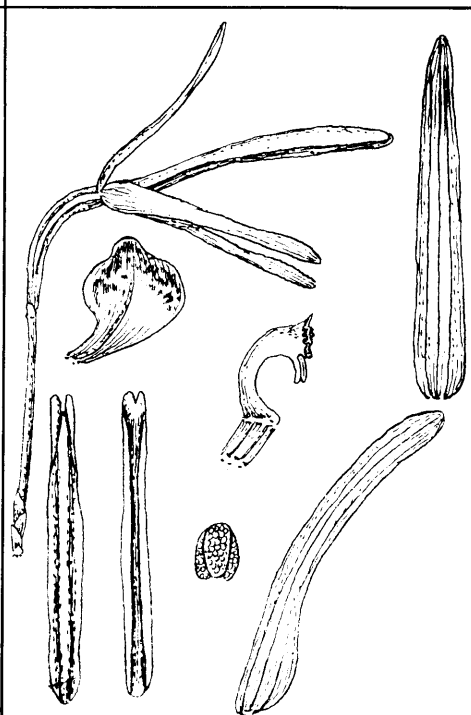
Bulbophyllum speciosum Schltr.



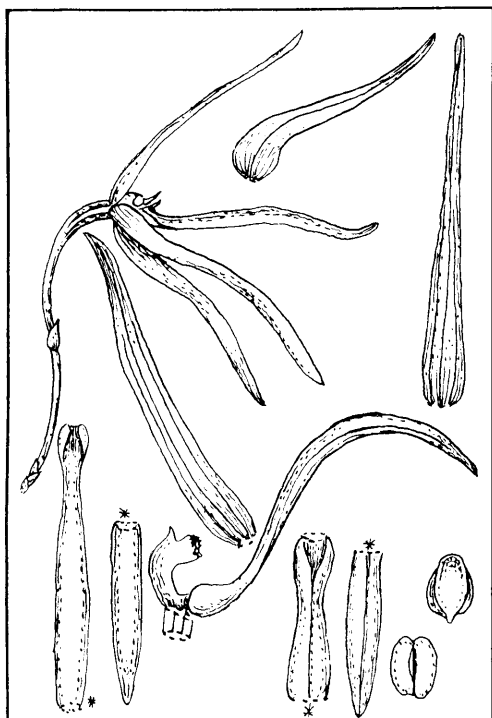
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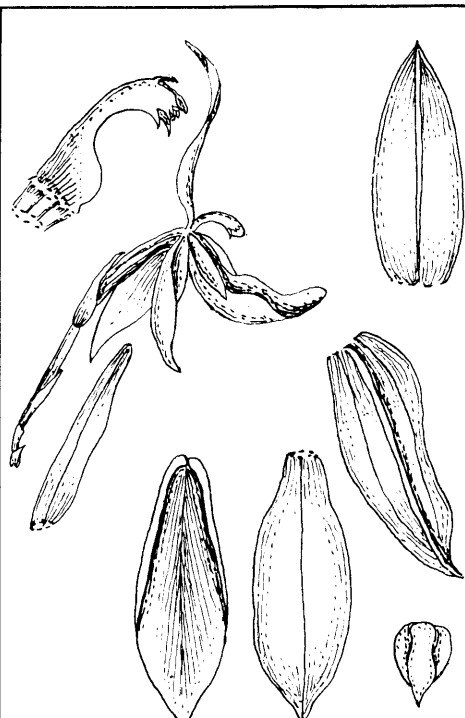
Bulbophyllum longilabre Schltr.



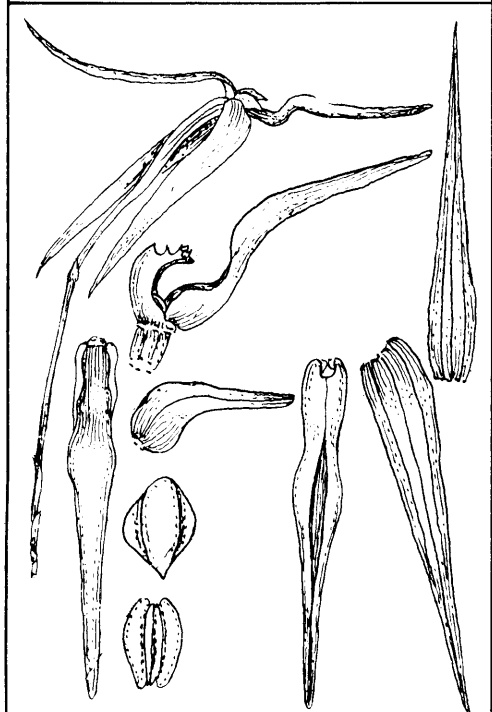
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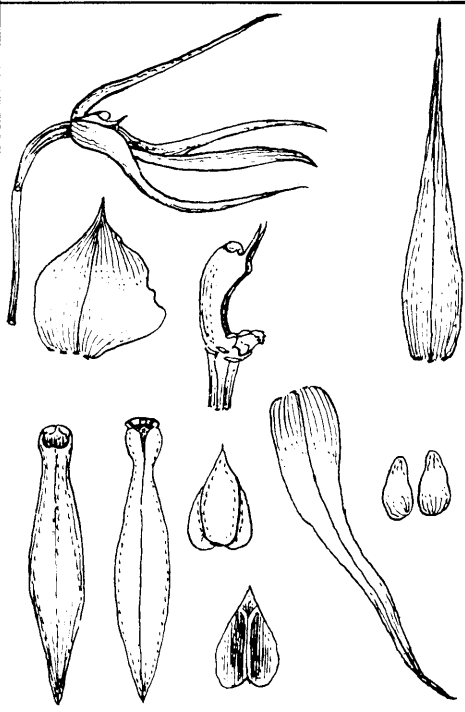
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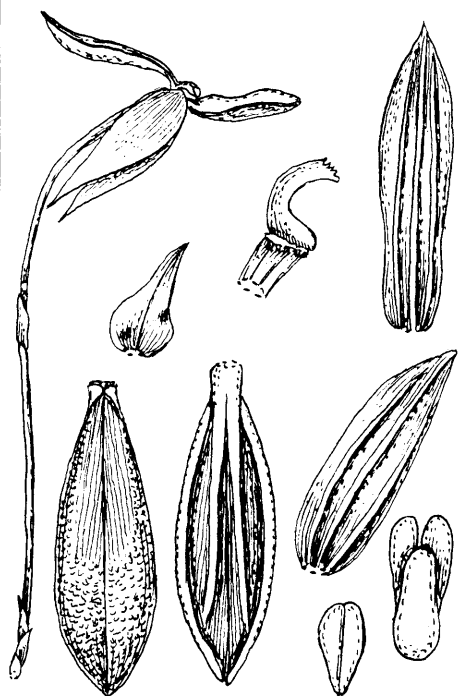
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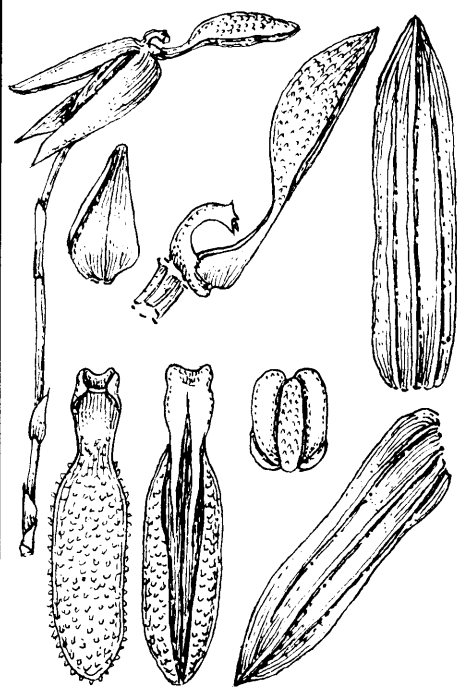
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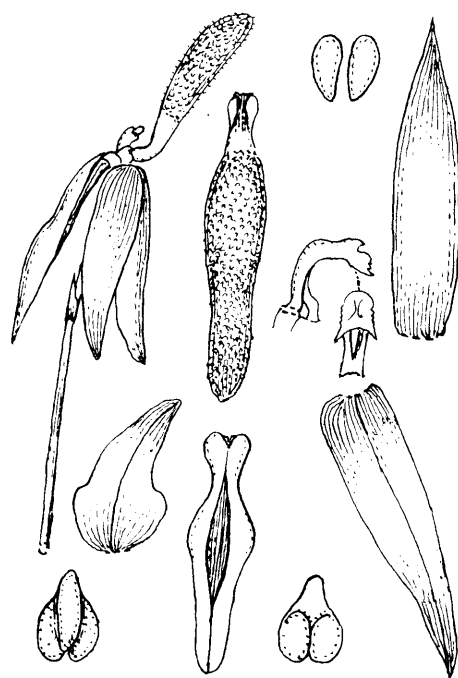
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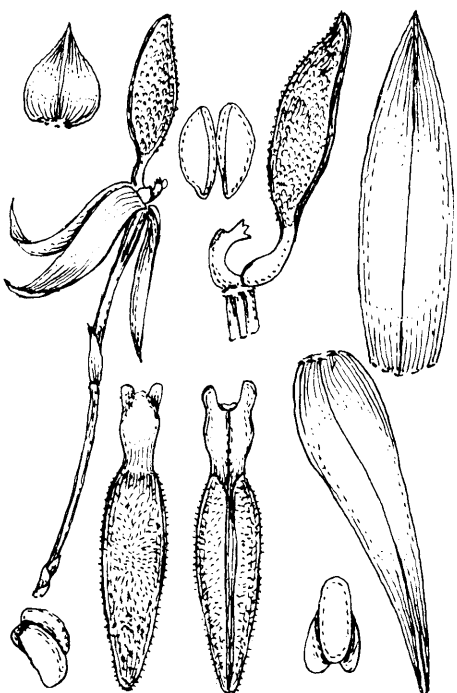
Bulbophyllum gobiense Schltr.



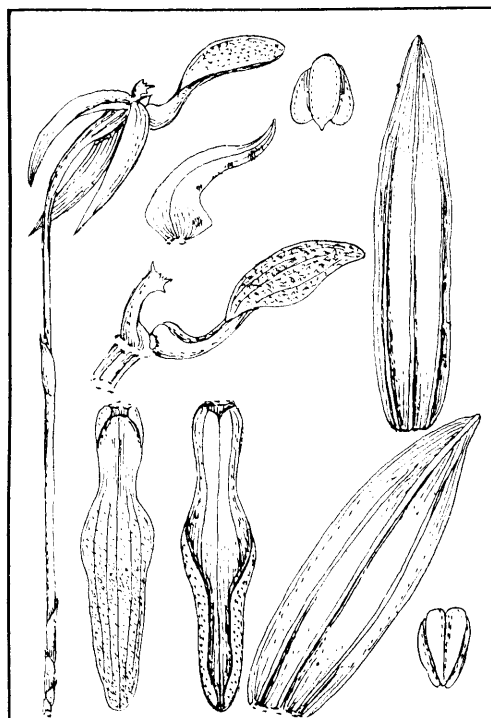
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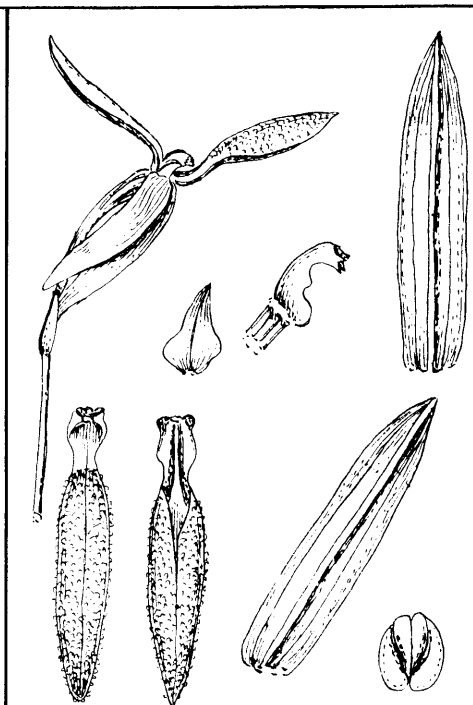
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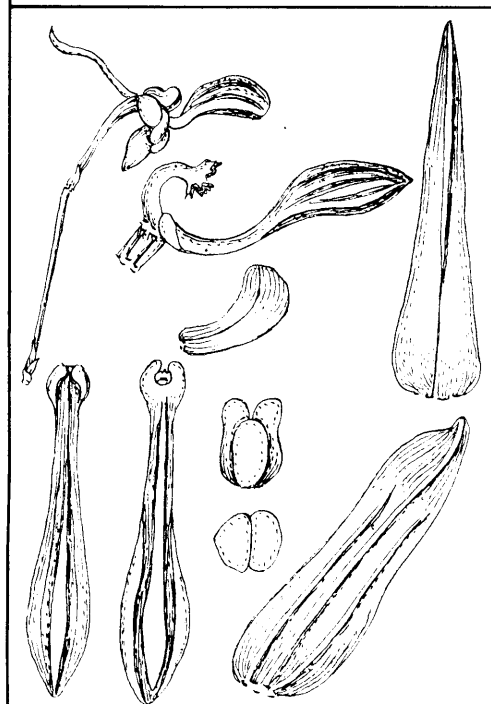
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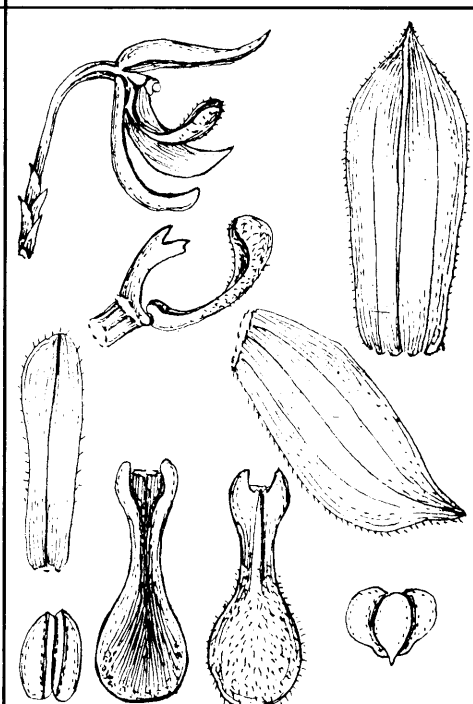
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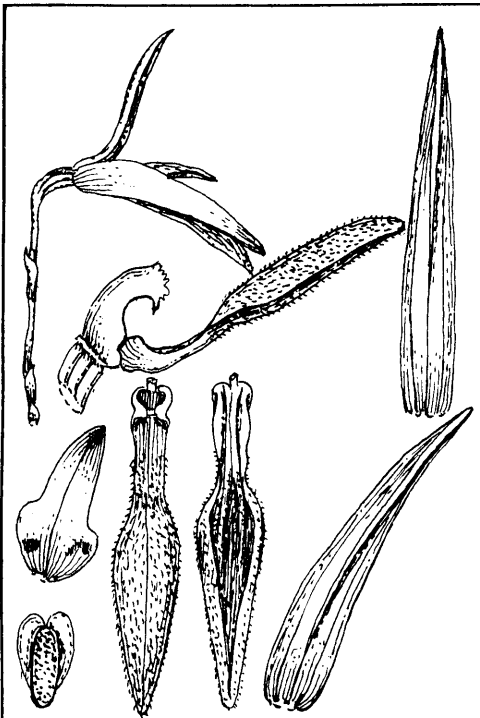
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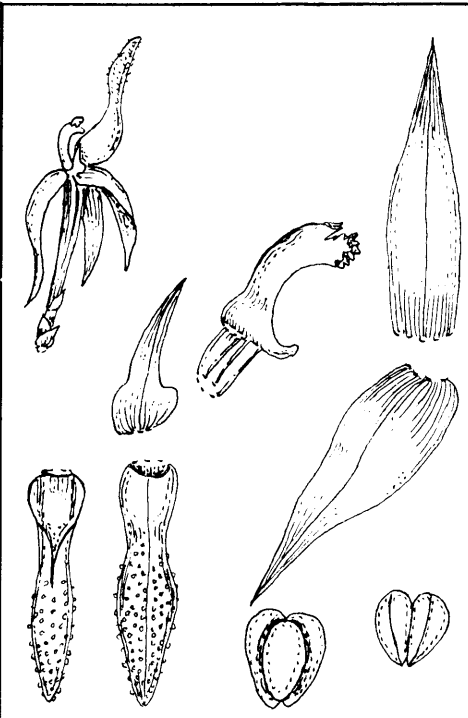
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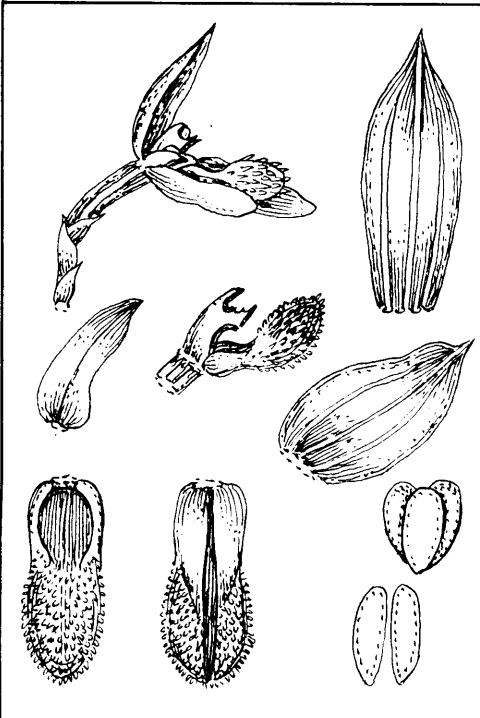
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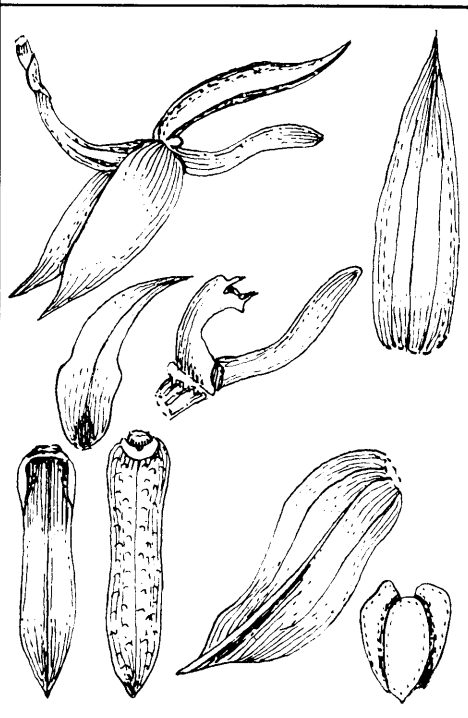
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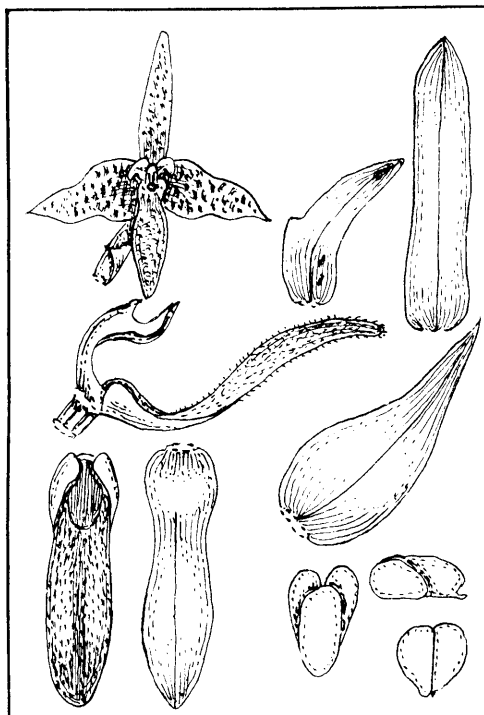
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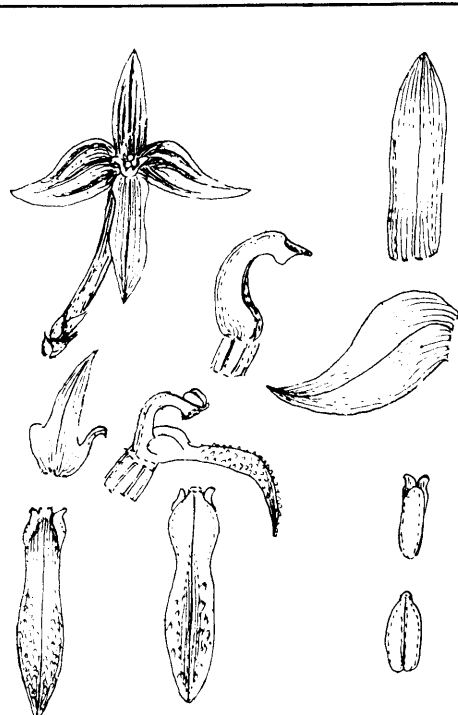
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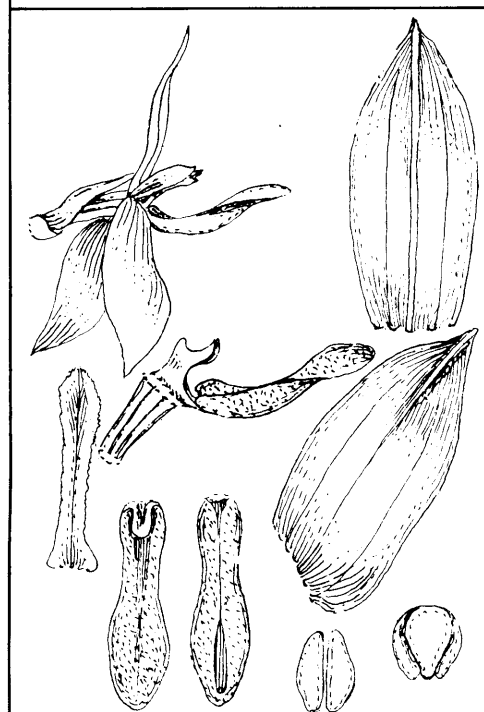
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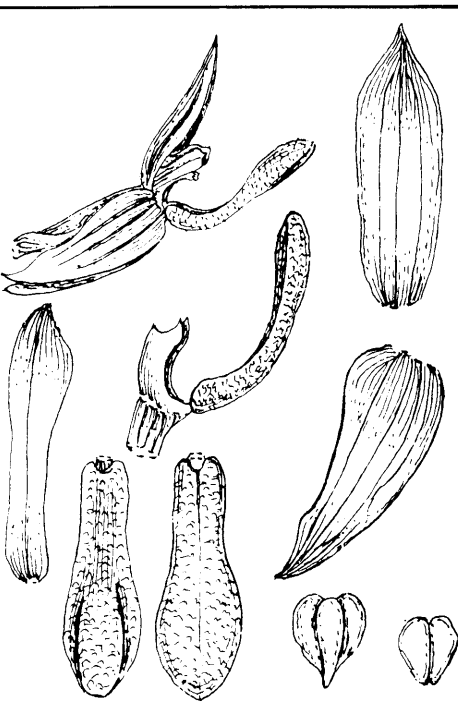
Bulbophyllum cruciatum J.J. Sm.



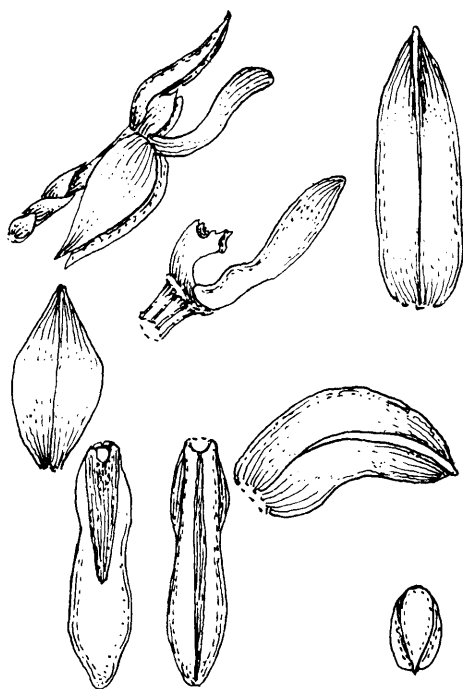
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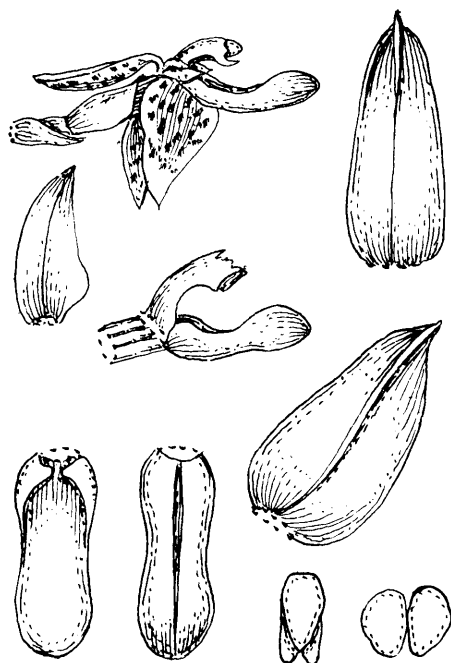
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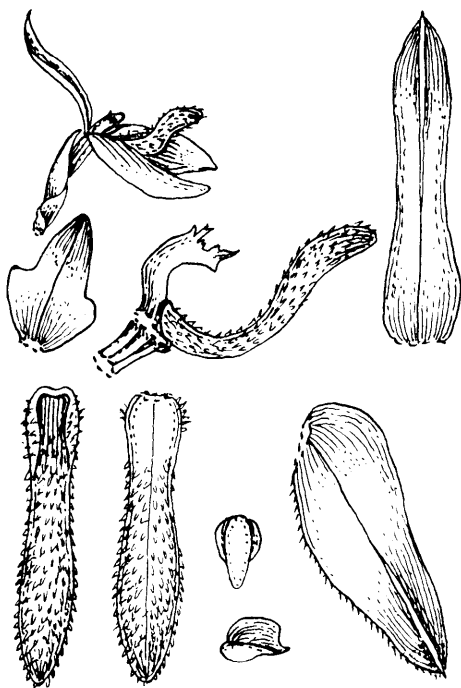
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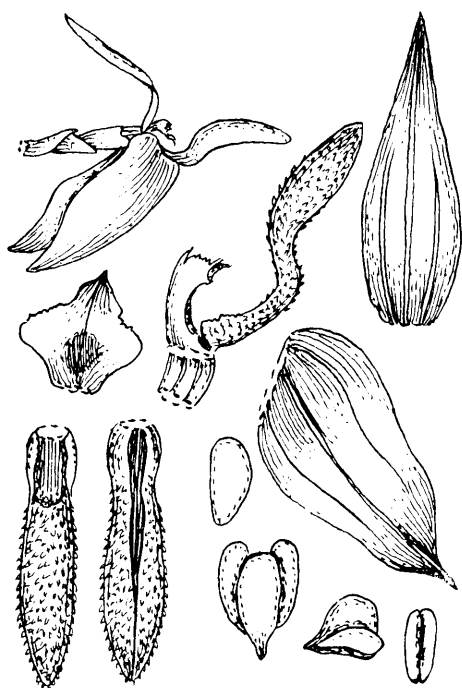
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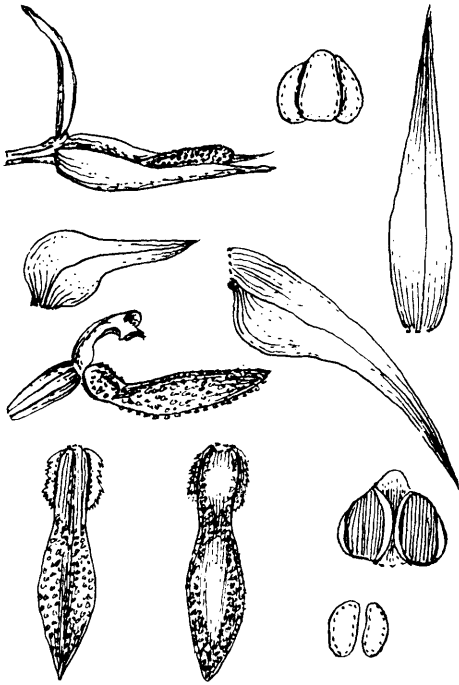
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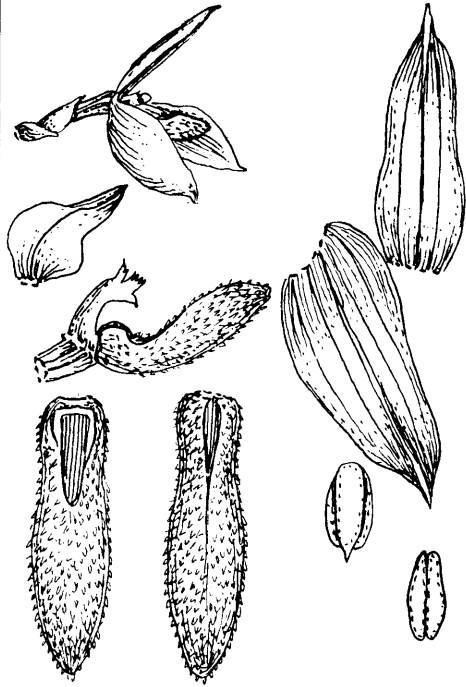
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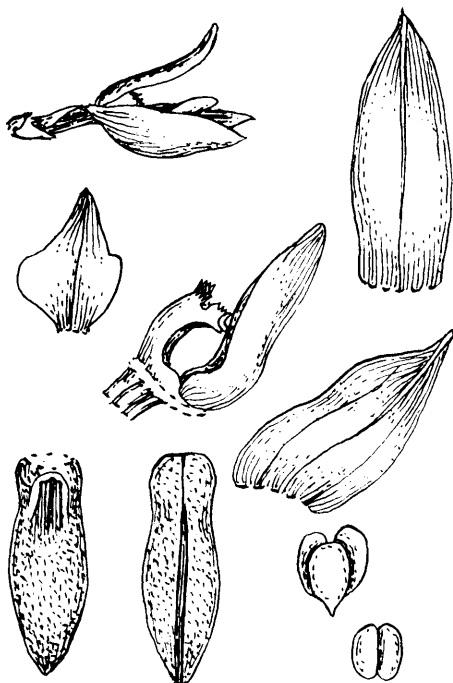
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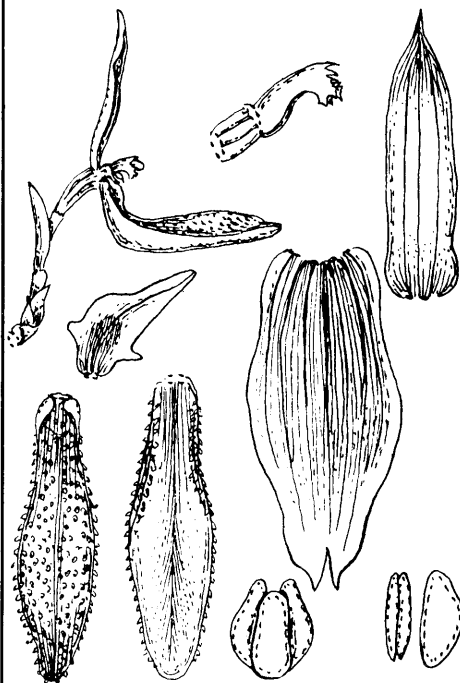
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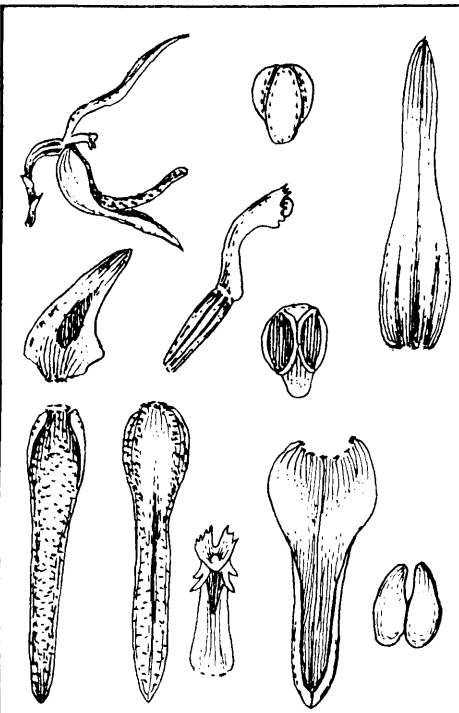
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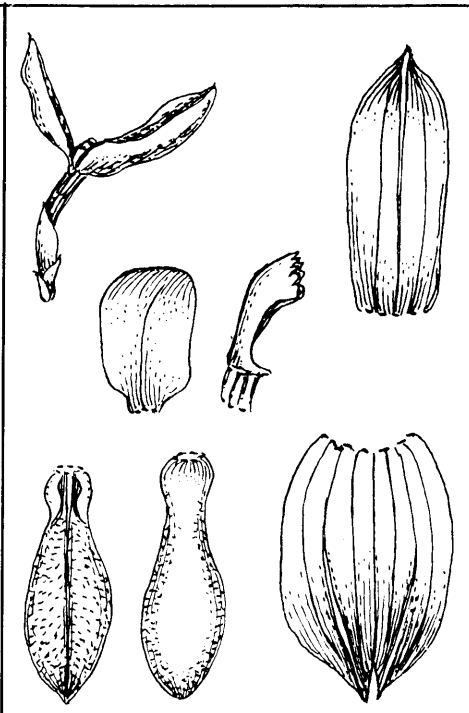
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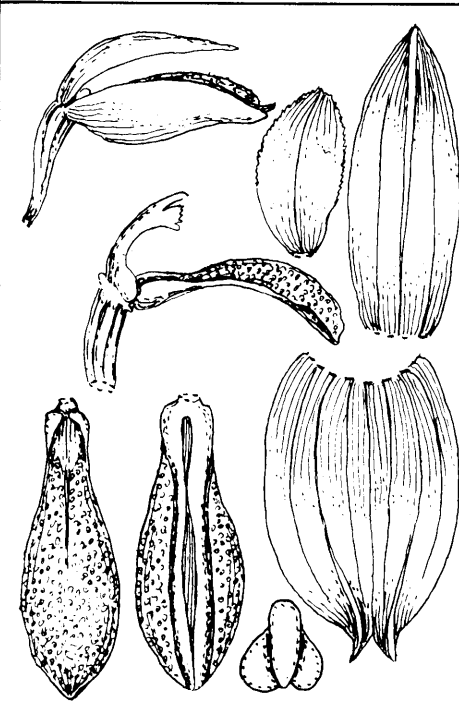
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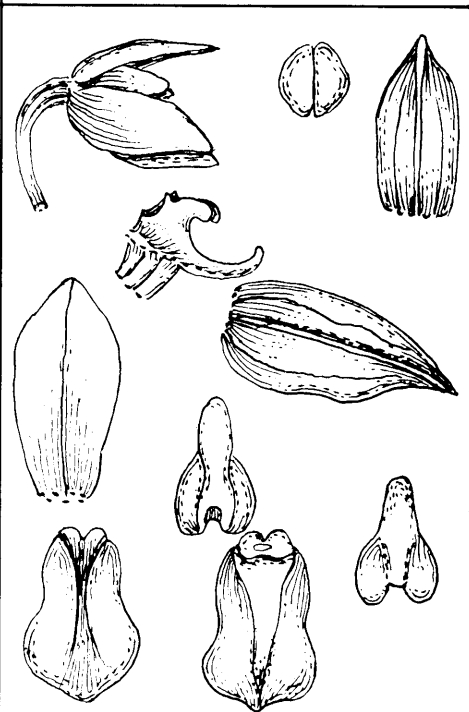
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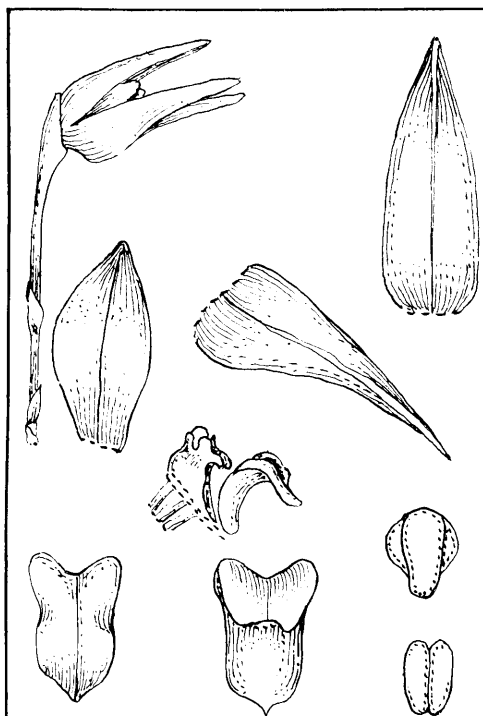
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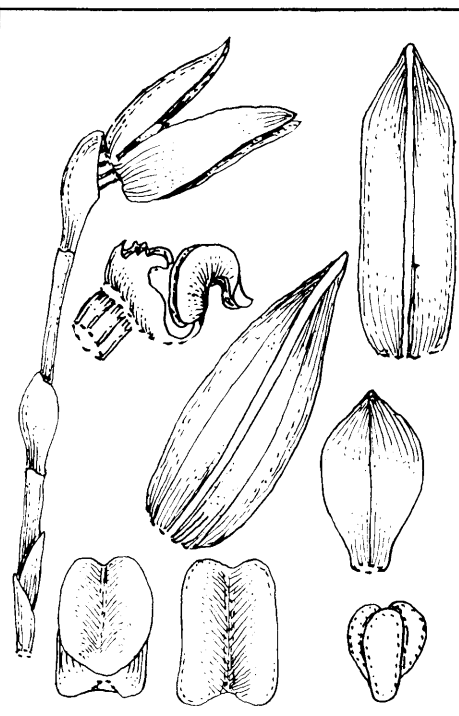
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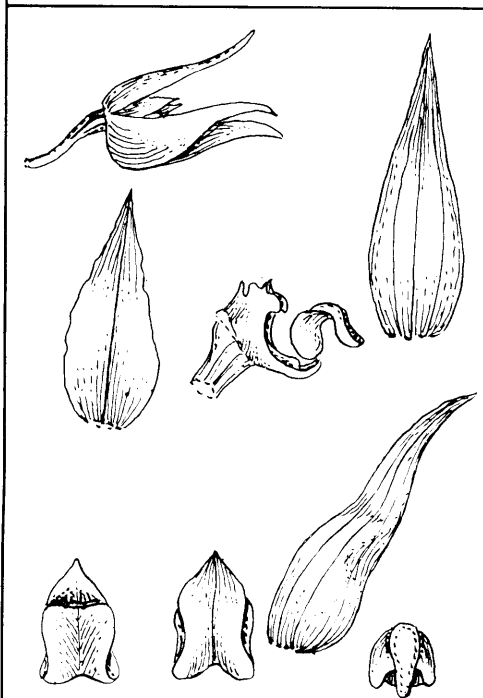
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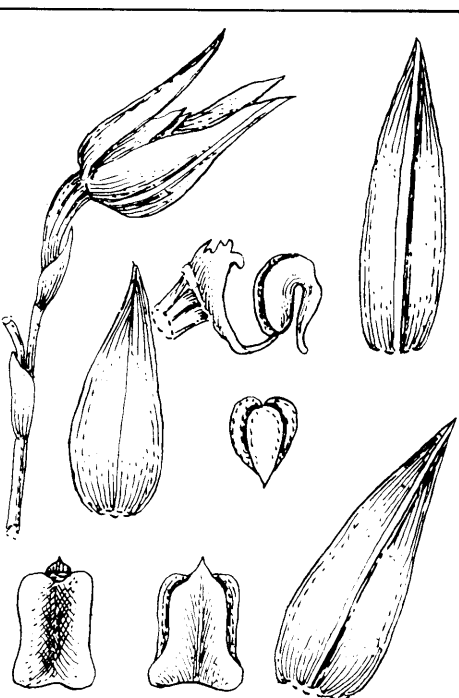
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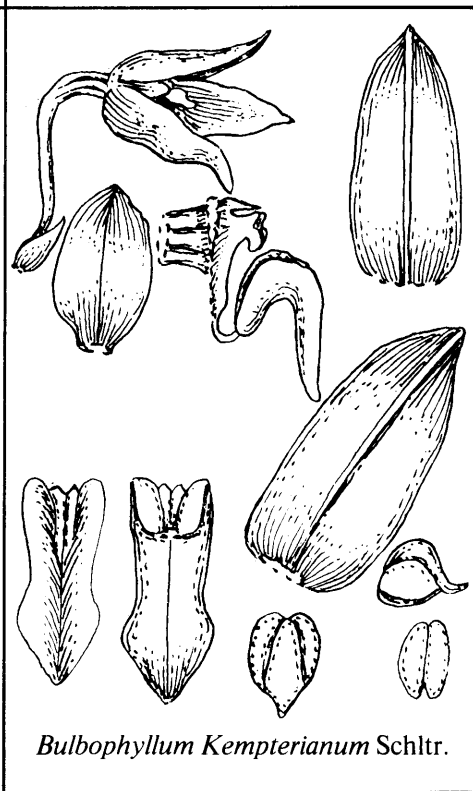
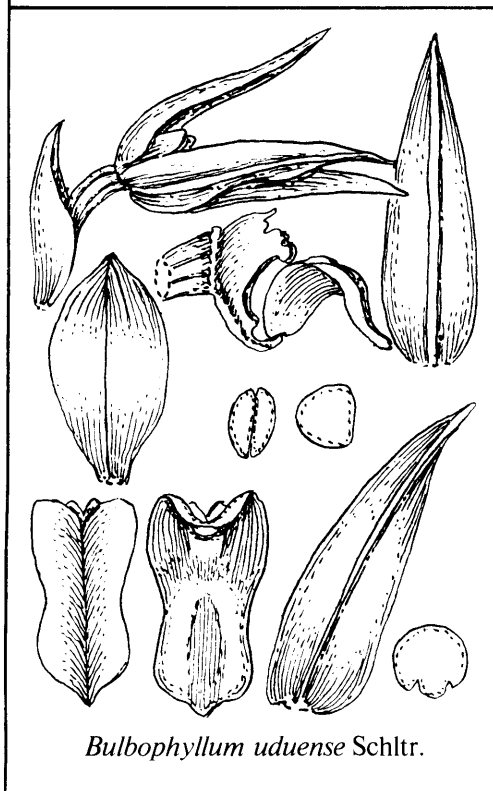
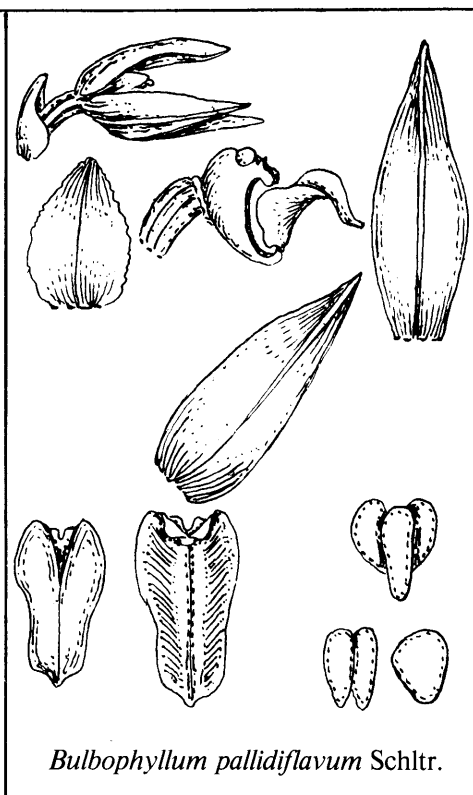
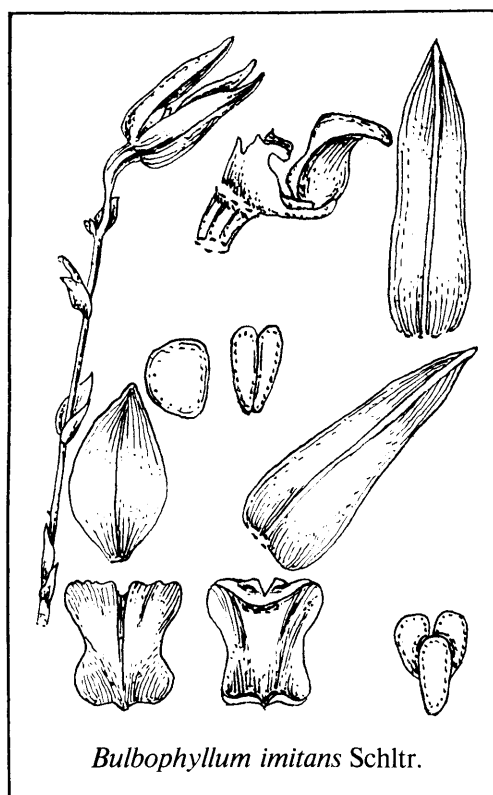
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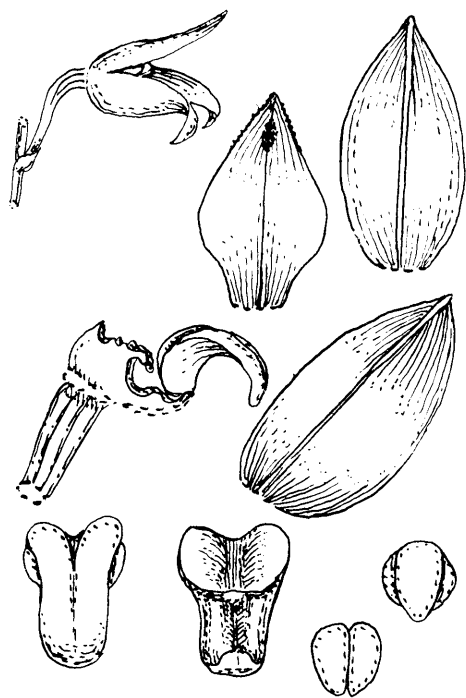


Bulbophyllum manobulbum Schltr.

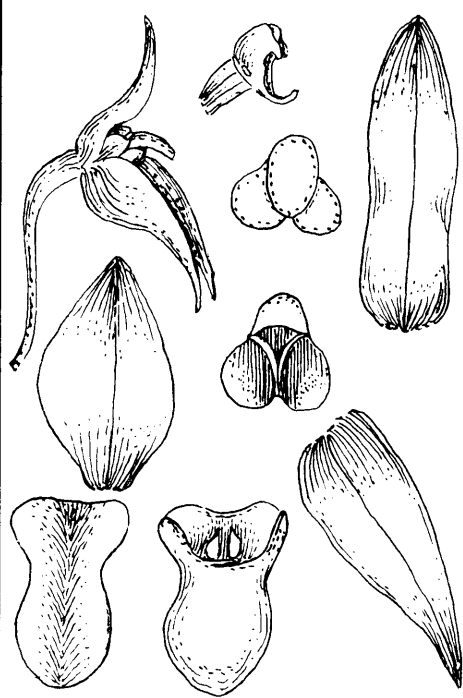


Bulbophyllum Govidjoae Schltr.

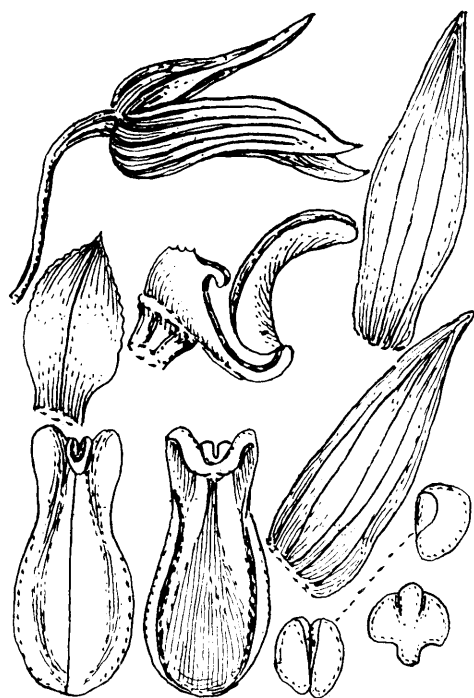




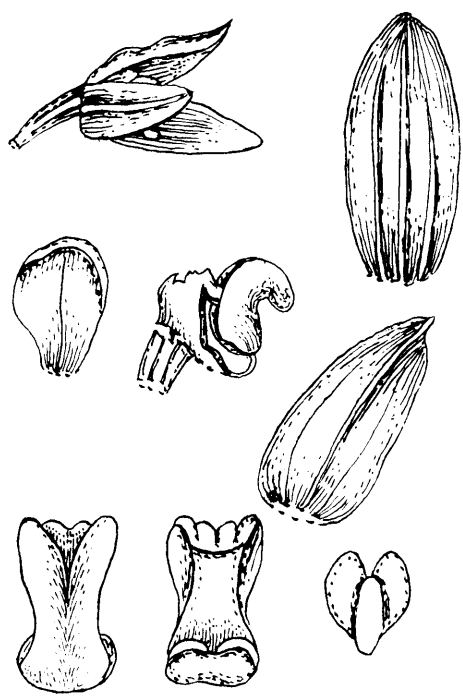
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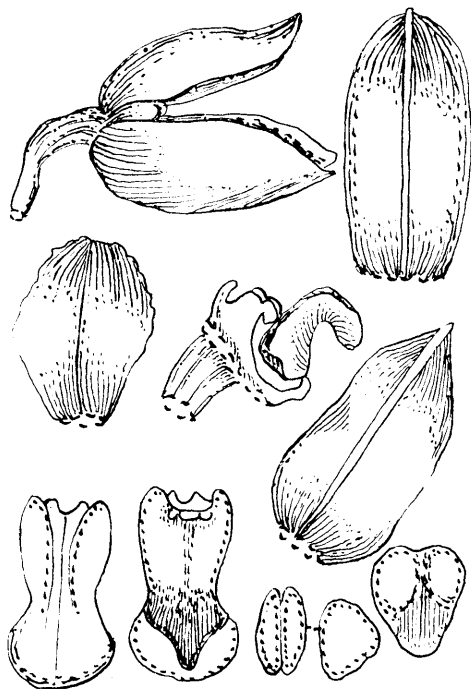
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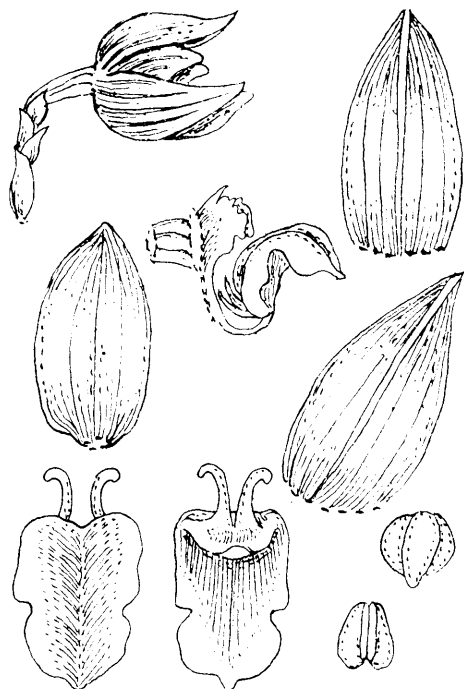
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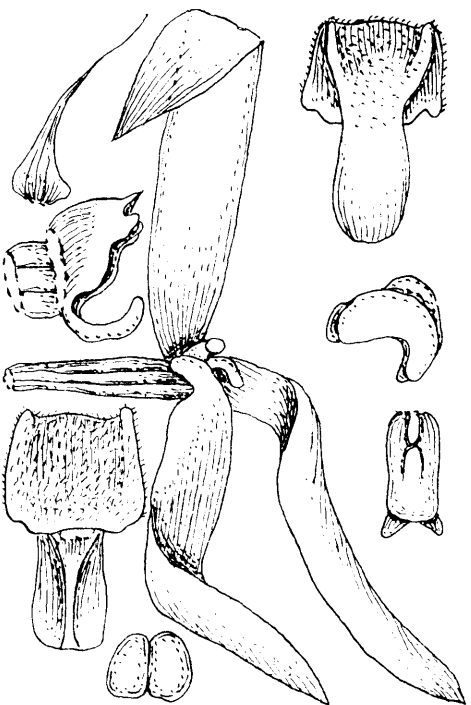
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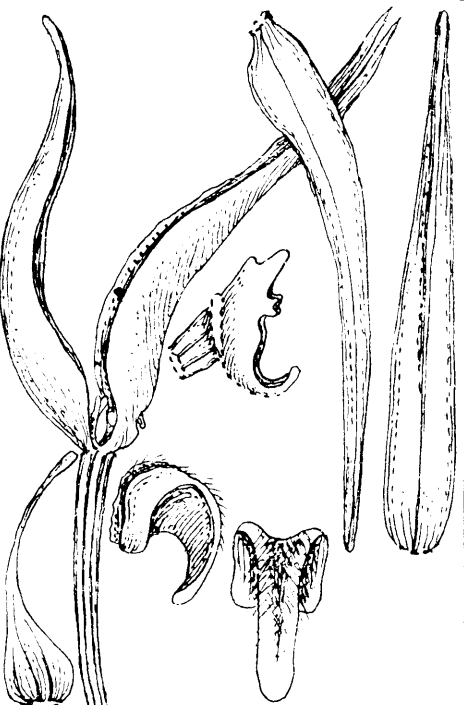
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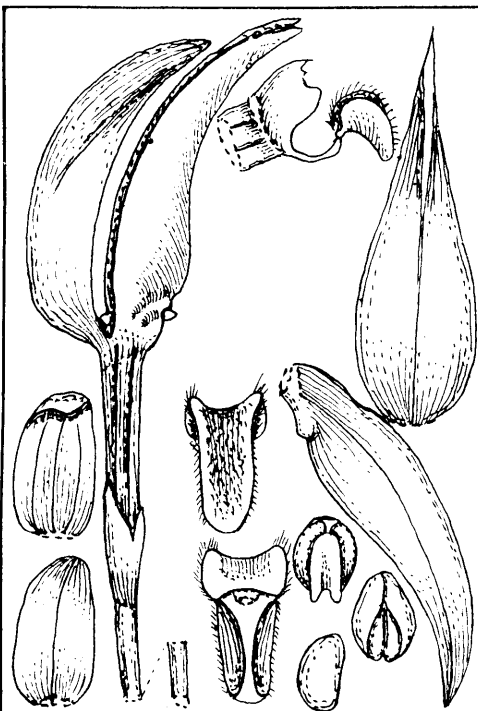
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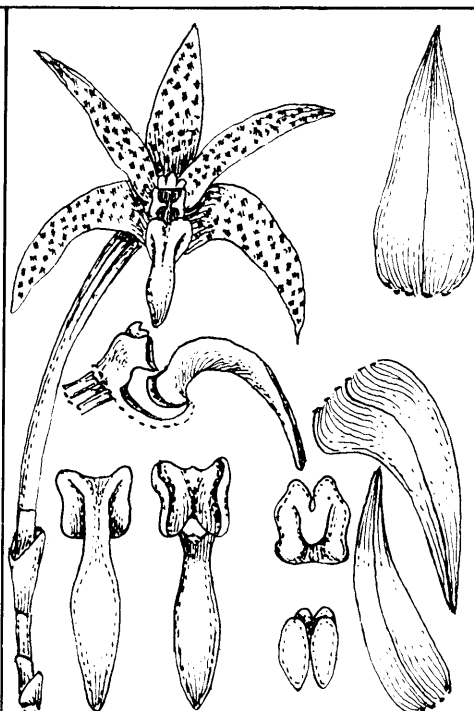
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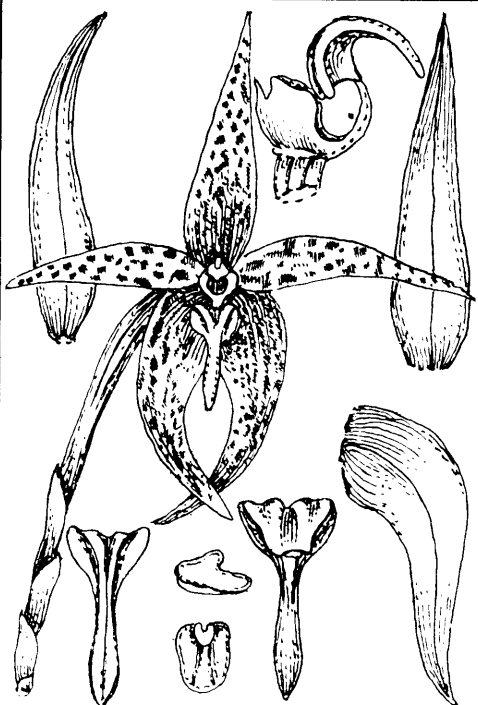
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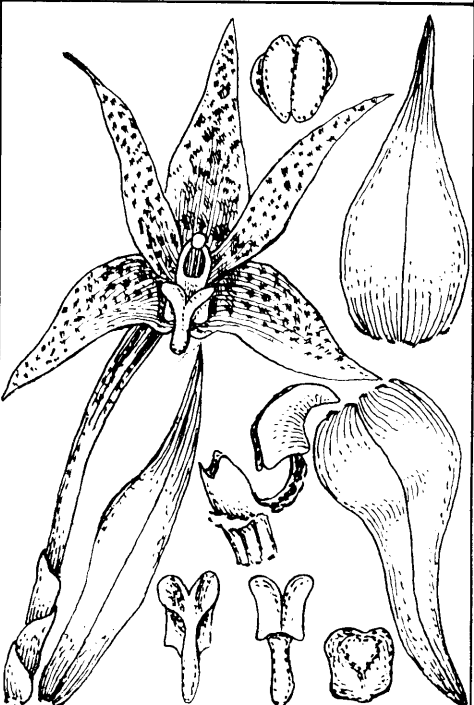
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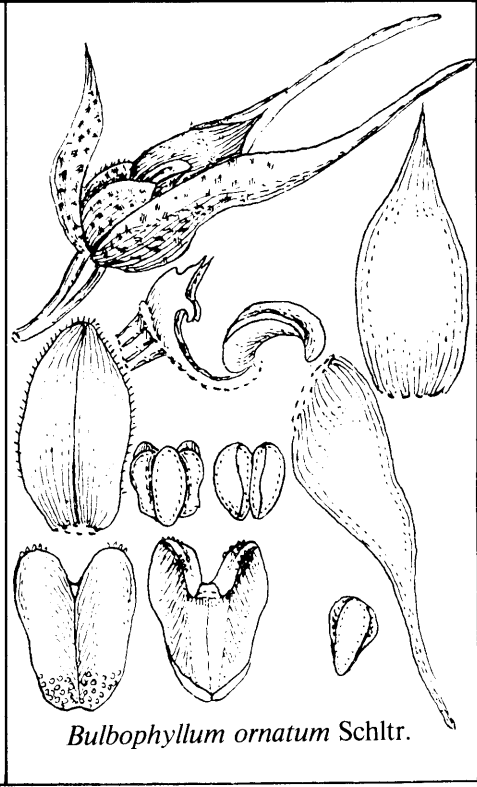
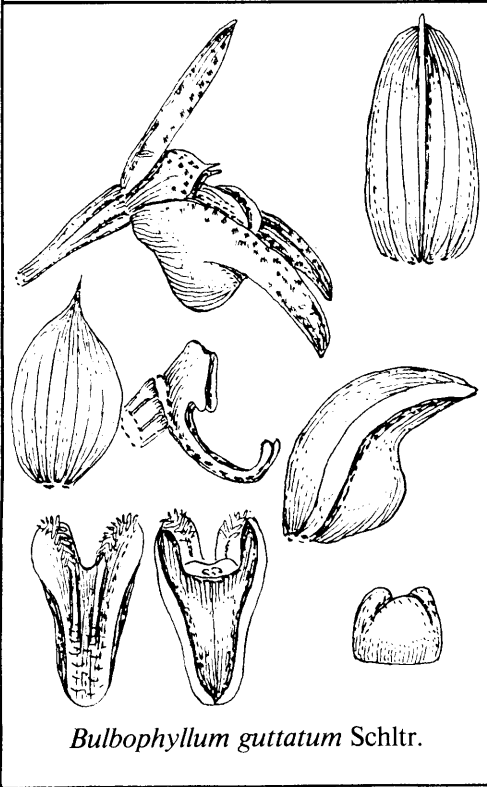
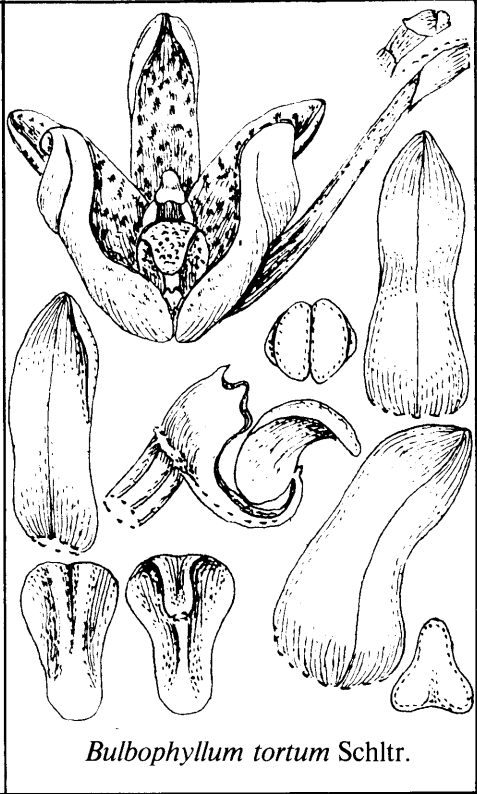
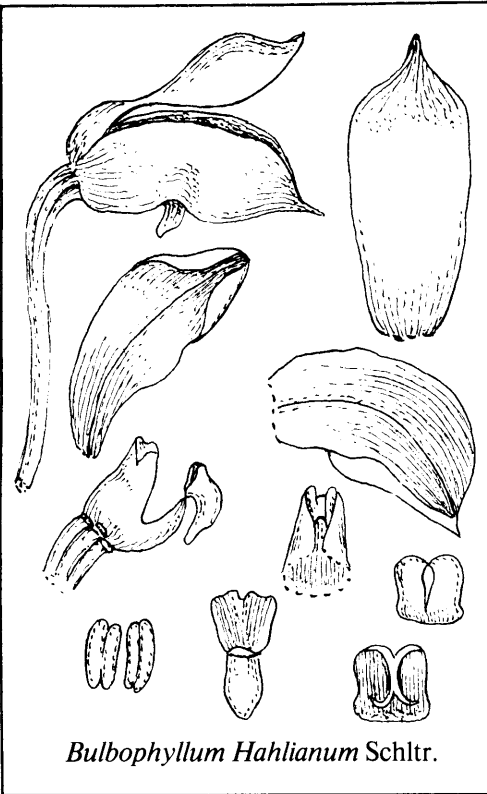
Bulbophyllum Wernerii Schltr.

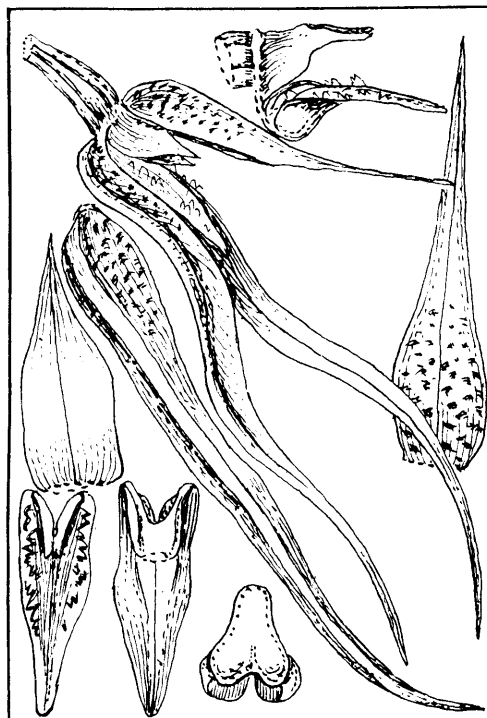


Bulbophyllum grandifolium Schltr.

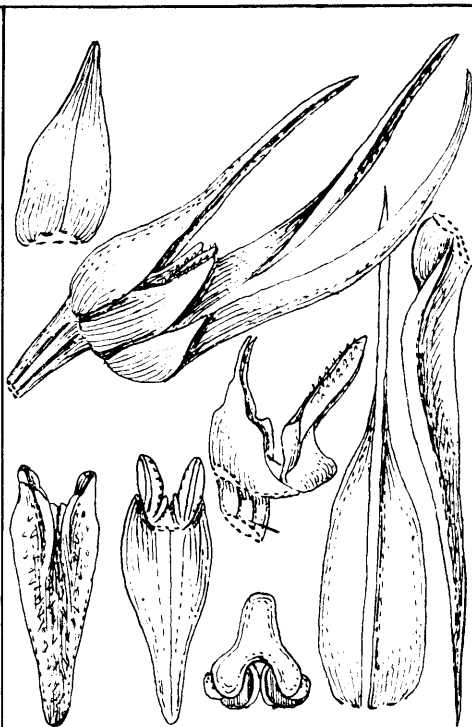


Bulbophyllum truncicola Schltr.

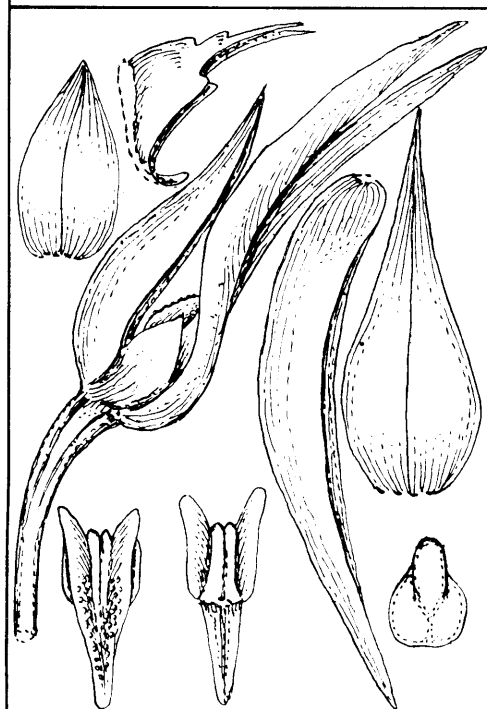




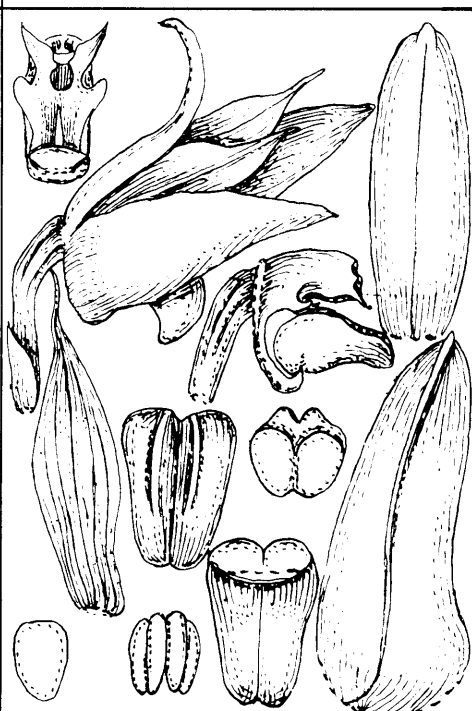
Bulbophyllum odontoglossum Schltr.



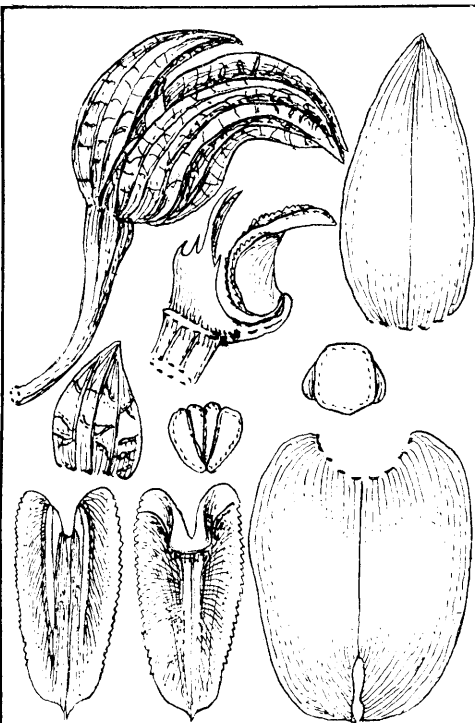
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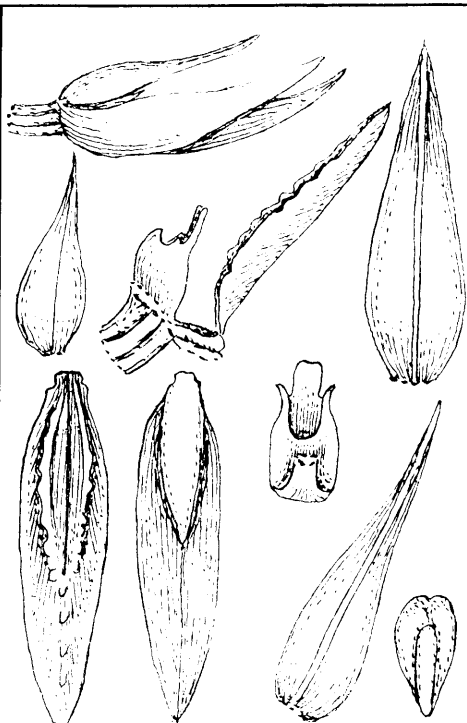
Bulbophyllum oobulbum Schltr.



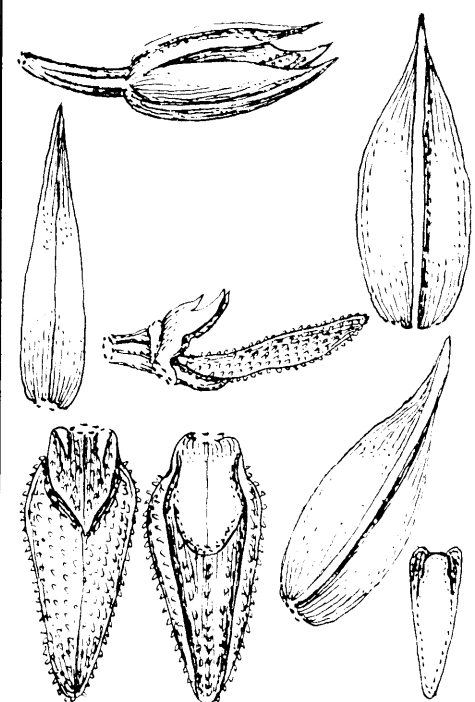
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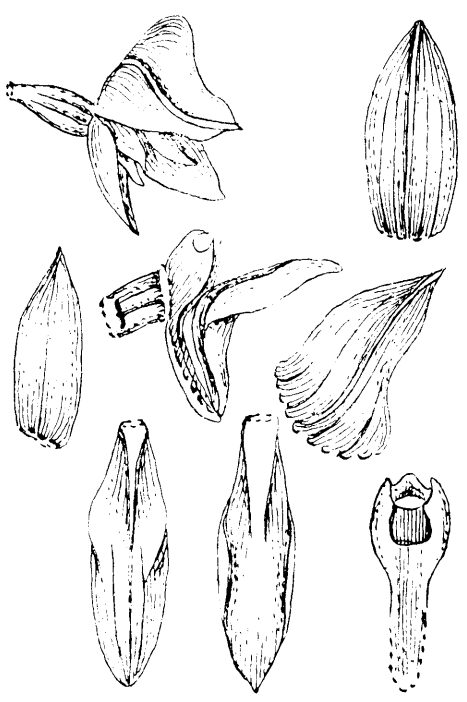
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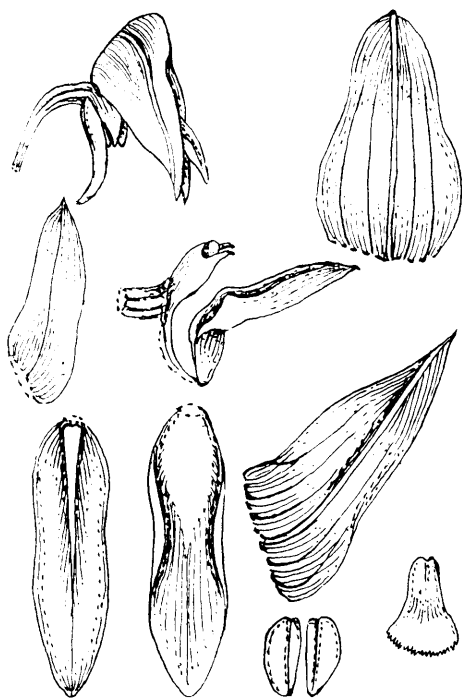
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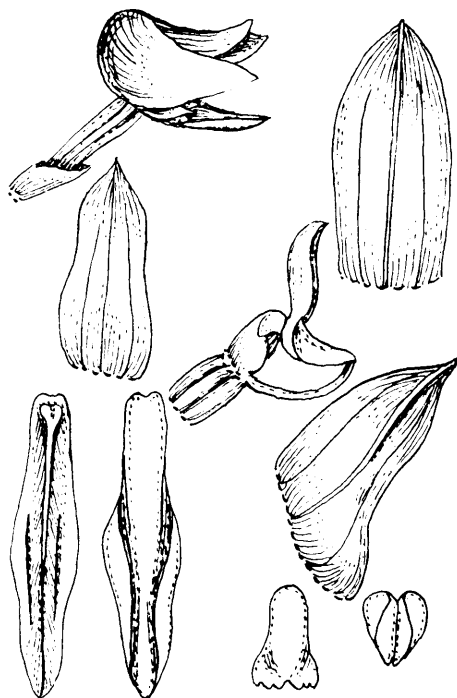
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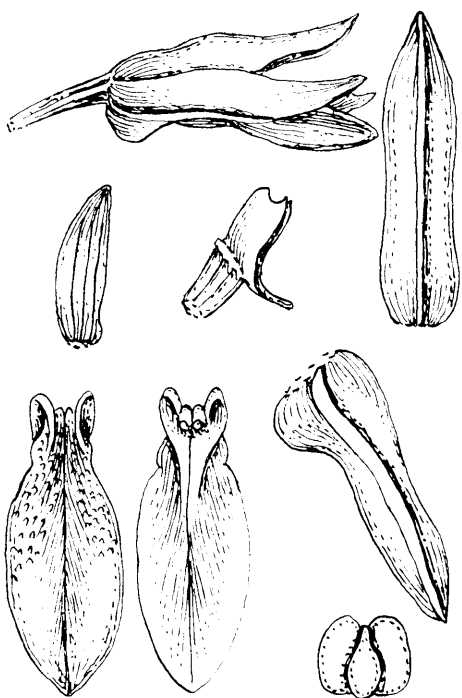
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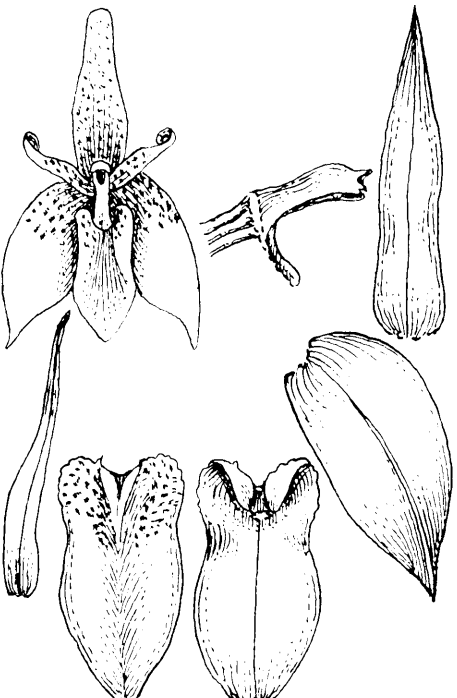
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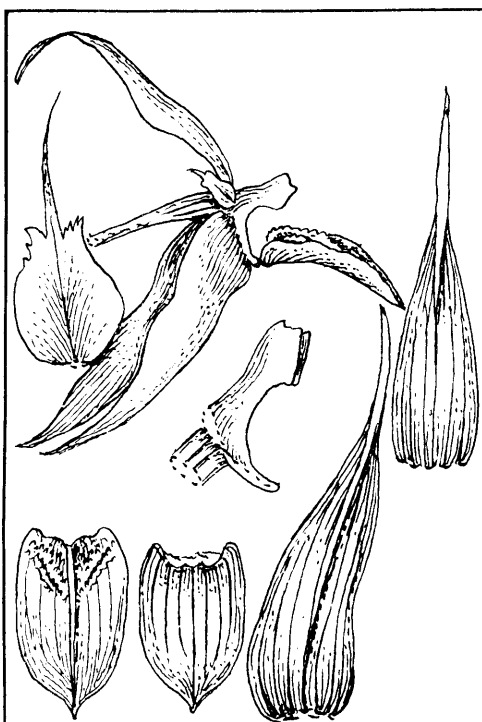
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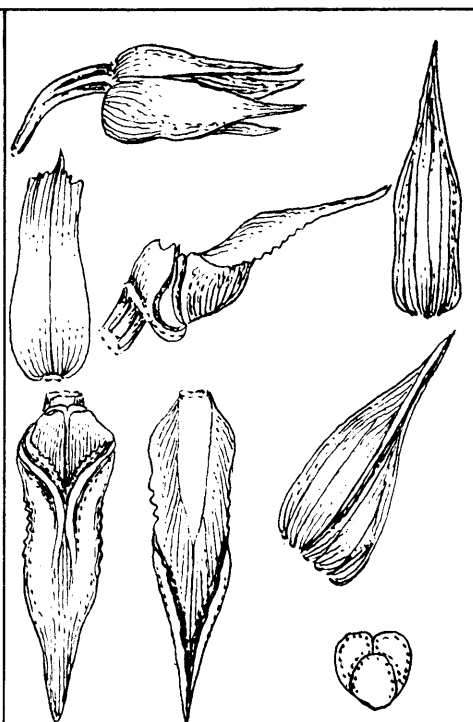
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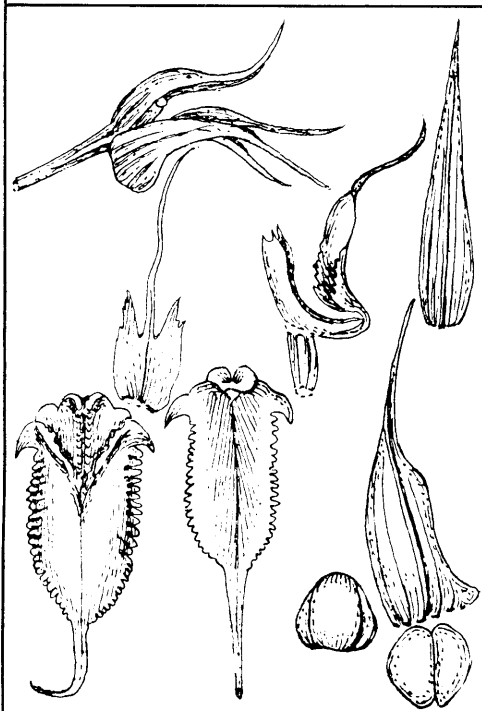
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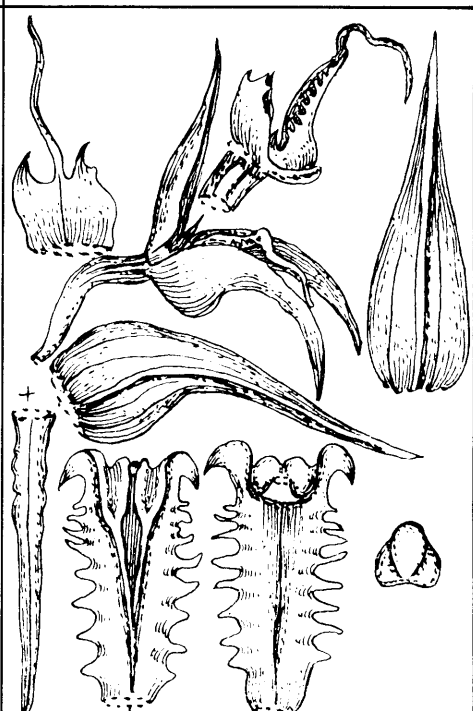
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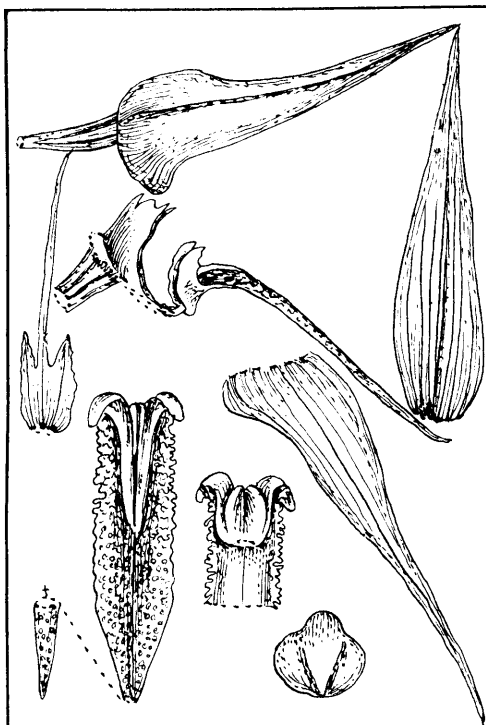
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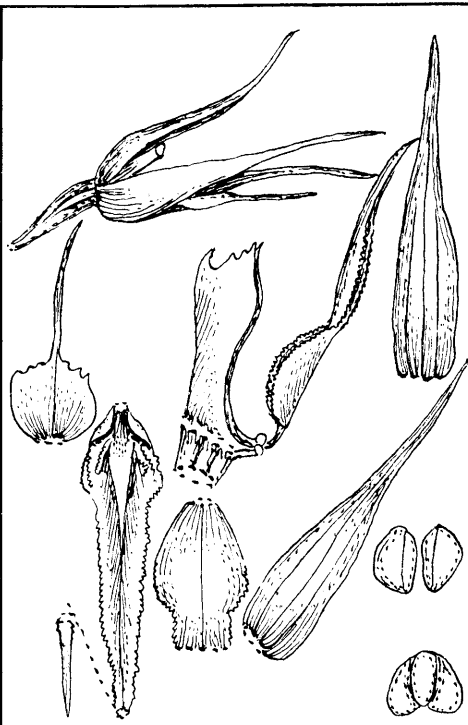
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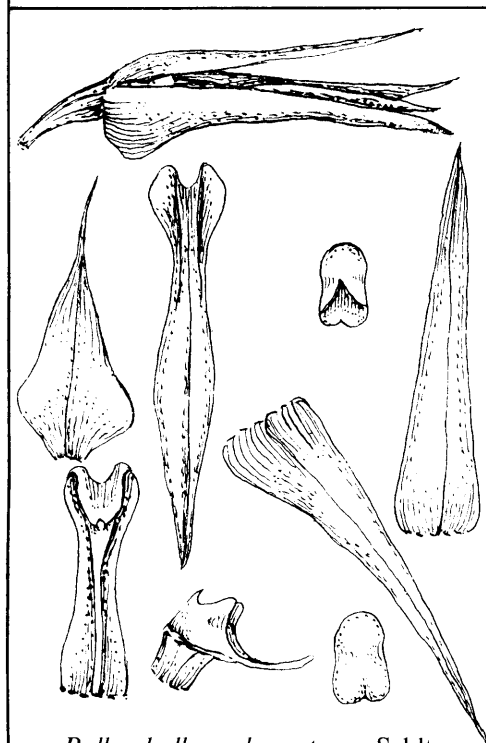
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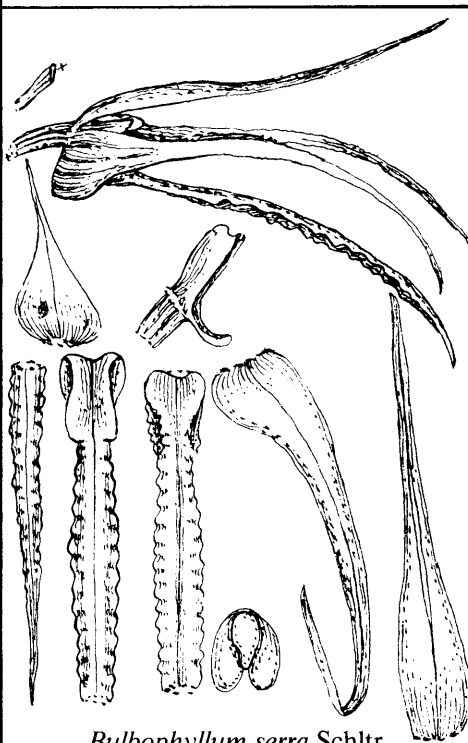
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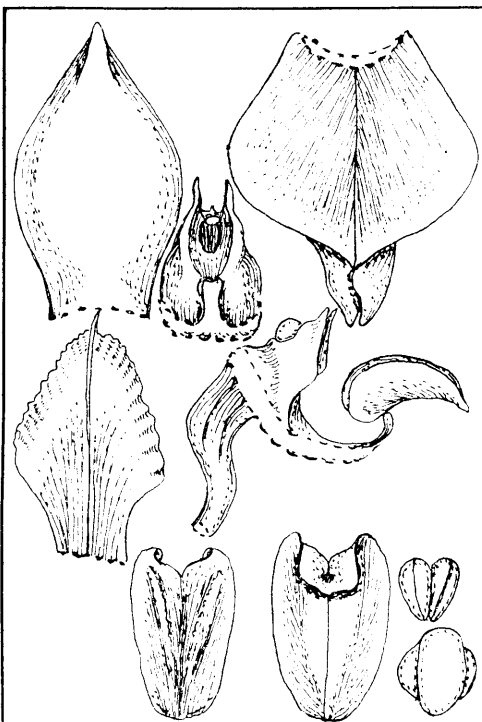
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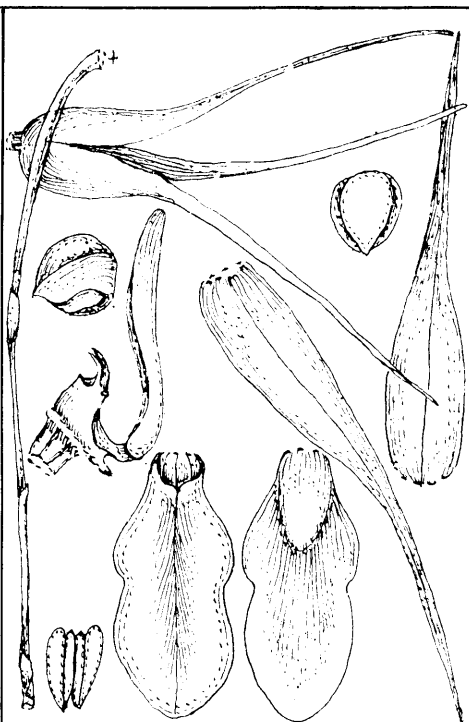
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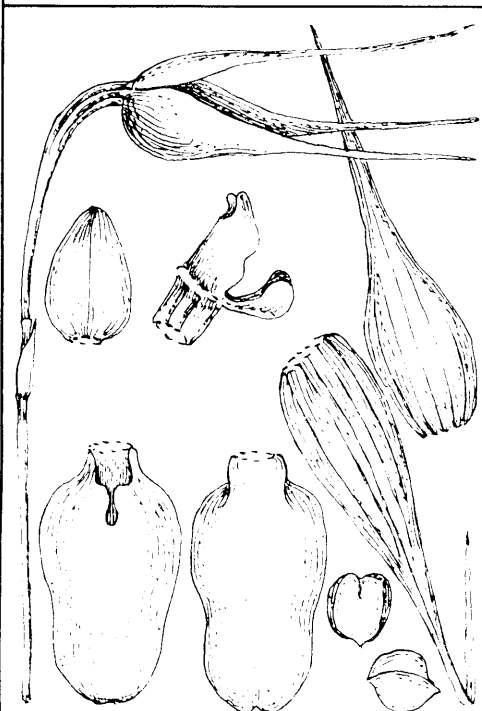
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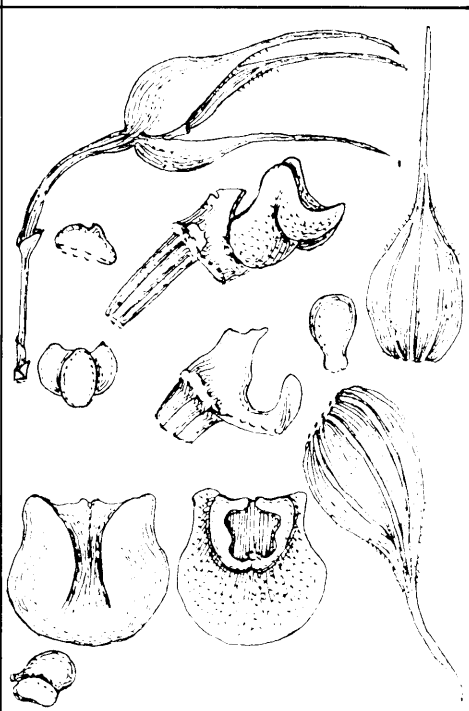
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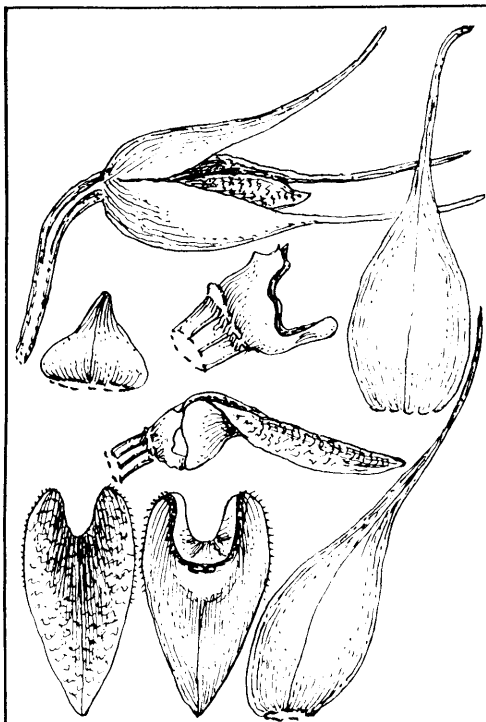
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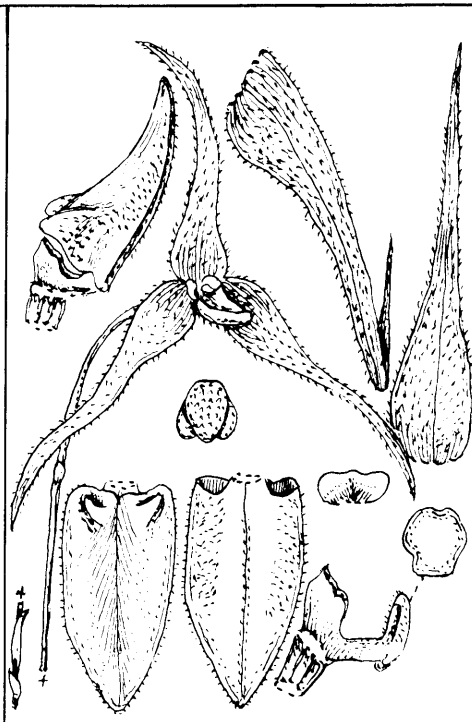
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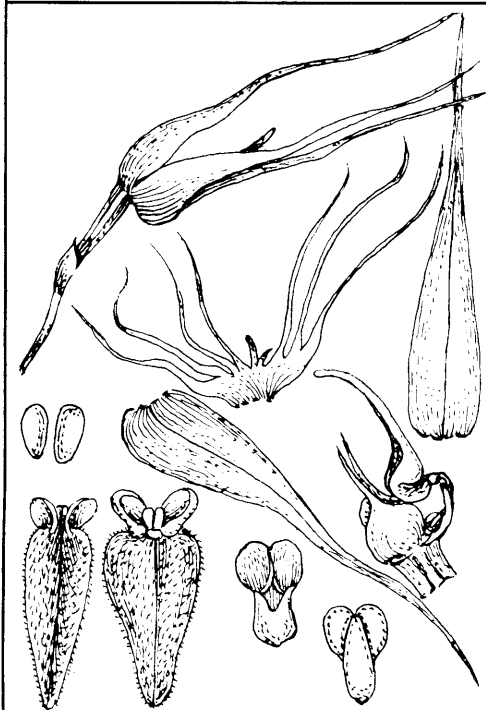
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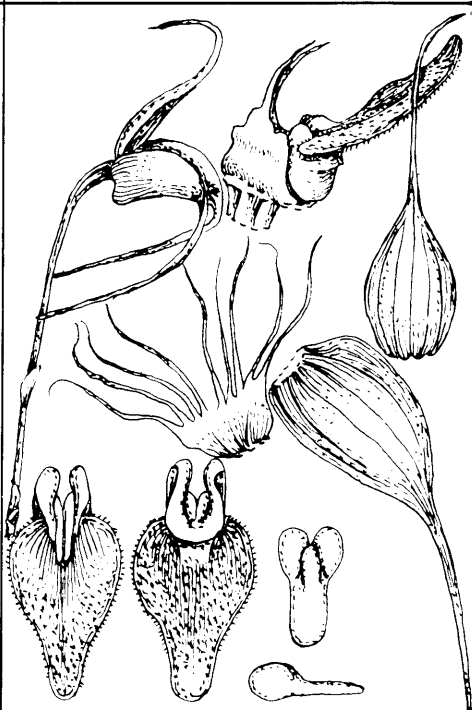
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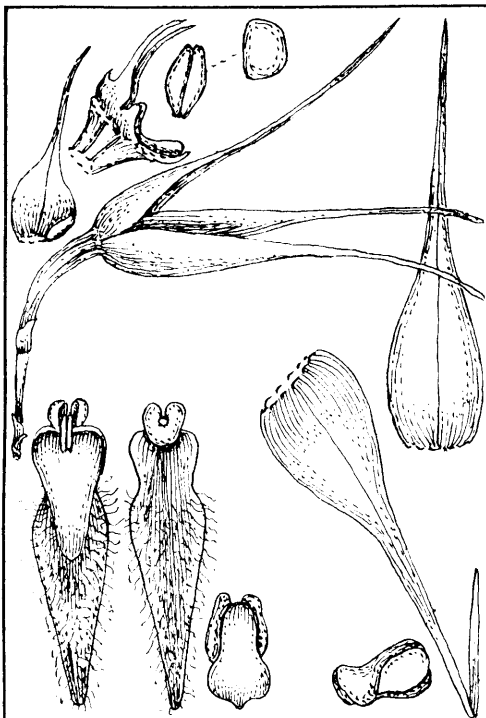
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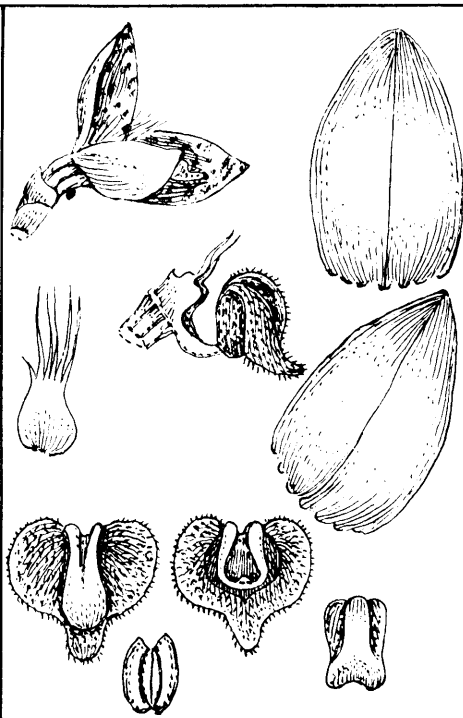
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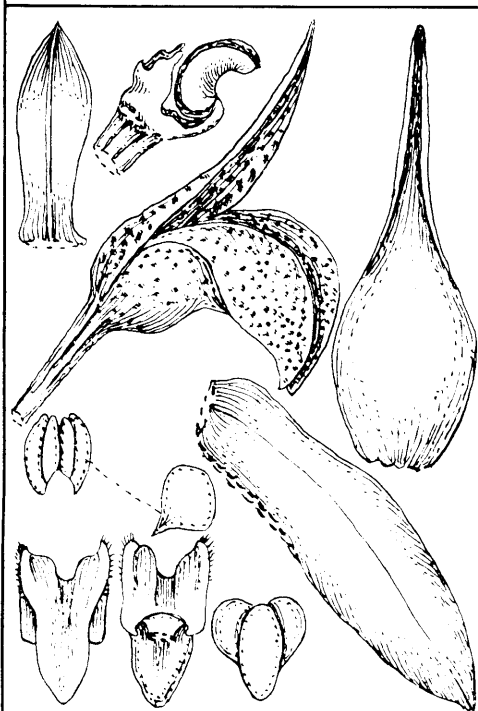
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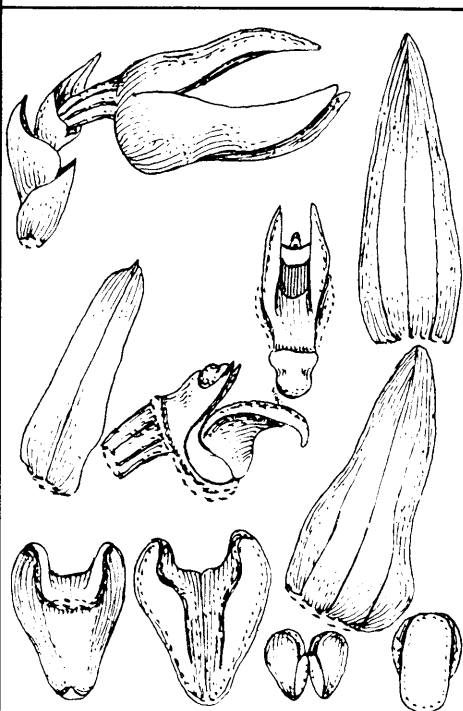
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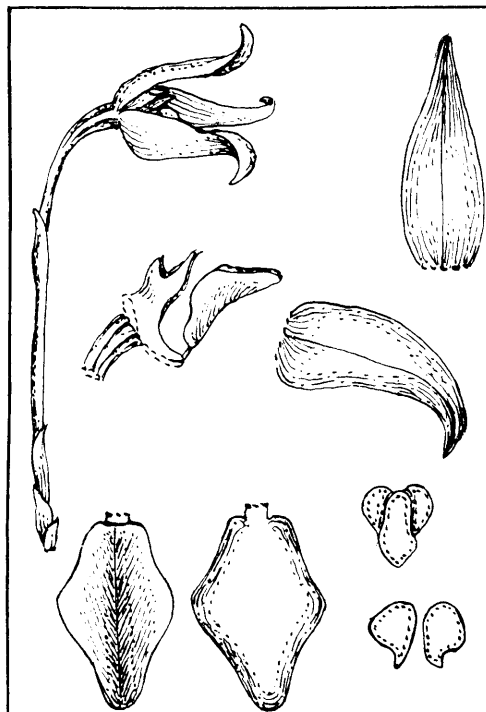
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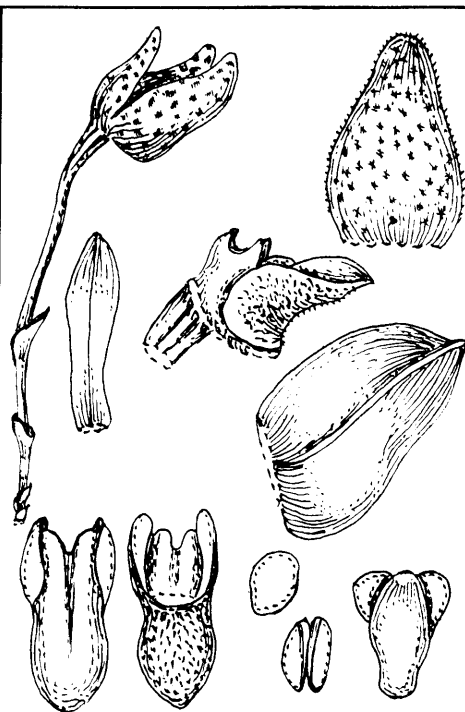
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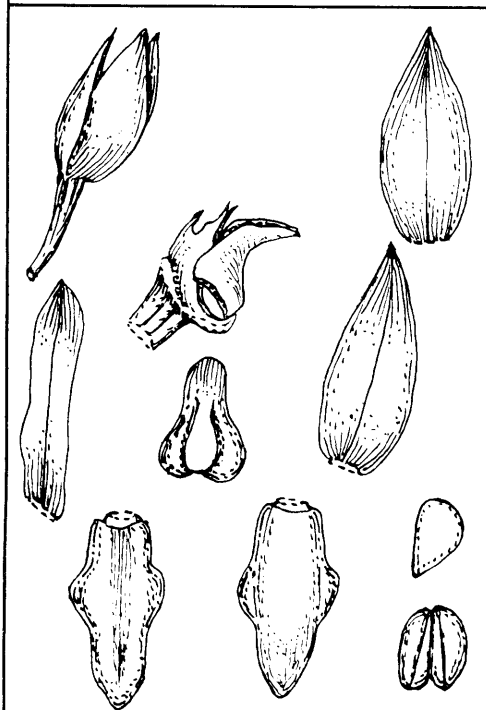
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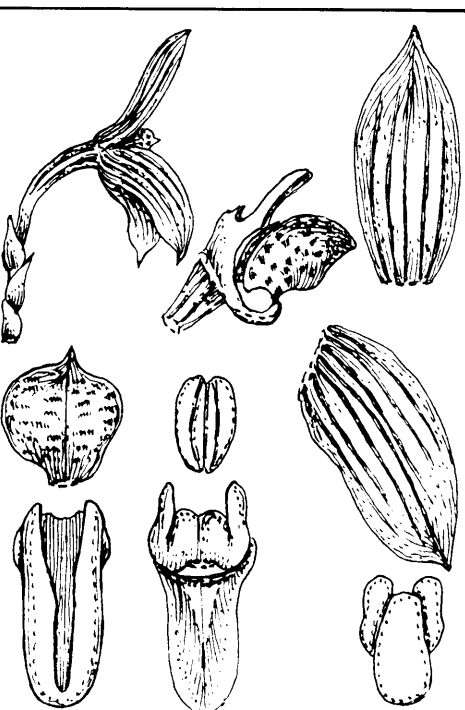
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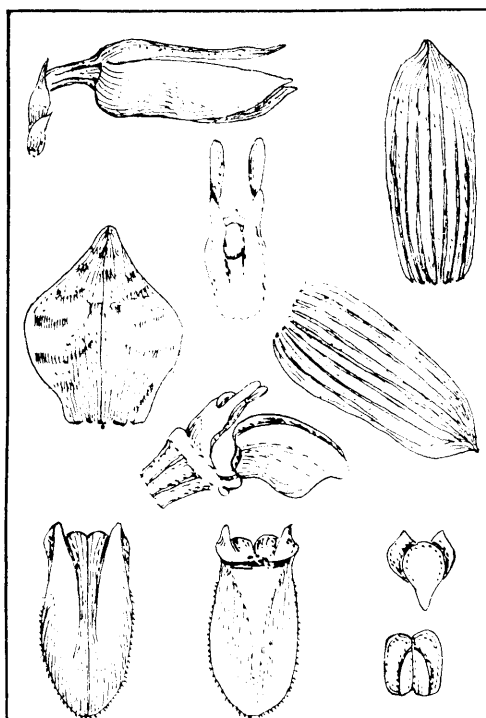
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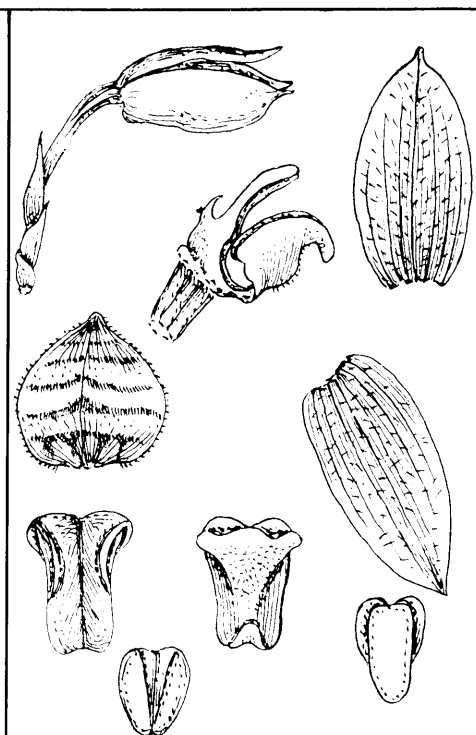
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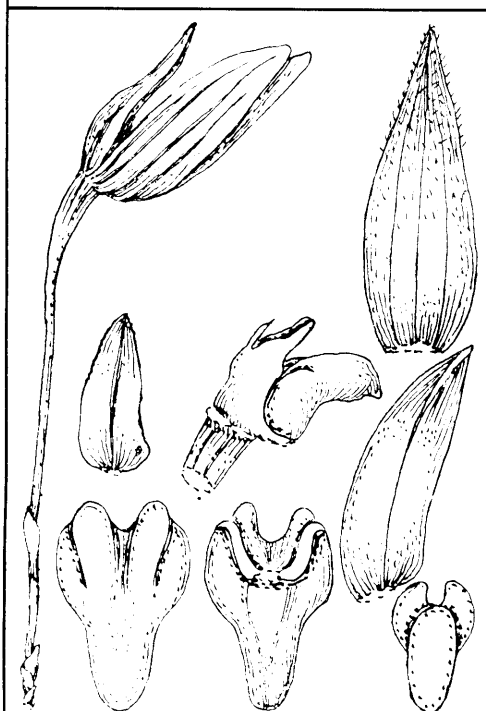
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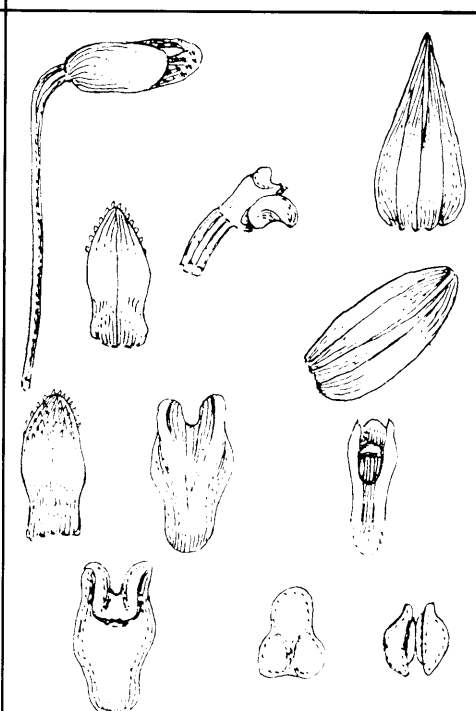
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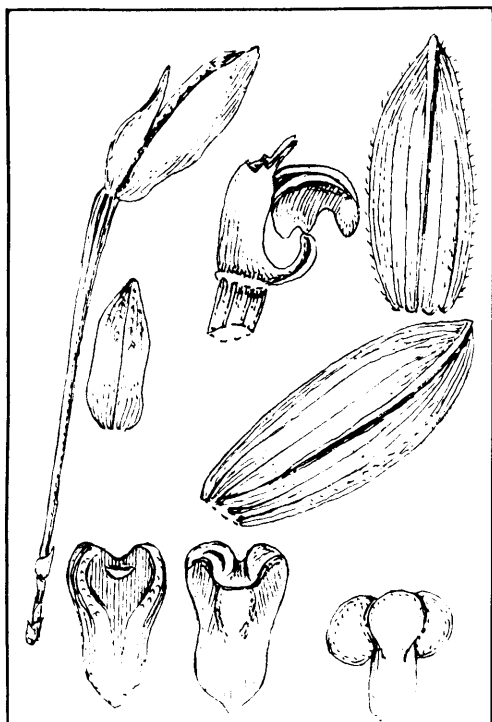
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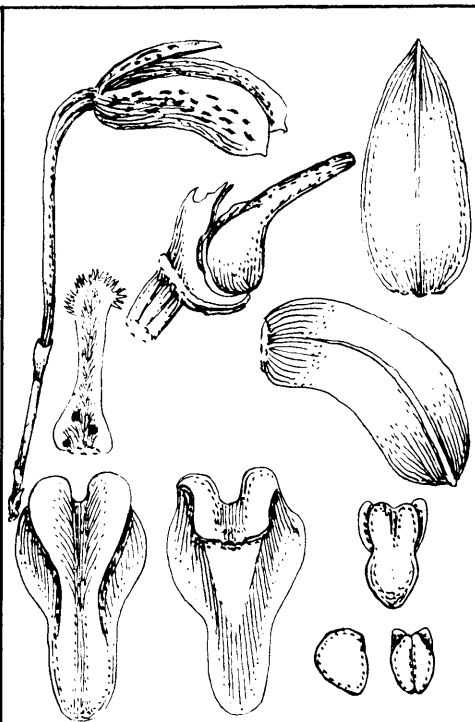
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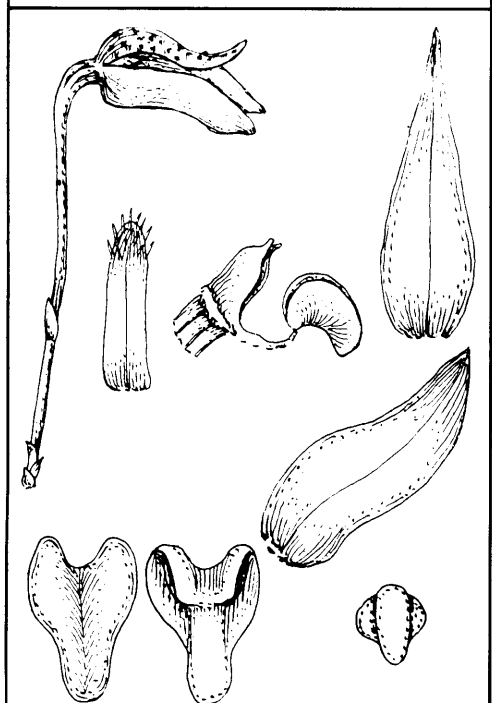
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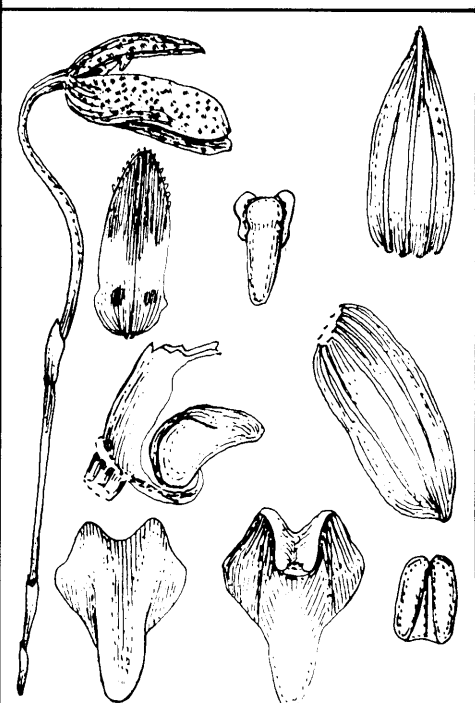
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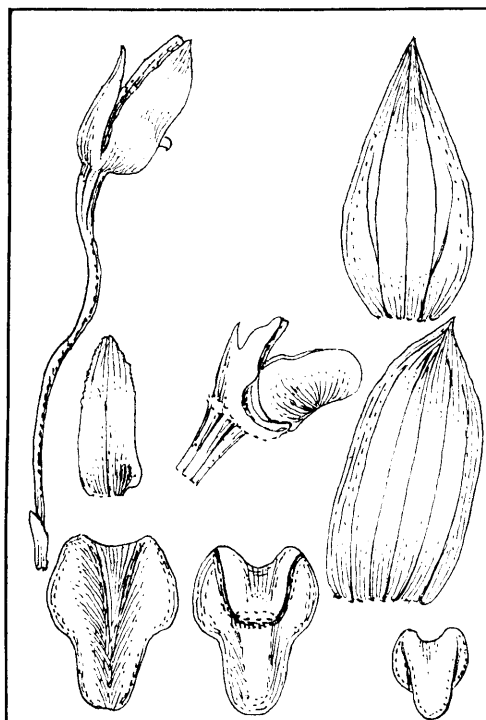
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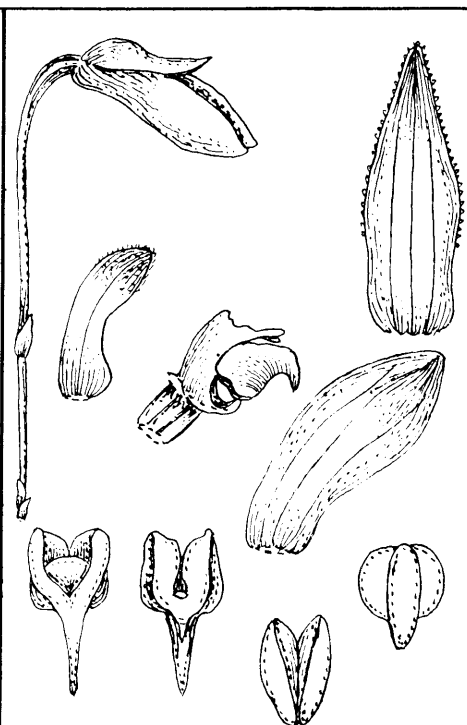
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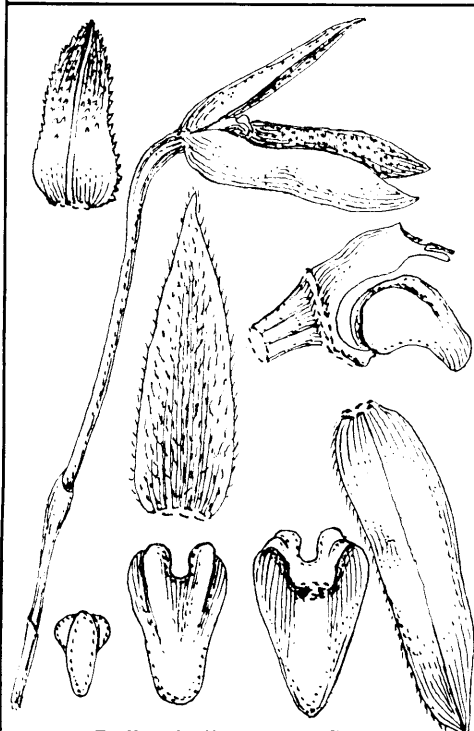
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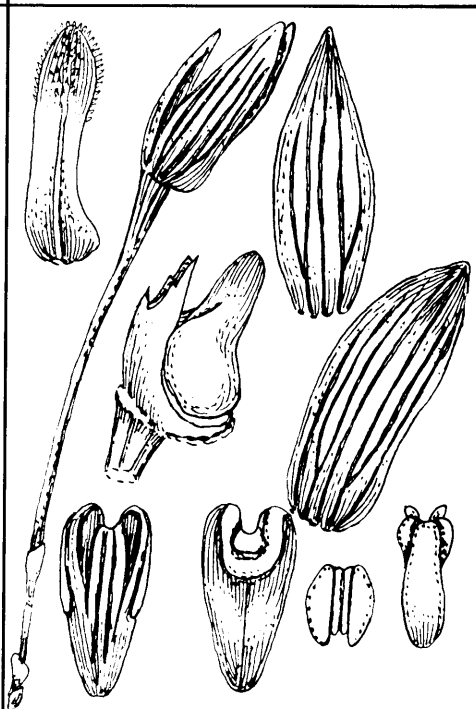
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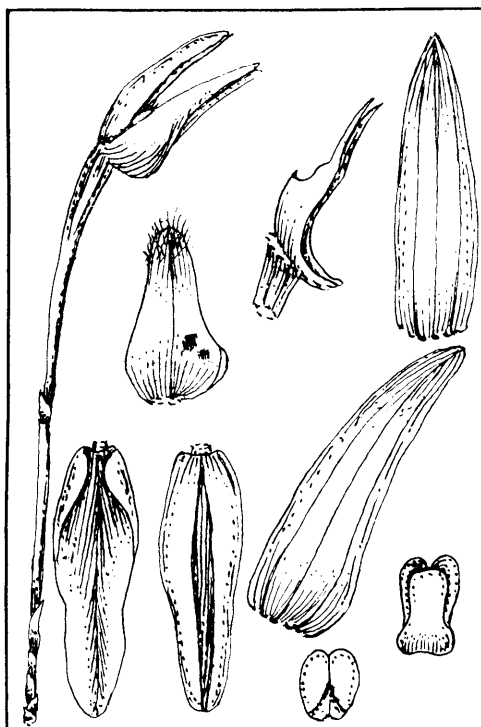
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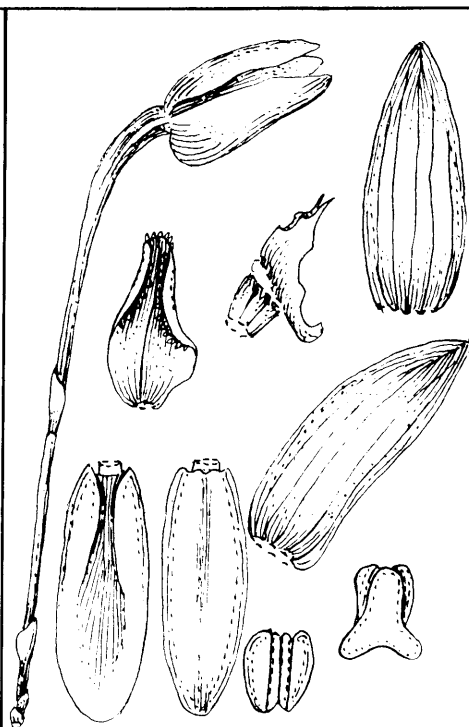
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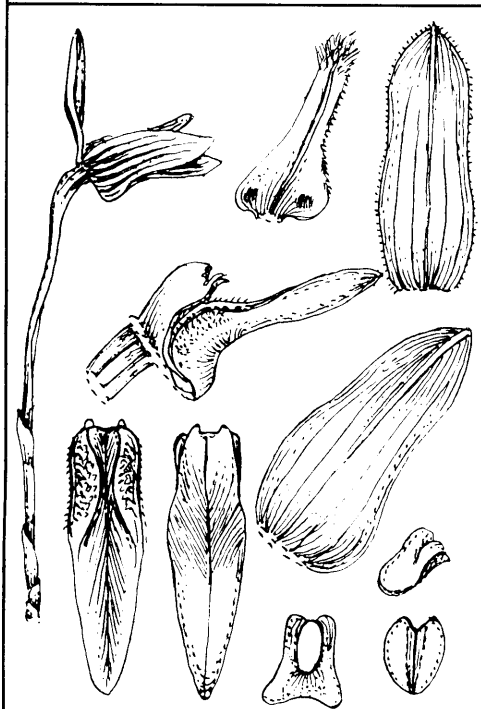
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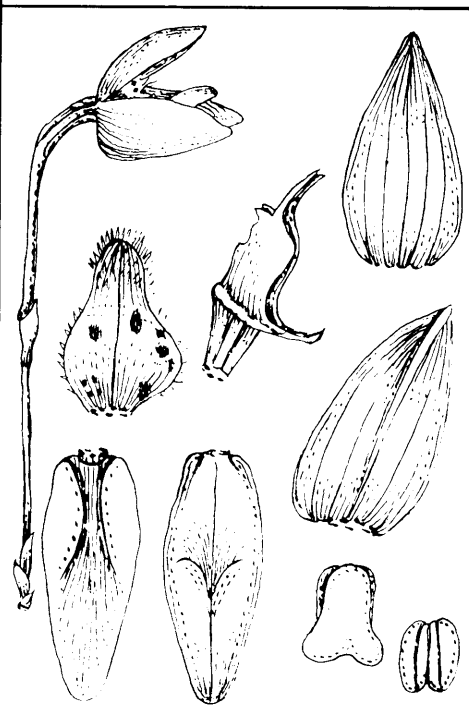
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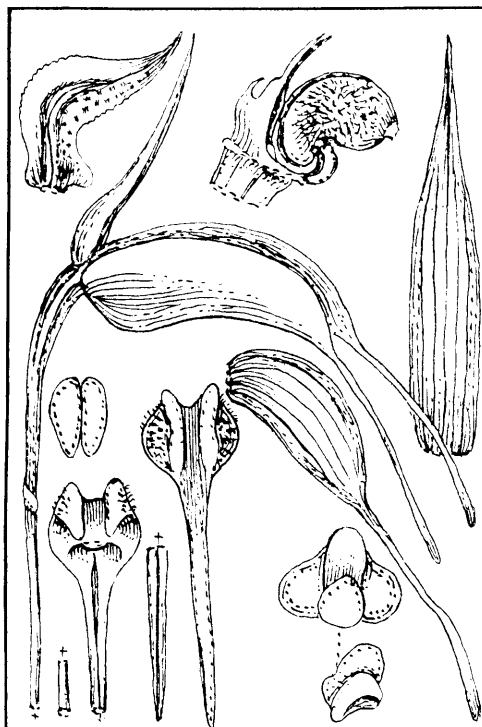
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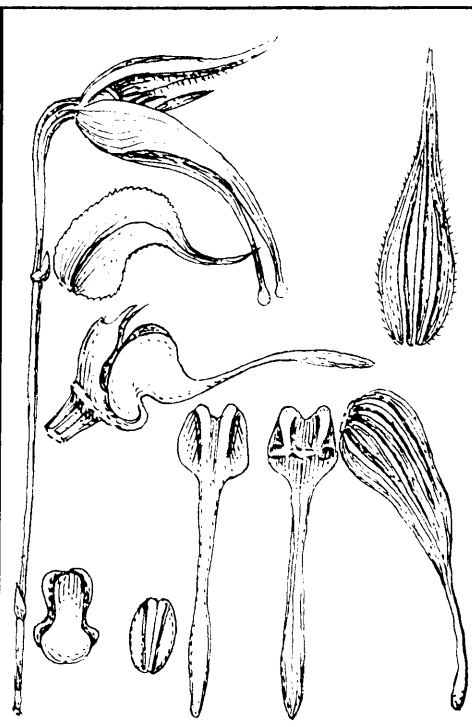
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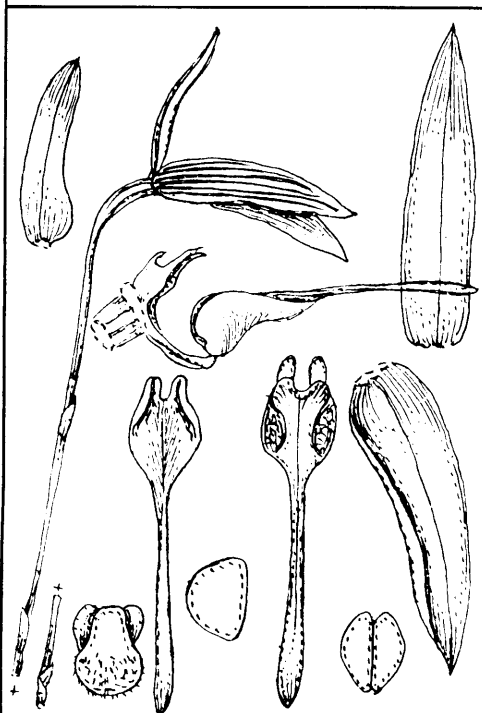
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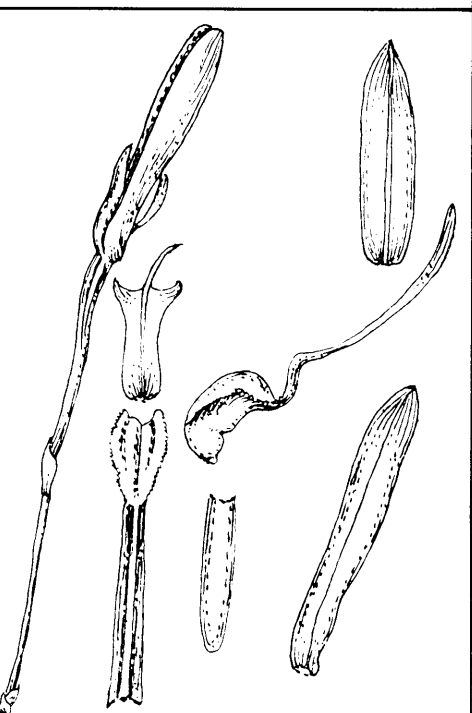
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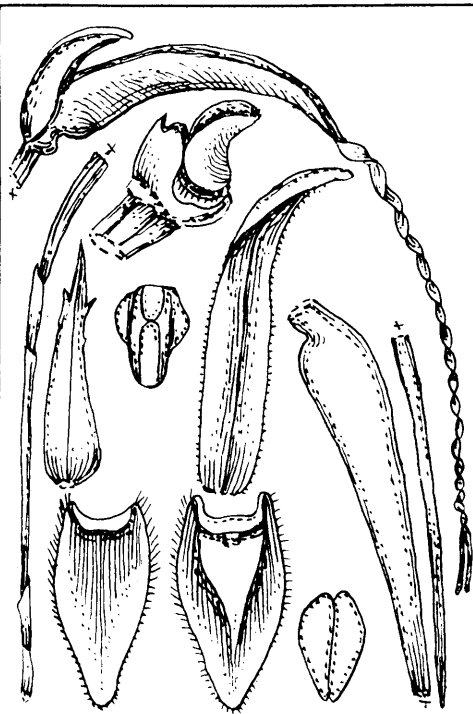
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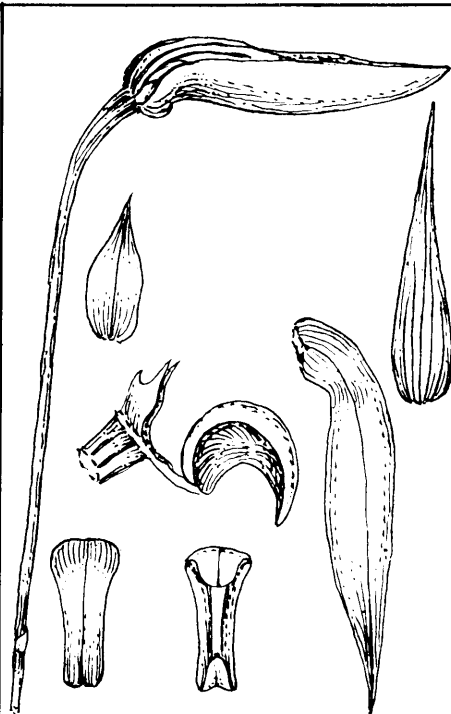
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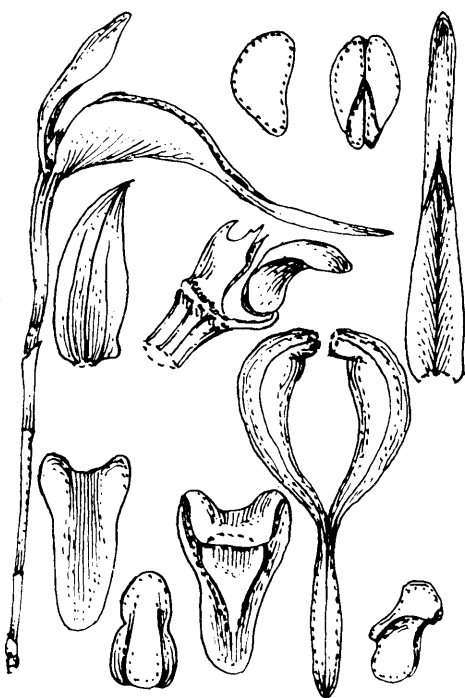
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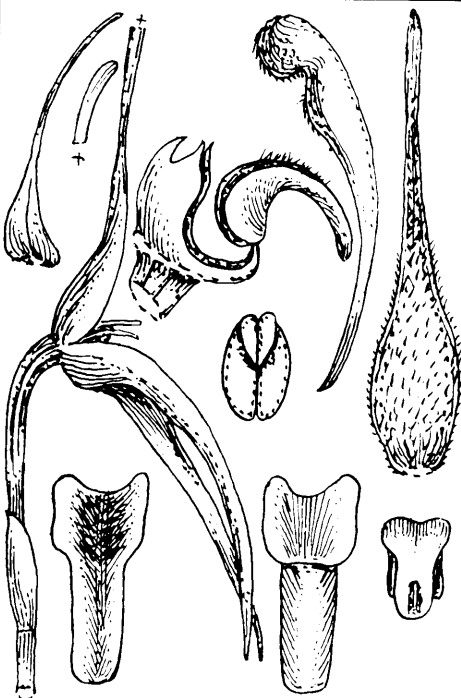
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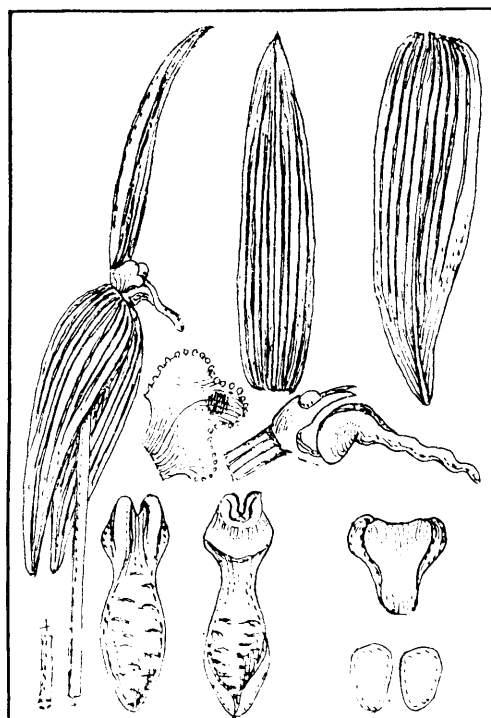
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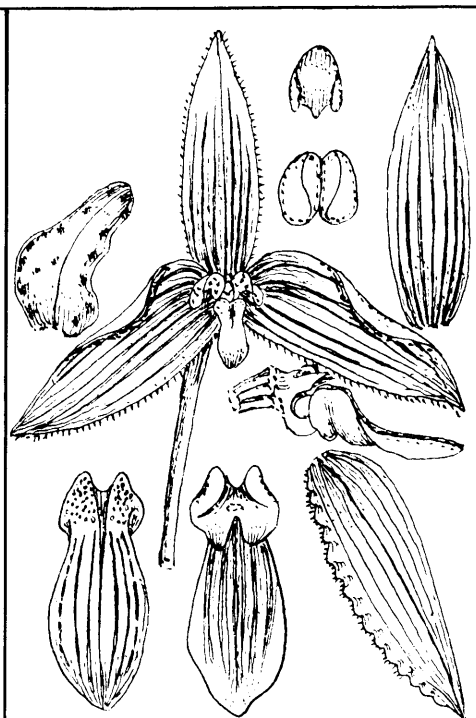
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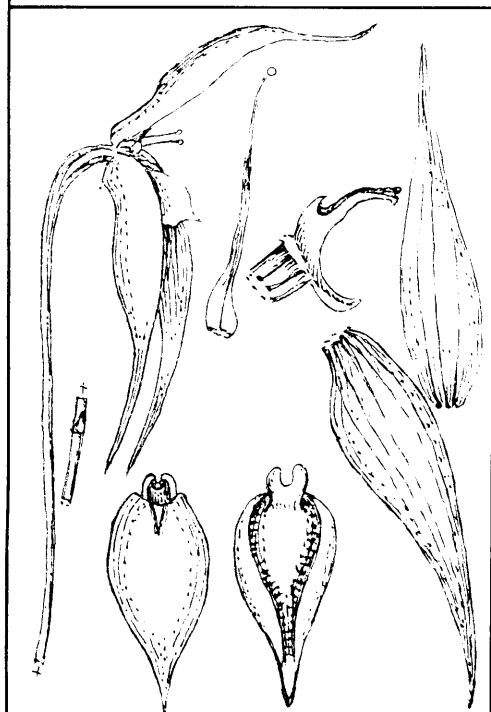
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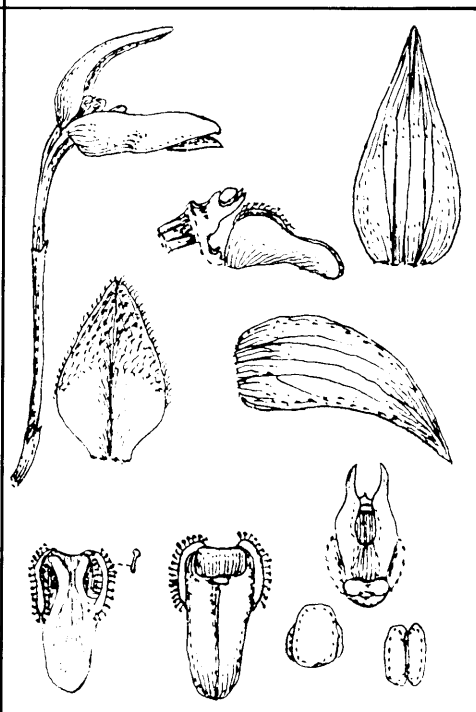
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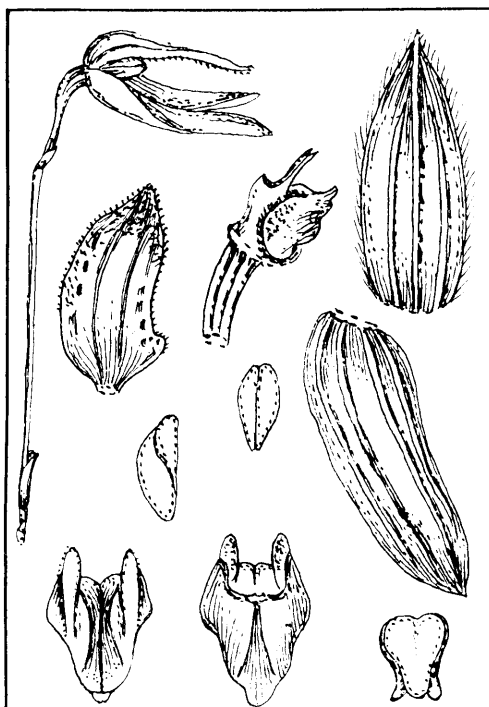
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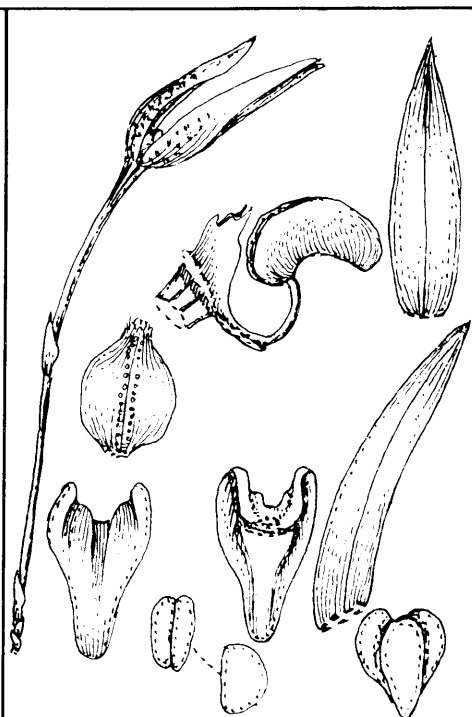
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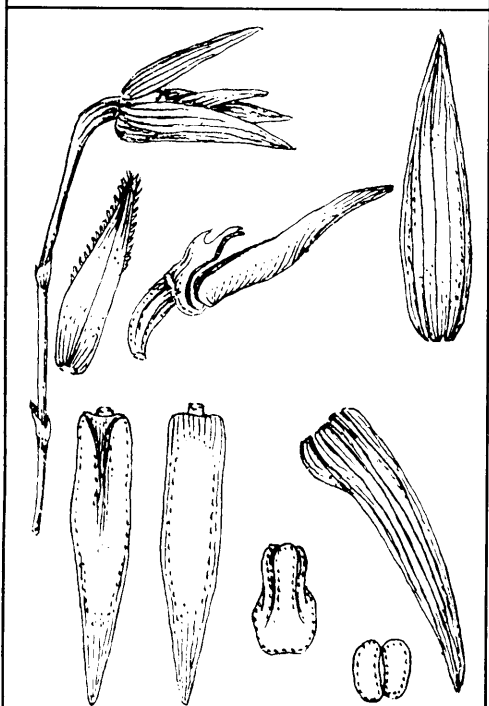
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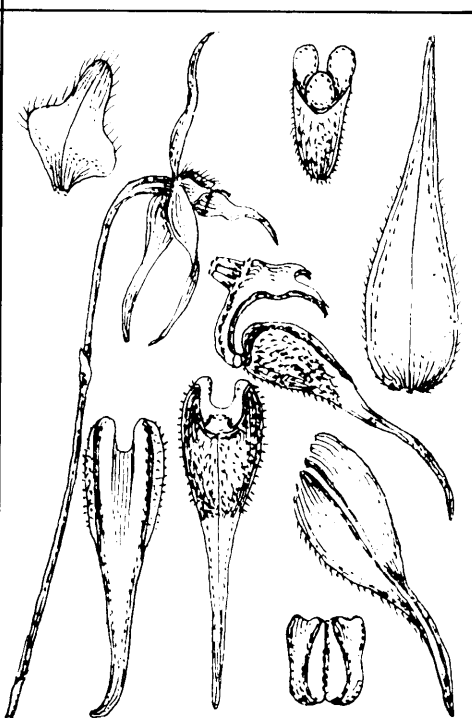
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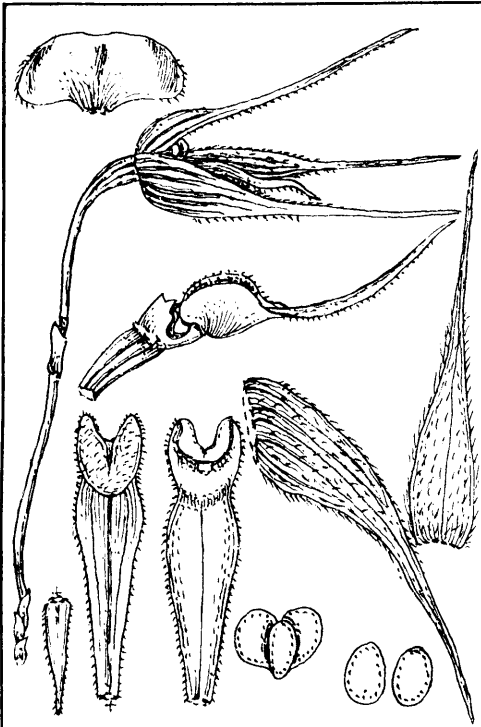
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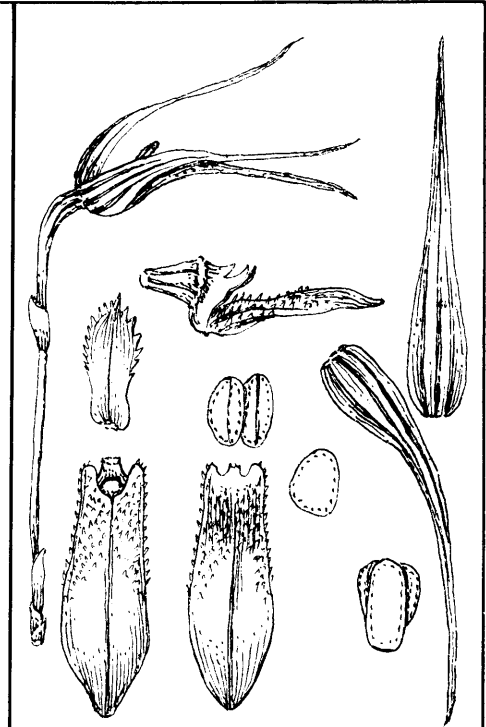
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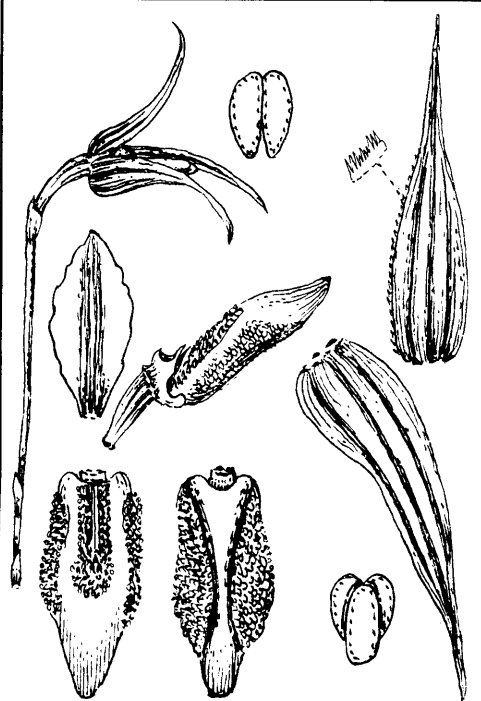
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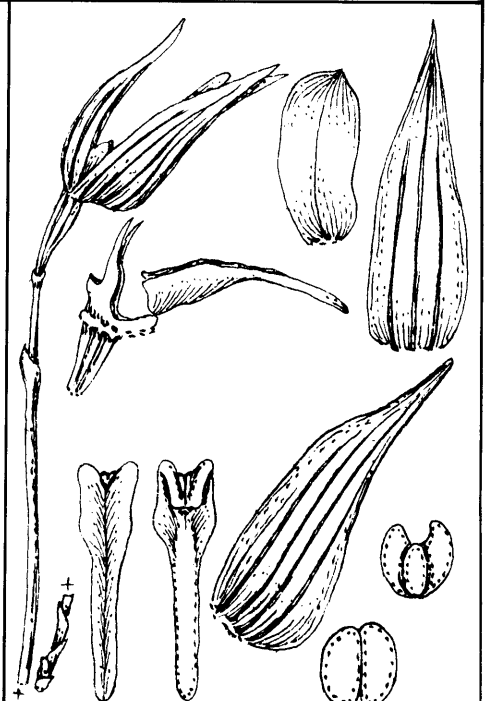
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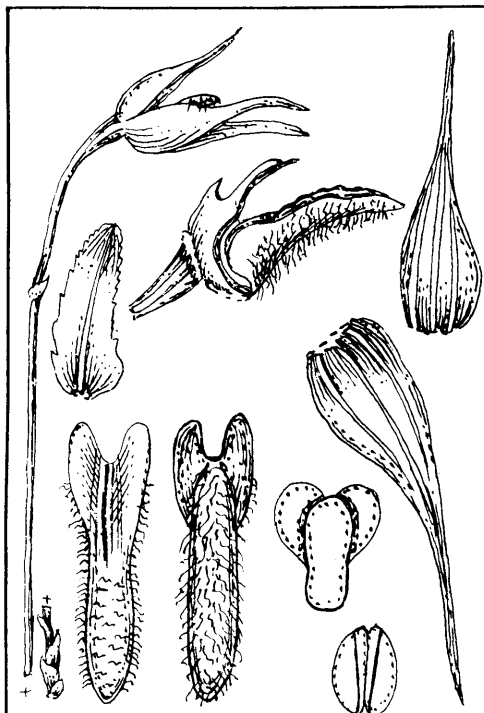
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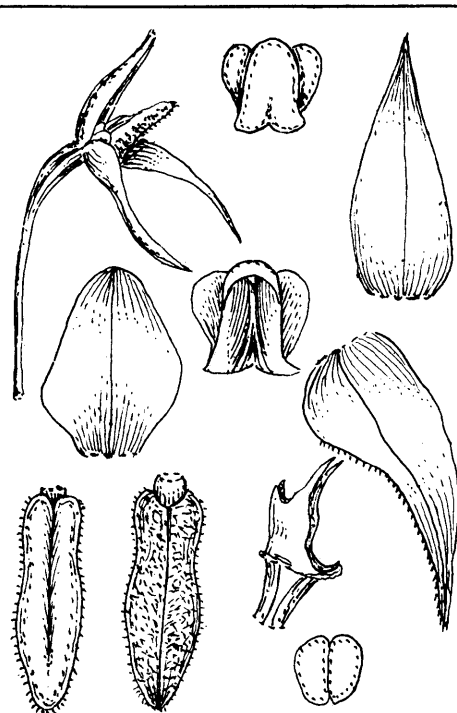
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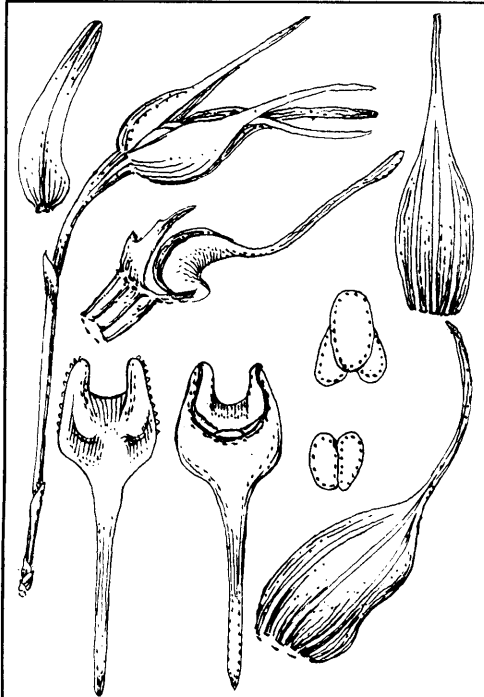
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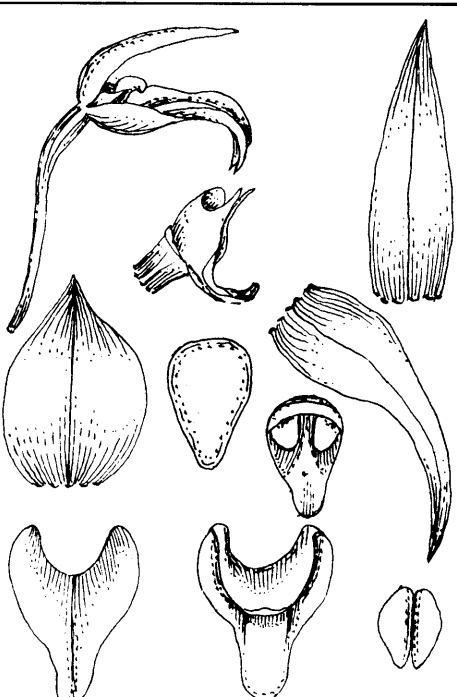
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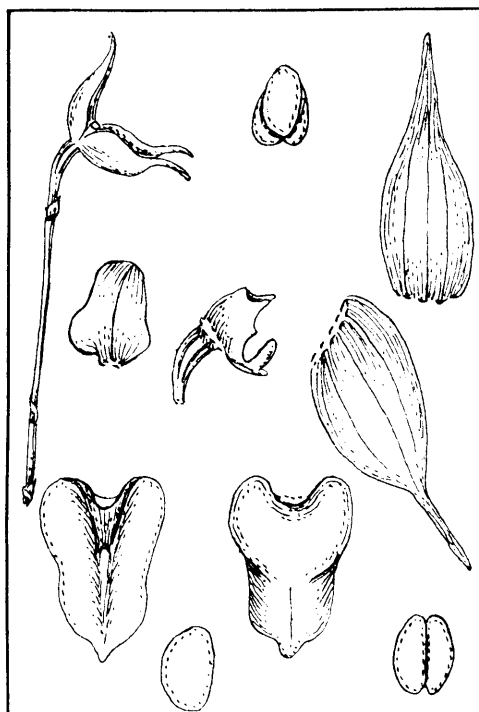
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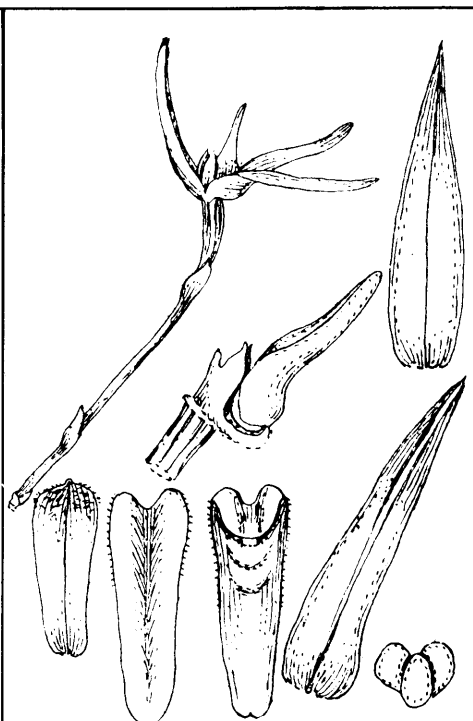
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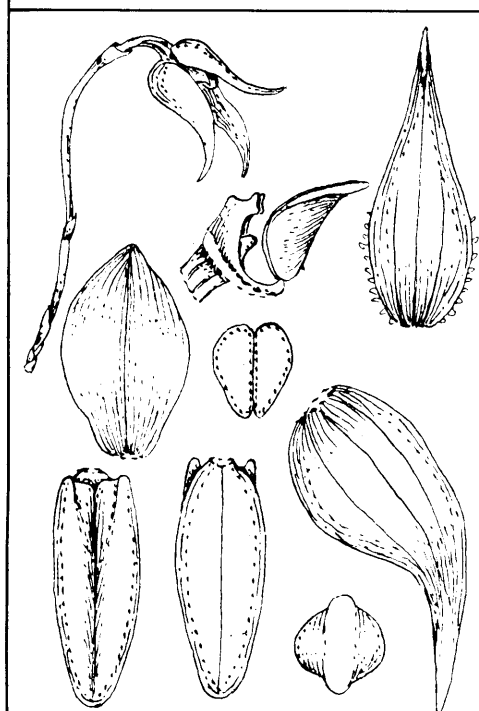
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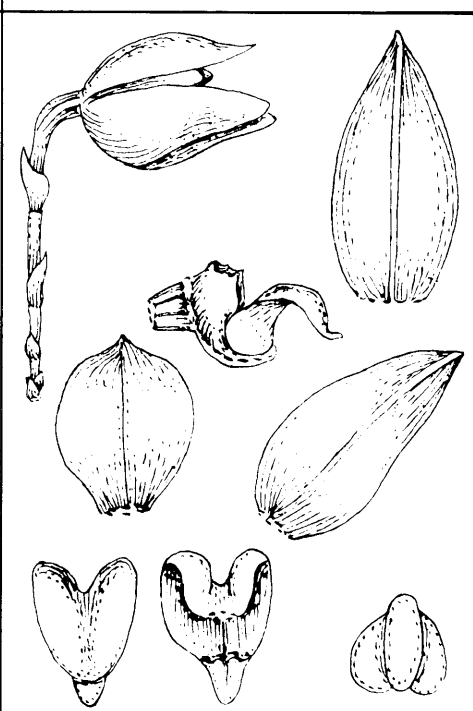
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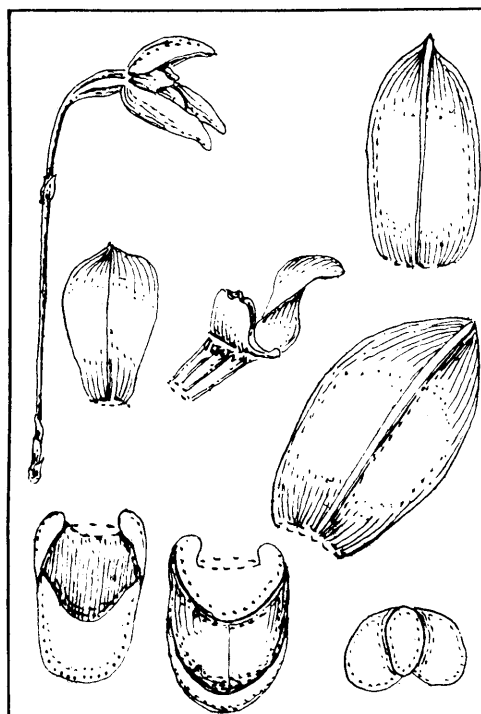
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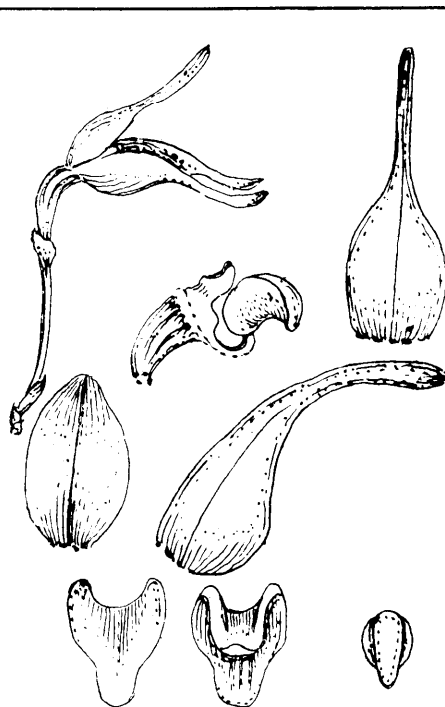
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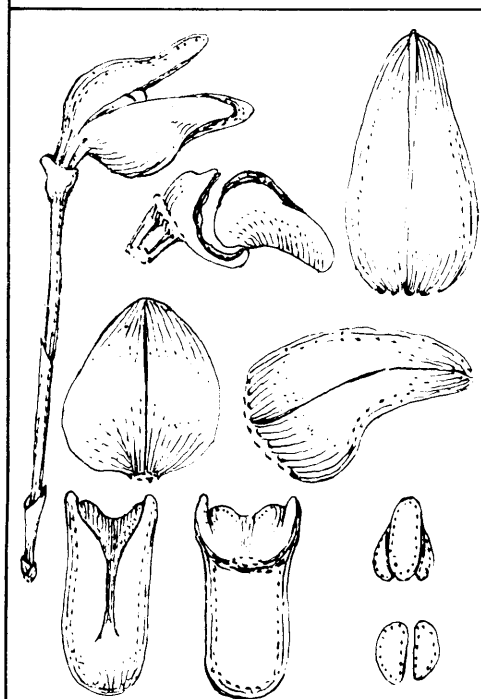
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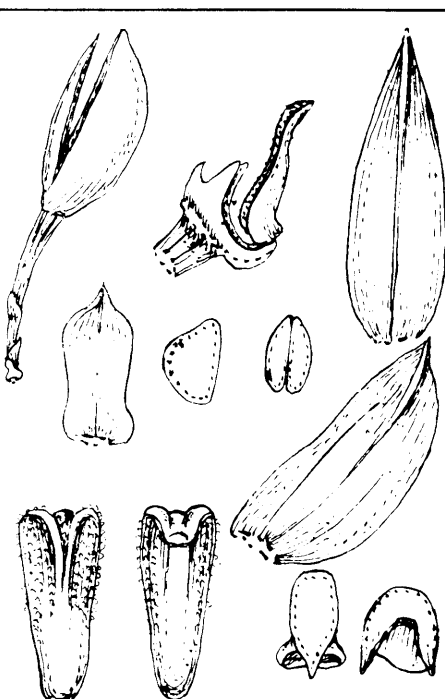
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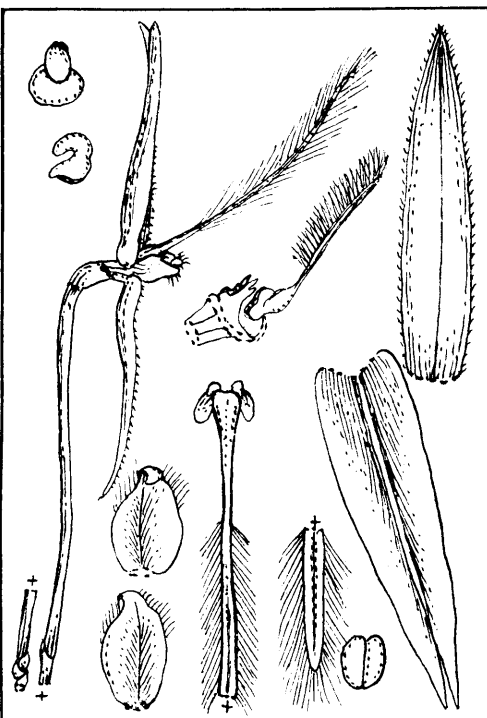
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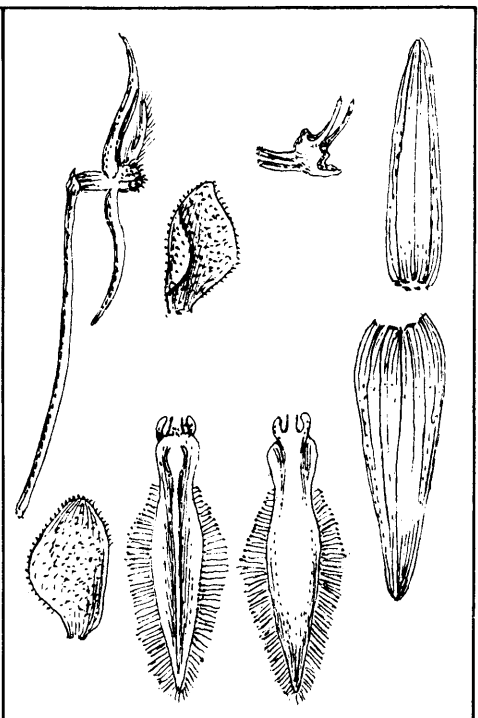
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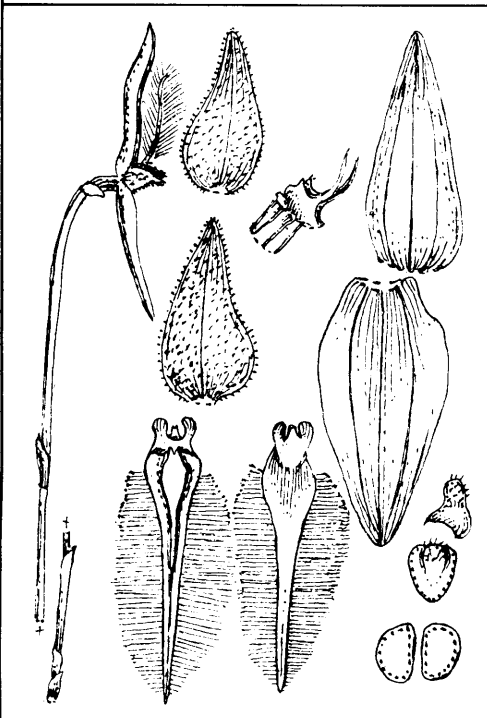
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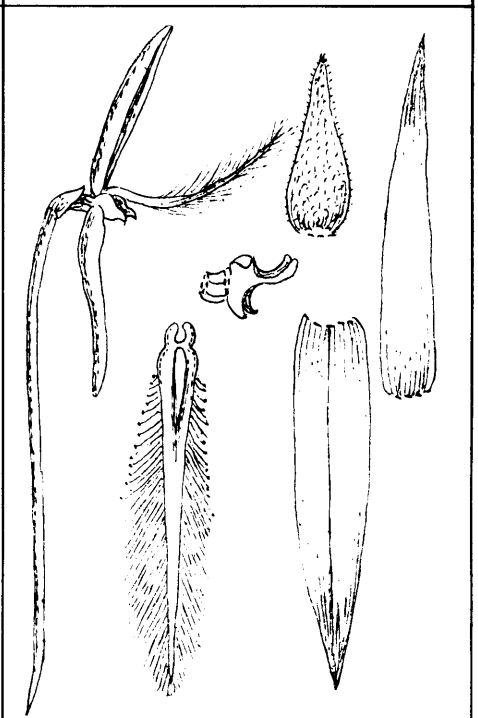
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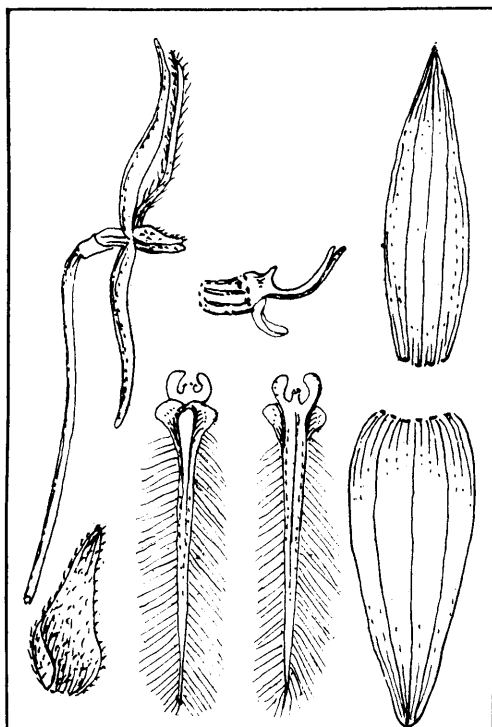
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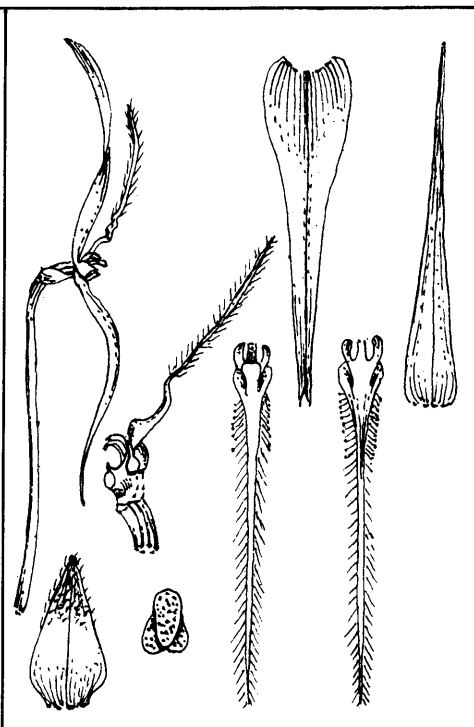
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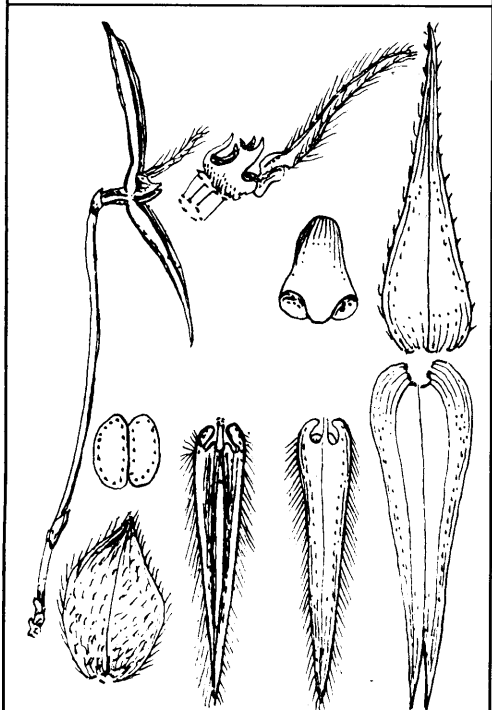
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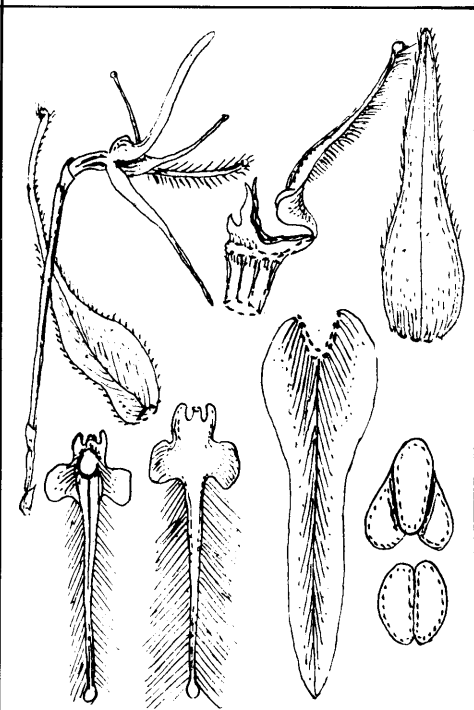
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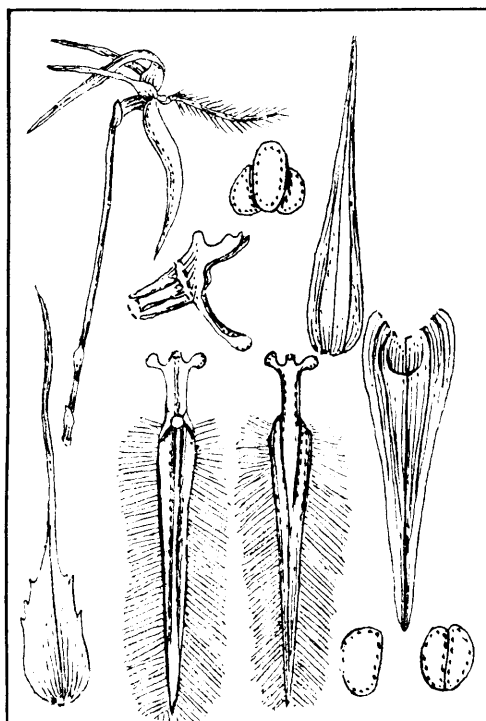
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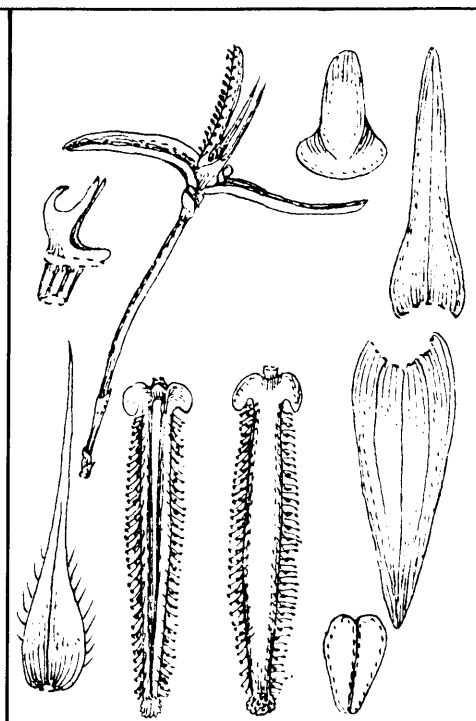
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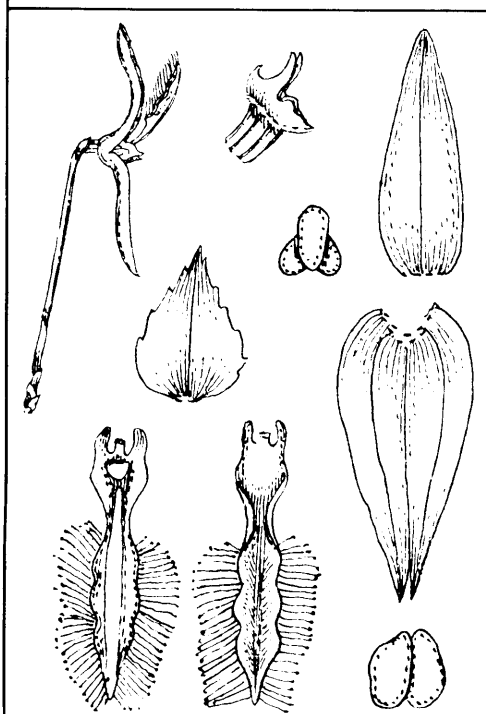
Bulbophyllum tentaculiferum Schltr.



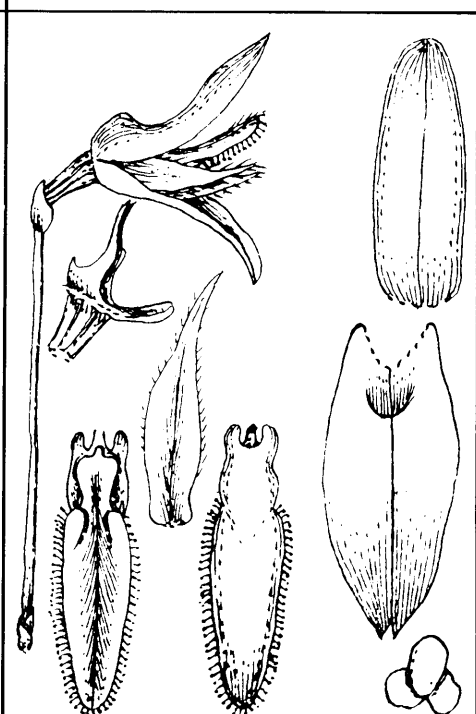
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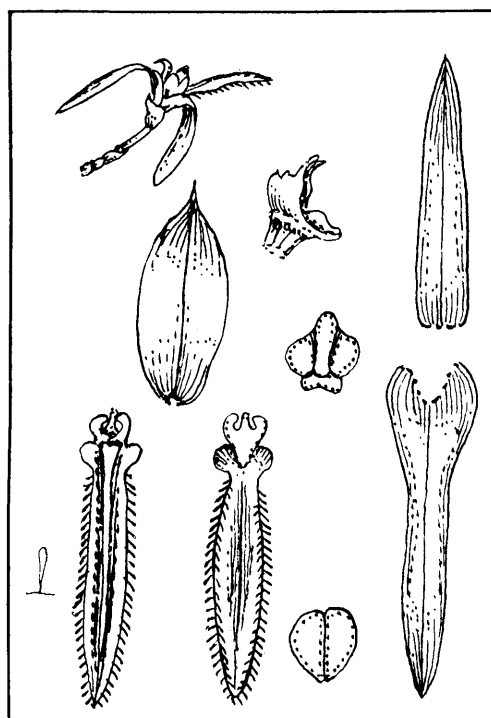
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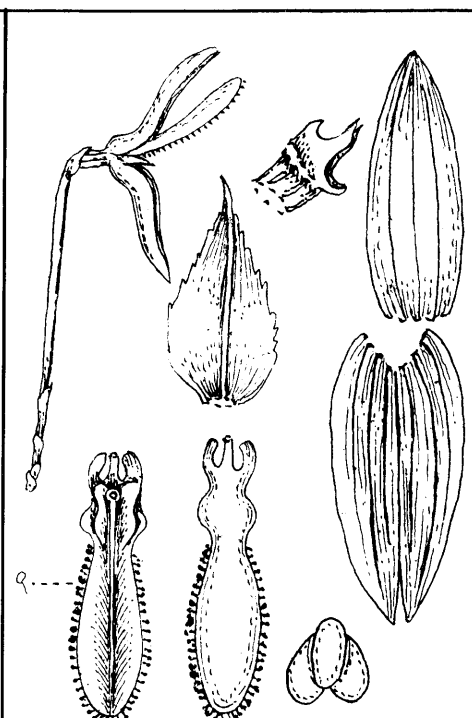
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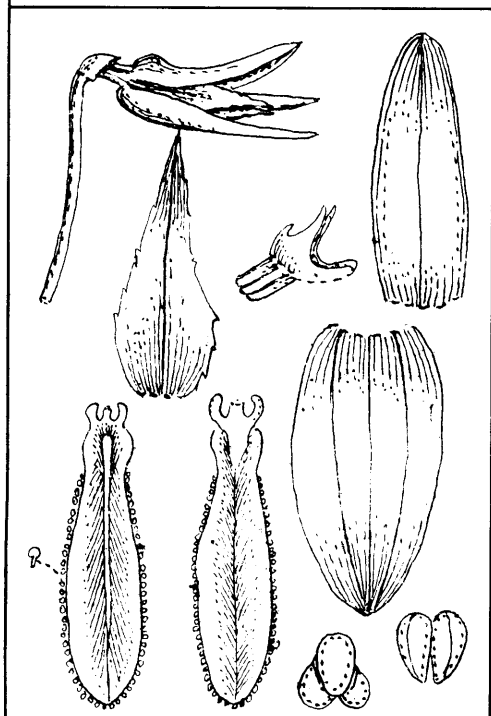
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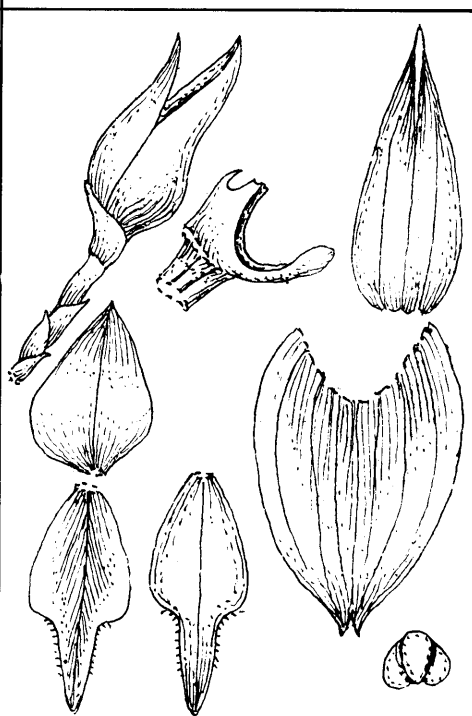
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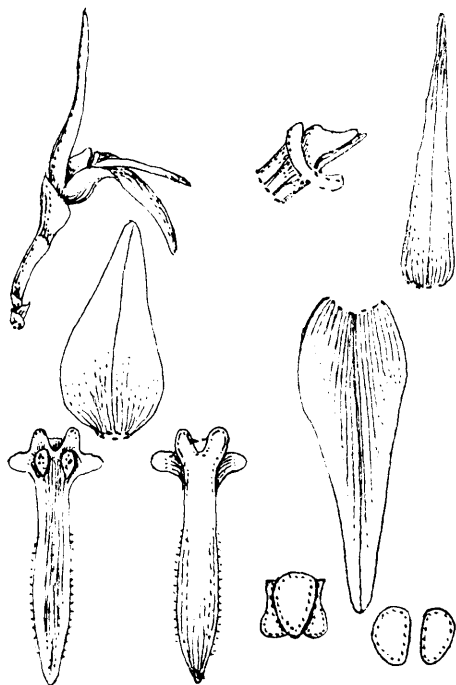
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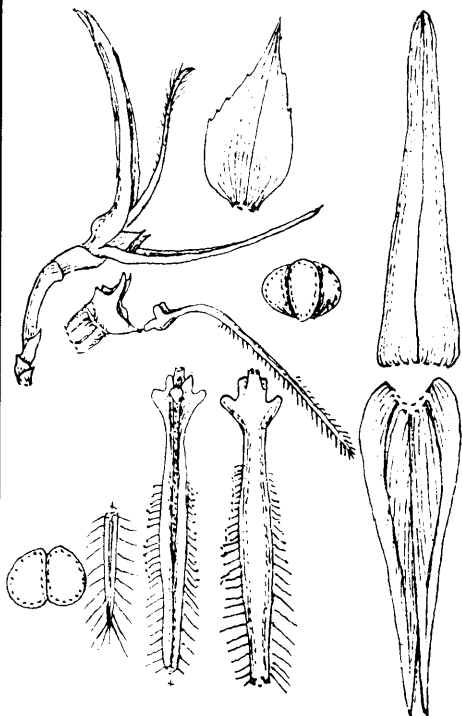
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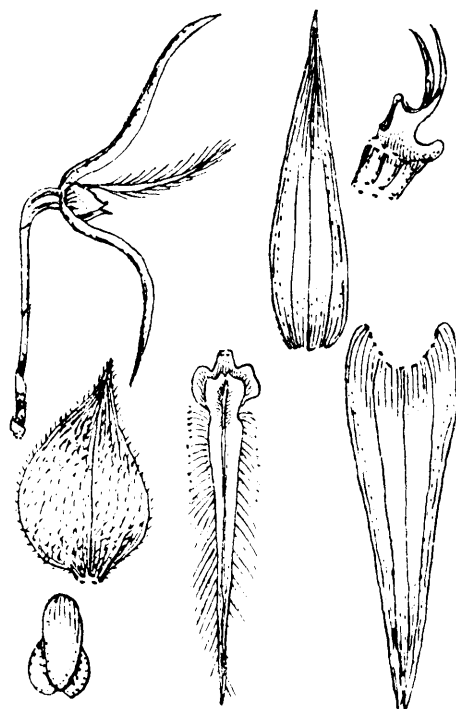
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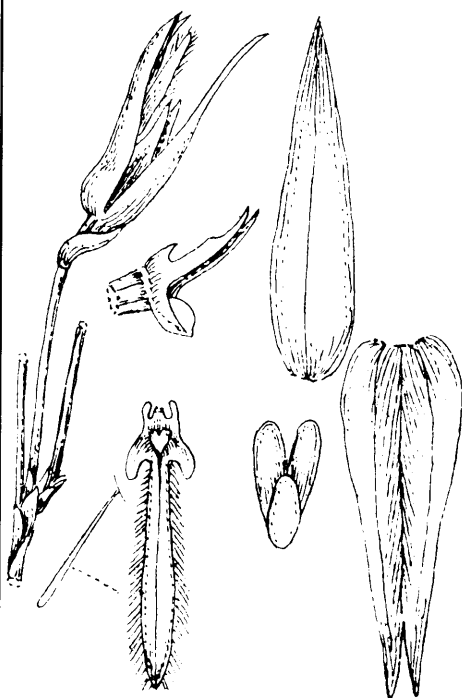
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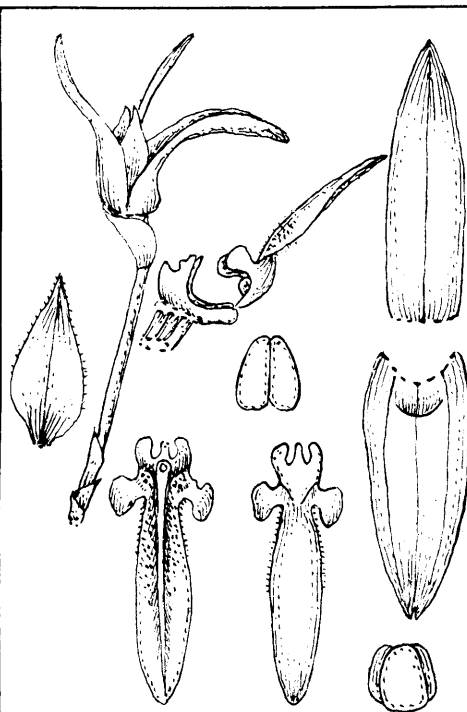
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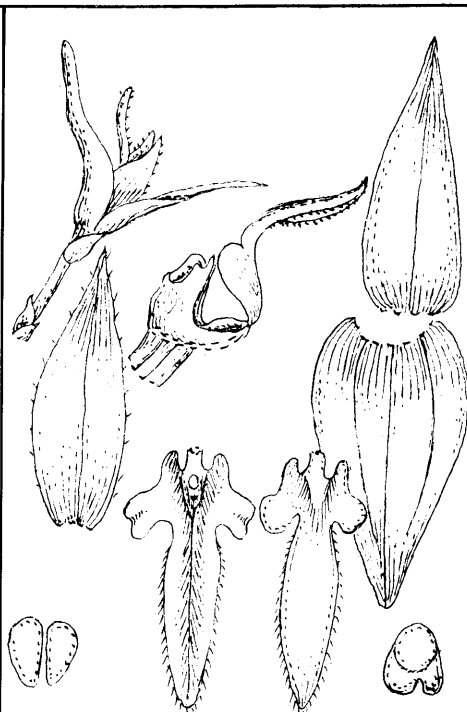
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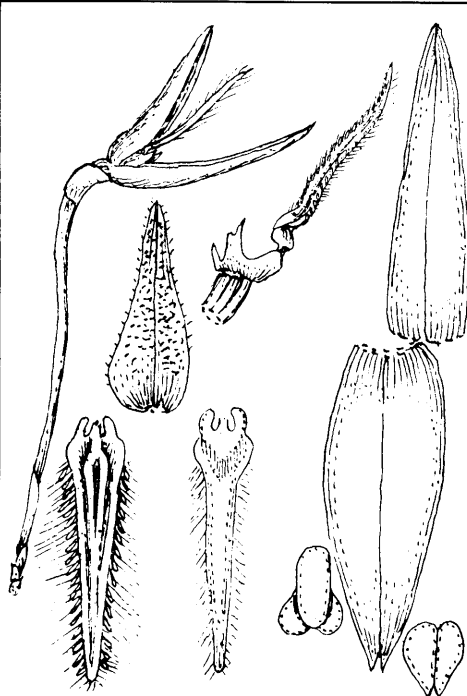
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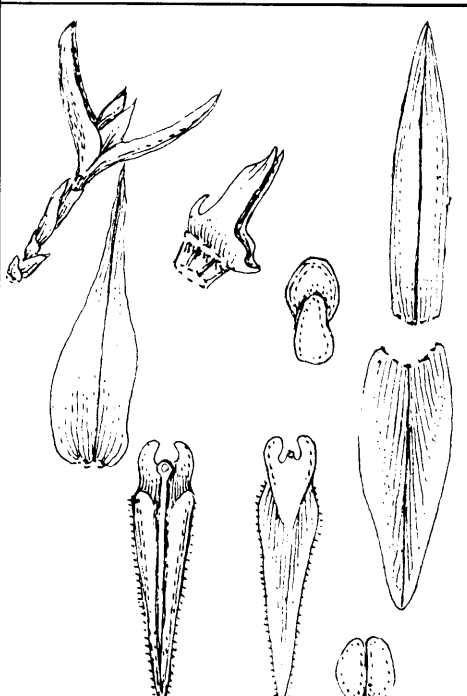
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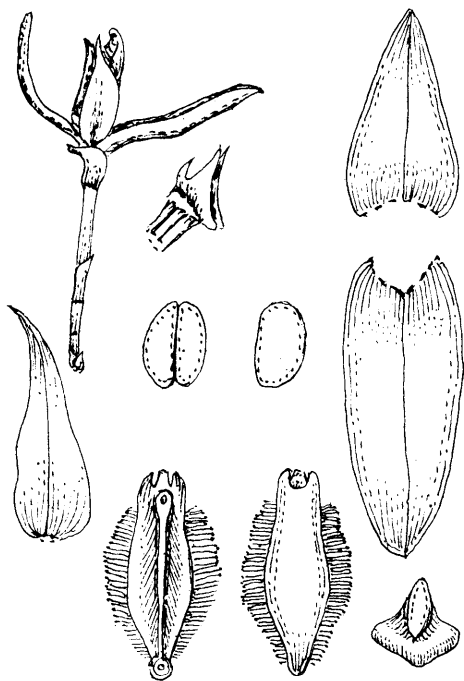
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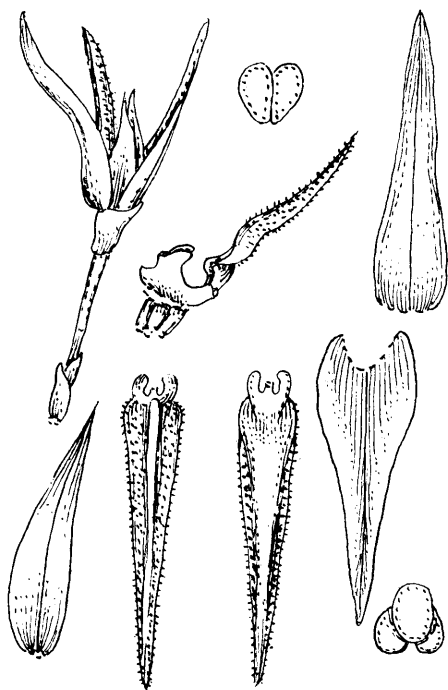
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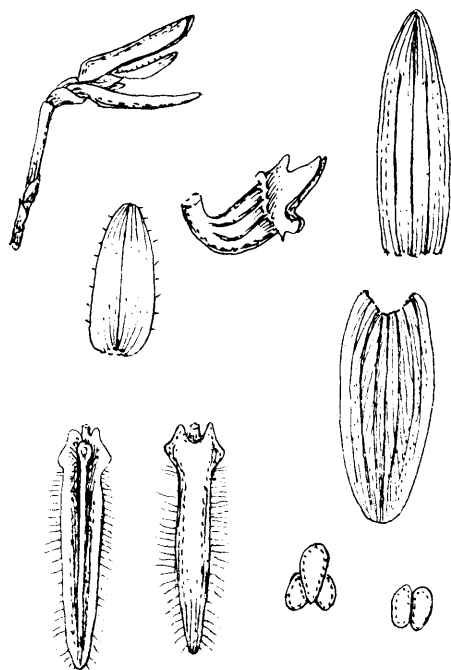
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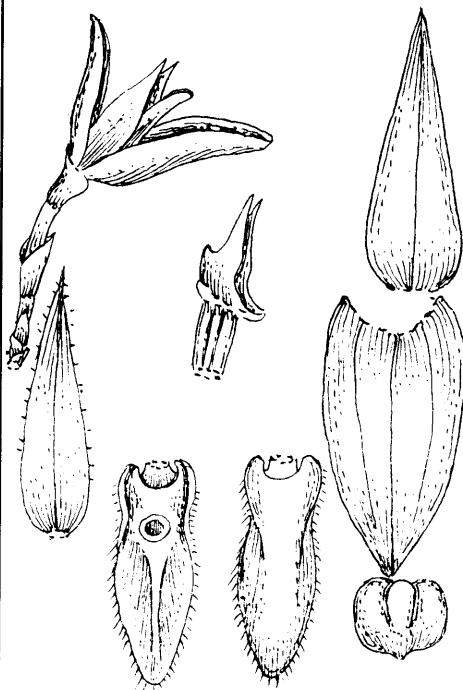
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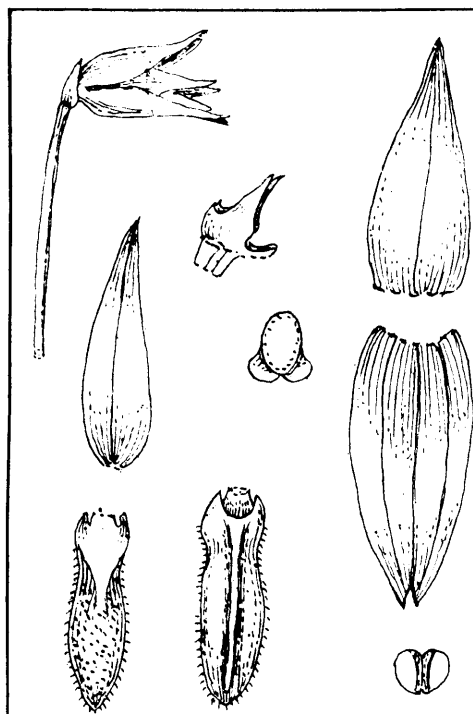
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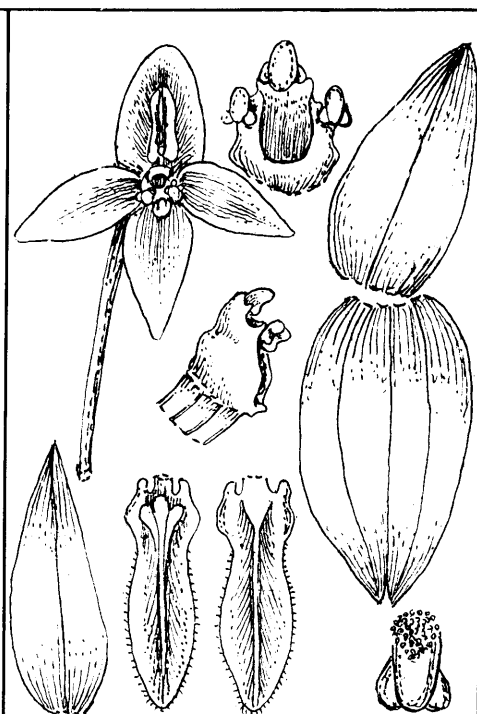
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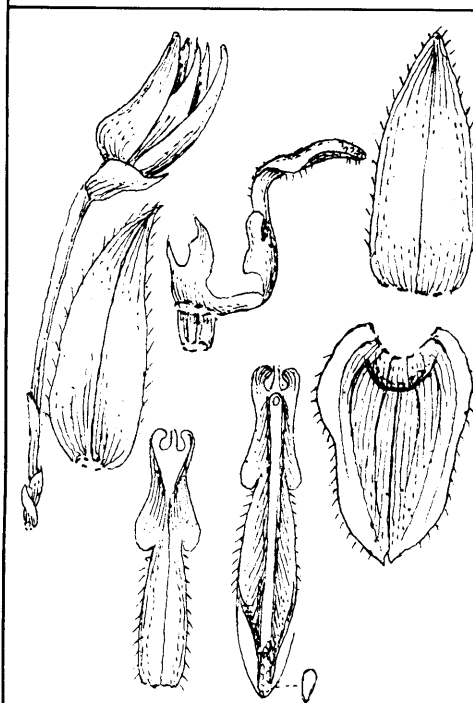
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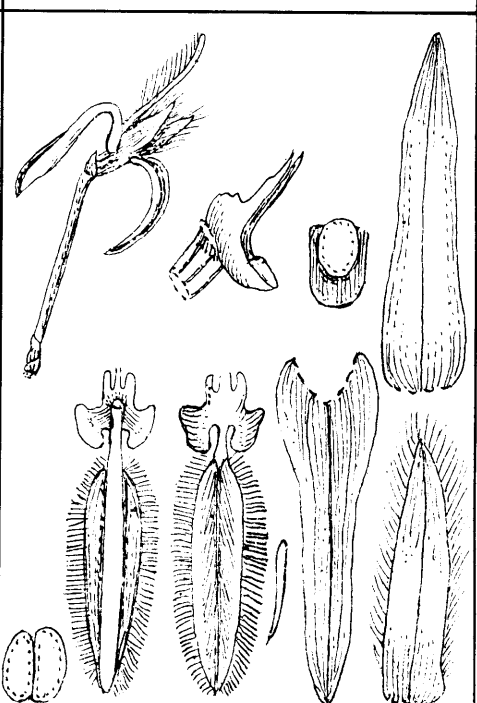
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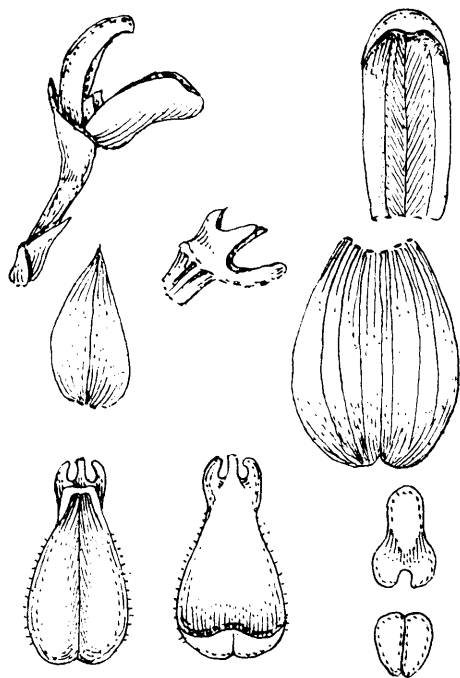
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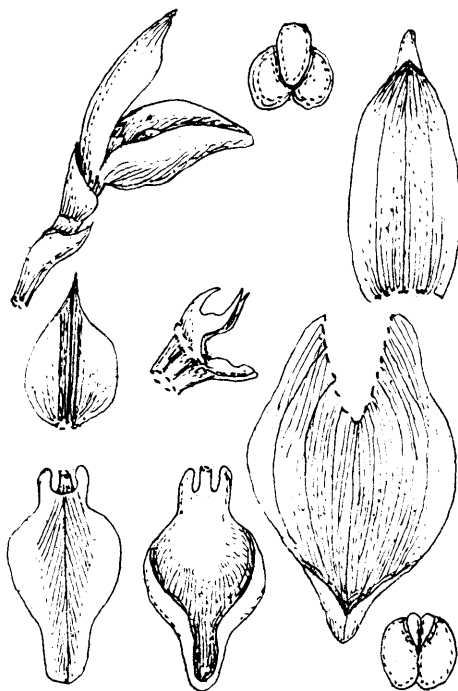
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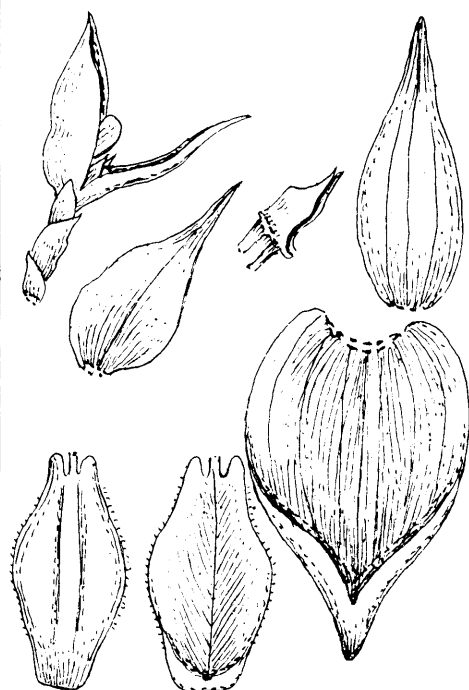
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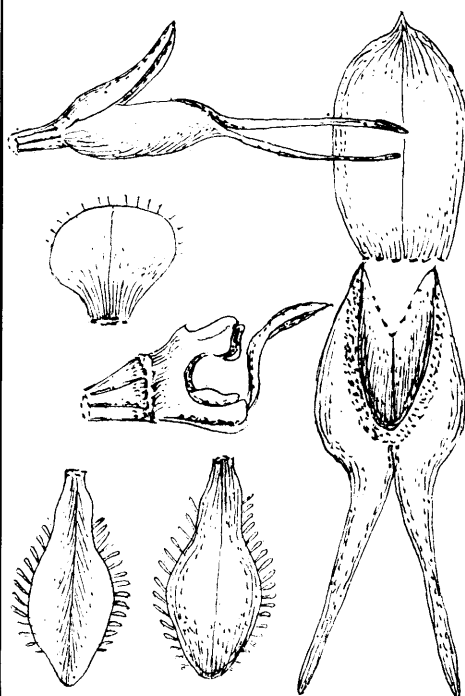
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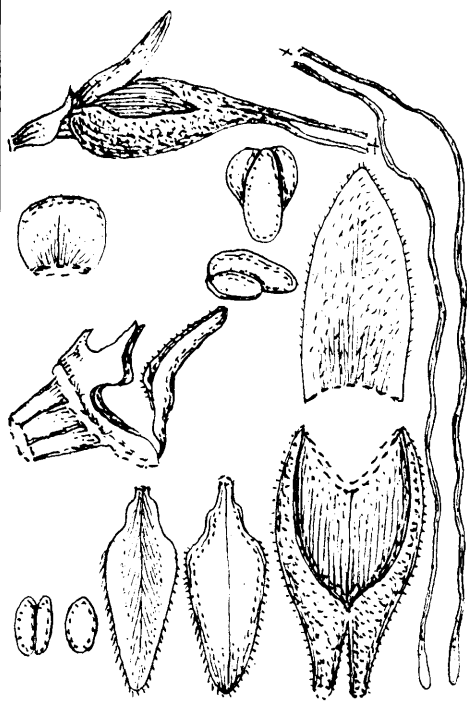
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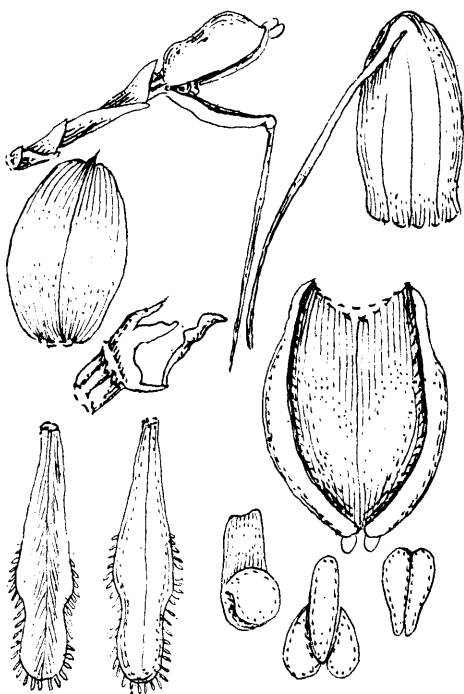
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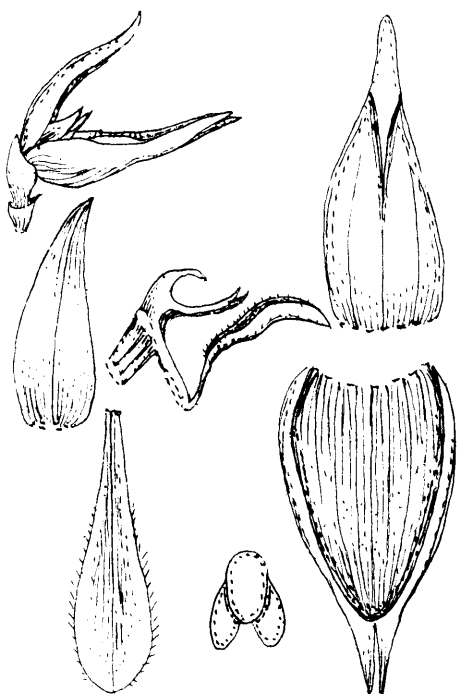
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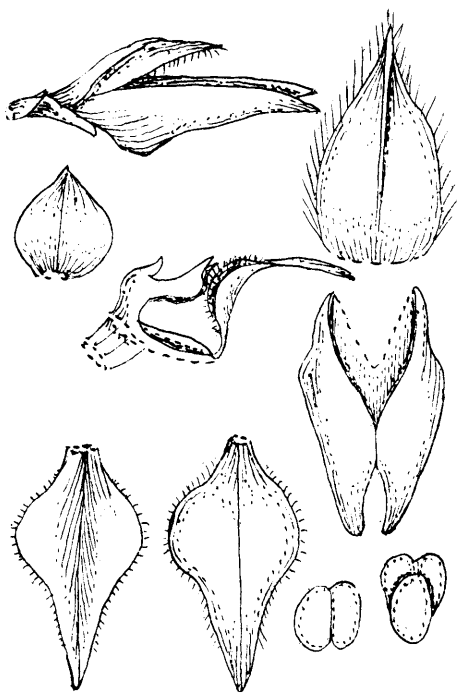
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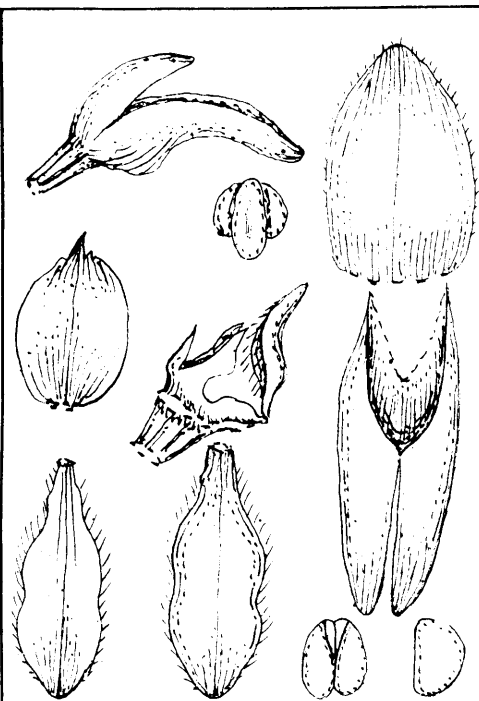
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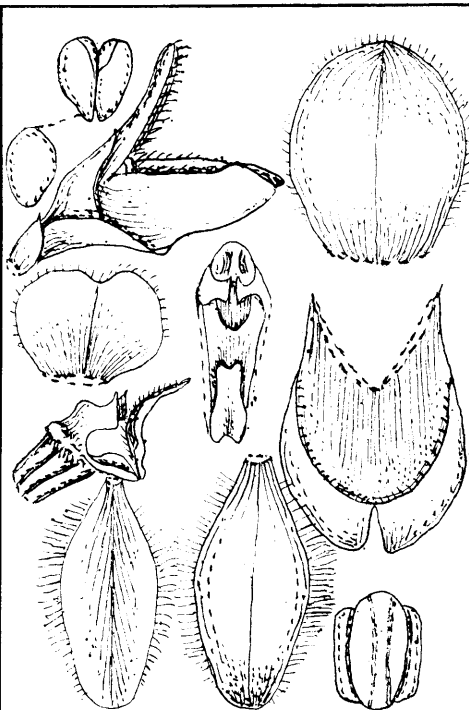
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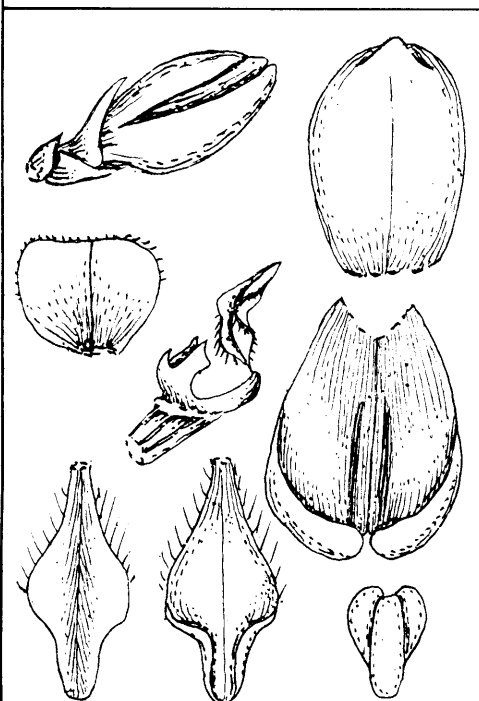
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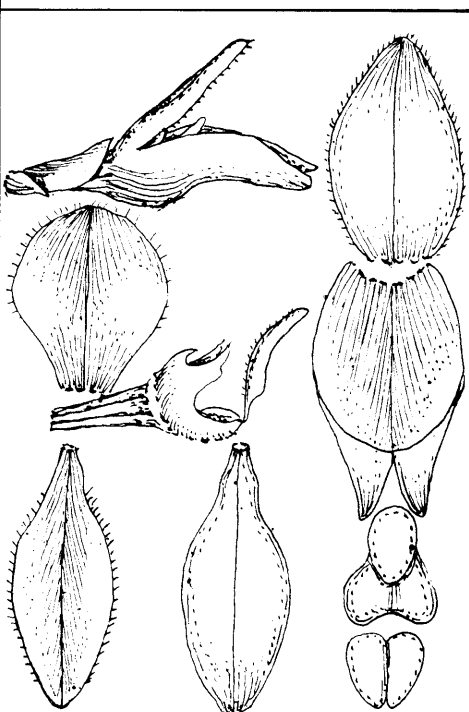
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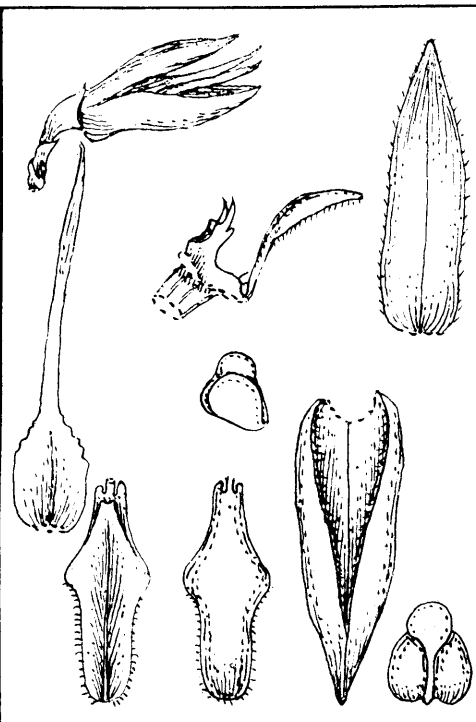
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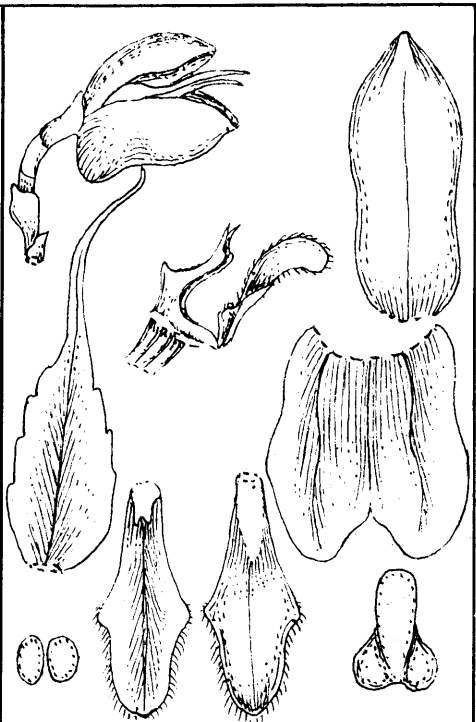
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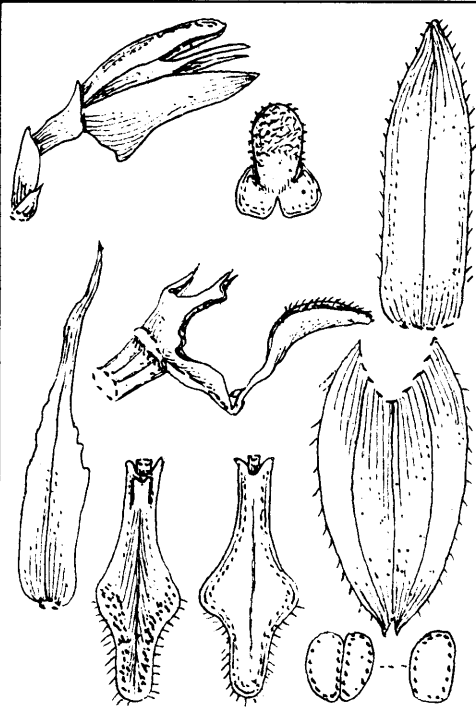
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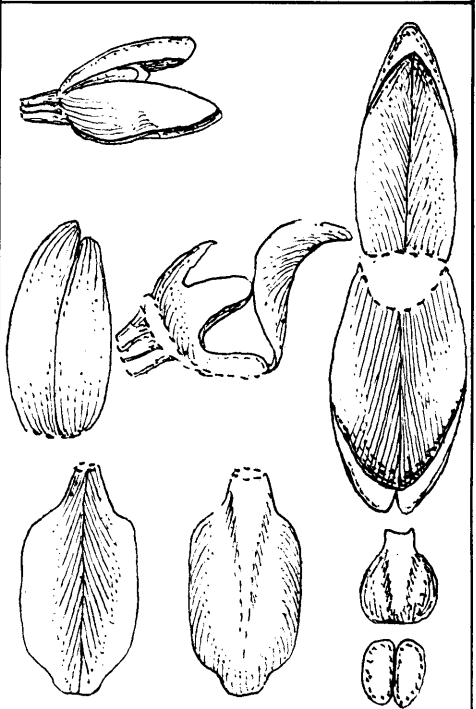
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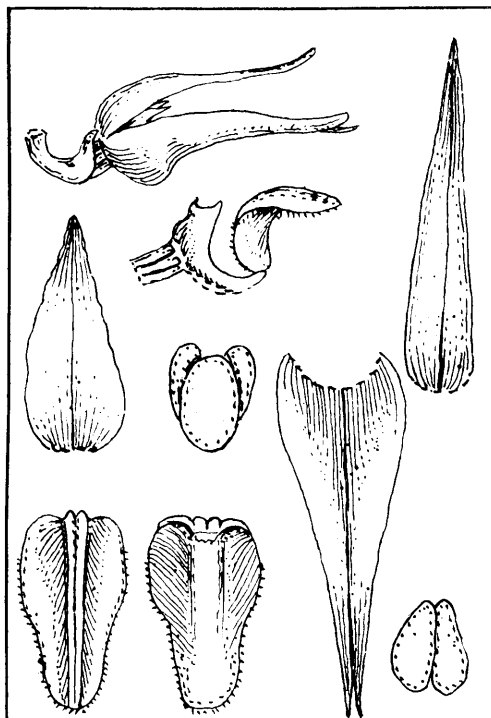
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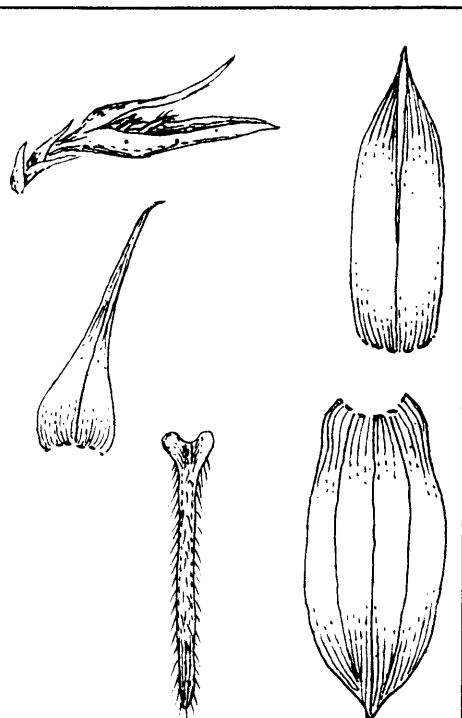
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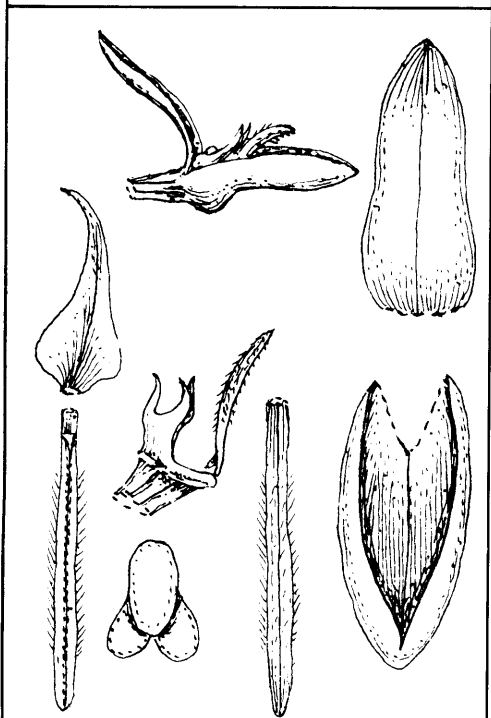
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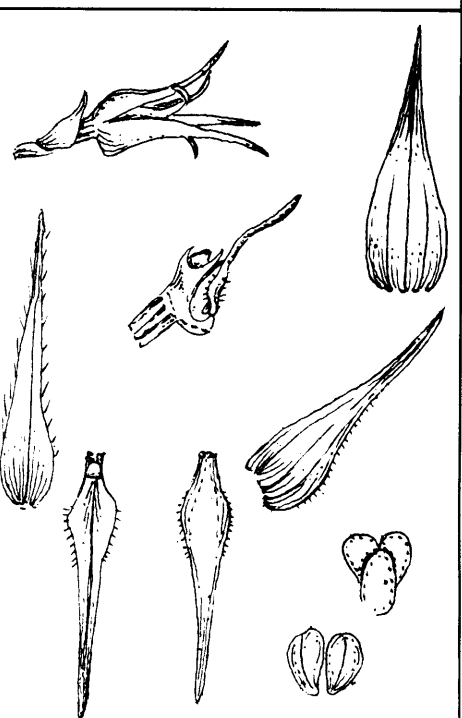
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Bulbophyllum bisepalum Schltr.



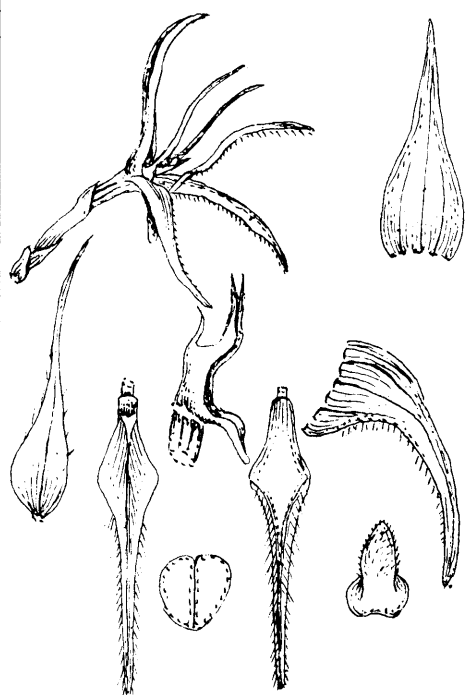
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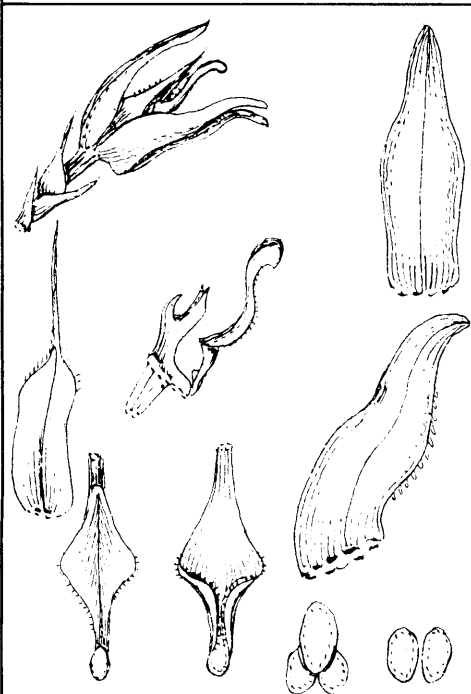
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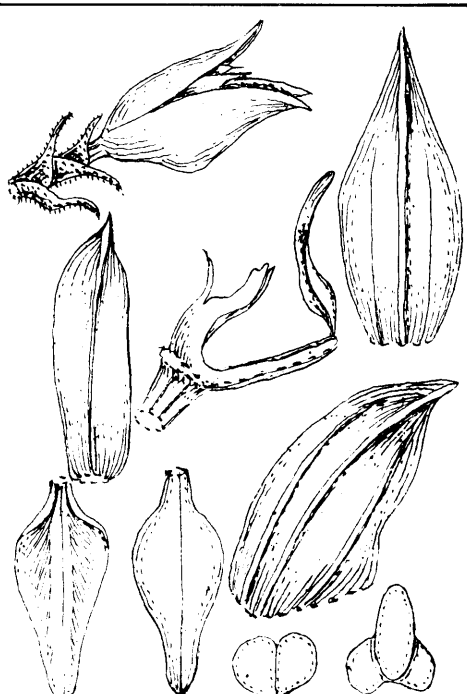
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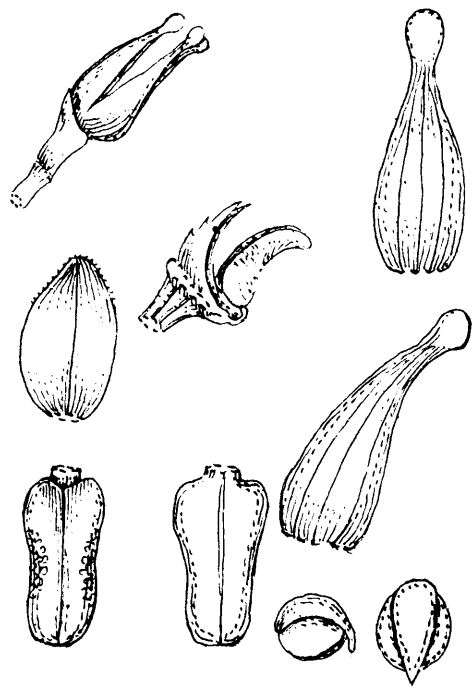
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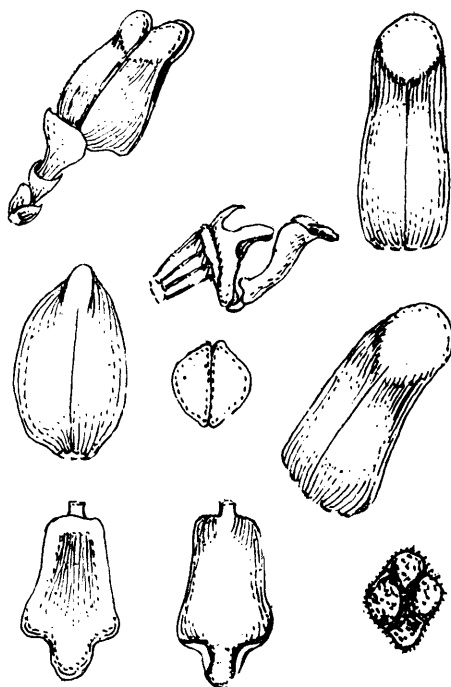
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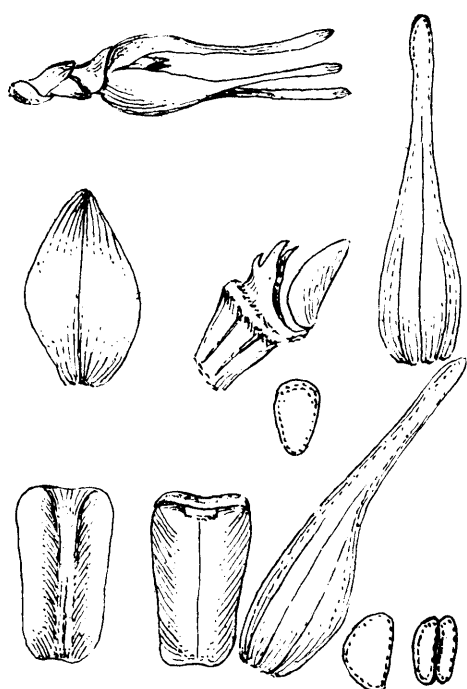
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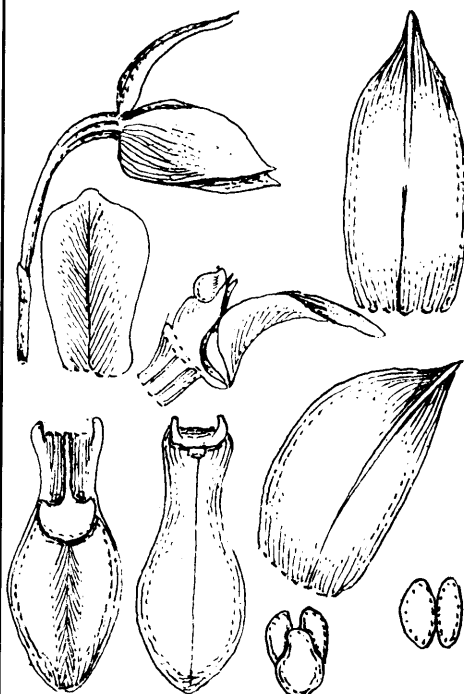
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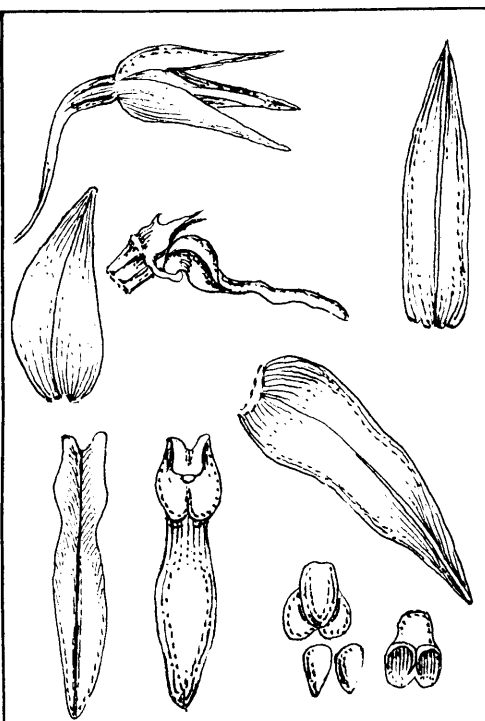
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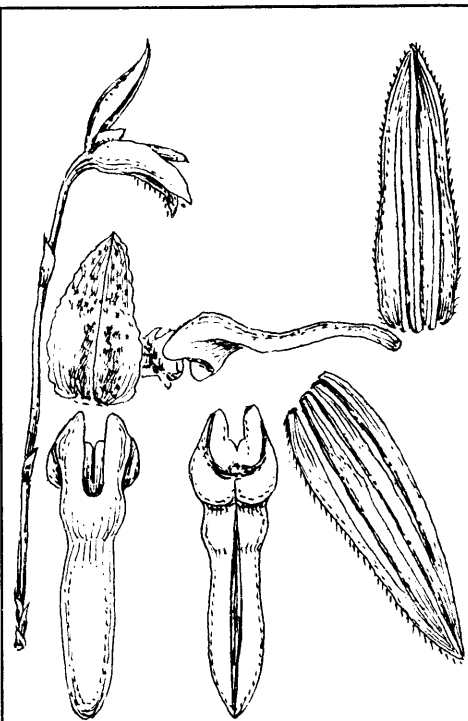
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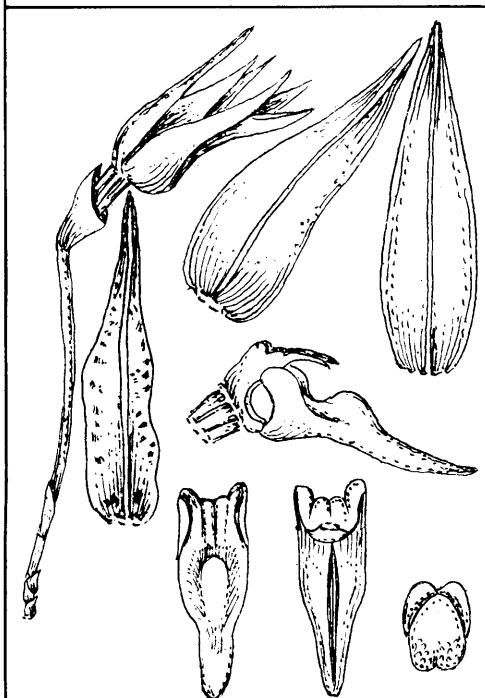
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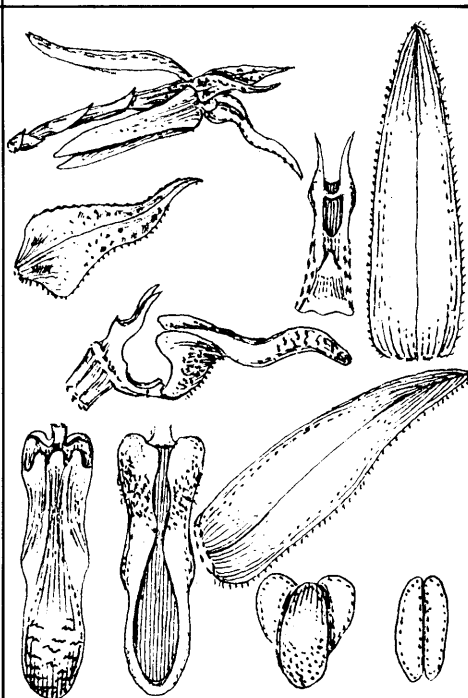
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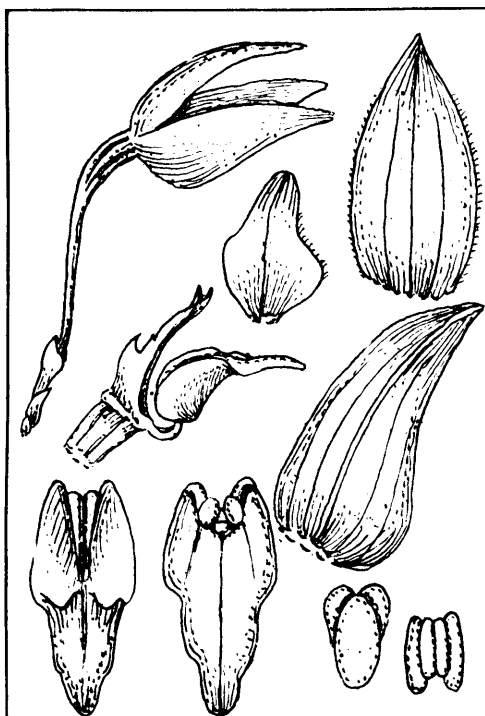
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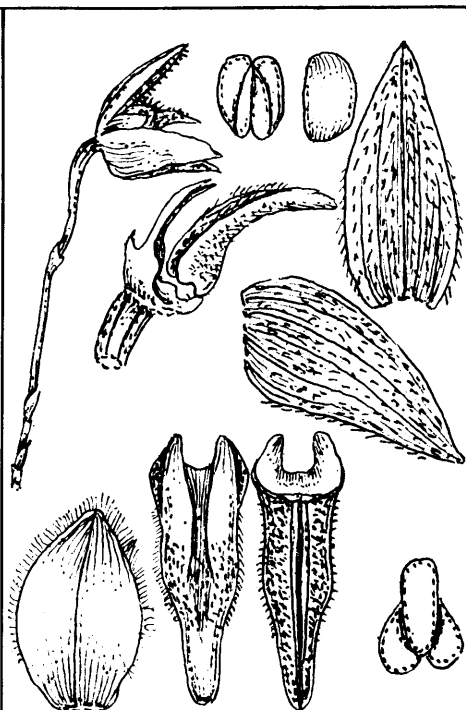
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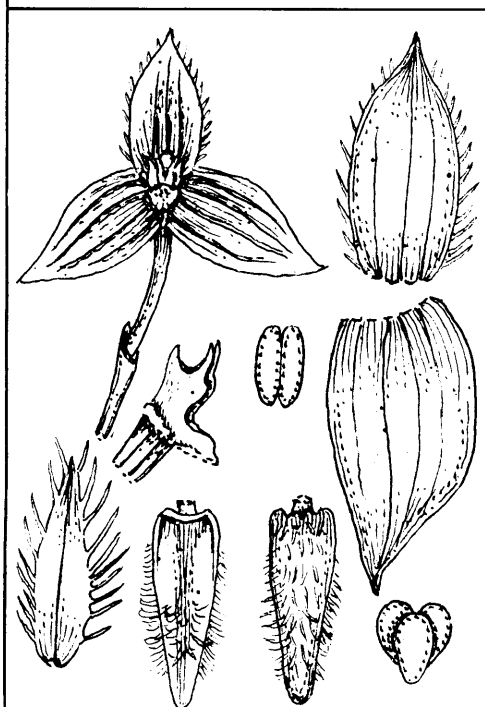
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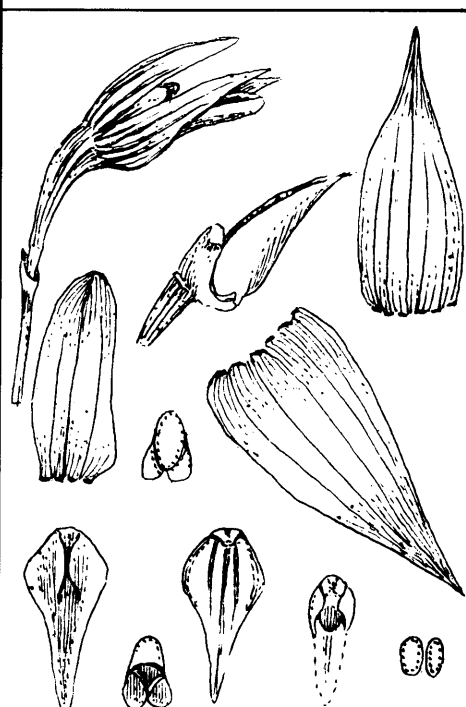
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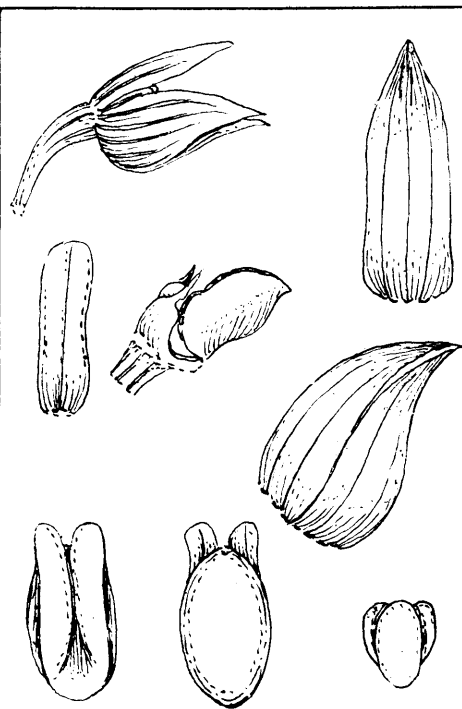
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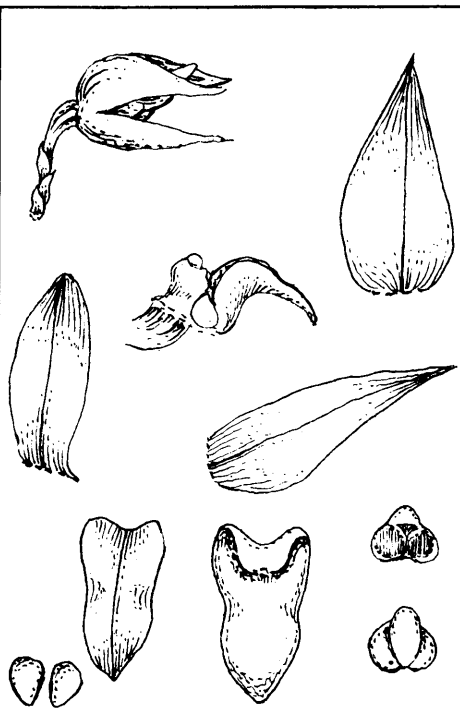
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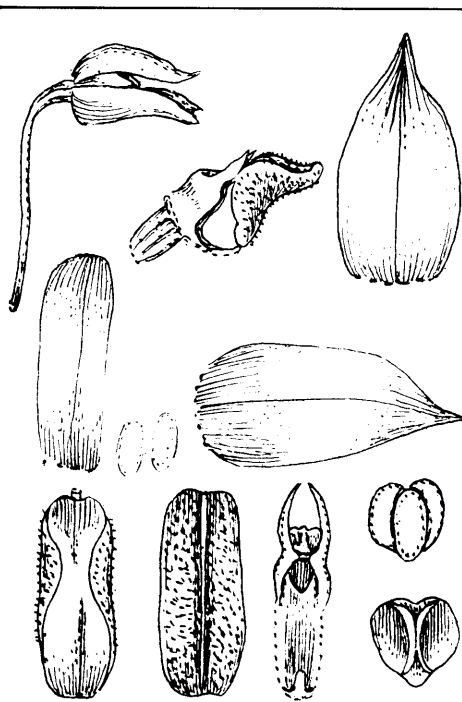
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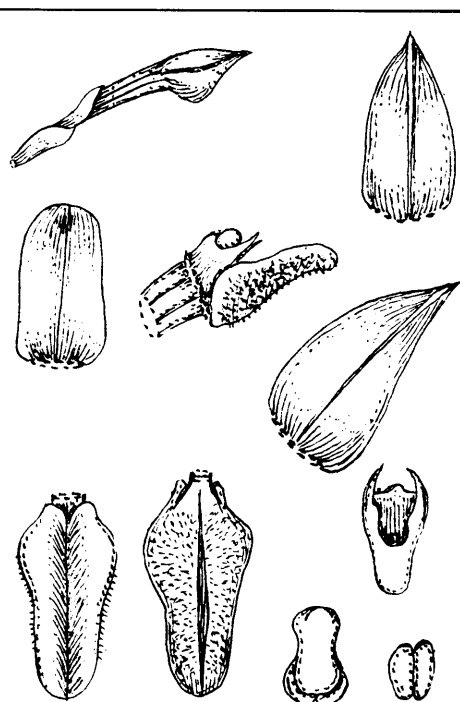
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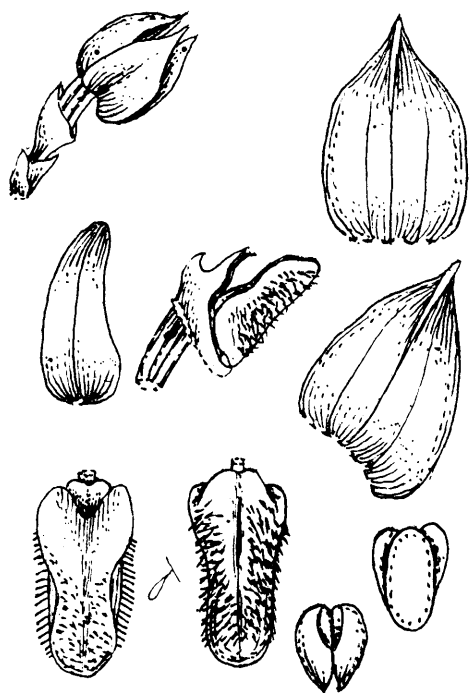
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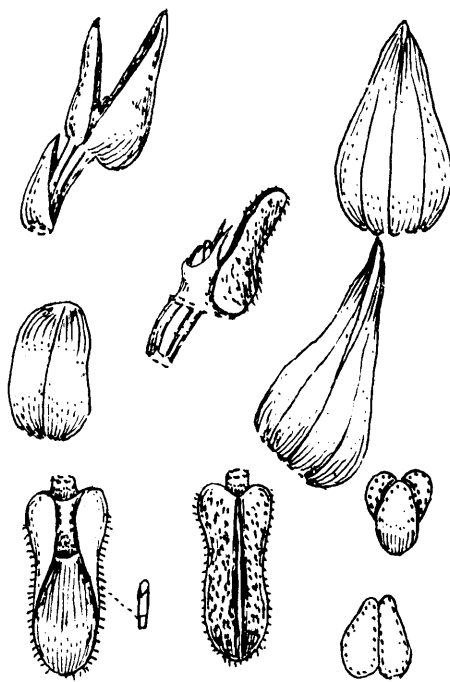
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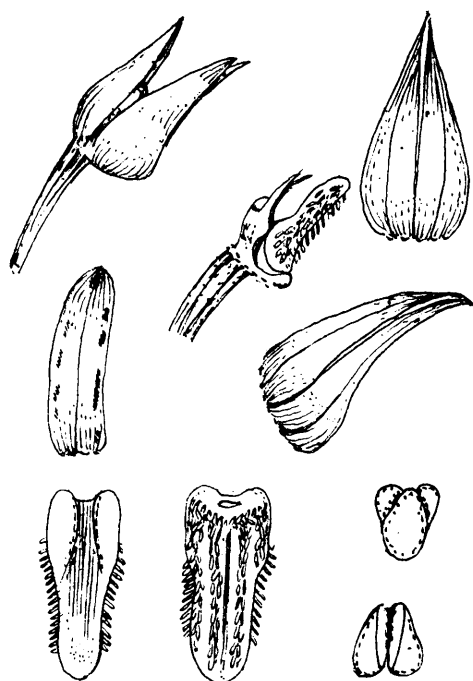
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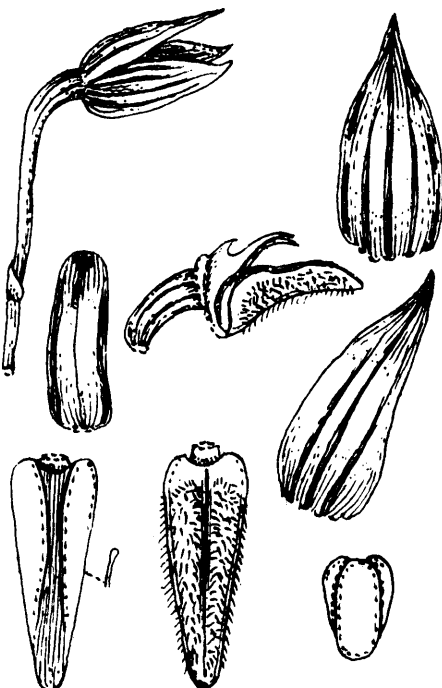
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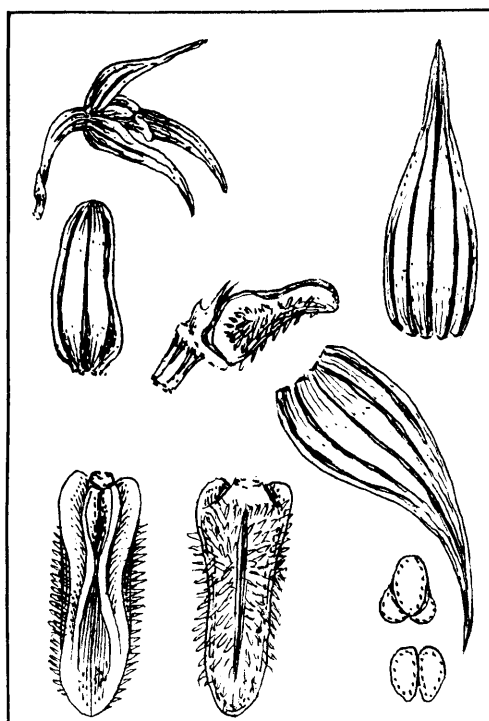
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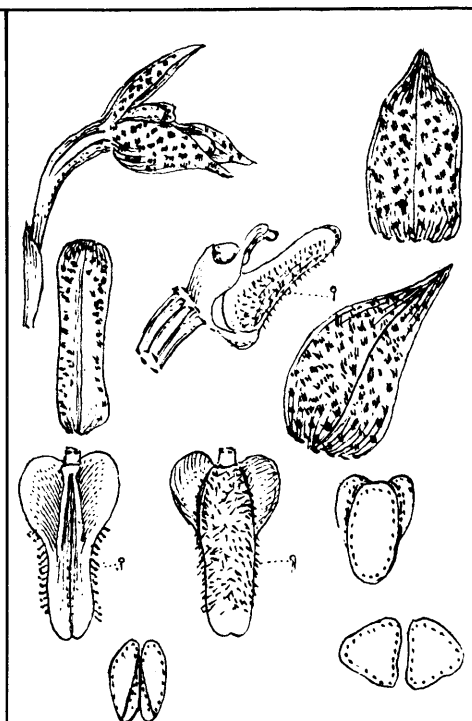
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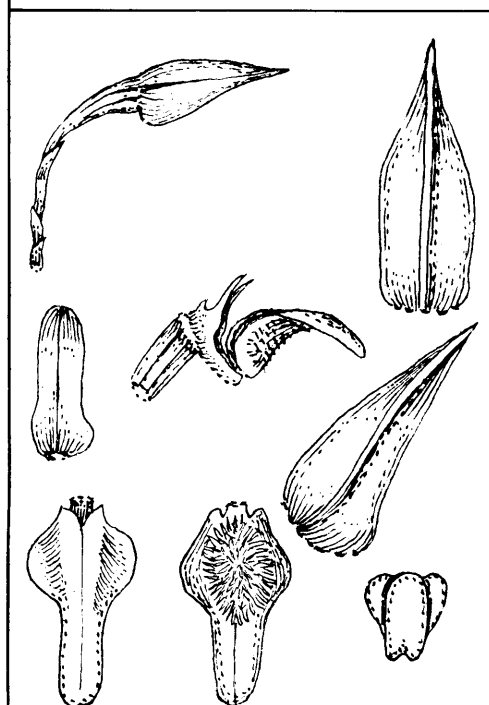
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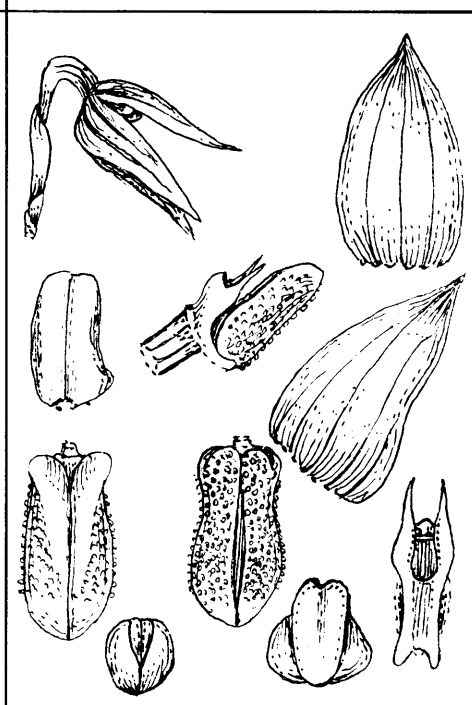
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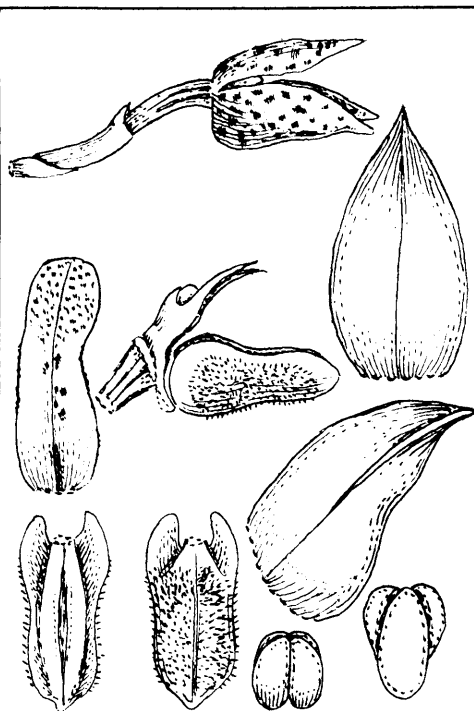
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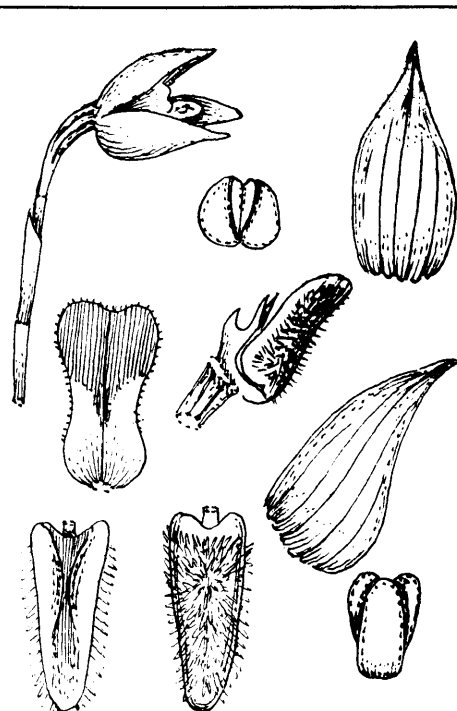
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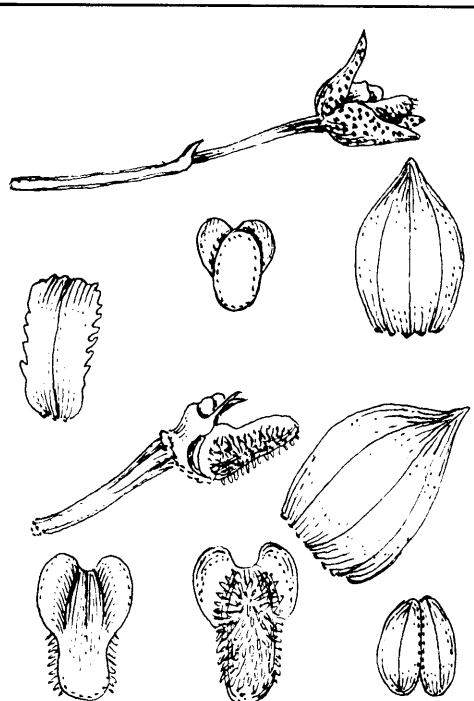
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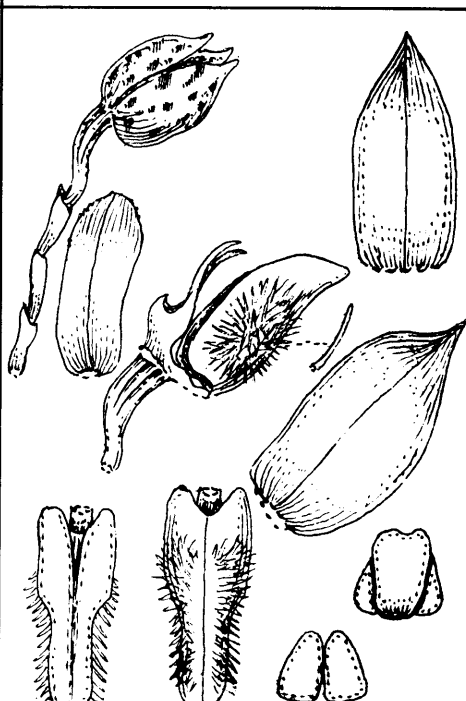
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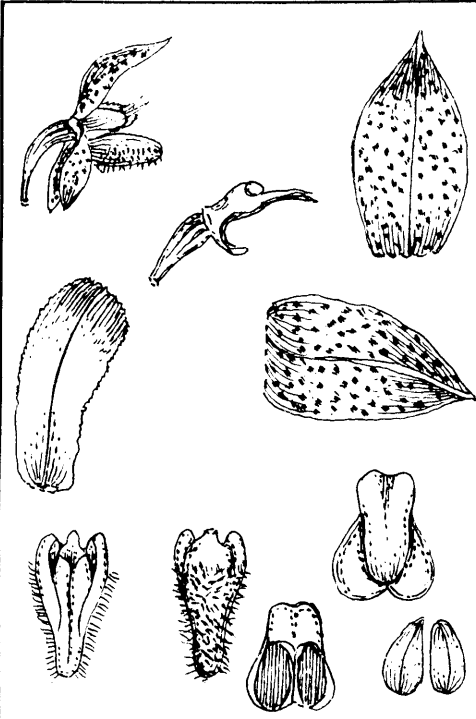
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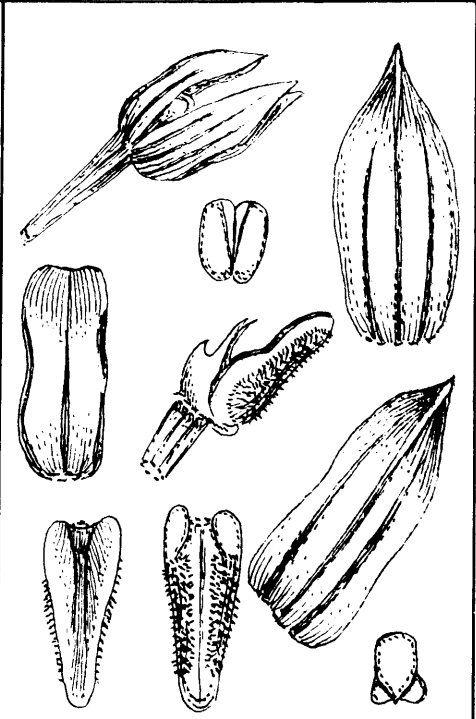
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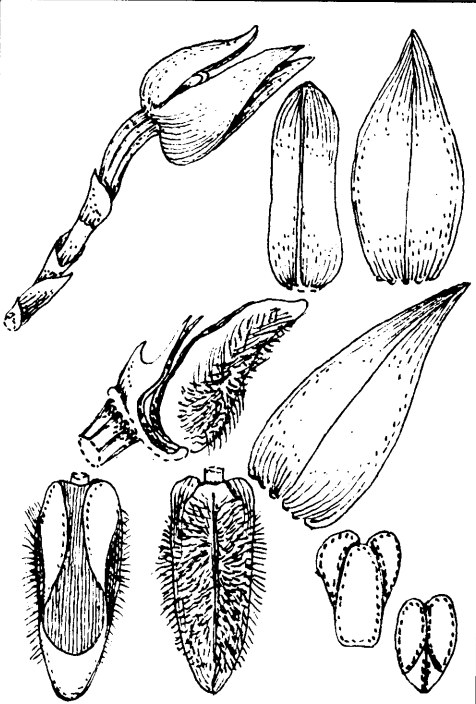
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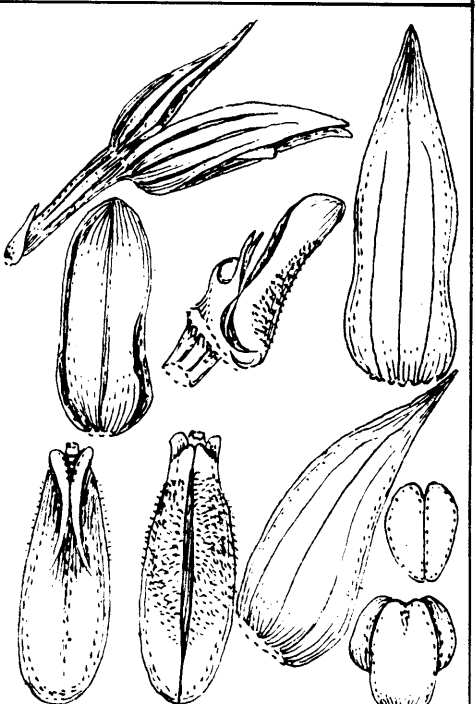
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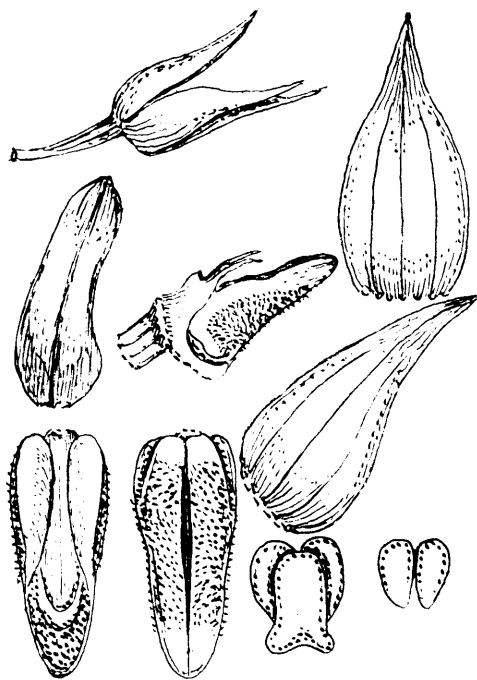
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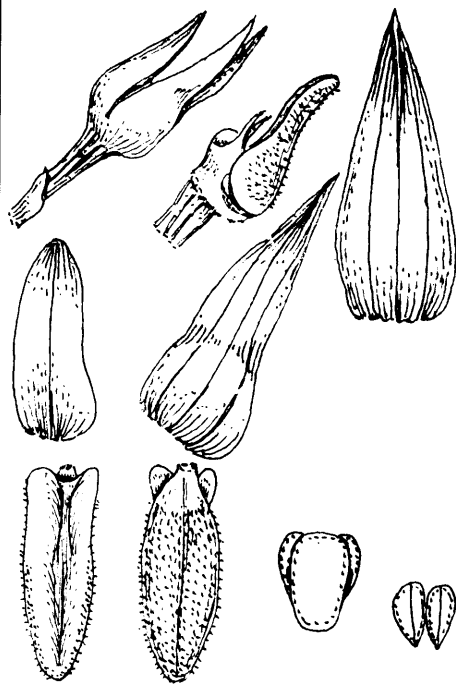
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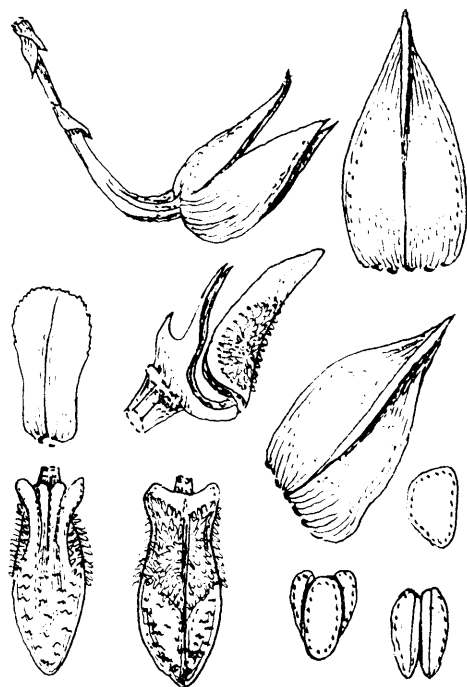
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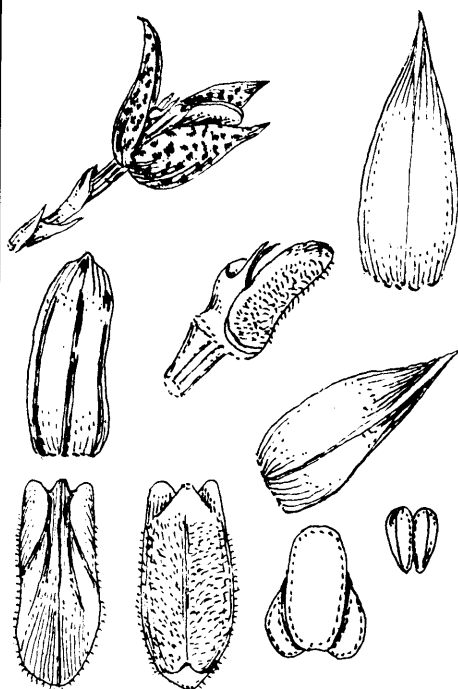
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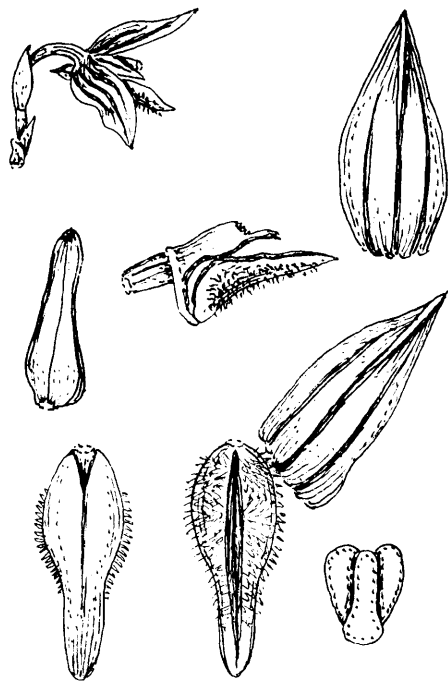
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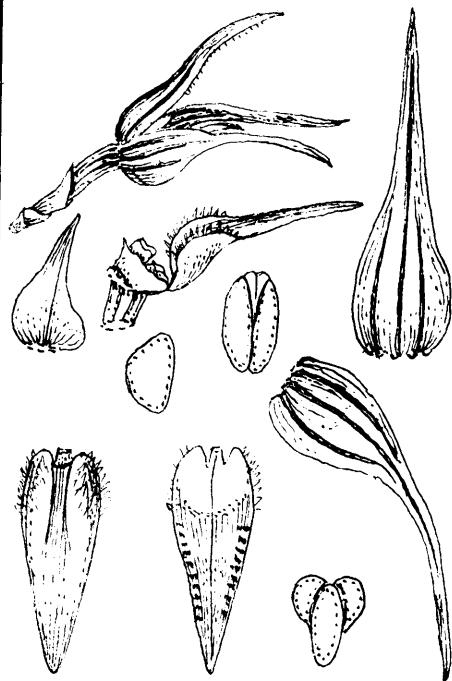
Bulbophyllum dependens Schltr.



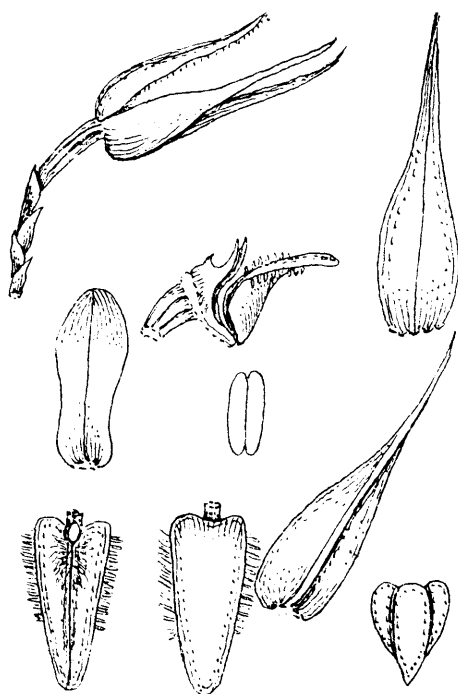
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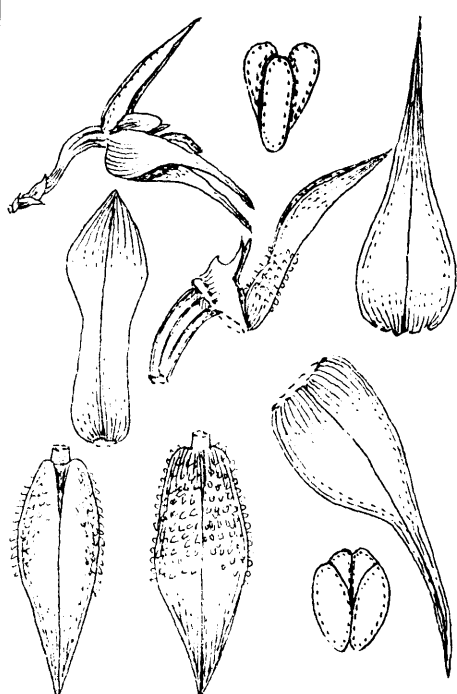
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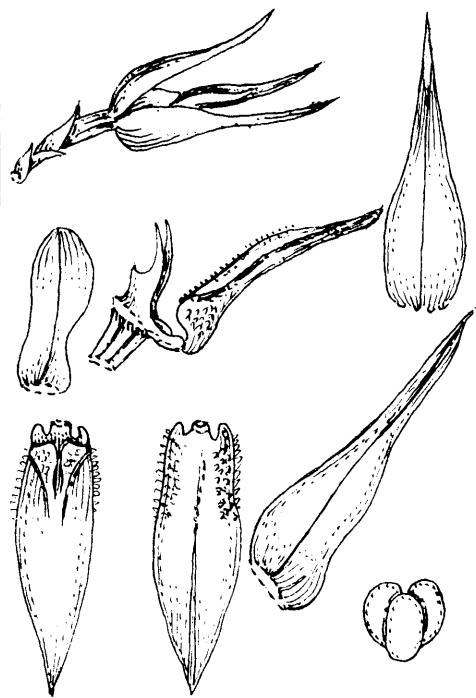
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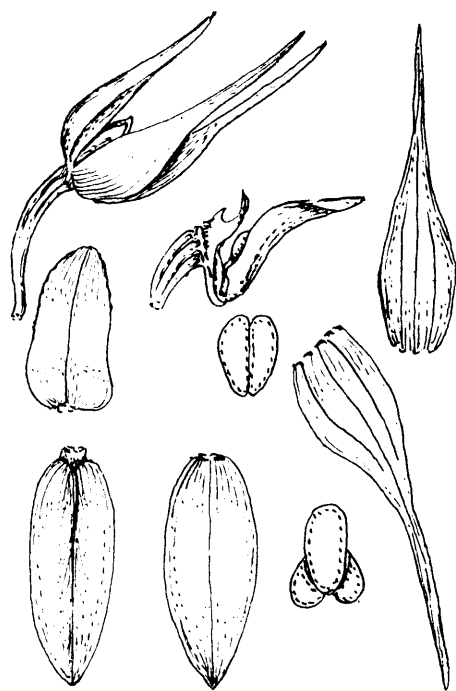
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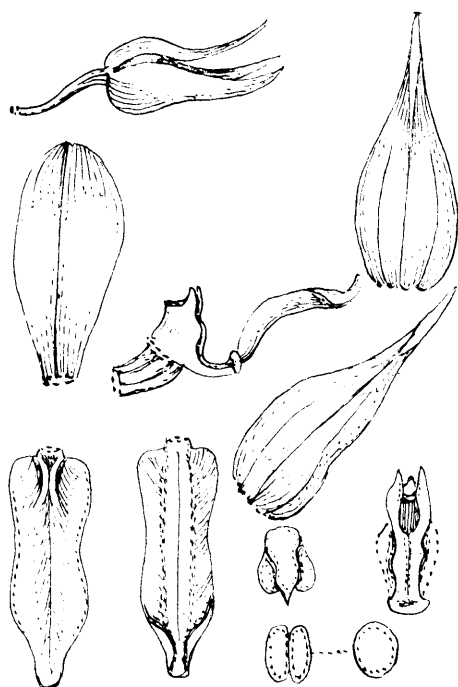
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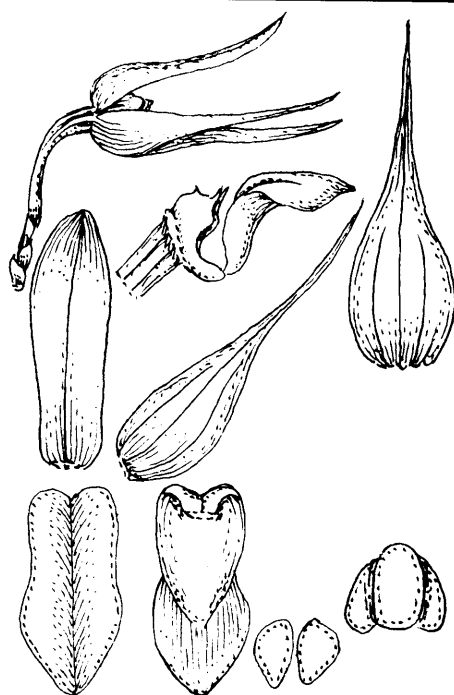
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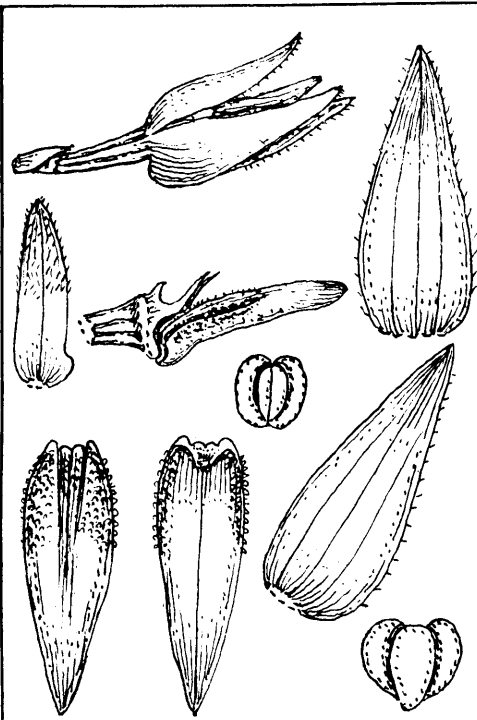
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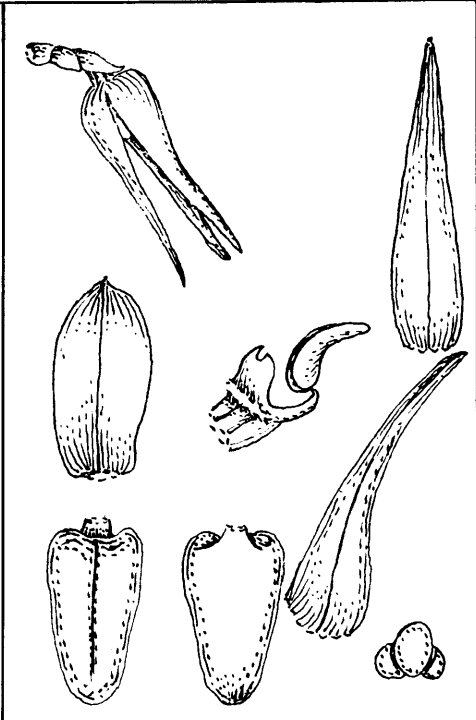
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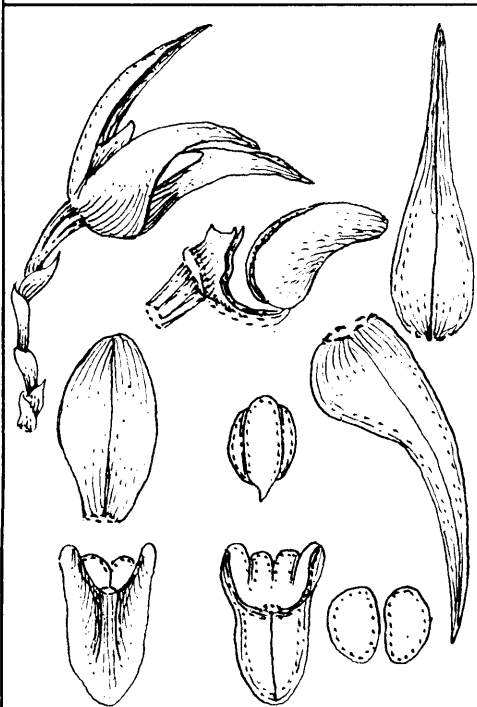
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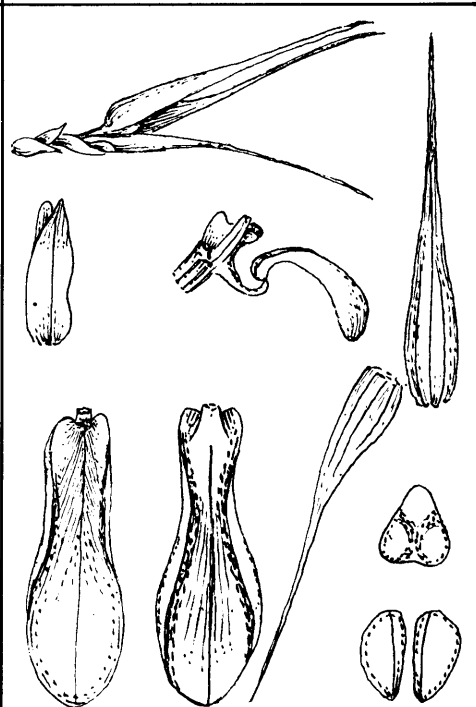
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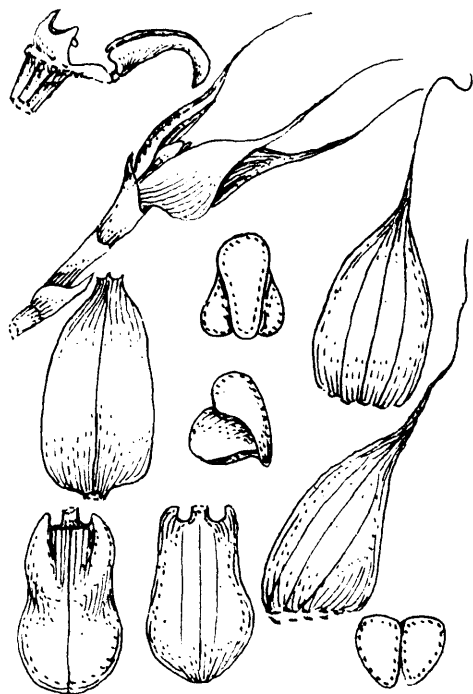
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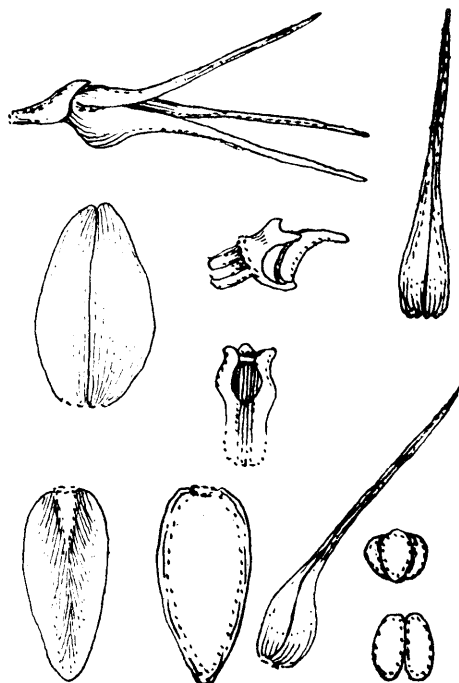
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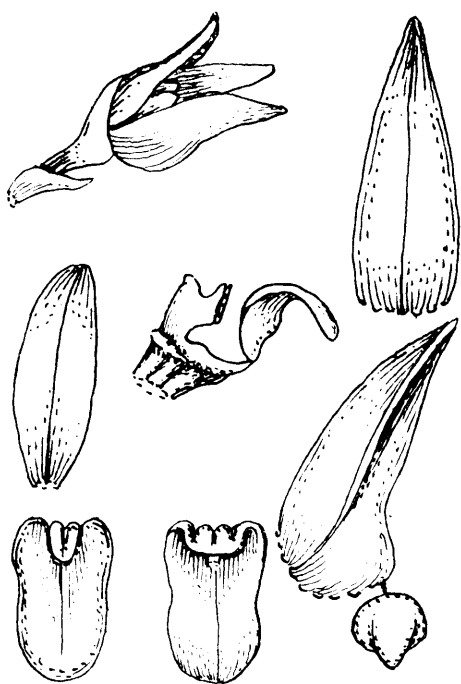
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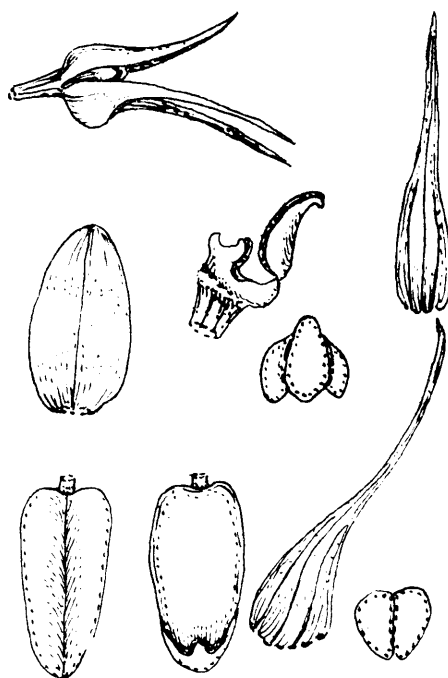
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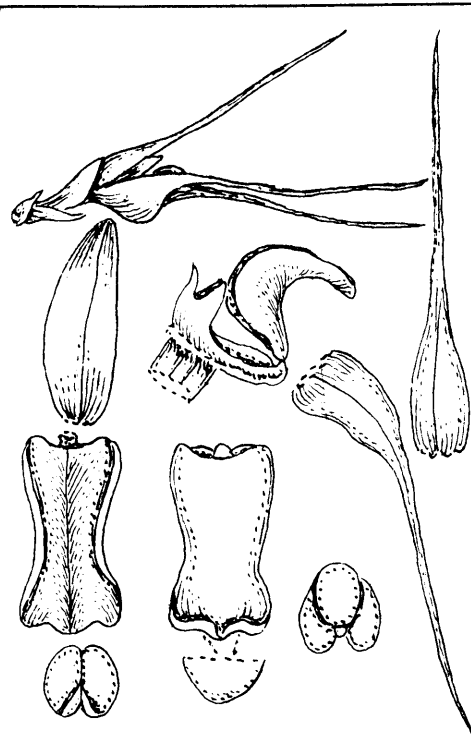
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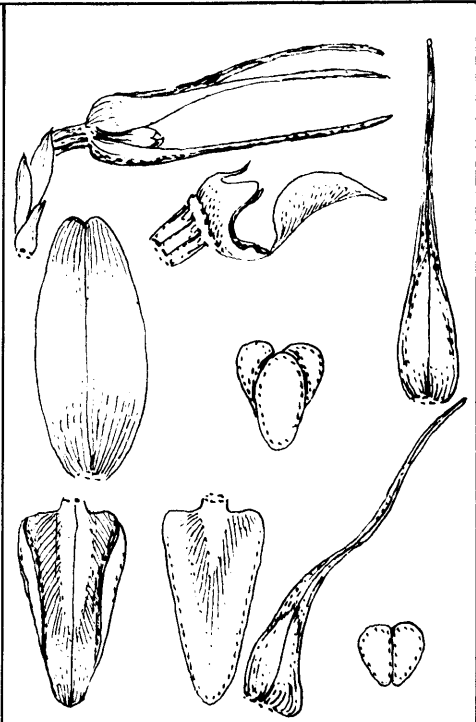
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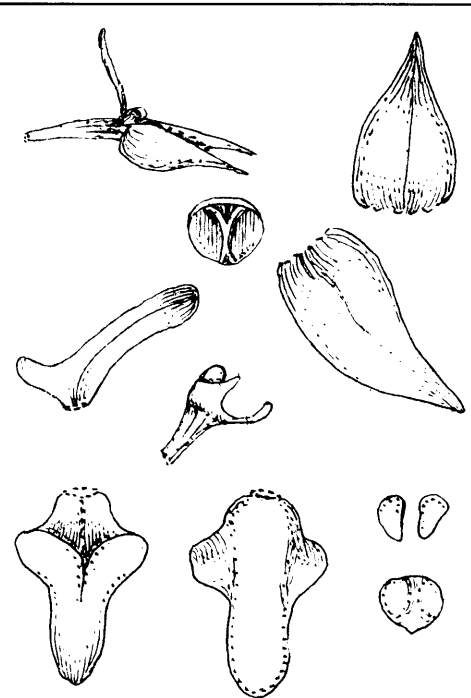
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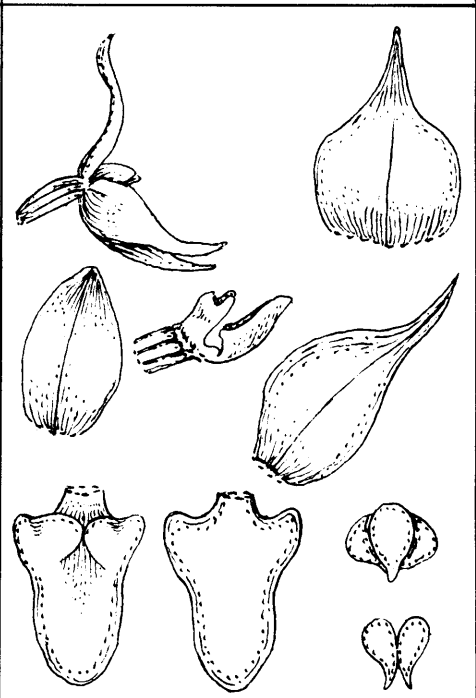
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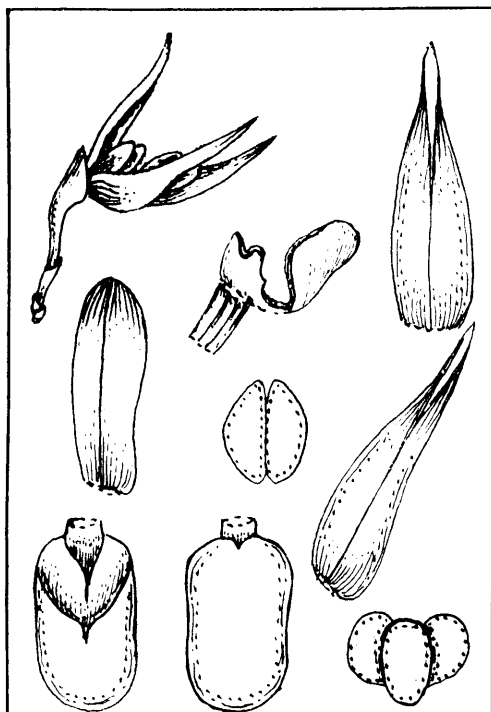
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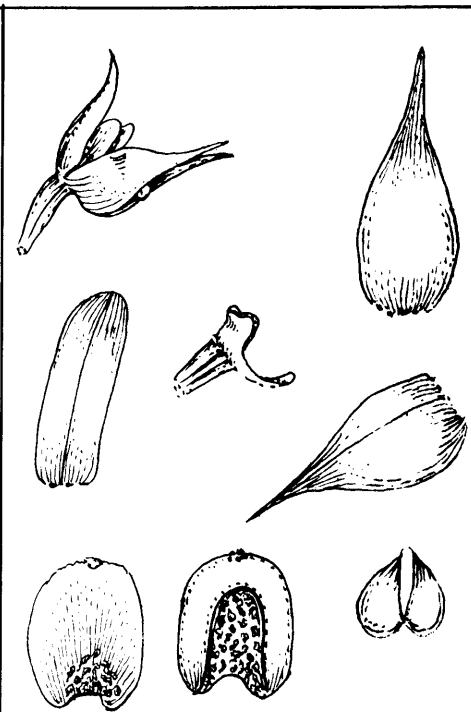
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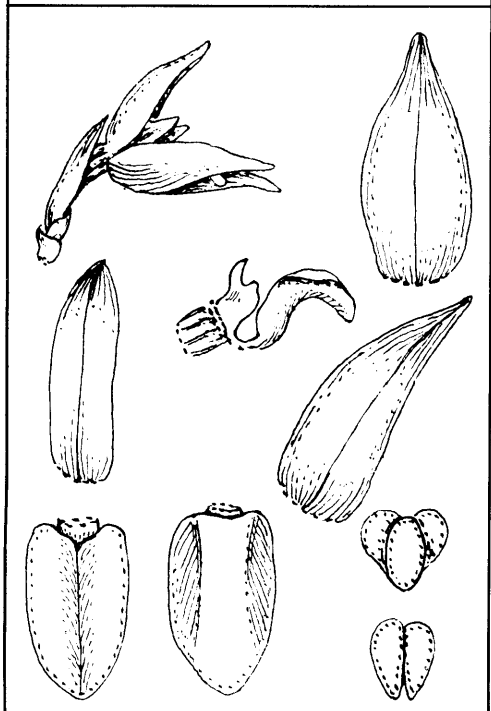
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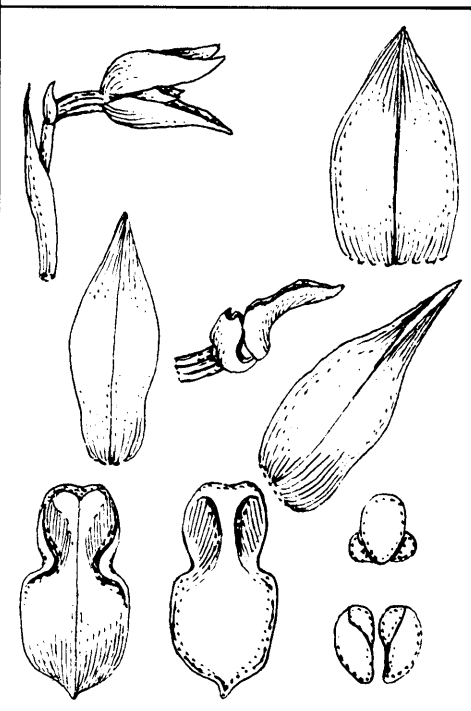
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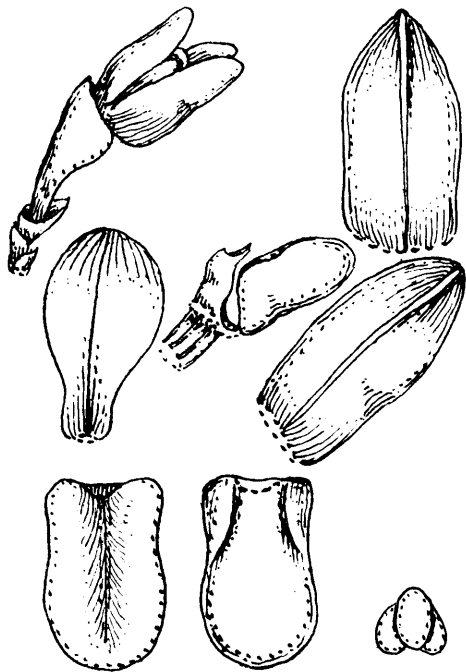
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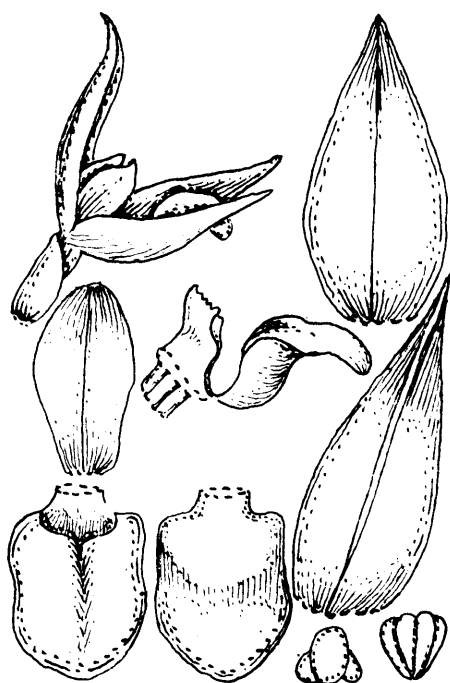
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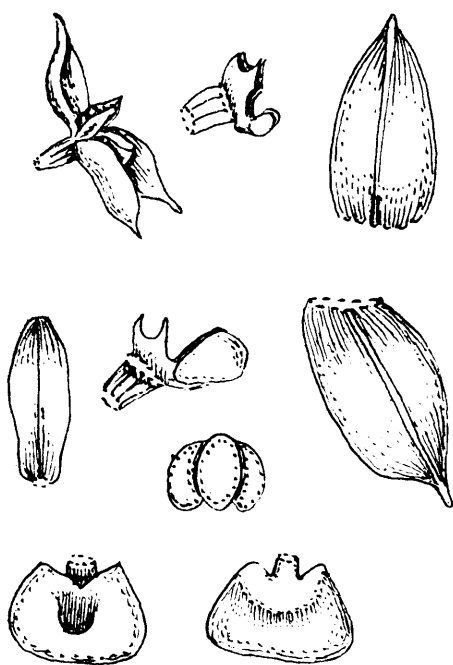
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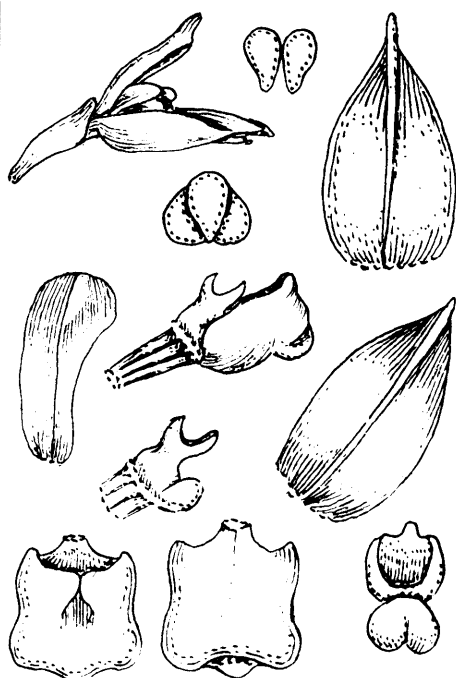
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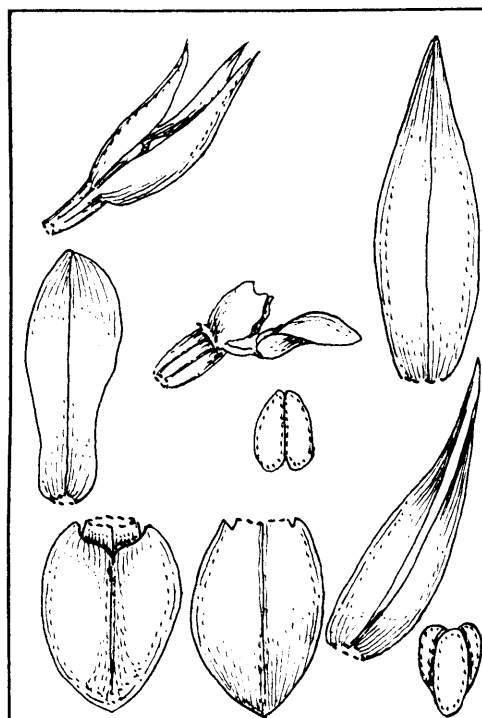
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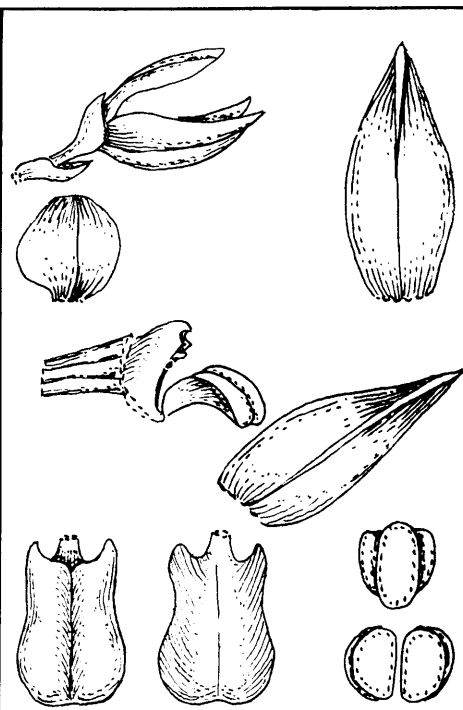
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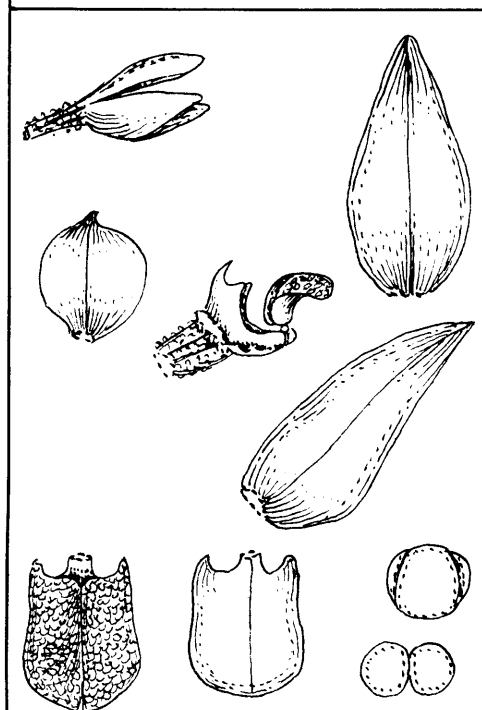
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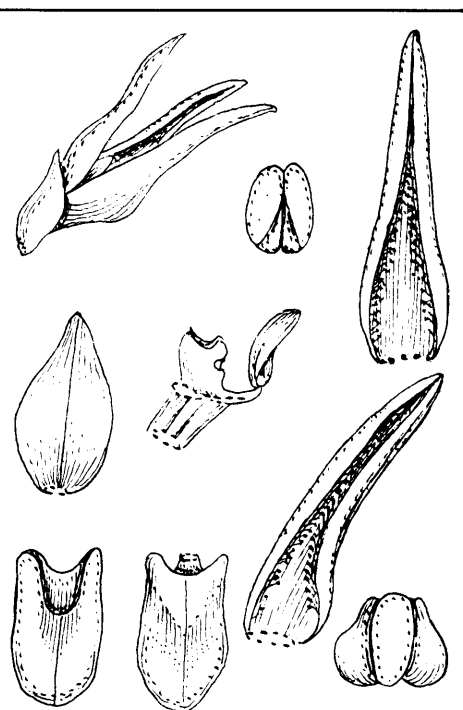
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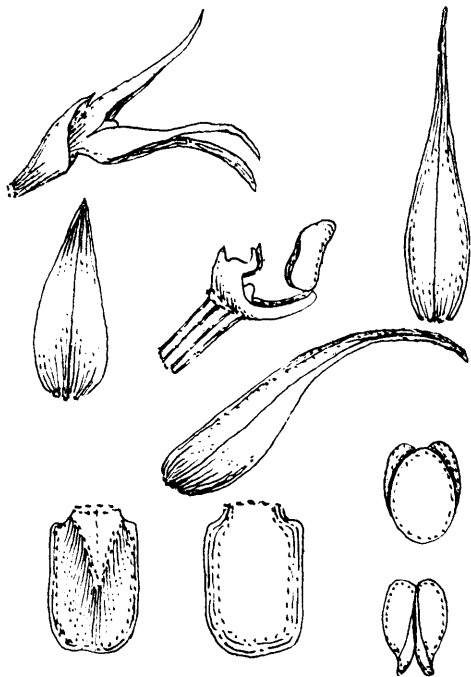
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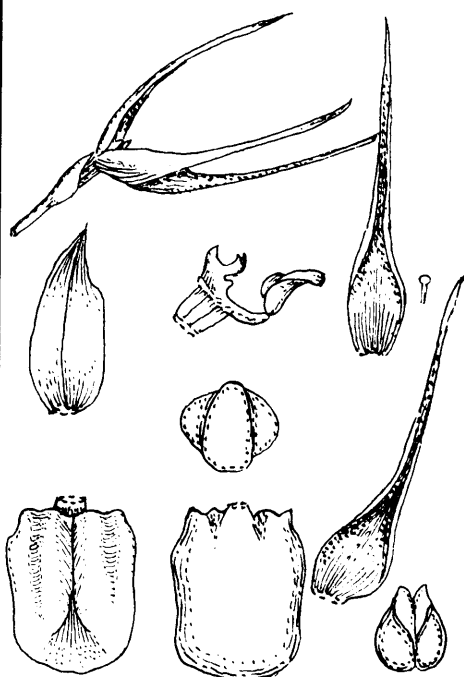
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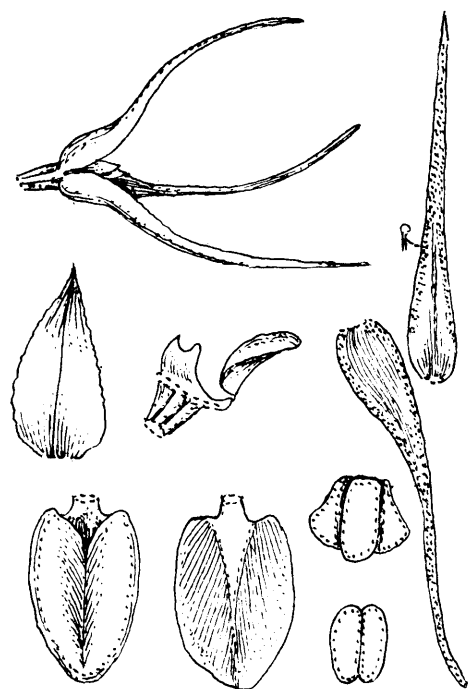
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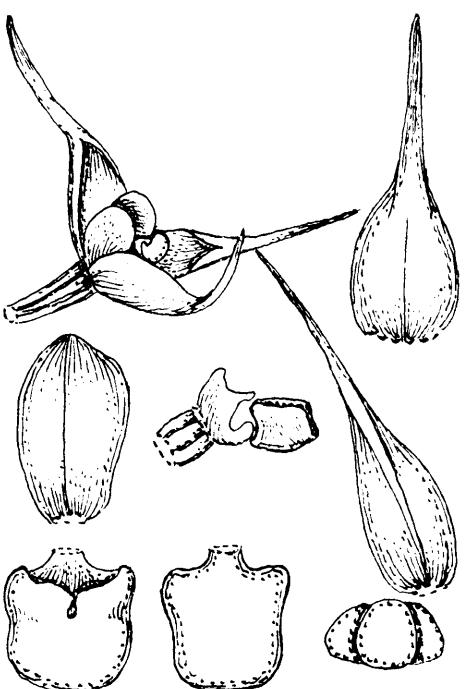
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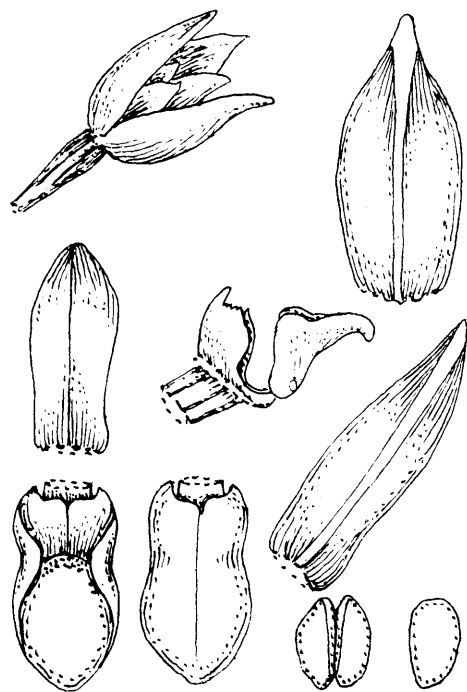
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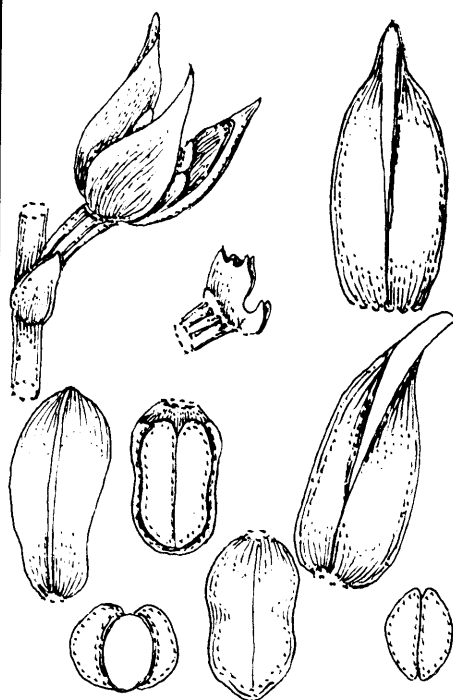
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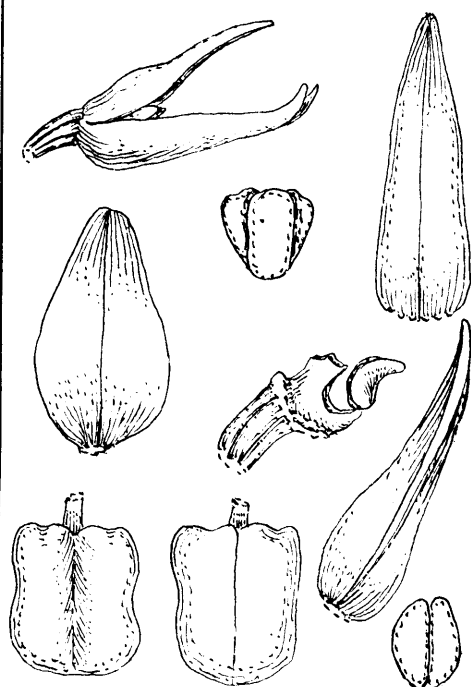
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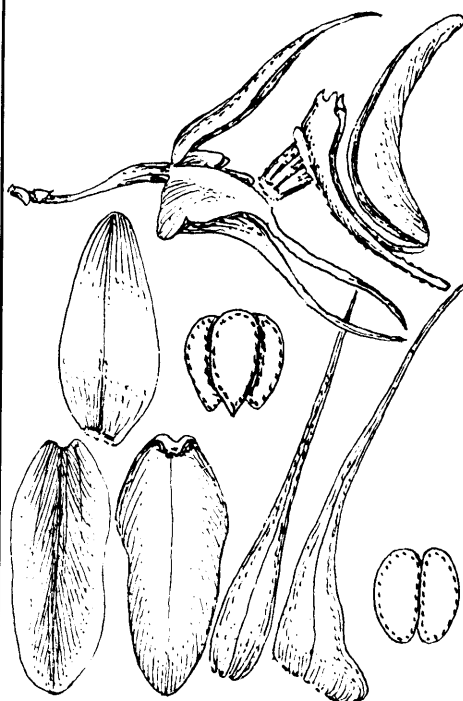
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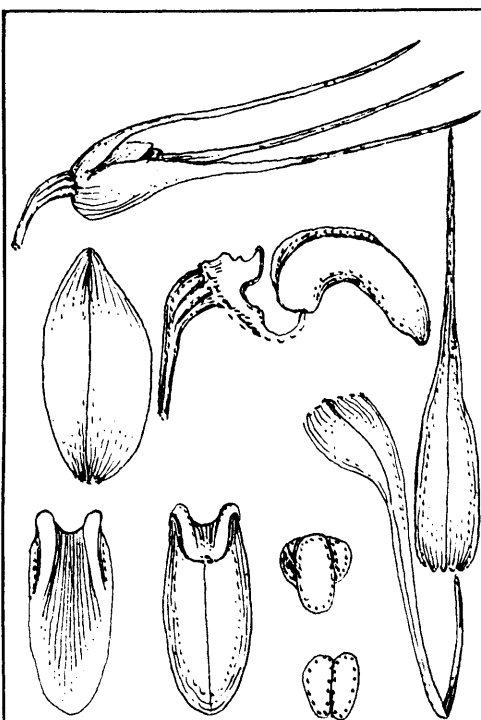
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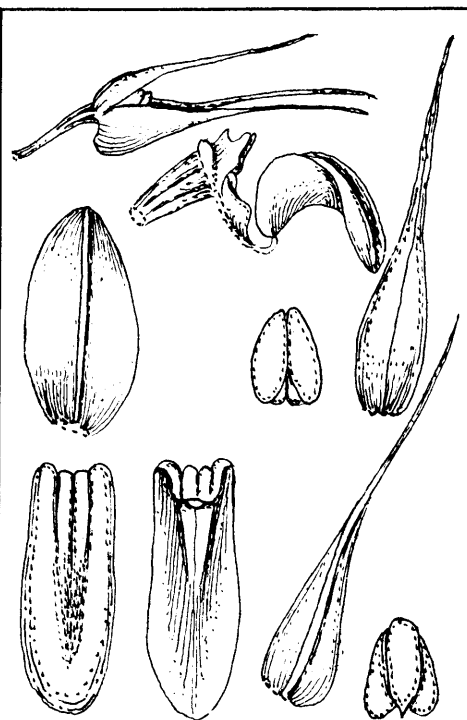
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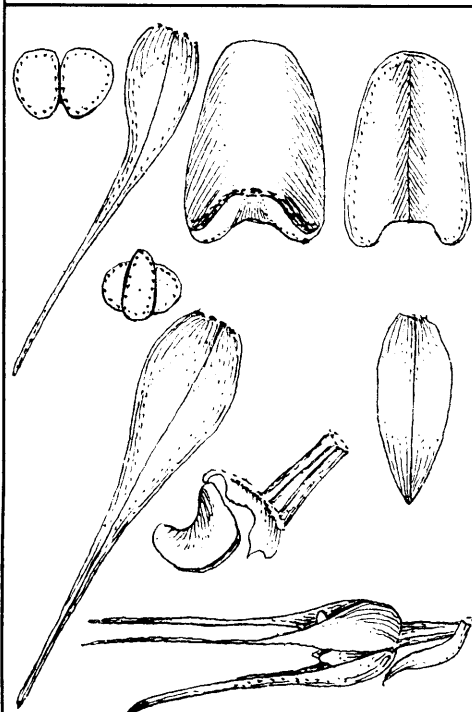
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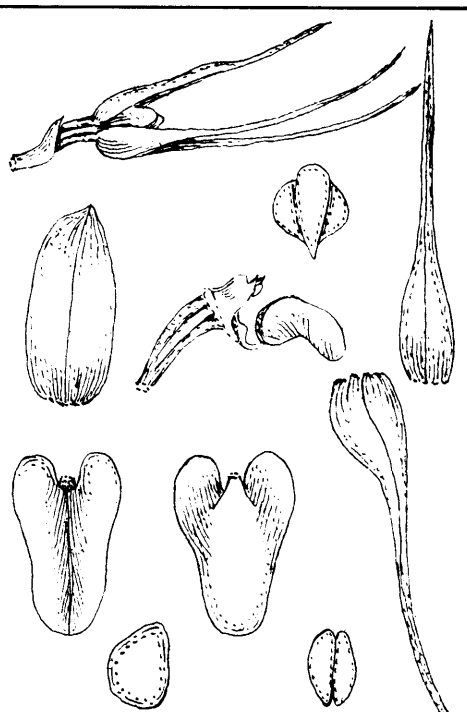
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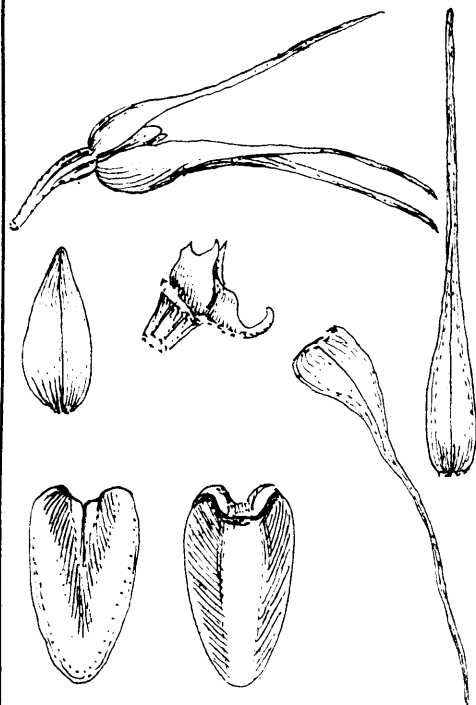
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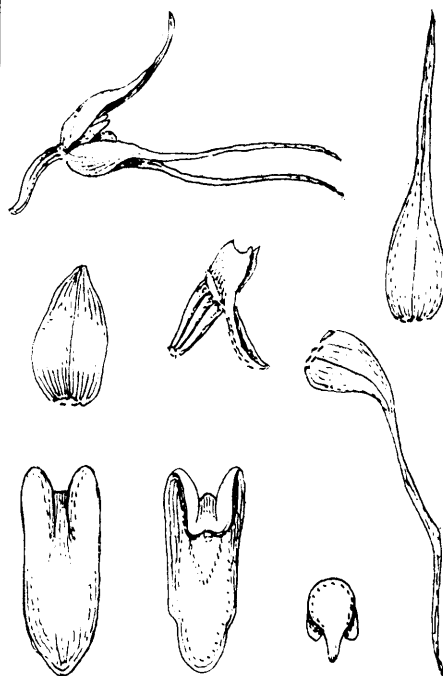
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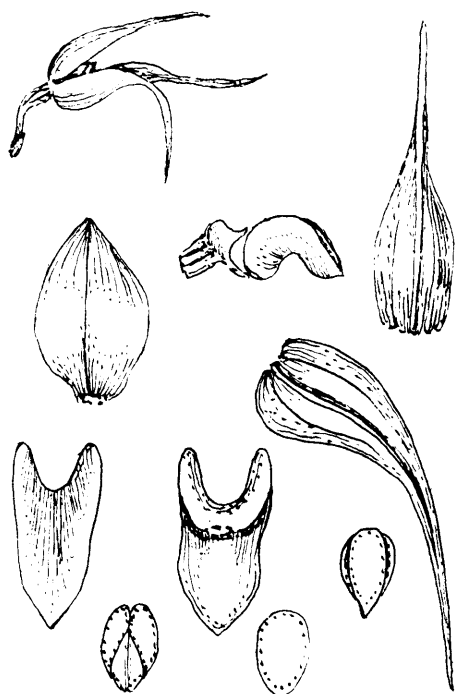
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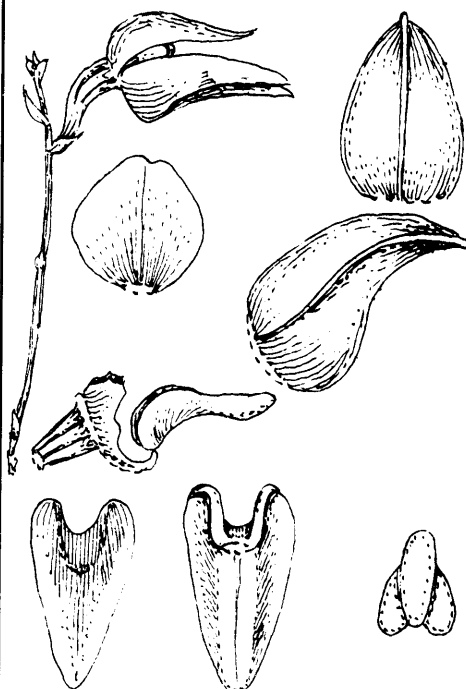
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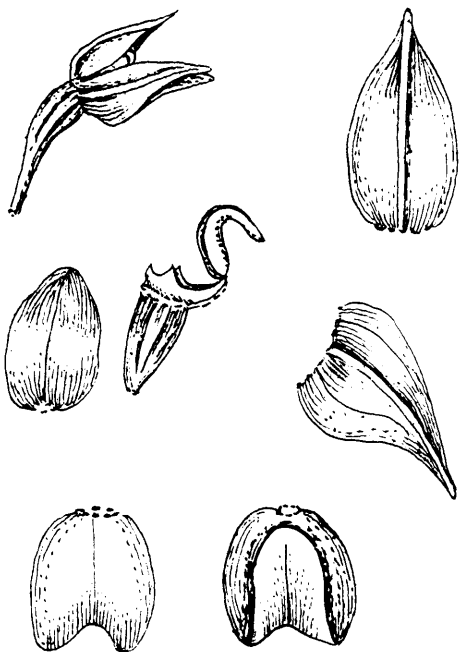
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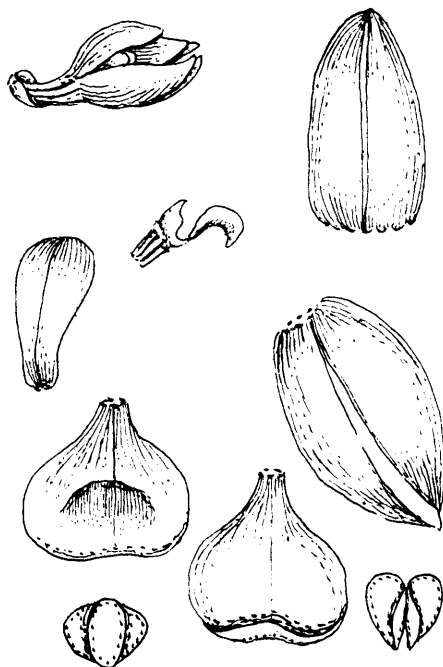
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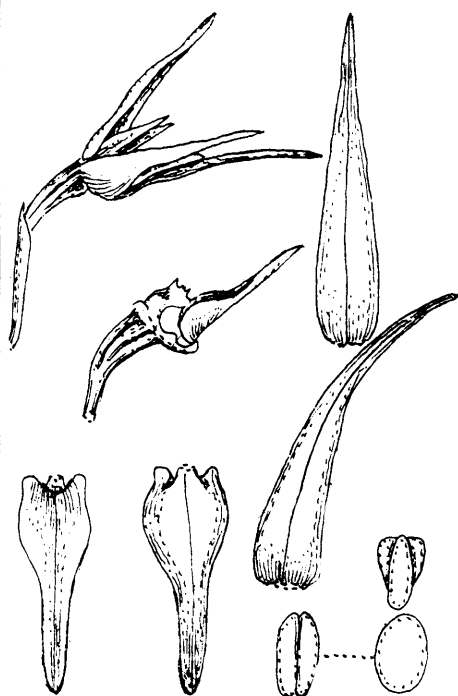
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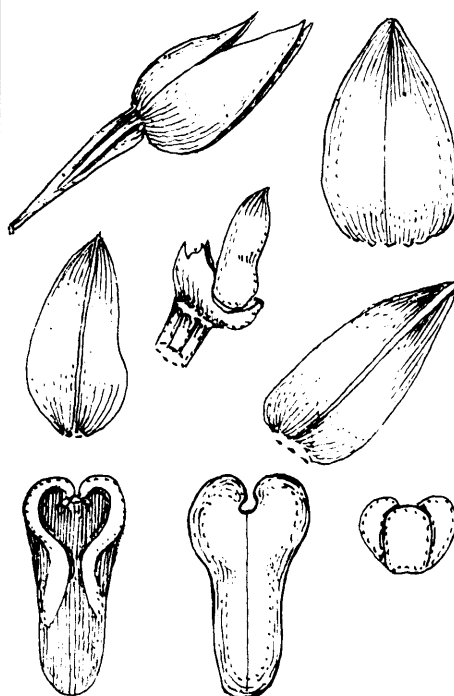
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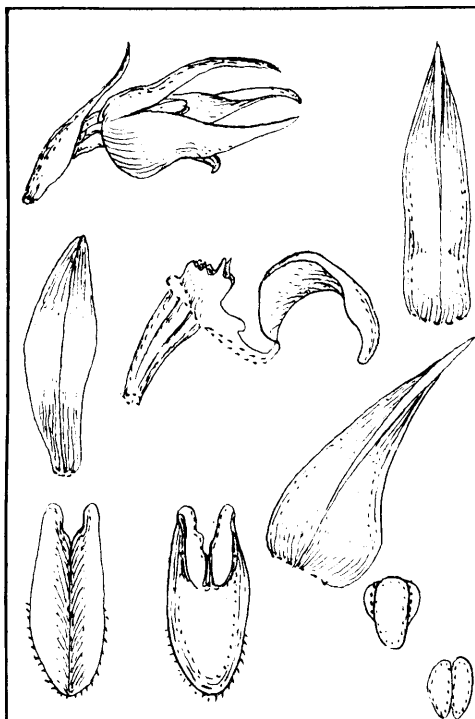
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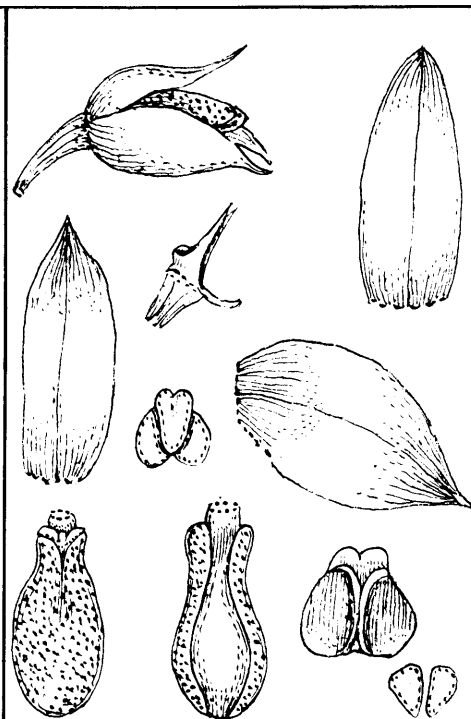
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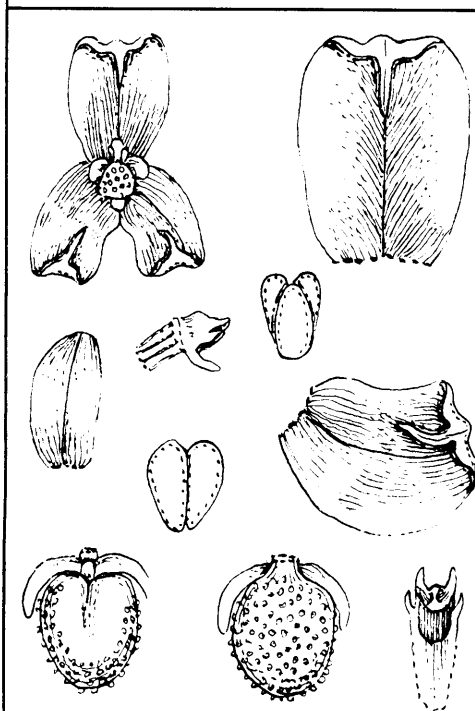
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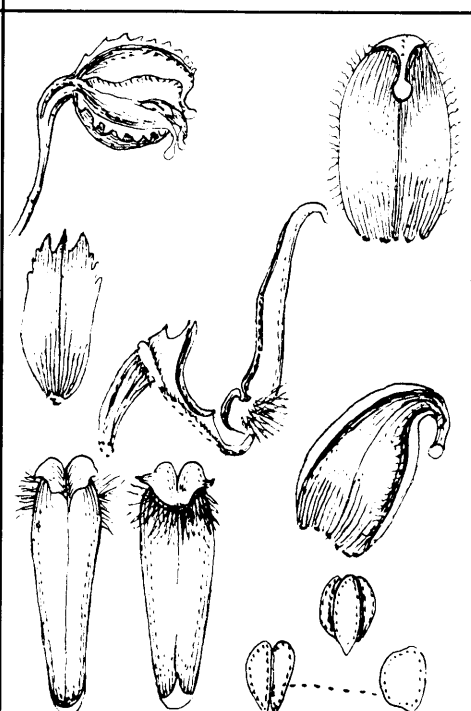
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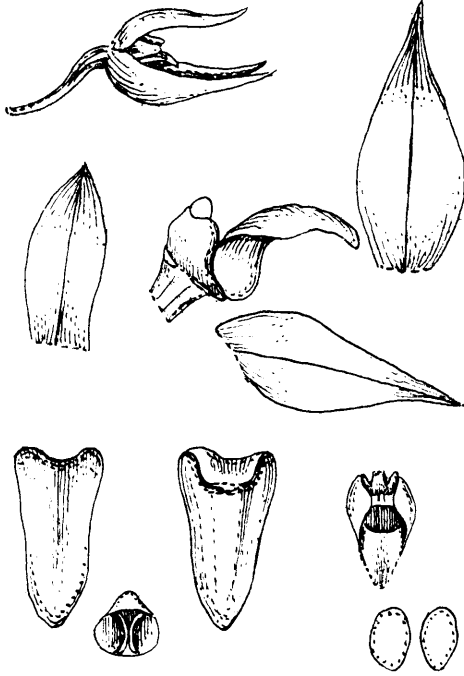
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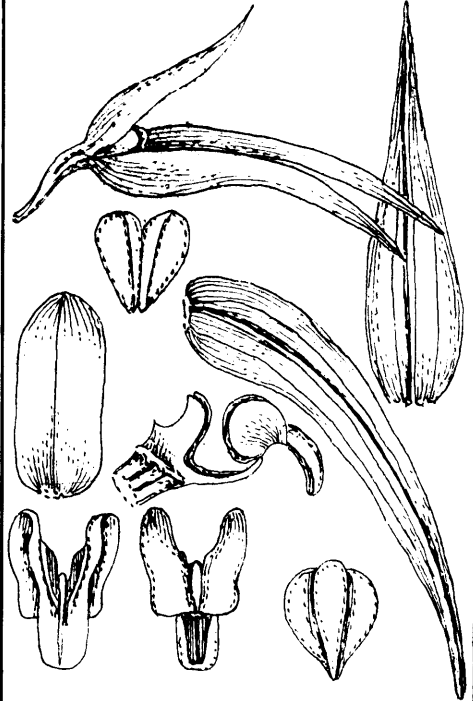
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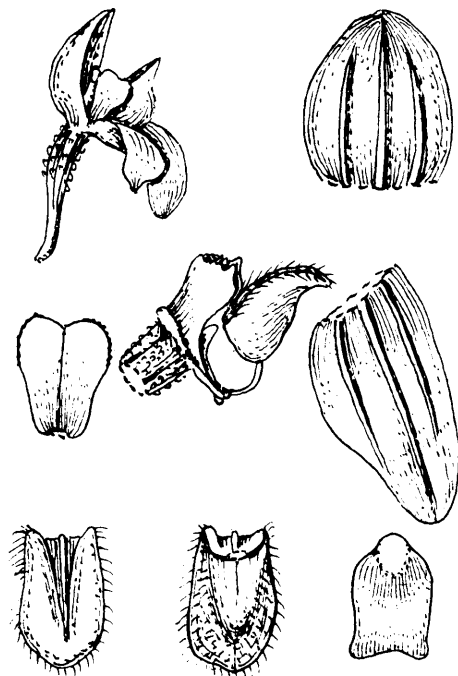
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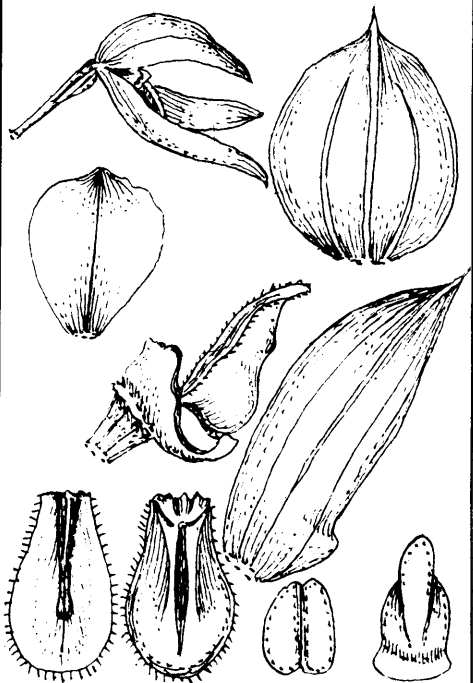
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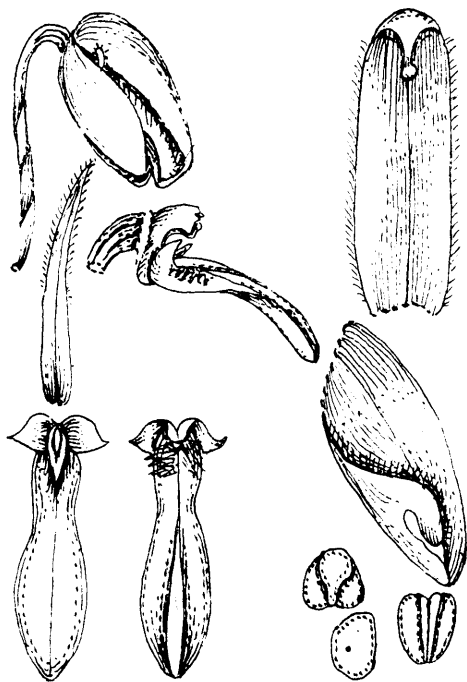
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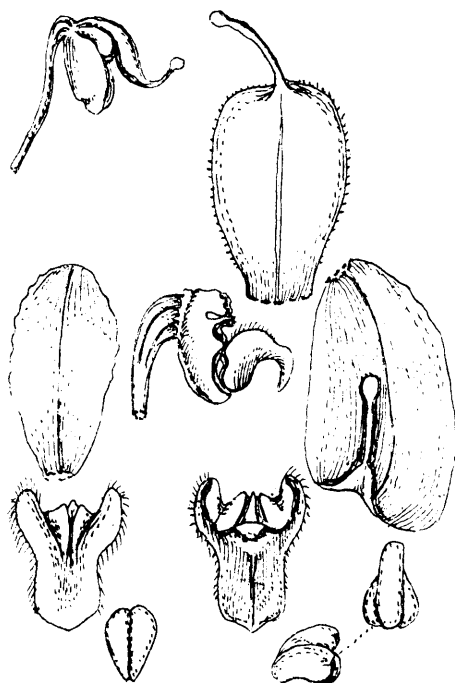
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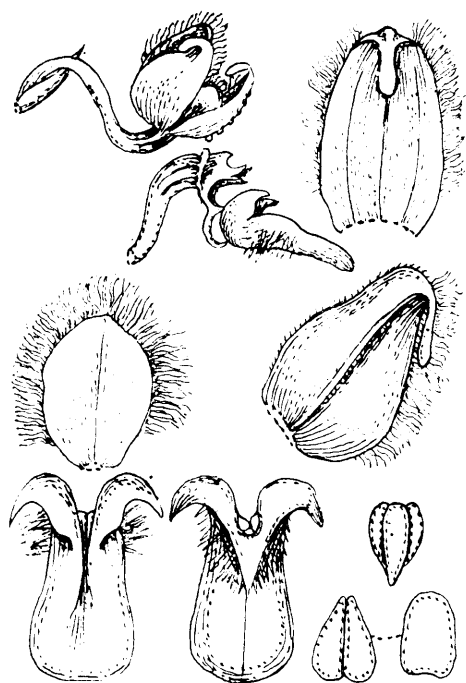
Bulbophyllum verrucirhachis Schltr.



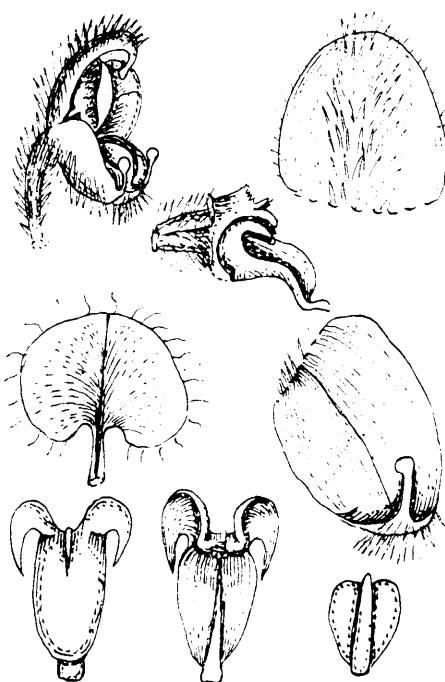
Bulbophyllum antennatum Schltr.



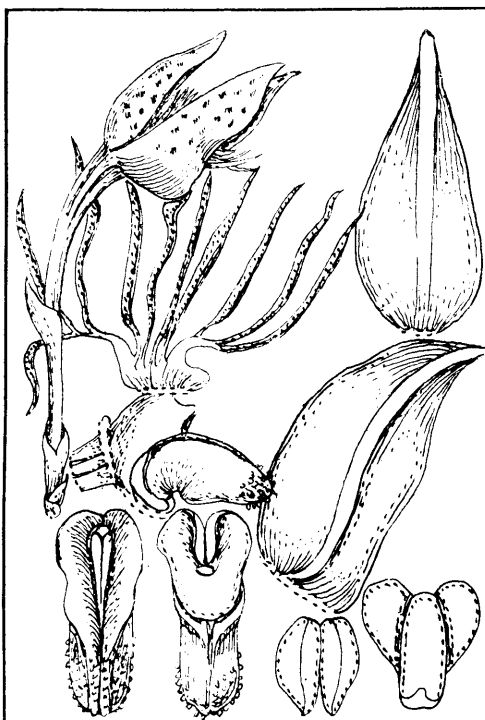
Bulbophyllum trachypus Schltr.



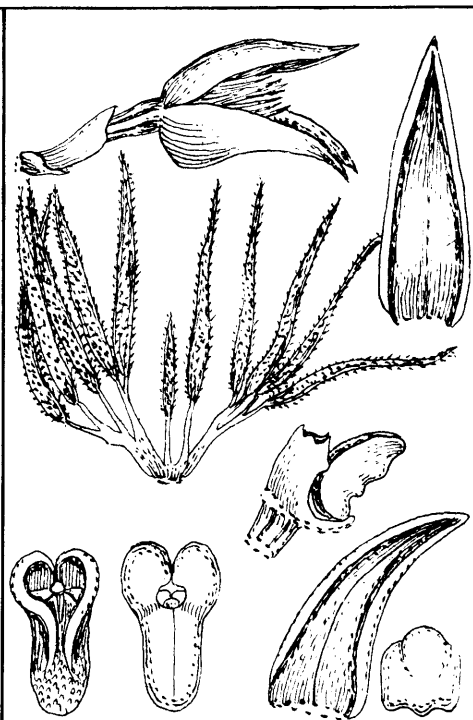
Bulbophyllum barbellatum Schltr.



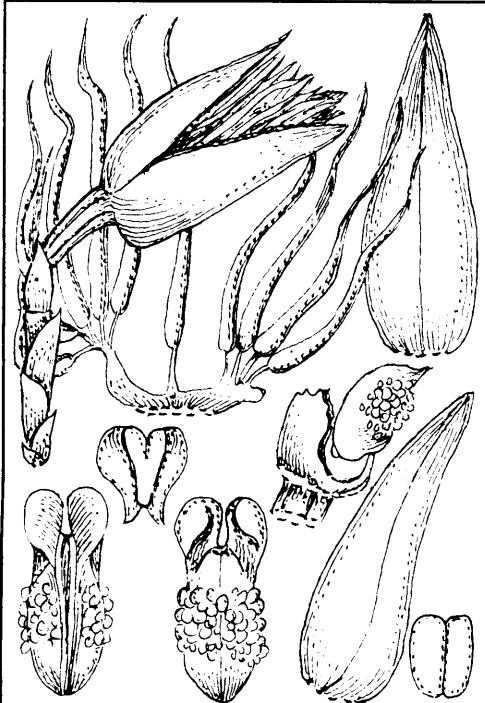
Bulbophyllum erinaceum Schltr.



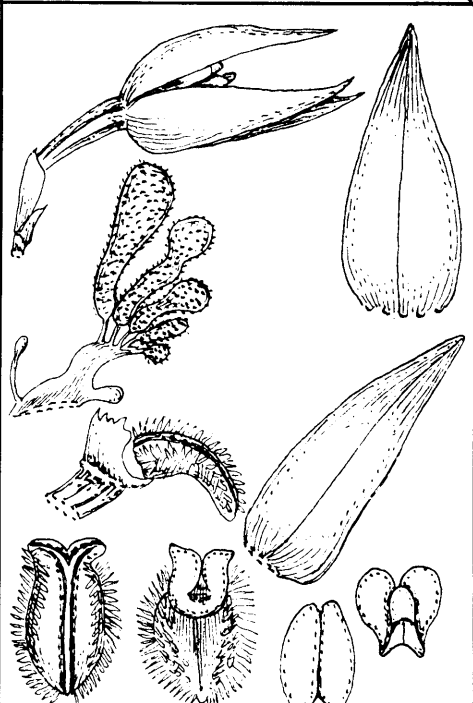
Bulbophyllum decarhopalon Schltr.



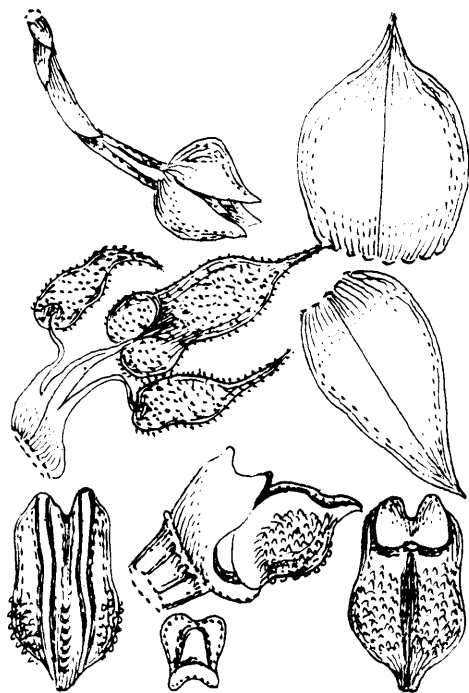
Bulbophyllum chlororhopalon Schltr.



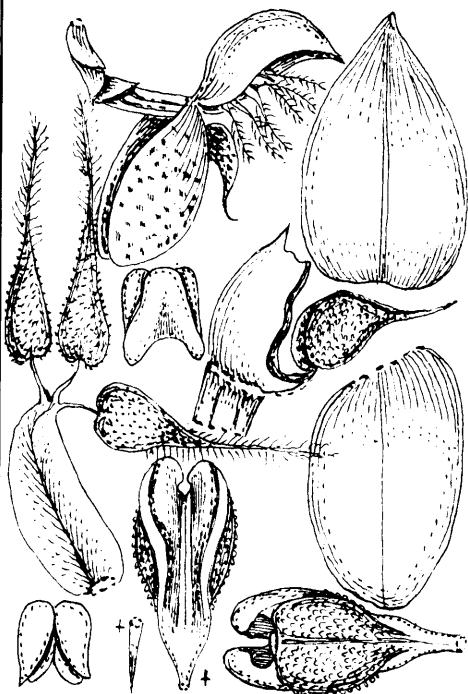
Bulbophyllum psilorhopalon Schltr.



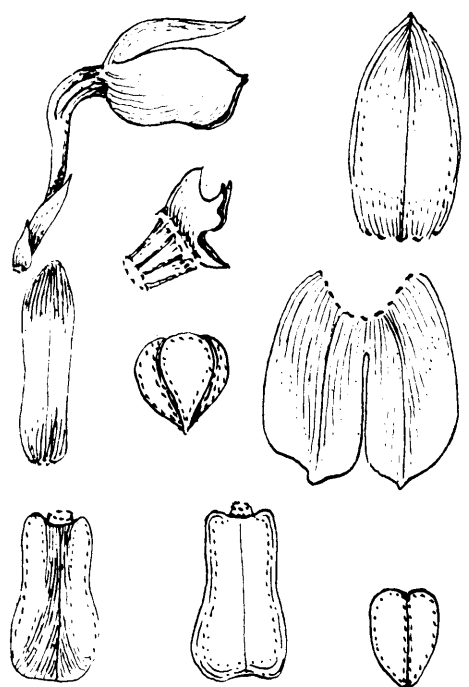
Bulbophyllum heterorhopalon Schltr.



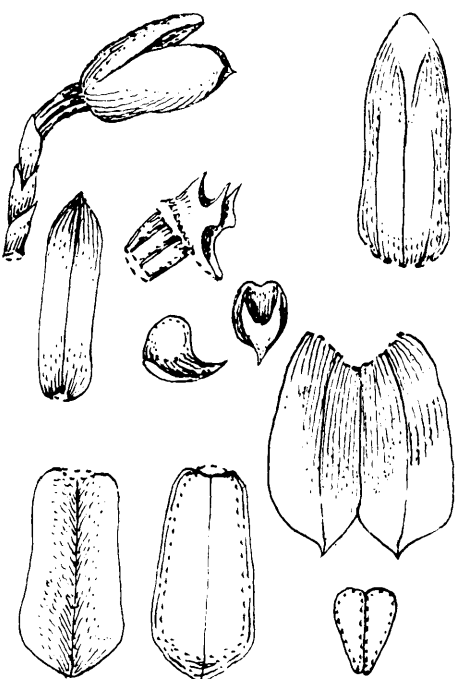
Bulbophyllum macrorhopalon Schltr.



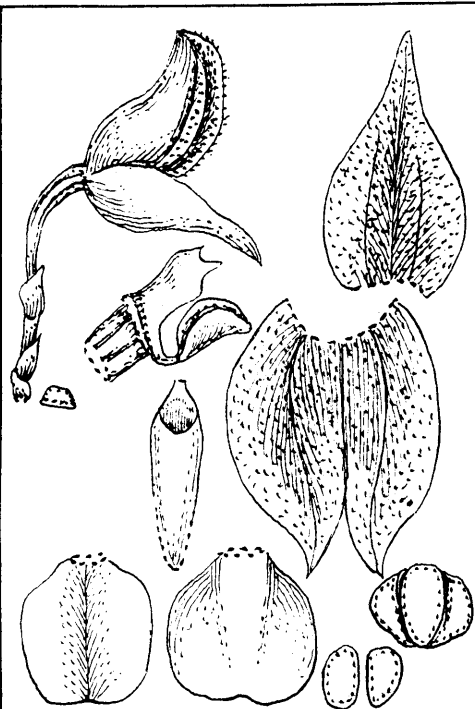
Bulbophyllum trirhopalon Schltr.



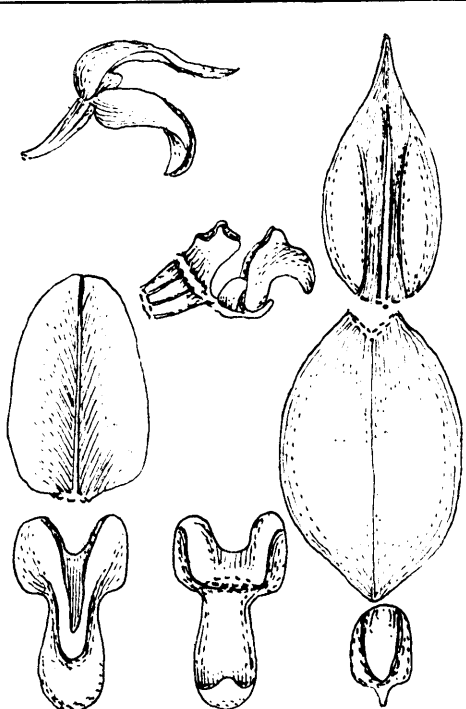
Bulbophyllum nemorosum Schltr.



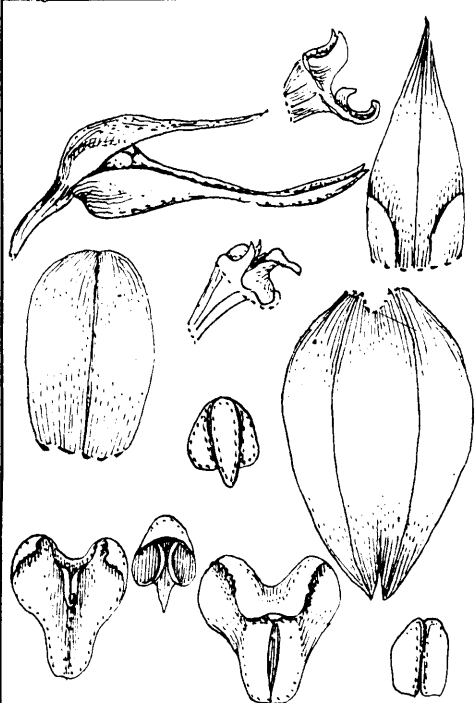
Bulbophyllum nubigenum Schltr.



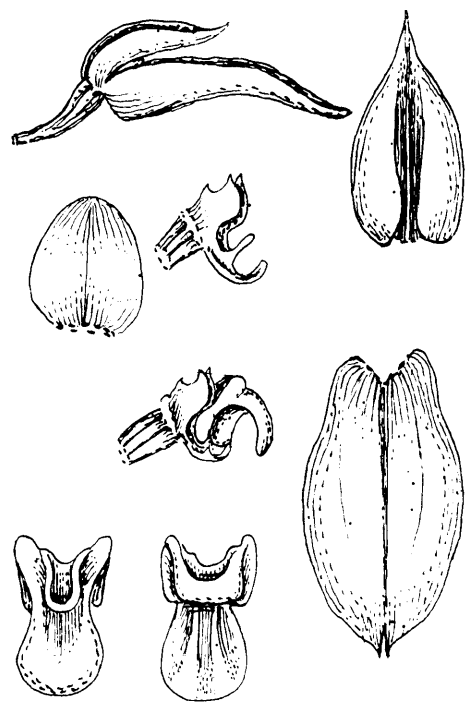
Bulbophyllum cycloglossum Schltr.



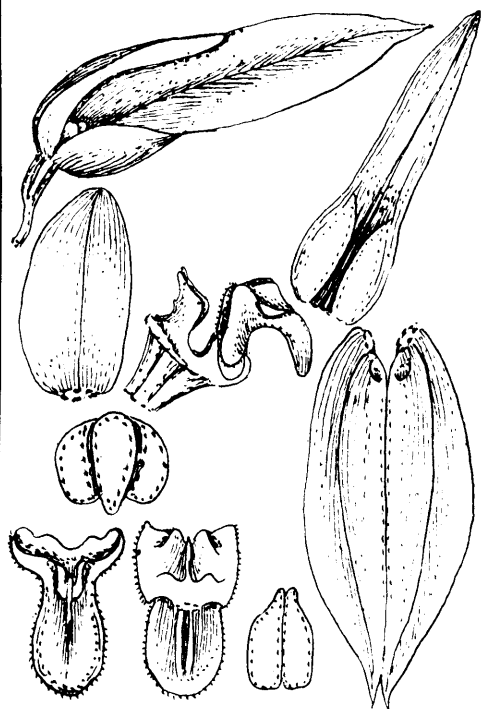
Bulbophyllum callichroma Schltr.



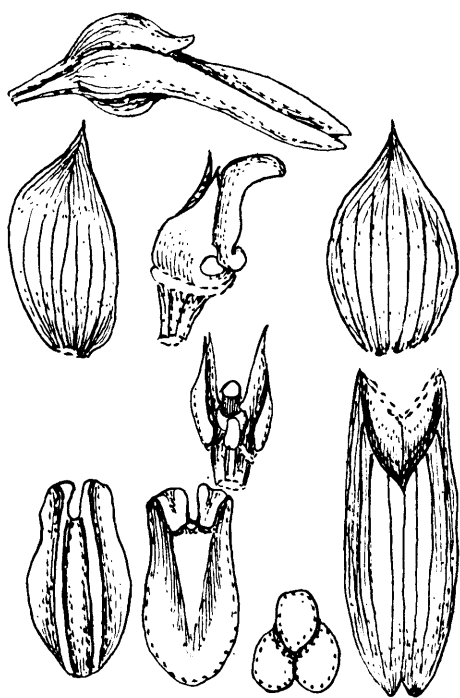
Bulbophyllum chloranthum Schltr.



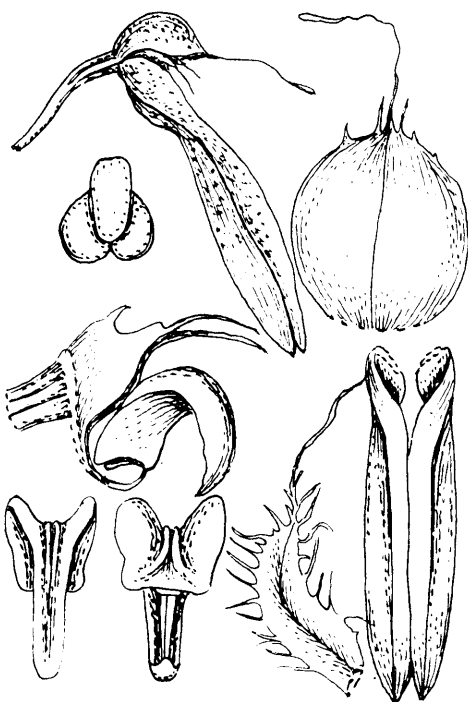
Bulbophyllum calothyrsus Schltr.



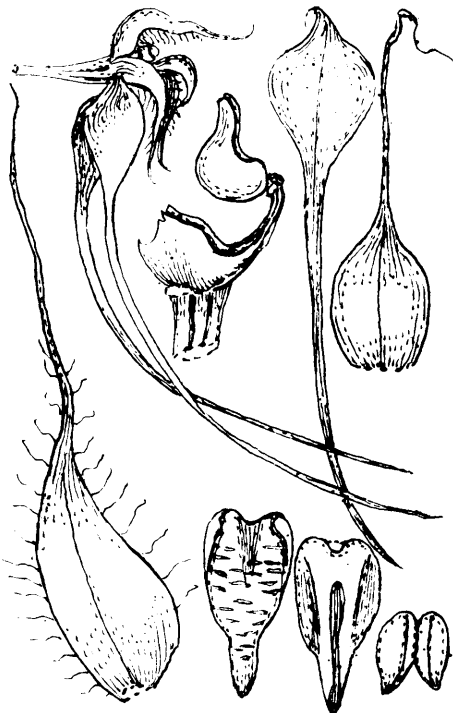
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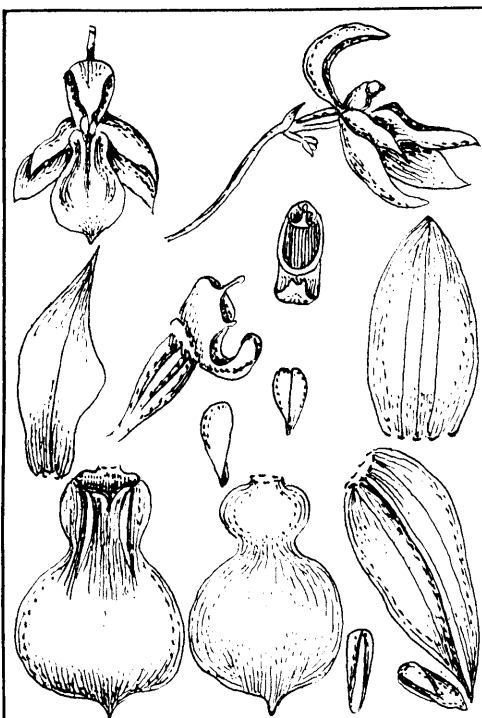
Cirrhopetalum pachybulbum Schltr.



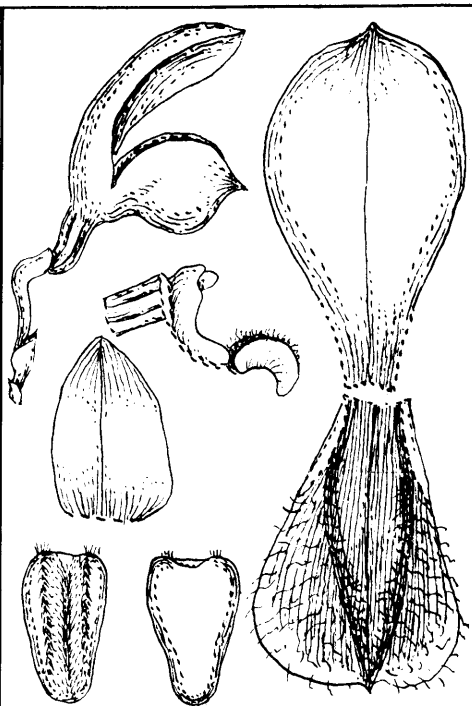
Cirrhopetalum kenejianum Schltr.



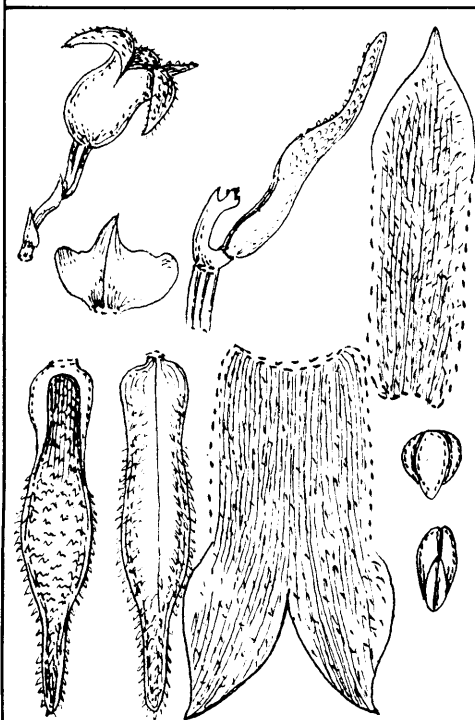
Cirrhopetalum warianum Schltr.



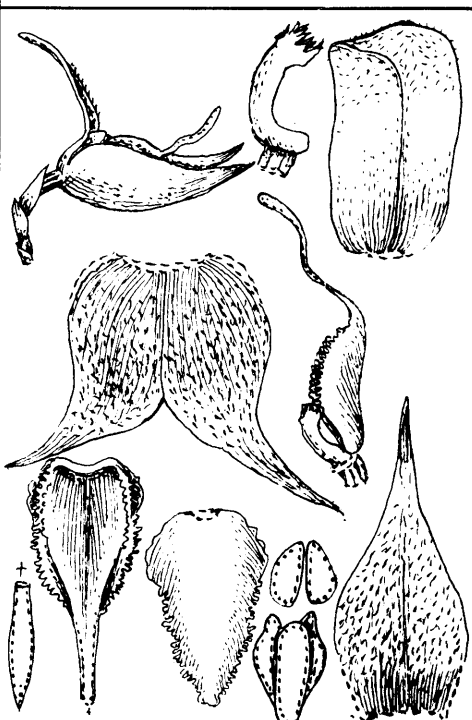
Dactylorhynchus flavesceus Schltr.



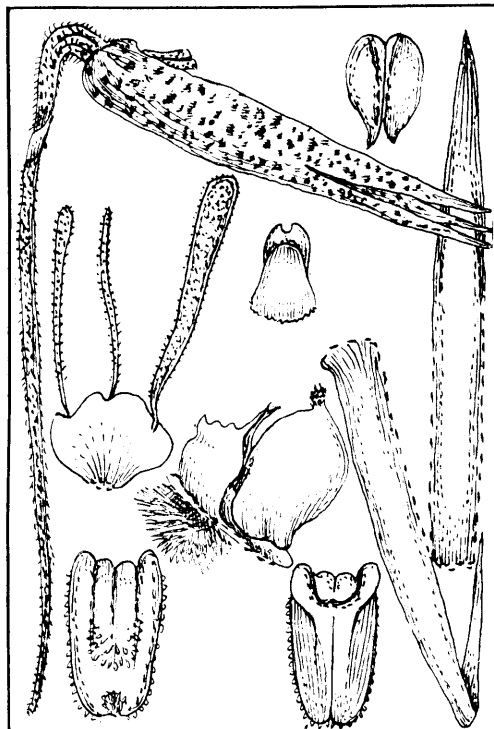
Tapeinoglossum centrosemiflorum
(J.J. Sm.) Schltr.



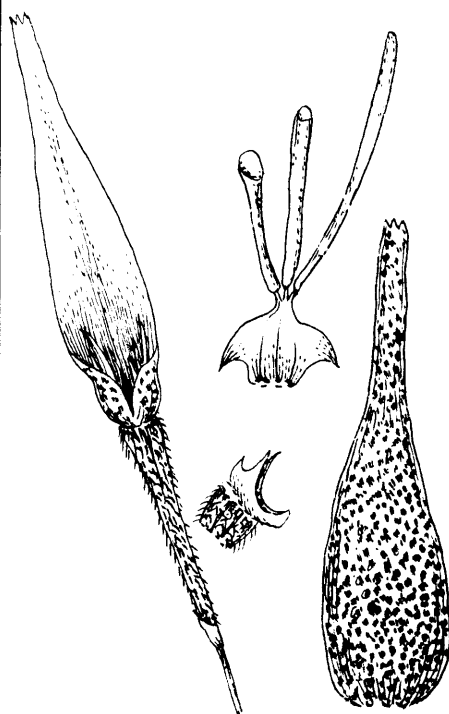
Codonosiphon campanulatum Schltr.



Codonosiphon papuanum Schltr.



Monosepalum dischorens Schltr.



Monosepalum torricellense Schltr.

Group XXII *Thelasinae*

There are few groups of orchids, the size of which has increased so greatly in recent decades in proportion to its numbers as that of *Thelasinae*. The group was established in the year 1889, in 'Engl. Pflanzenfam.' II, 6, p. 181, and was placed erroneously with *Acriopsis* Reinw. Later I separated the latter genus which is related closely to *Thecostele* Rchb. f., but I made a new error by placing *Thelasis* Bl. in the *Podochilinae*. However, as soon as I had an opportunity to study more thoroughly the question of the relationship of *Thelasis* Bl., I realised *Phreatia* Lindl. and *Thelasis* Bl. form a distinct group as explained by J.J. Smith in 'Orch. Fl. Java' (1906), p. VII. (preface). The position assigned to the group in Pfitzer's classification, viz. after *Bulbophyllinae*, seems to me quite the correct one and I have therefore left it there unaltered, though J.J. Smith would like to give it a place beside the *Podochilinae*. With a better knowledge of the floral structure and the occurrence of some very remarkable forms, I have found it necessary to divide the group into five genera.

At the top of the group stands *Chitonanthera* Schltr., the only genus with four pollinia, thus making a sharp contrast with the others with eight pollinia, and being distinguished also by the structure of its column.

Related to *Chitonanthera* Schltr. is the second genus, *Octarrhena* Thw., which is well separated, by its footless column and the form of its corolla, from *Phreatia* Lindl., with which it has been united often by subsequent authors.

This is followed by *Oxyanthera* Brogn., a close relative of the genus which follows, which I have kept separate for the better delimitation of the latter, although the two usually are united.

The fourth genus, *Thelasis* Bl., closes the series of those with a footless column.

From all these four genera, *Phreatia* Lindl. forms a contrast in that it possesses a distinct column-foot and shows rather large variations in habit and structure of the flowers, with which I shall have to deal later on. In the following determination key, a brief survey of the most important generic characters is given:

- A. Pollinia 4 *Chitonanthera* Schltr.
- B. Pollinia 8
 - I. Column-foot absent
 - (a) Petals and labellum very small, sepals spreading, stems elongated, leaves equitant *Octarrhena* Thw.
 - (b) Petals and labellum almost similar to the sepals which are inclined together and keeled. Plants without stems.
 - 1. Pseudobulbs markedly compressed, completely covered by several leaf-bearing sheaths. Flower stems slender, inflorescence usually very loose. Labellum concave at the base *Oxyanthera* Brogn.
 - 2. Pseudobulbs thick and fleshy, with one fleshy leaf. Flower stem fleshy. Inflorescence very dense, cylindrical or globose. Labellum flat *Thelasis* Bl.

- II. Column-foot very distinct, forming
a mentum with the lateral sepals *Phreatia* Lindl.

Of these five genera, the first four are very characteristic in habit, but in *Phreatia* Lindl., the habit varies within wide limits, so that a rather natural division, according to habit, results. The geographical distribution of the group matches the distribution of the genus *Phreatia* Lindl., but with the difference that the most western one, *Octarrhena pusilla* Thw., occurs in Ceylon, whereas no species of *Phreatia* has been reported from that island.

82. *Chitonanthera* Schltr.

This genus, established by me in the year 1905, comprised initially three species, to which I added a somewhat doubtful fourth the following year. However, my last journey has shown that the number of species was by no means exhausted, since three more have to be added, while on the other hand *C. ? miniata* Schltr. proves to be an *Octarrhena* and probably *C. ? MacGregorii* Schltr. ('Bull. Herb. Boiss.' sphalm. *Chitonanthera ? MacGregorii* Schltr.) will have to be excluded from the genus. There remain five undoubted species, which, strange to say, have been found, up to the present, only in the Bismarck Range of German New Guinea, for although I have climbed many other mountains in New Guinea and, likewise, have collected orchids diligently at still higher altitudes in Dutch New Guinea, no further species of the genus have been found in other localities. Nevertheless, I presume that further exploration of Papuasia will soon show that the distribution area of this genus is larger than at present indicated.

All species are epiphytes of the upper mist-forest formations.

Morphologically, it is remarkable that, while all hitherto-described species in the group have jointed leaves, unjointed leaves are found in the new species *C. podochiloides* Schltr. On account of this characteristic, I find it necessary to make this species the Type of a section *Podochilodes* which I place opposite the section *Eu-Chitonanthera*.

§ 1. *Podochilodes*

As I have just explained, the only species of the section, *C. podochiloides* Schltr., stands sharply in contrast to those of the section *Eu-Chitonanthera* owing to its unjointed foliage-leaves.

1. *C. podochiloides* Schltr., sp. nov.

Epiphyticum, pusillum, e basi ramosum; rhizomate brevi, cauliformi; radicibus filiformibus, glabris; caulibus simplicibus, flexuosis, usque ad 7 cm longis, foliis omnino absconditis; foliis equitantibus linearibus, apiculatis, erecto-patentibus, 4.5–7 mm longis, c. 1.25–1.5 mm latis, carnosulis; racemis axillaribus 1–2-floris, quam folia duplo fere brevioribus, pedunculo brevi paucivaginulato; bracteis ovalibus ovario brevioribus; floribus minutis; sepalis suborbicularibus, breviter acuminatis, vix 1.5 mm longis, lateralibus obliquis; petalis minutissimis, oblongis, obtusis, minutissime papillois, quam sepala fere 5–6-plo brevioribus; labello oblongo, apiculato, minute papilloso, 1.25 mm longo; columna brevi, papillosa, clinandrio biaurito recurvo, amplo; stigmatibus angusto, transversis; ovario cylindraceo glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18698, flowering in Nov. 1908.

This species is distinguished readily from the others by its sectional characteristics, but in flower structure indicates a true *Chitonanthera*. The flowers are a brilliant red-lead colour.

§ 2. *Eu-Chitonanthera*

These stand in definite contrast to the species of the preceding section owing to their distinctly jointed leaves. I have so grouped the species here that those with fairly narrow leaves come first and those with broader leaves last.

2. *C. angustifolia* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 194.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1600–1800 m—R. Schlechter no. 14009, flowering in Jan. 1902; no. 18679, flowering in Nov. 1908.

To my former remarks about this species I should now like to add that the petals and the lip, as well as the column, are closely papillose. These details escaped my notice on account of the smallness of the flowers. The clinandrium is directed obliquely upwards. The flowers are orange-red with slightly darker petals and lip.

3. *C. aporoides* Schltr., sp. nov.

Epiphyticum, pensile, usque ad 25 cm longum, pluricaule; rhizomate valde abbreviato; radicibus filiformibus, glabris; caule flexuoso, tenui, dense foliato, vaginis equitantibus omnino oblecto, simplicibus; foliis erecto-patentibus, falcato-linearibus, acutis, equitantibus, vagina inclusa 1.5–2.5 cm longis, basi 2.5–3.5 mm latis; racemis brevibus, cum pedunculo brevi 7–10 mm longis, laxe 2–3-floris; bracteis ovatis, acutis, ovarium paulo excedentibus vel aequantibus; floribus minutis; petalis oblongis, obtusiusculis, glabris, 2.75 mm longis, lateralibus obliquis; petalis oblongis, obtusis, minutissime papillois, quam sepala c. 6-plo brevioribus; labello ligulato apicem versus sensim paulo angustato, glabro, obtuso, sepalis subaequilongis; columna crassa, brevi, minutissime papillosa, clinandrio refracto, dorso alte bifido; anthera reniformi-cucullata, apiculata; pollinibus 4 oblique oblongoideis, stipite distincto, glandula lineari minuta; ovario cylindraceo glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18713, flowering in Nov. 1908.

This species is related very closely to the following one, but differs in the papillose, longer petals, the column and the anther and is without doubt specifically different, as confirmed by a comparison with living material. The flowers are brownish with a green lip and column.

4. *C. oberonioides* Schltr., sp. nov.

Epiphytica, pensilis, 15–25 cm longa, pluricaulis; rhizomate valde abbreviato; radicibus filiformibus, glabris; caulibus tenuibus, vaginis foliorum equitantibus omnino absconditis, dense foliatis; foliis equitantibus, subfalcato-linearibus, acutis, vagina inclusa 1.5–2 cm longis, 2–2.5 mm latis; racemis laxius 2–4-floris, folio subduplo brevioribus, breviter pedunculatis; bracteis ovato-triangulis, acutis, ovario fere aequilongis; floribus minutis; sepalis oblongis, obtusiusculis, c. 2 mm longis, lateralibus obliquis, glabris; petalis oblique semioblongis, obtusis, glabris, minutis, quam sepala fere 7–8-plo brevioribus; labello lanceolato-ligulato, obtusiusculo, glabro, sepalis aequilongis, columna brevi, crassa, minutissime papillosa, clinandrio dorso bipartito, refracto; anthera reniformi-cucullata, umbonata, antice truncata; pollinibus oblique clavatis, 4, stipite subnullo, glandula minuta; ovario cylindrico glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800–2400 m—R. Schlechter no. 18695, flowering in Nov. 1908.

This species has smaller leaves and smaller, differently coloured flowers from the previous one. Furthermore the shorter petals are glabrous, the anther and the pollinia are different. The flowers are yellow-brown with a dark brown lip and column.

5. *C. falcifolia* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 194.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 14010, flowering in Jan. 1902; no. 18581, flowering in Nov. 1908.

Here I must augment my original description by adding that the petals, lip and column are all papillose. The lip becomes slightly narrower towards the base. The

species has broader leaves than the previous one. The flowers are salmon-coloured with a darker lip and column.

83. *Octarrhena* Thw.

Two years ago I published a list of the species, known up to the present, which belong to this genus. Since then four new species have been recorded and J.J. Smith has united his genus *Vonroemeria* (as *O. tenuis* J.J. Sm.) with *Octarrhena*. I have also come to the conclusion that the plant initially described by me as *Chitonanthera* ? *MacGregorii* Schltr., would be designated better as *O. MacGregorii* Schltr. Thus the genus *Octarrhena* Thw. has increased to 13 species. With the new species described here and the accession of *O. miniata* Schltr. the number in the genus will be 19.

The following species occur in the other parts of New Guinea:

From British Papua we know at present only the above-mentioned *O. MacGregorii* Schltr., which is, evidently, a very close relative of *O. tenuis* J.J. Sm.

Dutch New Guinea, however, has up to the present produced four species, viz. *O. Lorentzii* J.J. Sm., *O. tenuis* J.J. Sm., *O. gibbosa* J.J. Sm. and *O. arfakensis* J.J. Sm.

All species known from our Territory are epiphytes of the mist-forest formation, and, therefore, belong to those orchids which require considerable moisture and a moderate temperature. The remaining species of the genus which occur partly in Ceylon and in the hinterland of India, and partly in the Moluccas and Philippines as well as in New Caledonia, seem to occur under exactly similar conditions. So far as is known at present, the distribution area of the genus reaches its eastern boundary in New Caledonia.

1. *O. umbellulata* Schltr., sp. nov.

Epiphytica, pusilla, 5–8 cm alta; radicibus filiformibus, flexuosis, glabris; caule stricto vel paulo flexuoso, bene foliato, vaginis foliorum oblecto, simplici; foliis erecto-patentibus subulatis vel subfiliformibus, obtusiusculis, 1.5–2.5 cm longis, 0.75–1 mm diametro; pedunculis erectis gracilibus, 1–1.5 cm longis, apice 4–6-floris; bracteis lanceolatis, acutis, ovario brevioribus; floribus subumbellatis, minutis, glabris; sepalis late ovatis, obtusis, vix 1.5 mm longis, lateralibus obliquis; petalis suborbicularibus, obtusis, obliquis, quam sepala plus duplo brevioribus; labello oblongo-ligulato obtuso, 0.75 mm longo; columna brevi, crassa, rostello triangulo bidentato; anthera reniformi-cucullata, umbonata, obtuse subrostrata; polliniis oblique obovoideis, stipite anguste lineari, polliniis duplo fere longiore, glandula parvula suborbiculari; ovario breviter pedicellato, clavato, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18707, flowering in Nov. 1908.

This species differs from all the previously described ones in the umbellifer-like, shortened inflorescences. The flowers are yellowish green.

2. *O. exigua* Schltr., sp. nov.

Epiphytica, erecta, simplex, 2.5–3 cm alta; radicibus filiformibus, glabris; caule stricto 1–1.5 cm longo, dense foliato, vaginis foliorum oblecto; foliis erecto-patentibus, equitantibus, linearibus, acutis, 5–9 mm longis, 1–1.5 mm latis; racemis erectis, laxe 5–9-floris, folia aequantibus vel paulo tantum excedentibus; bracteis ovatis, acuminatis, ovario pedicellato plus duplo brevioribus; floribus minutis, glabris; sepalis lato ovatis, obtuse apiculatis, c. 1 mm longis; lateralibus obliquis; petalis oblique latiovalibus, obtusis, quam sepala fere 3-plo brevioribus; labello lanceolato-linguiformi, infra medium paulo constricto, medio gibbo obscuro donato, apice ipso subacuto, 0.75 mm longo; columna brevi, crassa, rostello triangulo bidentato; anthera reniformis-cucullata, obtusissima; polliniis obovoideis, stipite lineari, aequilongo, glandula parvula; ovario pedicellato clavato, c. 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19735, flowering in June 1909.

Of all the species in the region, this one is the smallest. The flower components are, also, thoroughly characteristic, in particular the lip. The flowers are yellow.

3. *O. wariana* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 2–5 cm alta; radicibus filiformibus, glabris; caule simplici, stricto vel leviter flexuoso, dense foliato, vaginis foliorum oblecto; foliis erecto-patentibus, equitantibus, linearibus, acutis, 6–15 mm longis, 1–1.5 mm latis; racemis subdense pluri-multifloris, sensim elongatis, folia demum superantibus, gracilibus; bracteis ovatis, acuminatis, ovarium subaequantibus; floribus minutis, glabris; sepalis late ovatis, obtusis, 0.75 mm longis, lateralibus obliquis, petalis late ovalibus, obliquis, obtusissimis, quam sepala duplo brevioribus; labello late elliptico, obtuso, infra medium utrinque margine obtuse subrhombico-angulato, petalis vix majore; columna brevi, crassa, rostello triangulo, bidentato, humili, clinandrio dorso ampliato; anthera reniformi-cucullata, glabra, umbonata; ovario cum pedicello brevi clavato, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19784, flowering in June 1909.

This species somewhat resembles *O. miniata* Schltr. but is smaller and characterised by the shape of the petals and lip. The flowers are orange-brown.

4. *O. torricellensis* Schltr., sp. nov.

Epiphytica, pusilla, 2–3 cm alta; radicibus filiformibus, glabris; caule 1.5–2.5 cm alto, dense foliato, vaginis foliorum omnino abscondito; foliis erecto-patentibus, subulato-linearibus, equitantibus, acutis, 1–1.7 cm longis, c. 1 mm latis; racemis laxe 6–10-floris, folia vulgo paulo excedentibus; bracteis ovatis, acuminatis, ovario fere aequilongis; floribus minutis, glabris; sepalis ovalibus, obtusis, vix 1 mm longis, lateralibus obliquis, intermedio paulo latioribus; petalis oblique obovato-spathulatis, obtusissimis, quam sepala subtriplo brevioribus; labello ligulato, subacuto, sepalis plus duplo brevioribus; columna brevi, crassa; rostello parvulo, bidentato; anthera reniformi-cucullata, umbonata, glabra; ovario cum pedicello c. 1.5 mm longo, clavato.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20142, flowering in Sept. 1909.

The individual small stems of this species usually are bunched together. In habit it reminds one of *C. umbellulata* Schltr., but has quite different inflorescences and flower components. The flowers are pale flesh-coloured.

5. *O. firmula* Schltr., sp. nov.

Epiphytica, erecta, firmula, 3.5–7 cm alta; radicibus filiformibus, glabris; caule stricto, 2.5–6 cm alto, dense foliato, vaginis foliorum omnino oblecto; foliis erecto-patentibus, equitantibus, linearibus, acutis, carnosius, 7–13 mm longis, 1.5–1.79 mm latis; racemis laxe 5–9-floris, erectis, folia duplo fere superantibus; bracteis late ovalibus, apiculatis, ovario plus duplo brevioribus; floribus minutis, glabris; sepalis ovatis, obtusis, 1.25 mm longis, lateralibus obliquis, basin versus margine anteriore paulo ampliatis; petalis obliquis, late ovatis, obtusis, quam sepala plus duplo brevioribus; labello ovato, obtuso, petalis vix longiore; columna brevi, crassa, rostello triangulo bidentato; anthera reniformi-cucullata, umbonata, obtusissima; ovario cum pedicello brevi clavato, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20285, flowering in Sept. 1909.

In appearance this species differs from the above in stronger growth and in the longer racemes. The flowers also have good characteristics, particularly in the shape of the lip. The flowers are yellow.

6. *O. miniata* Schltr. [Ed.—comb. nov.]

Chitonanthera ? *miniata* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 195.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 13995, flowering in Jan. 1902.

I am sure now that this plant must be classed with *Octarrhena* and not with *Chitonanthera* where I included it earlier, albeit with some doubt. The species stands about intermediate between those described above and the much more robust *O. angraecoides* Schltr. The flowers are orange-red.

7. *O. angraecoides* Schltr., in Fedde, Repertor. IX (1911), p. 217. [Ed.—comb. nov.]
Phreatia angraecoides Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 185.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14502, flowering in Apr. 1902; no. 20254, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16530, flowering in Sept. 1907; no. 17730, flowering in May 1908; on trees in the forests of the Dischore Range, on the Gomadjidji [Mountain], alt. c. 950 m—R. Schlechter no. 19363, flowering in May 1909.

By far the most robust growing species, not only in the region, but in the whole genus. It is recognised easily by the shape of the broad, equitant leaves and the closely flowered, cylindrical inflorescence. The flowers are yellow-green or sulphur-yellow.

84. *Oxyanthera* Brogn.

This genus has again been united recently by J.J. Smith with *Thelasis* Bl., although J.D. Hooker, and later myself, had urged its reinstatement. I quite understand that it would appear inconsistent for me to support a genus on the grounds of its habit, which apparently is distinguished only from *Thelasis* Bl. by characteristics shared in a measure with the genus *Phreatia* Lindl. Nevertheless, after a closer investigation of the question, every keen observer must come to the conclusion that there is a greater gap between *Oxyanthera* Brogn. and *Thelasis* Bl., than exists between *Eu-Phreatia* and *Bulbophreatia* as sections of the genus *Phreatia* Lindl. Irrespective of the fact that in *Oxyanthera* Brogn. the flowers may be distinguished from those of *Thelasis* Bl. by their texture, the great variety in the species of *Thelasis* Bl. in regard to consistence of leaves and other vegetative parts counts for much. I only wish that all orchidaceous genera could be separated so easily at sight, and were as constant in their apparently less important characters as *Oxyanthera* Brogn. and *Thelasis* Bl. I am well aware that I shall be charged with inconsistency in expressing my opinion about certain characters of a vegetative nature, but as before I shall emphasise the view that not only in a family or in a group belonging to a family of plants, but indeed even in a genus, there may be the same vegetative characteristics which are sometimes of primary, sometimes of secondary, or sometimes of hardly any consequence at all. There is a repetition of apparent contradictions in every system of classification, be it ever so natural. Nature cannot be compelled by simple rules. Of course, the various parts of a stem do not always develop into a ray-like figure in one plane, but usually in the form of a tree in which every branch develops in a different direction, whether it be according to a purely vegetative side or that one or another flower-characters play the principal part, that is to say forms the principal character. The botanist is, therefore, very often guided by his impression as to the importance of certain characteristics. For these reasons I retain *Oxyanthera* Brogn. as a genus separate from *Thelasis* Bl.

Only two species of *Oxyanthera* Brogn. require consideration as far as our Territory is concerned, viz. those mentioned here. Of these, *O. papuana* Schltr. seems to occur in the hill-country, even as high up as the lower boundary of the mist-forest formations, or indeed into them, while *O. abbreviata* Schltr. is known only from a single location in the vicinity of the sea-coast, as mentioned below.

It may be mentioned especially, that in by far the majority of cases the flowers of the species are cleistogamic, that is to say that the rostellum is undeveloped entirely, so that fertilization is assumed by the dropping of the pollinia on to the stigma, or by the growth of the pollen-tubes after overflow of the stigmatic secretion. In many of these cases the flowers do not open at all, although I often have observed that such flowers open before fertilization has taken place. Fertilization, however, is assured within a

short space of time in consequence of the exudation of the stigmatic secretion, which brings the pollinia within its reach.

1. *O. papuana* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 126.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700–800 m—R. Schlechter no. 14330, flowering in Apr. 1902; no. 20197, flowering in Sept. 1909; on trees near the Djamu Gorge, alt. c. 350 m—R. Schlechter no. 16524, flowering in Sept. 1907; on trees in the forests at the foot of the Bismarck Range, alt. c. 350 m—R. Schlechter no. 18658, flowering in Nov. 1908; on trees in the hill-forests near Udu, on the Waria [River], alt. c. 500 m—R. Schlechter no. 19903, flowering in June 1909; on trees on the Waria [River] near Pema, alt. c. 200 m—R. Schlechter no. 17467, flowering in Mar. 1908; on trees in the forests of the Maboro Range, alt. c. 800 m—R. Schlechter no. 19545, flowering in May 1909.

The species is related very closely to *O. carinata* (Bl.) Schltr., but differs in the more closely defined three-edged ovary, slightly larger flowers, a longer, more pointed rostellum, longer tapered anther, longer pollinia stems and a longer viscid disc. Cleistogamous forms of this species occur quite frequently, sometimes they have a normal labellum, at other times more lancet-shaped and very pointed. The flowers are yellow-green or yellow with white tips.

2. *O. abbreviata* Schltr., sp. nov.

Epiphytica, erecta, c. 10 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis oblongis, ancipitibus, unifoliatis, c. 1.5 cm altis, medio fere 5 mm latis, vaginis 4–6 foliiferis omnino absconditis; foliis ligulatis, inaequaliter et obtuse bilobulatis, glabris, 5.5–7.5 cm longis, medio fere 7–9 cm altis; pedunculo gracillimo erecto, paucivaginulato, tereti, glabro, c. 6 cm longo, racemo valde abbreviato, dense multifloro; bracteis lanceolatis, acutis, ovario bene brevioribus; floribus in genere inter minores, glabris; sepalis ovatis, acutis, extus carinatis, 2 mm longis, lateralibus obliquis; petalis oblique lanceolatis, obtusiusculis, sepalis subaequilongis; labello late ovali, acuminato, marginibus apicem versus incurvis, sepalis subaequilongo, concavulo; columna perbrevis, in speciminibus erostellata, glabra; anthera ovato-cucullata, glabra; ovario breviter pedicellato glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Danip, not far from Alexishafen, alt. c. 70 m—R. Schlechter no. 19206, flowering in Mar. 1909.

The cleistogamous form of a species related to *O. micrantha* Brogn., but distinguished easily from it by the shorter blunter leaves and the shape of the flower components. The flowers are brownish flesh-coloured.

85. *Thelasis* Bl.

I have stated already my reasons for the generic separation of *Oxyanthera* Brogn. and *Thelasis* Bl. so that there is no need to repeat them. The two new species treated here are related closely in habit to the well known *T. capitata* Bl. and *T. elongata* Bl. from the Malayan Archipelago, although they grow under different conditions from these.

The only species known from the immediate neighbouring regions at present is *T. globiceps* J.J. Sm. from Dutch New Guinea. From the Admiralty Islands, thus in German New Guinea, *T. triptera* Rchb. f. has been recorded, but this requires confirmation. *T. triptera* Rchb. f., originally described from the Philippines, is identical with *T. elongata* Bl. and therefore the species has been included as a doubtful one. I will refer later to *T. elongata* Krzl. (nec Bl.) from the Sattelberg [Mountain].

The two species occurring here are not found in the vicinity of the sea like most of those in the Malayan Archipelago, for both are epiphytes of the mountain-forests, and even *T. cycloglossa* Schltr. occurs at an altitude of 300 to 500 m, while *T. compacta* Schltr. is found only sparsely in the mist-forest formation.

1. *T. compacta* Schltr., sp. nov.

Epiphytica, compacta, pumila, 2–5 cm alta; rhizomate brevi; radicibus flexuosis, glabris; pseudobulbis approximatis, obliquis, depressis, oblongoideis, unifoliatis, usque ad 1 cm longis, 5–7 mm latis, nunc medio late conicis; folio ligulato, inaequaliter et obtuse bilobulato, carnosus, 2–4 cm longo, medio 4–8 mm lato; pedunculo erecto, stricto, carnosulo, paucivaginulato, spica capitiformi subglobosa, dense multiflora, folium haud superante; bracteis latissime ellipticis, apiculatis, ovarium superantibus; floribus inversis, carnosus, glabris; sepalis triangulis subacutis, 2.75 mm longis, lateralibus obliquis alticarinatis; petalis oblique elliptico-ligulatis, obtusiusculis, quam sepala paulo brevioribus et tenuioribus; labello e ungue perbrevis late ovato, acuto, marginibus incurvo, petalis aequilongo, c. 1.75 mm infra medium lato, ecalloso; columna perbrevis, carnosus, apoda, in speciminibus nostris erosti; ovario acute tricostato, sessili, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19145, flowering in Jan. 1909.

Clearly a close relative of *T. globiceps* J.J. Sm. and also related to *T. capitata* Bl. It is well characterised by the very short, but definite, lip-spur. The flowers are green.

2. *T. cycloglossa* Schltr., sp. nov.

Epiphytica, gracilis, decumbens; rhizomate elongato; radicibus filiformibus, glabris; pseudobulbis oblique depresso-conicis, unifoliatis, usque ad 1 cm altis, basi nunc 1 cm diametro; folio erecto, ligulato, inaequaliter et obtuse bilobulato, basin versus sensim paulo angustato, 5–8.5 cm longo, medio fere 5.5–7 mm lato; pedunculo erecto, stricto vel substricto, paucivaginulato, folia aequante vel paulo superante, spica dense multiflora, sensim elongata, usque ad 2 cm longa; bracteis recurvulis suborbicularibus, apiculatis, ovarium aequantibus; floribus mediocribus, carnosulis, glabris, inversis; sepalis oblongis, subacutis, vix 3 mm longis, lateralibus obliquis, alticarinatis; petalis oblique elliptico-ligulatis, subacutis, quam sepala paulo brevioribus; labello suborbiculari, basi lato, apice ipso subacuto, petalis aequilongo, expanso 2.5 mm lato; columna perbrevis, rostello alte triangulo, bifido; anthera lanceolato-cucullata, acutissima; polliniis oblique rhomboideis, stipite duplo longiore, tenui, basin versus attenuato, glandula minuta lanceolata; ovario tricostato, glabro, c. 1.2 mm longo, sessili.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 16566, flowering in Sept. 1907.

The species is related to *T. elongata* Bl. and *T. celebica* Schltr., but is distinguished readily from both by the very broad lip. The flowers are green.

3. *T. elongata*? Bl., Fl. Jav. Orch. (1858), p. 23, t. 7, f. 2.

Admiralty Islands; Nares Bay—Moseley.

I have considered already this species above and mentioned that, at present, I am inclined to doubt the identification. Hopefully, this question will be resolved soon. The *T. elongata*? determined by Kränzlin and cited in 'K. Schum. et Laut., Fl. Dtsch. Schutzgeb. Südsee' (1901), p. 249 has no connection with the genus *Thelasis*, it is rather a species of *Sarcochilus* or *Thrixspermum*.

86. *Phreatia* Lindl.

Only a few years ago no orchidologist could have thought that the genus *Phreatia* Lindl. would attain such large dimensions as it now possesses after inclusion of the species described here. In his treatise on the *Orchidaceae* in 'Pflanzenreich' [Plant Kingdom] Pfitzer mentions ten as the number of species, but even at that time there were 13 species known. Up to the year 1900, 24 species were recorded, but after that time the number increased very rapidly. Alone during 1905–6 I published 20 new species and a whole series was recorded also by J.J. Smith and R.A. Rolfe so that Kränzlin, who in 1911 published a 'monograph' of the *Thelasiniae* which is unfortunately as useless as the one on *Dendrobiinae*, recorded 79 species from which, of course, some will have to be excluded, being species of *Octarrhena*. Nevertheless 70 species remain. Since then, ten more novelties have become known, and to these I have to add here a further 50, so that the genus now possesses over 120 species. What an incredible increase during the past ten years.

I have written already repeatedly concerning the division of this genus. It is, in fact, quite simple, since nearly all the sections depend on the habit. I therefore divide it into the following sections:

§ 1. *Diplostypus* An aberrant, so far, monotypic section standing very isolated since the pollinia are subsessile, arranged in groups of four on two separate caudicles, the latter being attached to a common small viscid disc. I would, perhaps, have regarded this characteristic of greater significance if this species were otherwise not related closely to a species of the next section. The rostellum here is short and yet the species appears to show a relationship with *Oxyanthera* Brogn.

§ 2. *Rhynchophreatia* forms in some degree a link between *Oxyanthera* Brogn. and *Eu-Phreatia*. The species have the fairly long upright rostellum of *Oxyanthera*, but a distinct, though short, column-foot. In habit they also agree perfectly with *Eu-Phreatia*, in that the middle pseudobulb, which is characteristic for *Oxyanthera*, is suppressed.

§ 3. *Eu-Phreatia* has been characterised by me already. It contains the close-leaved, stemless species of the genus.

§ 4. *Caulophreatia* contains the species with distinct stems.

§ 5. *Bulbophreatia* has the flowers of *Eu-Phreatia*, but is distinguished by the formation of distinct pseudobulbs which sometimes are placed close together and other times at fair intervals on a long creeping rhizome.

§ 6. *Saccophreatia* is, in habit, like those species of *Bulbophreatia* in which the pseudobulbs stand close together, but in regard to the structure of the labellum it is very characteristic, for at the base of the claw there is a forward stretching, distinct, abruptly truncate sac or spur.

The distribution of the genus extends from India across the Malay Archipelago, the Philippines, Papuasias inclusive of Micronesia, northern Australia, New Caledonia to the Samoan Islands where four more species are found. So far as is at present known, all species are epiphytic.

[Ed.—Schlechter later removed the species belonging to the sections *Diplostypus* and *Rhynchophreatia* and placed them under his new genus, *Rhynchophreatia* Schltr. 'Engl. Bot. Jahrb.' 58 (1922), p. 148.]

§ 1. *Diplostypus*

So far only a single, widely distributed species is found in New Guinea, viz. *P. sphaerocarpa* Schltr. with which *P. thelasiflora* J.J. Sm., according to the original specimens before me, is identical.

This species is an epiphyte of the forests of the hill-country, up to an altitude of about 700 m. I have even found it at the lower border of the mist-forest formation in the Torricelli Range. The plant may be observed frequently on trees along the river courses.

1. *P. sphaerocarpa* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 192.

P. thelasiflora J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 32; in Nova Guinea VIII (1909), p. 107, t. XXXVI, fig. 120.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20209, flowering in Sept. 1909; on trees on the banks of the Nuru [River], alt. c. 100 m—R. Schlechter no. 13798, flowering in Dec. 1901; on trees in the mountain forests of Albo, alt. c. 250 m—R. Schlechter no.

16156, flowering in June 1907; on trees near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16838, flowering in Nov. 1907; on trees in the forests of the Kani Range, alt. c. 700 m—R. Schlechter no. 17648, flowering in May 1908; on trees in the forests of [Mount] Gomadjidji (Goromia) on the Waria [River], alt. c. 400 m—R. Schlechter no. 17391, flowering in Mar. 1908; on trees in the forests at Pema, on the Waria [River], alt. c. 500 m—R. Schlechter no. 19418, flowering in May 1907. [Ed.—possibly 1909.]

Neu-Mecklenburg: On trees in the mountain forests of Punam (Rössel Range), alt. c. 550 m—R. Schlechter no. 14663, flowering in July 1902.

The species varies somewhat in the shape of the rhombic lip which at times is indented at the front on both edges and then appears faintly tri-lobed. There is a swelling at the base of the lip which continues to the front towards the edges and can be seen as faint keels in the dry state. The two pollinia-stems adhere together readily at times in the dry state, but then can always be separated without much effort. The flowers are brown-yellow with white tips, at times almost whitish.

§ 2. *Rhynchophreatia*

The two species arranged here are undoubtedly to be classified under *Phreatia*, although they possess the tall rostellum of *Oxyanthera* Brogn. All their other characteristics, however, point to *Phreatia* Lindl., and therefore the species are arranged here. Further, there is an undeniably close relationship between one species, *P. wariana* Schltr., and *P. sphaerocarpa* Schltr., while on the other hand, *P. digulana* Schltr. strikingly resembles some species of *Eu-Phreatia*. Both species are epiphytes of the hill-country, occurring in comparatively dry, warm situations.

2. *P. wariana* Schltr., sp. nov.

Epiphytica, erecta, 12–17 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis 6–10, erecto-patentibus, semiteretibus, subfiliformi-linearibus, apice inaequaliter bilobulatis, 5–15 cm longis, 1.5–2 mm latis; pedunculis erectis gracillimis, glabris, paucivaginulatis, foliis aequilongis vel paulo longioribus, racemo subdense multifloro, brevi, usque ad 2 cm longo; bracteis recurvis, ovato-cucullatis, acuminatis, pedicello brevioribus; floribus patentibus illis *P. sphaerocarpha* Schltr. similibus, glabris; sepalis ovatis, subacutis, 2.5 mm longis, lateralibus obliquis; petalis oblique lanceolato-ligulatis, acutis, quam sepala subaequilongis; labello e basi contracta late rhombeo, obtuso, 2.5 mm longo, basi callo oblongo retrorso antice decurrente ornato; columna brevi, rostellum alte triangulo, exciso; anthera ovato-cordata, cucullata, rostrata; polliniis oblique obovoideis, stipite tenui apicem versus paulo attenuato, glandula minuta orbiculari; ovario pedicellato clavato, 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the range-forests near Jaduna on the Waria [River], alt. c. 350 m—R. Schlechter no. 19327, flowering in Apr. 1909; on trees at the summit of [Mount] Gomadjidji on the Waria [River], alt. c. 450 m—R. Schlechter no. 17470, fruiting in Mar. 1908.

The species shows an undeniable relationship to *P. sphaerocarpa* Schltr., but also possesses the characteristic of the section *Rhynchophreatia*, viz. the tall rostellum and the anther extended to the front. The plain leaves halfway round the stem are very characteristic. The flowers are yellowish brown.

var. *montana* var. nov.

Differt a forma typica habitu valde compacto, c. 4 cm alto.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1000 m—R. Schlechter no. 19740, flowering in June 1909.

A mountain variety of the basic species. The flower colouration is identical with that of the Type-variety.

3. *P. digulana* Schltr., nom. nov.

Thelasis phreatioides J.J. Sm., in Bull. Dept. Agr. Ind. Néerl. XLV (1911), p. 11; in Nova Guinea VIII (1912) [1911], p. 602 t. C X. B.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Keel in the Minjem Valley, alt. c. 300 m—R. Schlechter no. 16176, flowering in June 1907.

I consider it more correct to include this plant under *Phreatia* since it possesses a definite, even though short, column-foot and otherwise has all the characteristics of *Phreatia* Lindl. This species was first described from Dutch New Guinea. The flowers are white.

§ 3. *Eu-Phreatia*

I retain the name *Eu-Phreatia* for this section, and cannot accept the name proposed later by J.J. Smith, viz. *Rhizophyllum*, since this was applied to another genus and therefore does not deserve any rights of priority as a section name within the genus *Phreatia* Lindl.

This section undoubtedly contains the larger part of the genus, and in its distribution coincides perfectly with that of the entire genus. In habit, many of the species are so alike that a determination is only possible by an accurate analysis of the flowers, which is not very simple owing to their small size.

Of the species recorded in our Territory up to the present, no less than 29 are new. However, the adjacent regions have supplied a series of new species during recent years. So far, three species belonging here are known from British Papua, viz. *P. Loriae* Schltr., *P. maxima* Krzl. and *P. Louisiadam* Krzl., whereas Dutch New Guinea already has supplied seven species, of which one, *P. bicostata* J.J. Sm., is still very doubtful. Besides the one just mentioned, the following are known from there: *P. bigibbosa* J.J. Sm., *P. breviscapa* J.J. Sm., *P. cucullata* J.J. Sm., *P. collina* J.J. Sm., *P. densissima* J.J. Sm. and *P. hollandiana* J.J. Sm.

The species occurring here are distributed fairly evenly over the Territory. Although, with few exceptions, species of *Phreatia* appear to avoid the immediate vicinity of the sea, it may nevertheless be said of *Eu-Phreatia* that they occur very abundantly in the forests of the plains and hill-country. However, there is also a series of species characteristic of the mist-forest formations of the mountains.

4. *P. inversa* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 187.

Neu-Mecklenburg: On trees in the mountain forests of Punam in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14644, flowering in July 1902.

A very characteristic species which, together with the following one, is well characterised by the shape of the lip. The species appears to be restricted to the Bismarck Archipelago. The flowers are pale green.

5. *P. trilobulata* Schltr., sp. nov.

Epiphytica, pusilla, 3–4 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis 6–8, erecto-patentibus, ligulatis, minute apiculatis, basi distincte petiolato-angustatis, 1.5–2.5 cm longis, medio fere 2–3.5 mm latis, vaginis imbricantibus striato-nervosis, late marginatis, c. 4 mm longis; racemis breviter pedunculatis, laxius multifloris, quam folia vulgo brevioribus, nunc subaequilongis; bracteis lanceolatis, acuminatis, ovarium aequantibus; floribus minutis, glabris; sepalis late ovatis, obtusis, c. 0.75 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, basi margine anteriore paululo dilatatis, quam sepala paulo brevioribus; labello circuito quadrato, apicem versus paululo angustato, apice obtuse trilobulato, i.e. bilobulato cum apiculo mediano lobuliformi lobulis lateralibus aequimagno, toto 0.65 mm longo, subaequilato; columna brevi, in speciminibus nostris cleistogamis erostellata, clinandrio triangulo dorso bene alto, pede brevi; anthera reniformi-cucullata, umbonata; ovario cum pedicello clavato, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Gomadjidji [Mountain] on the Waria [River], alt. c. 450 m—R. Schlechter no. 19362, flowering in May 1909.

Only cleistogamous flowers occur. The labellum, which is tri-lobed at the front, is a good characteristic of the species. The flowers are pale yellow.

6. *P. stipulata* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 3–4.5 cm alta; radicibus filiformibus, glabris; caule subnullo 4–8-foliato; foliis patentibus, oblique ligulatis, minute apiculatis, basi distincte petiolato-angustatis, 1.5–3 cm longis, medio fere 2.5–4 mm latis; vaginis striato-nervosis, late stipuliformi-marginatis, imbricantibus, 4–5 mm longis; racemis erectis, breviter pedunculatis, subdense multifloris, quam folia brevioribus vel rarius subaequilongis; bracteis lanceolatis, acuminatis, ovarium aequantibus; floribus minutis, glabris; sepalis late ovalibus, obtusis, vix 0.75 mm longis, lateralibus obliquis, basi margine anteriore infra medium paulo ampliatis; petalis quam sepala distincte brevioribus, oblique ovatis, obtusis; labello e basi concavula oblongo-quadrato, apicem versus minute dilatato, apice ipso subtruncato-obtusissimo trinervi, 6.5 mm longo, infra apicem c. 4.5 mm lato; columna perbrevis, rostello triangulo, exciso, clinandrio triangulo obtuso rostellum bene superante; anthera reniformi-cucullata, obtusissima; polliniis oblique obovoideis, stipite anguste lineari paulo longiore, glandula minuta, ovali; ovario pedicellato clavato, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 250 m—R. Schlechter no. 16770, flowering in Nov. 1907.

Definitely a close relative of *P. inversa* Schltr., but different in the lip and the column. The flowers are greenish yellow.

7. *P. sororia* Schltr., sp. nov.

Epiphytica, pusilla, 3–4.5 cm alta; radicibus filiformibus, glabris; caule subnullo, 6–8-foliato; foliis subpatentibus, ligulatis, minute apiculatis, basi sensim petiolato-angustatis, 1.7–3 cm longis, medio vel supra medium 3–4 mm latis, vaginis vix striatis, late marginatis, usque ad 4 mm longis; racemis breviter pedunculatis, erectis, dense multifloris, folia aequantibus vel paulo superantibus; bracteis lanceolatis, acuminatis, ovarium superantibus; floribus minutis, glabris, patentibus; sepalis oblongis, subacutis, 0.75 mm longis, lateralibus obliquis, margine inferiore infra medium dilatatis; petalis patentibus, oblique oblongis, subacutis, 0.5 mm longis; labello oblongo-quadrato, margine leviter undulato, apice obtuso apiculato, sepalis subaequilongis, 0.3–5 mm lato; columna perbrevis, rostello et clinandrio humili, pede brevi; anthera reniformi-cucullata, antice truncata; polliniis oblique obovoideis, stipite subaequilongis, lineari, glandula parvula orbiculari; ovario pedicellato, glabro, clavato, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16154, (TYPE), flowering in June 1909; [Ed.—probably 1907]; on trees in the forests above Meireka, at the foot of the Finisterre Range, alt. c. 600 m—R. Schlechter no. 17958, flowering in July 1908.

Likewise, a species closely related to *P. inversa* Schltr., but characterised by the narrower petals and the shape of the labellum. The column also shows considerable differences. The flower colouration is white.

var. *kenejiana* Schltr., var. nov.

Differt a forma typica racemis folia distincte superantibus laxius multifloris.

Kaiser-Wilhelms-Land: On trees in the forests near Kubai, in the Kenejia Valley, alt. c. 150 m—R. Schlechter no. 18932, flowering in Dec. 1908.

This cannot be considered as anything but a variety of the basic form with more extended inflorescences. The flowers are whitish yellow.

var. *litoralis* Schltr., var. nov.

Differt a forma typica habitu robustiore, foliis distinctius petiolatis, racemis laxius multifloris, folia paulo excedentibus, sepalis paululo latioribus, labello latiore subquadrato.

Kaiser-Wilhelms-Land: On trees in the forests at the mouth of the Waria, alt. c. 10 m—R. Schlechter no. 19942, flowering in July 1909.

Initially, this plant gives the impression of being specifically different from *P.*

sororia Schltr., but at present it appears to me best to consider it as a variety since the chief difference lies in the width of the lip. The flowers are white-yellow.

8. *P. microtatantha* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 3–5 cm alta; radicibus filiformibus, glabris; caule subnullo 6–12-foliato; foliis erecto-patentibus vel suberectis, plus minus arcuatis, linearibus, acutis vel distincte apiculatis, basi attenuatis, carnosulis, 2–3.5 cm longis, medio 2–3 mm latis; racemis breviter pedunculatis, laxe multifloris, quam folia tertia parte vel duplo brevioribus; bracteis lanceolatis, acuminatis, floribus aequilongis vel paulo longioribus; floribus in genere minutissimis, glabris; sepalis late ovatis, acuminatis, 0.5 mm longis, lateralibus obliquis; petalis oblique ovatis, acutis, 3.5 mm longis; labello e basi concavula oblongo-quadrato, apicem versus minute dilatato, antice obtusissimo, subexciso, 4 mm longo, 2.5 mm antice lato; columna perbrevis, rostello trilobato, apice breviter exciso, clinandrio subtrilobato rostellum dorso superante; anthera late rhomboideo-cucullata, umbonata; polliniis oblique obovoideis, stipite dimidio brevior, glandula minuta; ovario pedicellato, clavato, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Dscheregi, in the Waria Valley, alt. c. 500 m—R. Schlechter no. 17433, flowering in Mar. 1908.

This species is recognised in habit by the narrow leaves. It is related closely to *P. stipulata* Schltr. in the structure of the flower. The flowers are yellowish white.

9. *P. beiningiana* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 186.

Kaiser-Wilhelms-Land: On trees in the forests of [Mount] Gomadjidji, on the Waria [River], alt. c. 450 m—R. Schlechter no. 19921, flowering in June 1909.

Neu-Pommern: On trees in the forests on the Karo [River], in the Beining Range, alt. c. 300 m—R. Schlechter no. 13689, flowering in Oct. 1901.

In habit this species is similar to *P. stenophylla* Schltr. and is characterised by the pseudobulbs after a time reaching, for the section, an appreciable length. Both species differ, however, in their flowers. The flowers are pale yellow.

10. *P. altigena* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 185.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1500 m—R. Schlechter no. 13989, flowering in Jan. 1902.

Clearly, a rarer species from the mist-forest formations, which I did not find again during my last expedition. The species is related closely to *P. beiningiana* Schltr., but is easy to distinguish by the elongated racemes. The flowers are white.

11. *P. brevis* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 1.5–3.5 cm alta; radicibus filiformibus, glabris; caule subnullo, foliis abscondito; foliis 4–8, erecto-patentibus vel subpatentibus, linearibus, apice inaequaliter et obtuse bilobulatis, 1.5–3.5 cm longis, medio fere 2.25–3 mm latis; racemo erecto, dense multifloro, foliis fere aequilongo; bracteis lanceolatis, longe acuminatis, flores aequantibus vel subaequantibus; floribus minutis, glabris, inversis; sepalo intermedio suborbiculari, obtusissimo, 0.75 mm longo, lateralibus oblique ovato-triangularibus, obtusiusculis, intermedio aequilongis; petalis oblique oblongo-ovatis, obtusis, sepalis distincte brevioribus; labello e basi subunguiculato-angustata marginibus incurva in laminam orbicularem apiculatam expanso, 0.65 mm longo, medio fere 0.5 mm lato; columna perbrevis, rostello late triangulo, exciso, clinandrio humillimo, pede brevi; stigmatibus angusto transversis; anthera late rhomboideo-cucullata, umbonata; polliniis oblique obovoideis, stipite anguste lineari vix polliniis aequilongo, glandula minuta ovali; ovario pedicellato clavato, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20173, flowering in Sept. 1909.

[Ed.—no comment is made by Schlechter about this species.]

12. *P. brachystachys* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 186.

Neu-Mecklenburg: On trees in the forests near Punam, in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14672, flowering in July 1902.

A small species, probably most closely related to *P. stenophylla* Schltr., but differing in the shorter inflorescences and the shape of the lip. The flowers are pale green.

13. *P. stenophylla* Schltr., sp. nov.

Epiphytica, pusilla, erecta, 4–10 cm alta; radicibus filiformibus, glabris; caule valde abbreviato, vaginis foliorum abscondito; foliis 4–8, erectis vel erecto-patentibus, falcato-linearibus, subacutis, basin versus sensim subpetiolato-angustatis, 2.5–8 cm longis, medio vel supra medium 2–2.5 mm latis, vaginis hyalino-marginatis, striatis, usque ad 6 mm longis; racemis erectis, usque supra basin floriferis, subdense multifloris, 2–4 cm longis; bracteis patentibus lanceolatis, acuminatis ovarium aequantibus vel paulo superantibus; floribus minutis, glabris, inversis; sepalis ovatis, obtusis, 0.75 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusis, c. 6 mm longis; labello e ungue brevi subquadrata late suborbiculari-rhombeo, obtuse et minute apiculato, sepalis subaequilongis, supra medium 0.5 mm lato; columna perbrevis, glabra, rostello brevi, bidentato, clinandrio obtuso rostellum subexcedente; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite anguste lineari, polliniis aequilongis, glandula minuta; ovario breviter pedicellato clavato, glabro, 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16768 (TYPE), flowering in Nov. 1907; on trees in the forests above Meireka, at the foot of the Finisterre Range, alt. c. 600 m—R. Schlechter no. 17953, flowering in July 1908; on trees in the forests of the Mimi [Mountain] in the Waria Valley, alt. c. 500 m—R. Schlechter no. 19457, flowering in May 1909.

The species is distinguished from the following by the falcate leaves which are clearly narrower at the base. The flowers are whitish green.

14. *P. Finisterrae* Schltr., sp. nov.

Epiphytica, erecta, 10–12 cm alta; radicibus filiformibus, glabris; caule subnullo, vaginis imbricantibus abscondito; foliis 4–8, erectis vel suberectis, anguste linearibus, apice inaequaliter et obtuse bilobulatis cum apiculo interjecto, basin versus sensim paulo angustatis, 5–7 cm longis, medio fere 2–3 cm latis, obliquis; racemis erectis, subdense multifloris, elongatis, folia demum superantibus, cum pedunculo brevi c. 10 cm longo; bracteis lanceolatis, acuminatis, ovarium aequantibus vel paulo superantibus; floribus minutis, glabris, inversis; sepalis ovatis, obtusis, 0.75 mm longis; lateralibus obliquis, basin versus margine anteriore ampliatis; petalis oblique ellipticis, obtusis, c. 0.65 mm longis; labello e ungue brevi suborbiculari-concava in laminam late suborbiculari-rhombeam obtusissimam expanso, 6.5 mm longo, lamina medio 5.5 mm lata; columna brevi, rostello humili, bidentato, clinandrio humili; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite paulo breviori lineari, glandula parvula orbiculari; ovario brevissime pedicellato, cylindrico, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19092, flowering in Jan. 1909.

The species is distinguished very well from its relatives by the long racemes extending beyond the leaves which are almost three-toothed at the tips. The flowers are white.

15. *P. Loriae* Schltr., in Fedde, Repertor. III (1907), p. 318.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19718, flowering in June 1909.

This and the following four species are related very closely to each other, but as far as I am able to judge at present are best regarded as separate species. *P. Loriae* Schltr. and *P. kaniensis* Schltr. are distinguished from the others by the short pedicels which have only very small sheaths. This plant takes on a blackish colouration when dried. The flowers are green.

16. *P. kaniensis* Schltr., sp. nov.

Epiphytica, erecta, 11–18 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis erecto-patentibus, 4–6, linearibus, oblique acutatis, basin versus paulo angustatis, carnosulis, dorso carinatis, 11–23 cm longis, medio fere 0.4–1 cm latis, vaginis striatis rugulosis, hyalino-marginatis, usque supra 1 cm longis; racemis dense multifloris, elongatis, erectis, pedunculo brevi vaginulis paucis parvulis

obsesso incluso 6–11 cm longis; bracteis patentibus, acuminatis, ovarium vulgo paulo superantibus; floribus parvulis, glabris, inversis; sepalis ovatis, obtusiusculis, 0.75 mm longis, lateralibus obliquis, basin versus margine anteriore paulo ampliatis; petalis oblique oblongis, obtusis, c. 6 mm longis; labello e basi subcuneato-oblonga breviter rhombeo, apiculato, 6.5 mm longo, infra apicem 5 mm lato; columna brevi, rostello humillimo, bidentato, clinandrio dorso triangulo rostellum distincte superante; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite lineari, fere aequilongo, glandula parvula orbiculari; ovario subsessili cylindrico, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 700–1000 m—R. Schlechter no. 16529 (TYPE), flowering in Sept. 1907; no. 17340, flowering in Feb. 1908.

Externally this species is distinguished from *P. Loriae* Schltr. in that it does not turn blackish on drying. Its leaves and inflorescences are longer, the petals broader and the stalks of the pollinia are longer. The column also shows differences. The flowers are greenish white.

17. *P. polyantha* Schltr., sp. nov.

Epiphytica, erecta, 16–20 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis erectis vel suberectis, 6–8, oblique linearibus, subacutis, basin versus sensim angustatis, subtus ecarinatis, 6–18 cm longis, medio fere 6–8 mm latis; racemis erectis, dense multifloris, elongatis, pedunculo incluso 10–14 cm longis, pedunculo 3.5–5 cm longo, vaginis 2 satis magnis amplexantibus obsesso; bracteis recurvulis acuminatis, flores subaequantibus; floribus minutis, glabris; sepalis late ovatis, obtusis, 0.75 mm longis, lateralibus obliquis, basi antice paulo ampliatis; petalis oblique ovalibus, obtusis, c. 6 mm longis; labello e basi oblonga supra medium late rhombeo-dilatato, obtuso, 6.5 mm longo, quarta parte apicali 5 mm lato; columna perbrevis, rostello bidentato et clinandrio humili; anthera reniformi-cucullata, umbonata; ovario subsessili cylindrico, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dscheregi [Mountain] in the Waria Valley, alt. c. 400 m—R. Schlechter no. 17432, flowering in Mar. 1909. [Ed.—possibly 1908.]

This species is distinguished from the two previous ones by the large sheaths on the pedicels, as well as by the thinner leaves which are keel-less. The flowers are white.

18. *P. vaginata* Schltr., sp. nov.

Epiphytica, erecta, 11–17 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis erectis vel suberectis, 4–6, linearibus, subacutis, apice ipso obliquo cum apiculo, carnosulis, subtus carinatis, 7–14 cm longis, medio fere 4–7.5 mm latis; racemis dense multifloris, elongatis, folia vulgo paulo superantibus, pedunculo 4.5–6 cm longo, vaginis 2–3 magnis, amplexantibus fere omnino obecto; bracteis acuminatis, flores aequantibus vel paulo superantibus; floribus minutis, glabris; sepalis perlate, ovatis, obtusis, 0.75 mm longis, lateralibus obliquis, basi antice ampliatis; petalis oblique ovatis, obtusis, 0.65 mm longis; labello e basi cuneata sensim antice perlate rhombeo, obtusissimo, sepalis aequilongo, infra apicem 0.6 mm lato; columna brevi, rostello humili bidentato, clinandrio truncato; anthera late reniformi-quadrata, umbonata; polliniis oblique obovoideis stipite lineari, paulo brevior, glandula oblanceolata, parvula; ovario sessili, cylindrico, 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20300, flowering in Sept. 1909.

The differences between *P. polyantha* Schltr. and this species already have been mentioned above. The sheaths on the pedicels are very large in this case. The flowers are greenish white.

19. *P. myriantha* Schltr., sp. nov.

Epiphytica, erecta, 23–28 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis erectis vel suberectis, linearibus, acutis, basin versus sensim paulo angustatis, carnosulis, subtus carinatis, exsiccatione nigricantibus, 12–16 cm longis, medio fere 0.9–1.2 cm latis; racemis folia dimidio et ultra superantibus, dense multifloris, pedunculo 7–8 cm longo, vaginis 2 distantibus mediocribus amplexantibus obsesso; bracteis acuminatis, ovarium paulo excedentibus; floribus minutis, glabris; sepalis intermedio oblongo, obtuso, 0.75 mm longo, lateralibus aequilongis, oblique latiovatis, obtusis, basi antice ampliatis; petalis oblique oblongis, obtusis, 0.65 mm longis; labello cuneato, antice perlate rhombeo, obtusissimo, sepalis aequilongo, infra apicem 0.6 mm lato; columna brevi, rostello late triangulo, bidentato, quam clinandrium altiore; ovario subsessili, cylindrico, 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19535, flowering in May 1909.

Like *P. Loriae* Schltr. this species is blackish when dry. Compared with its relatives, it is conspicuous by the multi-flowered inflorescences which extend well beyond the leaves. The flowers are greenish white.

20. *P. rhomboglossa* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 190.

Neu-Mecklenburg: On trees in the forests near Punam in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14649, flowering in July 1902.

This species is related closely to the following two in the shape of the lip, but also well distinguished by the pointed leaves, clearly narrower at the base and with quite different sheaths. The flowers are white.

21. *P. gladiata* (A. Rich.) Krzl., in Engl. Pflanzenr. IV, 50, II B. 26.

Oberonia gladiata A. Rich., Sert. Astrol. (1832), p. 6, t. 12.

Eria gladiata Rchb. f., in Seem., Flor. Vit. (1868), p. 300.

Neu-Mecklenburg: Near Port Carteret—Lesson.

[Ed.—no other information cited.]

This species has been credited to New Zealand in error by Kränzlin, which proves that he has not taken the trouble to consider the original description carefully. Furthermore, in error, Kränzlin has given the name *P. Richardiana* (Rchb. f.) Krzl. and the habitat of 'Neu-Mecklenburg', to a plant which should be designated *P. micrantha* (A. Rich.) Schltr.; it is not from our Territory but comes from the island of Vanikoro.

A close examination of Richard's original specimen would be necessary to determine which species is really present. It appears to me likely that the illustration is not quite correct and should represent the plant that I have described as *P. oxyantheroides* Schltr.

22. *P. collina* Schltr., sp. nov. [Ed.—later homonym; non J.J. Sm.]

Epiphytica, valida, c. 15–25 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis erecto-patentibus, 6–10, ligulatis, inaequaliter et obtuse bilobulatis, basin versus haud angustatis, 13–20 cm longis, 1.1–1.7 cm latis, vaginis leviter carnosulis foliis aequilatis, 3–4 cm longis; racemis subdense multifloris, elongatis, folia vulgo distincte superantibus, pedunculo gracili 10–14 cm longo, vaginulis paucis obsesso; bracteis lanceolatis, acuminatis, ovario pedicellato paulo brevioribus; floribus parvulis, inversis, glabris; sepalis late ovatis, obtusis, 1.25 mm vix longis, lateralibus obliquis, antice basi paulo ampliatis; petalis oblique ovatis, obtusis, quam sepala paulo brevioribus; labello late rhombeo, obtuso basi obscure bigibbo, 1 mm longo et lato; columna brevi, rostello bidentato quam clinandrium triangulum obtusum paulo brevius; anthera reniformi-cucullata; pollinibus oblique obovoideis, stipite lineari aequilongo, glandula parvula orbiculari; ovario pedicellato clavato c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 20259, flowering in Sept. 1909; on trees in the forests of Wobbe, on the Minjem [River] alt. c. 250 m—R. Schlechter no. 16438 (TYPE), flowering in Aug. 1907; on trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16600, flowering in Sept. 1907; on trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 17994, flowering in July 1908; on trees in the forests on the Saki [River] alt. c. 250 m—R. Schlechter no. 18288, flowering in Sept. 1908; on trees in the forests of the Maboro Range, alt. c. 600 m—R. Schlechter no. 19533, flowering in May 1909.

Initially, I thought that this species corresponded with *P. oxyantheroides* Schltr., but I am now sure that it is different specifically. The whole foliage does not spread as much to the sides, the flowers are larger, the petals more ovate and the labellum is not as broad and has two round swellings at the base. The flowers are white.

var. *linearis* Schltr., var. nov.

Differt a forma typica foliis bene angustioribus, c. 7–8 mm latis.

Kaiser-Wilhelms-Land: On trees in the forests near Udu, on the Waria [River], alt. c. 250 m—R. Schlechter no. 17456, flowering in Mar. 1908.

Probably, only a narrow-leaved form of the species which is distributed fairly widely from the hill-country up to the boundary of the mist-forest formation. The flowers are white.

23. *P. oxyantheroides* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 189.

Neu-Mecklenburg: On trees at the beach near Bo and Kannawit, alt. c. 5 m—R. Schlechter no. 14628, flowering in June [Ed.—possibly July] 1902.

Clearly, a species which is restricted to the beach formations of the Bismarck Archipelago. Already I have indicated above the reasons which induced me to separate it from *P. collina* Schltr.

The flowers are white.

24. *P. valida* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 193.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 13975, flowering in Jan. 1902.

To date the largest known species of the genus. On superficial observation, it has a certain similarity to *Earina validior* Rehb. f., but there is no doubt of its relationship to *Phreatia*. The species is fairly unique in the shape of the lip. Unfortunately, I have only a single specimen of this remarkable plant. The flowers are white.

25. *P. oreogena* Schltr., sp. nov.

Epiphytica, pusilla, c. 6 cm alta; radicibus filiformibus, glabris caule subnullo, vaginis foliorum abscondito; foliis 4–6, erecto-patentibus, lineari-ligulatis, obtusis cum apiculo minuto, 2.5–3.5 cm longis, medio fere 3–4 mm latis, basin versus sensim angustatis; racemis laxe 15–20-floris, folia dimidio fere superantibus, pedunculo gracili paucivaginulato, foliis brevioribus; bracteis lanceolatis, acuminatis, pedicello fere aequilongis; floribus minutis, cleistogamis, clausis, glabris, subpatentibus; sepalis ovatis, obtusis, 0.75 mm longis, lateralibus obliquis, subacuminatis, basi antice paulo dilatatis; petalis oblique oblongis, subacutis, sepalis paulo brevioribus; labello e basi subquadrata late rhombo-triangulari, obtuse acuminato, 0.75 mm longo, supra medium 0.7 mm lato; columna brevi, erostellata, clinandrio triangulo-lobato, pede brevi; anthera rotundato-cucullata; ovario pedicellato clavato, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17974, flowering in July 1908.

The cleistogamous form of a species otherwise unknown to me. Examination of the flowers indicates that only a small change could have occurred in the individual segments. The flowers are white.

26. *P. tenuis* Schltr., sp. nov.

Epiphytica, erecta, tenuis, c. 6 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis c. 4, erecto-patentibus, linearibus, obtusis, 3.5–5.5 cm longis, 2–3 mm medio latis; racemo erecto-patente, laxe 10–15-floro, secundo, gracillimo, pedunculo paucivaginulato, racemo ipso aequilongo, c. 3 cm longo; bracteis patentibus, lanceolatis, acuminatis, pedicello gracili aequilongo; floribus minutis, glabris; sepalis perlate ovalibus, apiculatis, vix 0.75 mm longis, lateralibus obliquis, basin versus antice paulo ampliatis; sepalis late ellipticis, acutis, paulo obliquis, quam sepala paulo brevioribus; labello suborbiculari, breviter acuminato, 0.65 mm longo, medio 0.6 mm lato; columna brevi, rostello bidentato et clinandrio tridentato humilibus; anthera reniformi-cucullata, umbonata; ovario graciliter pedicellato clavato, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, on the Rin-Tejao, [River] alt. c. 800 m—R. Schlechter no. 20125, flowering in Sept. 1909.

A very slim, delicate species which is characterised well by the shape of the labellum. Probably it is related closely to *P. oreogena* Schltr. The flowers are white.

27. *P. minima* Schltr., sp. nov.

Epiphytica, minima, vix 1 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis c. 4, patentibus, linearibus, obtusiusculis, basi paulo attenuatis, vix 1 cm longis, 1.5 mm medio latis; racemo capituliformi-abbreviato, breviter pedunculato, foliis plus duplo brevioribus; bracteis ovato-lanceolatis, acuminatis, flores superantibus; floribus minutis, inversis, glabris; sepalis ovatis, obtusis, vix 0.5 mm excedentibus, lateralibus obliquis, basin versus antice ampliatis; petalis oblique oblongo-ligulatis, obtusis, quam sepala paulo brevioribus; labello panduriformi, sepalis aequilongo, e basi suborbiculari medio conspicue constricto, dimidio superiore sursum in laminam orbicularem apiculatam expanso; columna brevi, rostello humili, bidentato, clinandrio triangulo paulo altiore; anthera reniformi-cucullata, apiculata; polliniis oblique obovoideis, stipite duplo brevioribus, glandula minuta orbiculari; ovario subsessili, glabro, 0.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19734, flowering in June 1909.

At present the smallest known species of the genus. It is characterised excellently by the very short, capitate inflorescence and by the lip. The flowers are greenish white.

28. *P. monticola* Schltr., sp. nov.

Epiphytica, erecta, 4–5 cm alta; radicibus filiformibus, glabris; caule valde abbreviato, vaginis abscondito; foliis 6–8, erecto-patentibus, subfalcato-ligulatis, apice inaequaliter et obtuse bilobulatis, basi petioliformi-angustatis, 1.3–2.5 cm longis, medio 2–3 mm latis; racemis gracilibus, folia superantibus, subaxe multifloris, pedunculo gracili paucivaginulato incluso usque ad 4 cm longis; bracteis lanceolatis, acuminatis, ovario pedicellato subduplo brevioribus; floribus erecto-patentibus, subsecundis, minutis, glabris; sepalis late ovatis, obtusis, 1.5 mm longis, lateralibus obliquis, basi antice ampliatis; petalis oblique ovatis, obtusis, quam sepala paulo brevioribus; labello e basi semiorbiculari-unguiculata concavula in laminam subquadrato-reniformem, apiculatam subito breviter expanso, sepalis aequilongo, lamina 1.25 mm lata, 1 mm longa; columna brevi, rostello humili bidentato, clinandrio obtuso aequilongo; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite subaequilongo, glandula parvula; ovario breviter pedicellato clavato, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18226, flowering in Sept. 1908.

In appearance this species is somewhat reminiscent of *P. petiolata* Schltr., but is more compact and has a completely different labellum which is characterised by the upper corners of the labellum-disc protruding only about 0.3 mm. The flowers are white.

var. *minor* Schltr., var. nov.

Differt a forma typica floribus minoribus, sepalis c. 1 mm longis.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19115, flowering in Jan. 1909.

It appears to me correct to consider this as the small-flowered variety of the basic form. The flowers are white.

29. *P. bismarckiensis* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 7–8 cm alta; radicibus filiformibus, glabris; caule subnullo, vaginis abscondito; foliis c. 4, erecto-patentibus, falcato-obliquis, ligulatis, obtusis, basin versus sensim angustatis, 3–4.5 cm longis, medio fere 4.5–6 mm latis; racemis erectis, subdense multifloris, subsecundis, flores fere duplo superantibus, pedunculo gracili paucivaginulato, quam folia paulo brevioribus; bracteis lanceolatis, acuminatis, ovarium fere aequantibus; floribus minutis, glabris; sepalis late ovatis, obtusis, 1.25 mm longis, lateralibus obliquis, basin versus antice ampliatis; petalis oblique oblongis, obtusis, quam sepala distincte brevioribus, vix 1 mm longis; labello e basi semiorbiculari-unguiculata in laminam circuitu semiorbicularem obscure 5-labulatam expanso, petalis aequilongo, lamina 6 mm longa, basi 8.5 mm lata; columna brevi, rostello bidentato clinandrio aequalto; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite lineari paulo brevioribus, glandula minuta rotundata; ovario pedicellato, glabro, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18559, flowering in Oct. 1908.

The species is related closely to the previous one, but differs in the shape of the leaves which are not narrowed at the base of the stem, and also in the lip. The flowers are white.

30. *P. brachyphylla* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 3–6 cm alta; radicibus filiformibus, glabris; caule valde abbreviato, vaginis foliorum abscondito; foliis 4–6, subpatentibus, oblique ligulatis, apiculatis, basi sensim paulo angustatis, 1–1.7 cm longis, medio 3–4 mm latis; racemis erecto-patentibus, laxe 10–15 floris, folia plus duplo superantibus, pedunculo gracili paucivaginulato, folia vulgo paulo excedente; bracteis lanceolatis, acuminatis, ovario pedicellato duplo fere brevioribus; floribus minutis, inversis, glabris; sepalis late ovatis, subacutis, c. 1 mm longis, lateralibus obliquis, basin versus paulo ampliatis; petalis oblique ellipticis, obtusis, 0.75 mm longis; labello sepalis aequilongo, e ungue orbiculari concavulo in laminam perlate ovato-cordatam, basi utrinque obtuse auriculatam, obtuse apiculatam dilatato, lamina 0.6 mm longa, basi 0.7 mm lata; columna brevi, rostello late triangulo bidentato, clinandrio obtuse triangulo distincte altiore; anthera reniformi-cucullata, umbonata; pollinibus oblique rhomboideo-globosis, stipite perbrevis lineari, glandula minuta, oblonga; ovario pedicellato, glabro, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20266, flowering in Sept. 1909.

A characteristic species distinguished in the genus by the relatively short leaves. The flowers are white.

31. *P. scaphioglossa* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 192.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 500 m—R. Schlechter no. 17970, flowering in July 1908.

Neu-Mecklenburg: On trees in the forests near Punam in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14648, flowering in July 1902.

The species is related closely to *P. platychila* Schltr., but is characterised by the smaller flowers, the broader and flatter spur on the lip and the relatively broader and shorter disc. The flowers are white.

32. *P. imitans* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 6–10 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis falcato-ligulatis, obtusis, basin versus sensim paulo angustatis, glaucis, 3–9 cm longis, medio fere 5–9 mm latis; racemis gracilibus subaxe multifloris, folia fere aequantibus, pedunculo gracillimo paucivaginulato usque ad 5 cm longo; bracteis lanceolatis, acuminatis, ovarium aequantibus; floribus minutis, glabris; sepalis late ovatis, obtusis, vix 0.75 mm longis, lateralibus obliquis, basin versus antice paulo ampliatis; petalis perlate et oblique rhombeis, obtusis, sepalis paulo brevioribus; labello e ungue brevi suborbiculari in laminam quadrato-suborbicularem minute apiculatam dilatato, sepalis subaequilongo, lamina 0.5 mm longa, basi 0.65 mm lata; columna brevi, rostello et clinandrio humili; anthera reniformi-cucullata; pollinibus oblique obovoideis, stipite perbrevis, lineari, glandula minuta; ovario pedicellato, clavato, glabro, c. 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Kelel on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16194, flowering in June 1907.

This species, in common with *P. scaphioglossa* Schltr., has the blue-green colour of the leaves. Both are so similar in habit that I initially considered uniting them. However, the differences in the flowers are so marked that I feel myself compelled to consider them as separate species.

33. *P. gracilis* Schltr., sp. nov.

Epiphytica, erecta, gracilis, 5–10 cm alta; radicibus filiformibus, glabris; caule subnullo, vaginis foliorum abscondito; foliis erecto-patentibus, c. 4–6, oblique ligulatis, obtusiusculis, basin versus sensim paulo angustatis, 3–8 cm longis, medio fere 4–7 mm latis; racemo laxo 10–25-floro, quaquaverso, folio aequante vel paulo superante, pedunculo gracili paucivaginulato foliis distincte

breviore; bracteis lanceolatis, acuminatis, ovario duplo fere brevioribus; floribus minutis, glabris; sepalis perlate ovalibus, obtusis, vix 1 mm longis, lateralibus obliquis, basin versus antice ampliatis; petalis late obovato-spathulatis, obtusissimis, obliquis, sepalis paulo brevioribus; labello e basi late ovali-ligulata concavula in laminam late reniformem, obtuse apiculatam, basi truncatam subito dilatato, sepalis aequilongo, lamina 0.6 mm longa, basi 0.9 mm lata; columna brevi, in speciminibus nostris erostellato, clinandrio bene alto truncato; anthera reniformi-cucullata; ovario pedicellato glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18003 (TYPE), no. 17992, flowering in July 1908; on trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19547, flowering in May 1909.

The species is related closely to the previous two mentioned but the blue-green colour of the leaves is lacking, and the flowers appear laxer. The shape of the petals is fairly characteristic. The flowers are white.

34. *P. platychila* (Krzl.) Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 190.

Thelasis platychila Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzgeb. Süds. (1901), p. 249.

Kaiser-Wilhelms-Land: On trees in the forests of Wobbe on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16274, flowering in July 1907; on trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 17593, flowering in Apr. 1908; on trees in the forests on the Maijen [River], alt. c. 50 m—R. Schlechter no. 17928, flowering in July 1908; on trees in the primary-forest on the Ramu [River], alt. c. 130 m—Kersting no. 2400, flowering in July 1896; on trees by the creeks, in the Bismarck Range, alt. c. 400 m—R. Schlechter no. 14088, flowering in Jan. 1902.

It would appear that the species is distributed widely in the central part of Kaiser-Wilhelms-Land. It is related closely to *P. scaphioglossa* Schltr., but distinguished easily by the lack of the blue-green leaves and the somewhat restrained lip-claw at the base of the disc. The flowers are white.

35. *P. linearifolia* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 188.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1100 m—R. Schlechter no. 14457, flowering in Apr. 1902.

It would appear that I did not collect this species again during my last expedition. The species shows certain similarities with *P. collina* Schltr. var. *linearis* Schltr., but the leaves are smaller and the labellum-disc definitely separated from the short broad claw. The flowers are white.

36. *P. caudata* Schltr., sp. nov.

Epiphytica, erecta, gracilis, 17–20 cm alta; radicibus filiformibus, glabris; caulibus valde abbreviatis, vaginis foliorum absconditis; foliis suberectis, 4–6, falcatis, anguste linearibus, acutis, basin versus sensim paululo angustatis, 10–15 cm longis, medio fere 2.5–3.5 mm latis; racemis gracillimis, arcuatis, vel suberectis, caudiformibus, elongatis, subdense multifloris, folia aequantibus vel superantibus, pendunculo, paucivaginulato, racemo ipso subaequilongo; bracteis lanceolatis, acuminatis, flores vulgo subaequantibus, nunc paululo excedentibus; floribus minutis, inversis, glabris; sepalis ovatis, obtusiusculis, vix 1 mm longis, lateralibus obliquis, basi margine anteriore valde ampliatis; petalis oblique ellipticis, obtusis, c. 0.75 mm longis; labello e ungue oblongo concavulo in laminam semiorbiculari-reniformem apiculatam expanso, 1 mm longo, lamina c. 0.5 mm longa, c. 0.85 mm lata; columna brevi, clinandrio humili rostello humili bidentato paulo brevior; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite lineari, paulo brevior, glandula minuta rotundata; ovario breviter pedicellato, clavato, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 250 m—R. Schlechter no. 16892 (TYPE), flowering in Nov. 1907; on trees in the forests on the Wakeak [Creek], alt. c. 400 m—R. Schlechter no. 19041, flowering in Jan. 1909.

A species recognised easily by the outward appearance of the tail-like, lengthened, slim inflorescences. It is related most closely to the following species. The flowers are white.

var. *tenuissima* Schltr., var. nov.

Differt a forma typica racemis laxifloris et labelli lamina paulo angustiore.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17698, flowering in May 1908.

It is possible that this plant may later prove to be a separate species. The specimen at hand appears to show definite similarities to the basic form. The flowers are white.

37. *P. urostachya* Schltr., sp. nov.

Epiphytica, erecta, 8–17 cm alta; radicibus filiformibus, glabris; caule subnullo, vaginis foliorum abscondito, foliis 4–6, suberectis, linearibus, inaequaliter et obtuse bilobulatis, basin versus vix angustatis, 5–8 cm longis, medio fere 4–6 mm longis; racemis usque supra basin dense multifloris, caudiformi-elongatis, folia plus minusve superantibus; bracteis ovato-lanceolatis, acuminatis, flores subaequantibus; floribus minutis, inversis, glabris; sepalis late ovatis, obtusis, vix 0.75 mm longis, lateralibus obliquis, basin versus antice paulo ampliatis; petalis oblique suborbiculari-spathulatis, obtusissimis, vix 0.6 mm longis; labello sepalis aequilongo, e basi quadrato-unguiculata concavula in laminam semiorbicularem obtusissimam subito dilatato, lamina c. 0.6 mm longa, basi 1 mm lata; columna brevi, clinandrio humili rostello bidentato aequialto; anthera reniformi-cucullata, umbonata; pollinibus oblique obovoideis, stipite vix semilongo lineari, glandula parvula orbiculari; ovario sessili, cylindraceo, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600–800 m—R. Schlechter no. 20345 (TYPE), no. 20193, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16950, flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19173, flowering in Jan. 1909; on trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 800 m—R. Schlechter no. 19827, flowering in June 1909; on trees in the forests on the Govidjoa [Creek], alt. c. 1000 m—R. Schlechter no. 19755, flowering in June 1909.

A fairly widely distributed species in the mist-forest formation of the ranges in our Territory. It has the tail-like extended inflorescences in common with *P. caudata* Schltr., but the flowers are attached to the rachis without caudicles. The frequent appearance of swollen flowers is noticeable with this species. The flowers are white.

38. *P. Jadunae* Schltr., sp. nov.

Epiphytica, erecta, 5–8 cm alta; radicibus filiformibus, glabris; caulibus subnullis; foliis 4–6, plus minusve patentibus, ligulatis, apiculatis, basin versus paululo angustatis, 3.5–7.5 cm longis, medio fere 5–8 mm latis; racemis erectis, subdense multifloris, folia fere aequantibus, quaquaversis, pedunculo brevi, paucivaginulato; bracteis lanceolatis, acuminatis, floribus paulo brevioribus vel aequi longis; floribus minutis, inversis, glabris; sepalis late ovatis, obtusiusculis, vix 1 mm longis, lateralibus obliquis, basi margine anteriore paulo dilatatis; petalis perlate rhombeis, quam sepala paulo brevioribus; labello sepalis aequilongo, e ungue suborbiculari antice contracto, dimidio anteriore in laminam late triangulo-reniformem obtusam subito dilatato, lamina basi 1 mm lata; columna brevi, clinandrio obtuse triangulo reniformem bidentatum superante; anthera reniformi-cucullata, umbonata; pollinibus oblique obovoideis, stipite brevioris lineari, glandula parvula orbiculari; ovario pedicellato clavato, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 19338, flowering in May 1908. [Ed.—possibly Apr. 1909.]

This species has more splayed leaves than the others, but in other respects is related closely to the previously mentioned one. It appears to be restricted to the Waria Valley. The flowers are white.

39. *P. longibractea* Schltr., sp. nov.

Epiphytica, suberecta, 6–12 cm alta; radicibus filiformibus, glabris; caule subnullo; foliis suberectis, 3–4, ligulatis, apiculatis, basin versus sensim paulo angustatis, 3–8 cm longis, medio fere 5–9 mm latis; racemis folia plus minusve superantibus dense multifloris, elongatis, pedunculo foliis paulo brevior, vaginis pluribus acuminatis obsesso; bracteis lineari-lanceolatis, acuminatissimis, flores distincte superantibus; floribus minutis, glabris; sepalis late ovalibus, breviter acuminatis vel apiculatis 1.25 mm longis, lateralibus obliquis, basin versus antice valde dilatatis; petalis oblique oblongis, subacutis, 1 mm longis; labello e basi concava oblongo-unguiculata dimidio anteriore in laminam perlate reniformem apiculatam expanso, sepalis aequilongo, lamina basi 1.25 mm lata; columna brevi, rostellum bidentato, quam androclinium aequialto; anthera reniformi-cucullata, apiculata, umbonata; polliniis oblique obovoideis, stipite paulo brevior, lineari, glandula parvula; ovario pedicellato glabro, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19140, flowering in Jan. 1909.

A very distinct species recognised easily by the many bracts on the peduncle and by the long floral bracts. The flowers are white.

40. *P. stipulata* Schltr., sp. nov.

[Ed.—refer 'Neue Orchidaceen Papuasien' in Engl. Bot. Jahrb. 58 (1922–23) p. 149. "It will be necessary to rename *Phreatia potamophila* Schltr.—Orch. Dtsch. Neu-Guinea p. 937—to *P. rivularis* Schltr., as I have previously given the first name to a plant from the Celebes. For similar reasons *P. stipulata* Schltr.—Orch. Dtsch. Neu-Guinea, p. 928, must be altered to *P. djamuensis* Schltr."]

Epiphytica, erecta, 10–14 cm alta; radicibus filiformibus, glabris caule valde abbreviato, vaginis foliorum oblecto; foliis linearibus, oblique apiculatis, basi distincte petiolato-angustatis, 3.5–6.5 cm longis, 2.5 bis 3.5 mm latis, vaginis striatis apice utrinque in lobum oblongum stipuliformem productis; racemis dense multifloris, elongatis, folia subduplo superantibus, pedunculo gracillimo vaginulis paucis distantibus obsesso, foliorum longitudine; bracteis acuminatis, flores subaequantibus; floribus parvulis, glabris; sepalis ovatis, obtusis, vix 1 mm excedentibus, lateralibus obliquis, basin versus antice paulo ampliatis; petalis oblique ovatis, subacutis, sepalis subaequilongis; labello e ungue latiovato basi concavulo dimidio anteriore semiorbiculari obtuso, ungue supra basin 0.5 mm lato, lamina basi 0.7 mm lata; columna brevi, rostellum breviter 2-dentato, clinandrio late triangulo obtuso, rostellum paulo superante; anthera reniformi-cucullata; polliniis oblique obovoideis, stipite anguste lineari subaequilongo, glandula minuta, rotundata; ovario pedicellato glabro, clavato, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees near the Djamu Gorge, alt. c. 350 m—R. Schlechter no. 16798, flowering in Nov. 1907.

This and the following species have in common the peculiar stipule formation at the upper margin of the sheath. The differences between the individual species, incidentally all of which have the base of the leaves narrowed like a stem, lie in the shape of the flower segments, particularly that of the labellum. The flowers are white.

41. *P. petiolata* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 190.

Kaiser-Wilhelms-Land: On trees in the large sago swamp between the Warapussa and the Ramu [Rivers], alt. c. 150 m—R. Schlechter no. 13847, flowering in Jan. 1902; on trees on the banks of the Malia [River], at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18403, flowering in Oct. 1908.

A species which appears to be restricted to the Ramu Valley. It is related particularly closely to the following one, but differs in the labellum. The flowers are white.

var. *eitapensis* Schltr., var. nov.

Differt a forma typica labelli lamina margine leviter sinuata, columna apicem versus crassiore.

Kaiser-Wilhelms-Land: On trees in the forests near Peso, not far from Eitape, alt. c. 20 m—R. Schlechter no. 19992, flowering in Aug. 1909.

It is possible that this variety later may prove to be a species. The flowers are white.

42. *P. dischorensis* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 5–6 cm alta; radicibus filiformibus, glabris; caule valde abbreviato, foliis 6–8, erecto-patentibus, oblique lineari-ligulatis, basi distincte petioliformi-attenuatis, 2–4 cm longis, medio fere 2.5–4 mm latis, vaginis rugulosis, utrinque apice lobato-ampliat; racemis subaxe multifloris, elongatis, folia dimidio fere excedentibus, pedunculo paucivaginulato, foliis fere duplo brevioribus; bracteis lanceolatis, acuminatissimis, flores subaequantibus, floribus minutis, glabris; sepalis late ovatis, obtusis, 1 mm longis, lateralibus obliquis, basin versus antice dilatatis; petalis oblique ovatis, obtusis, sepalis paulo brevioribus; labello e ungue suborbiculari brevi perlate reniformi, obtuse apiculato, marginibus utrinque sinuato-curvato, ima basi concavulo, sepalis aequilongo, lamina basi 1 mm lata; columna brevi, rostello bidentato, clinandrio obtusissimo rostellum paulo superante; anthera reniformi-cucullata, umbonata; pollinibus oblique obovatoideis, stipite subduplo brevioribus, linearibus, glandula minuta; ovario pedicellato clavato, 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19685, flowering in June 1909.

This species is related closely to *P. petiolata* Schltr., but differs in the more compact growth and the much shorter-clawed labellum. The flowers are white.

43. *P. iridifolia* Schltr., sp. nov.

Epiphytica, erecta, 15–22 cm alta; radicibus filiformibus, glabris, caule valde abbreviato; foliis c. 6, erecto-patentibus, equitantibus, gladiiformi-ligulatis, subacutis, carnosius, 6–10 cm longis, medio fere 0.8–1.2 cm latis; racemis gracilibus subaxe multifloris, elongatis, folia subduplo excedentibus, pedunculo gracili, paucivaginulato, foliis fere aequilongo; bracteis lanceolatis, acuminatis ovario pedicellato aequilongis; floribus minutis, glabris; sepalis ovatis, obtusiusculis, 1.25 mm longis, lateralibus obliquis, basin versus antice dilatatis; petalis oblique oblongis, obtusis, sepalis paulo brevioribus; labello e basi ovali-unguiculata in laminam late ovalem, obtuse apiculatam expanso, sepalis aequilongo, lemina 0.9 mm longa, supra basin 0.5 mm lata; columna brevi, rostello vix bidentato, semiorbiculari, quam clinandrium paululo brevioribus; anthera reniformi-cucullata, subacuta; pollinibus oblique subglobosis, stipite anguste linearibus aequilongo, glandula minuta; ovario pedicellato, clavato, glabro, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Keel in the Minjem Valley, alt. c. 300 m—R. Schlechter no. 16355, flowering in Aug. 1907.

This species is distinguished easily from all the others in the Territory by the equitant leaves. The flowers are white.

§ 4. *Caulophreatia*

Here we have a small section distinguished from *Eu-Phreatia* by the development of a really definite elongated stem. The first two species mentioned form, to a certain extent, a connection between *Eu-Phreatia* and *Caulophreatia*, inasmuch that they approach the first in habit, yet a distinct stem-formation is present. I therefore thought it better to place both species here, although they have very little in common with typical species of *Caulophreatia*. The number of species is so far only small, for from Papuaia we know at present only *P. semiorbicularis* J.J. Sm. and *P. rupestris* J.J. Sm., in addition to those listed here. Both species are from Dutch New Guinea. Also belonging to this section is *P. caulescens* Ames from the Philippines, and this approximately exhausts the number of species, unless the little known *P. cauligera* Rchb. f. from the Sandwich Islands [Hawaiian Islands] may be included also.

44. *P. brevicaulis* Schltr., sp. nov.

Epiphytica, erecta, pusilla, 2–4 cm alta; radicibus, filiformibus, glabris; caule distincto etiam brevi, dense foliato, vaginis foliorum obecto; foliis patentibus, linearibus, obtusis, falcatis, 1–1.5 cm longis, medio fere 1–1.5 mm latis, basi paululo angustatis; racemis erectis, laxe 5–10-floris, foliorum longitudine vel paulo longioribus; bracteis lanceolatis, acuminatis, ovario pedicellato brevioribus; floribus in genere parvulis, inversis, glabris; sepalis late ovalibus, subacutis, 1.25 mm longis, lateralibus

obliquis, basin versus antice paulo dilatatis, breviter subacuminatis; petalis oblique ellipticis, subacutis, sepalis paulo brevioribus; labello e basi suborbiculari-unguiculata concavula in laminam late reniformem obtuse apiculatam subcrenulatam subito dilatato, 1.25 mm longo, lamina 0.75 mm longa, basi 1 mm lata; columna brevi, rostello humili, bidentato, clinandrio late triangulo, rostellum superante; anthera quadrato-reniformi, cucullata; polliniis oblique obovoideis, stipite valde abbreviato, lineari, glandula minuta; ovario pedicellato clavato, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1300 m—R. Schlechter no. 19668, flowering in June 1909.

The species is related most closely to *P. seleniglossa* Schltr., but differs in the shape of the floral segments. The flowers are white.

45. *P. seleniglossa* Schltr., sp. nov.

Epiphytica, erecta, pusilla, c. 3.5 cm alta; radicibus filiformibus, glabris; caule brevi sed distincto, dense foliato; foliis erecto-patentibus, lineari-ligulatis, inaequaliter ac obtuse bilobulatis, 1–1.3 cm longis, medio fere 2–2.75 mm latis; racemis laxe 3–6-floris, folia dimidio fere superantibus, pedunculo gracili; bracteis deltoideis, acuminatis, ovario bene brevioribus; floribus parvulis, glabris; sepalis late ovalibus, obtusis, 1.25 mm longis, lateralibus obliquis, basi antice paulo ampliatis; petalis oblique latiovatis, obtusis, c. 1 mm longis; labello e ungue suborbiculari, in laminam semilunatam expanso, apice minute apiculato, angulis obtusis, sepalis aequilongo, lamina 0.75 mm longa, basi 1.25 mm lata; columna perbrevis, clinandrio late triangulo obtuso, rostellum breviter bidentatum distinte superante; anthera reniformi-cucullata, apiculata, umbonata; ovario pedicellato clavato, c. 2–2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18816, flowering in Nov. 1908.

This species is distinguished from *P. brevicaulis* Schltr. by the shape of the lip, but has the common short growth. The flowers are white.

46. *P. macra* Schltr., sp. nov.

Epiphytica, gracilis, macra, 6–20 cm longa; radicibus filiformibus, glabris; caule elongato, gracili, laxe foliato, 1–1.5 mm diametro, flexuoso; foliis erecto-patentibus, linearibus, obtusiusculis, 3–6 cm longis, medio fere 1.25–1.75 mm latis; racemis foliorum longitudine laxe 15–20-floris, usque supra basin floriferis; bracteis lanceolatis, acuminatis, ovario fere aequilongis; floribus minutis, glabris; sepalis ovatis, obtusis, c. 1 mm longis, lateralibus obliquis, basin versus antice paululo ampliatis; petalis oblique oblongis obtusis, sepalis paululo brevioribus; labello e basi perbrevis unguiculata orbiculari, apiculato, lamina basi breviter subhastata, toto sepalis subaequilongo; columna perbrevis, clinandrio semiorbiculari rostellum bidentatum distincte superante; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite lineari paulo brevior, glandula minuta; ovario breviter pedicellato, clavato, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20141, flowering in Sept. 1909.

This species is the slimmest in the section and has the narrowest leaves. The flowers are white.

47. *P. longicaulis* Schltr., in K. Schum. et Laut., Nachtr. [1905], p. 189.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16544 [Ed.—possibly 16844], flowering in Nov. 1907; on trees on the creeks of the Bismarck Range, alt. c. 1000 m—R. Schlechter no. 14076, flowering in Jan. 1902.

The very good specimens now on hand show that the lip has a very short broad claw and an almost square, slightly concave disc. A specimen collected by A.W. Sayer near Bourawarri in British Papua in Aug. 1887 at an altitude of 2330 ft. belongs to this species.

48. *P. quadrata* Schltr., sp. nov.

Epiphytica, simplex, 20–25 mm longa; radicibus filiformibus, glabris; caule elongato, dense foliato, 3–5 mm diametro; foliis erecto-patentibus lineari-ligulatis, obtuse et inaequaliter bilobulatis, 5–8.5 cm longis, medio fere 5–7 mm latis; racemis filiformibus, sublaxe multifloris, elongatis, folia fere 2-plo superantibus; bracteis lanceolatis, acuminatis, ovarium aequantibus vel paulo superantibus; floribus

minutis, glabris; sepalis late ovatis, obtusiuscule et perbreviter acuminatis, 0.75 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, sepalis subaequilongis; labello late quadrato, apiculato, basi concavulo, sepalis aequilongo; columna perbrevis; rostello bidentato, et clinandrio humilibus; anthera reniformi-cordata, umbonata; polliniis oblique obovoideis, stipite lineari paulo brevior, glandula orbiculari, minuta; ovario sessilibus, glabro, 2 mm subattingente.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18181 (TYPE), flowering in Sept. 1908; on trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18565, flowering in Oct. 1908.

This species is related closely to *P. longicaulis* Schltr., but is distinguished readily by the longer leaves, the much longer inflorescences and, above all, by the shape of the labellum which is claw-less. The flowers are yellowish white.

49. *P. elongata* Schltr., sp. nov.

Epiphytica, simplex, 15–45 cm longa; radicibus filiformibus, glabris; caule elongato, paulo compresso, cum vaginis arcte amplectentibus usque ad 1 cm lato, densius foliato; foliis erecto-patentibus, ligulatis, inaequaliter bilobulatis, obtusis, 5–9 cm longis, medio fere 1.2–1.7 cm latis; racemis dense multifloris, elongatis, folia 2–3-plo superantibus, pedunculo foliis fere aequilongo, paucivaginulato; bracteis ovato-lanceolatis, acuminatis, ovarium subaequantibus; floribus parvulis, erecto-patentibus, inversis; sepalis ovatis, glabris, 1.75 mm longis, intermedio obtuso, lateralibus breviter acuminatis obliquis, basin versus antice paulo dilatatis; petalis oblique ovatis, obtusis, quam sepala paulo brevioribus; labello e basi unguiculata oblongo-ligulata in laminam late cordiformem obtuse apiculatam, dimidio inferiore minute papilloso-puberulam dilatato, sepalis aequilongo, lamina 0.85 mm longa, basi 1 mm lata; columna perbrevis, rostello bidentato clinandrium obtusissimum aequante; anthera reniformi cucullata, late cordato-umbonata; polliniis oblique obovoideis, stipite gracili aequilongo, anguste lineari; ovario cum pedicello clavato, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Gati Mountain, alt. c. 600 m—R. Schlechter no. 16987, flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 18243, flowering in Sept. 1908.

This species is distinguished easily from the others in the section by the particularly vigorous habit, as well as by the lip having a longer claw and by the papillose-haired disc. The flowers are white.

§ 5. *Bulbophreatia*

Next to *Eu-Phreatia*, this section may prove to be the second largest in the genus, and since on various occasions I have often drawn attention to its chief characteristics, it is not necessary to enter again into details.

Evidently, the section has reached the summit of its development in Papuaia, and irrespective of the abundance of species, we have here representatives of basic forms which are not found elsewhere, and still other basic forms of the section which are by no means missing in the Territory.

Besides the species mentioned here we know the following from Papuaia:

British Papua has supplied only two species up to the present, *P. albiflora* Ridl. and *P. papuana* Ridl. Considerably larger is the number of species recorded from Dutch New Guinea, viz. *P. Habbemae* J.J. Sm., *P. repens* J.J. Sm., *P. dulcis* J.J. Sm., *P. scandens* J.J. Sm., *P. pisifera* J.J. Sm. and *P. grandiflora* J.J. Sm.

This section is separated sharply from *Saccophreatia* in the absence of the sac or spur on the claw of the lip. In the latter section this spur stretches forward and is always abruptly truncate. The species which we must consider here are, with few exceptions, epiphytes of the mist-forest formations of the mountains, where they are found usually growing in colonies.

50. *P. microphyton* Schltr., sp. nov.

Epiphytica, perpusilla, 3.5–6 cm longa; rhizomate valde abbreviato; radicibus filiformibus, glabris;

pseudobulbis ovoideis, parvulis, bifoliatis, valde approximatis, 3–5 mm altis, infra medium 2–4 mm diametro; foliis suberectis, oblique linearibus, obtusis, basin versus sensim paululo angustatis, 1–3 cm longis, medio fere 1.25–2 mm latis; racemis gracillimis, laxe 10–20-floris, erectis, pedunculo foliis fere aequilongo, minute paucivaginulato; bracteis ovato-lanceolatis, acuminatis, ovario paulo brevioribus; floribus minutis, glabris, in speciminibus nostris cleistogamis; sepalis late ovalibus, breviter acuminatis, 1.25 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusis, quam sepala paulo brevioribus; labello e ungue ovato basi concavo in laminam late reniformem, obtusissimam, margine subcrenulatam expanso, sepalis subaequilongo, lamina 0.75 mm longa, basi 1.25 mm lata; columna brevi, clinandrio semiorbiculari, rostellum triangulum bidentatum multo superante; anthera reniformi-cucullata, apiculata; ovario pedicellato clavato, 2.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19716, flowering in June 1909.

One of the most delicate species of the section *Bulbophreatia*. It probably is related most closely to the following one, but has appreciably narrower leaves. The flowers are white.

51. *P. chionantha* Schltr., sp. nov.

Epiphytica, pusilla, gracilis, 5–8.5 cm alta; rhizomate abbreviato; radicibus filiformibus, glabris; pseudobulbis approximatis anguste ovoideis, bifoliatis, 4–6 mm altis, infra medium 2–3 mm diametro; foliis suberectis, oblique linearibus, apice minute et inaequaliter bilobulatis, basin versus sensim paulo attenuatis, 3–8 cm longis, medius fere 3–6 mm latis; racemis gracillimis, laxius multifloris, subsecundis, folia superantibus, pedunculo paucivaginulato gracillimo incluso usque ad 10 cm longis; bracteis lanceolatis, acuminatis, ovarium aequantibus vel paulo excedentibus; floribus parvulis, glabris; sepalis ovatis, obtusis vel minute apiculatis, 2 mm longis, lateralibus obliquis basi antice paulo ampliatis; petalis oblique ovatis, obtusiusculis, 1.25 mm longis; labello e ungue latiovato medio concavo in lamina perlate reniformem obtuse apiculatam expanso, sepalis aequilongo, lamina 1.25 mm longa, basi 2 mm lata; columna brevi, clinandrio subcucullato, rostello bidentato, parvulo; anthera ovato-cordata, cucullata; polliniis oblique obovoideis, stipite anguste lineari, glandula minuta; ovario pedicellato, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20202, flowering in Sept. 1909.

The species is related to *P. microphyton* Schltr., but is stronger in habit and has larger flowers with a broader lip-disc. The flowers are white.

52. *P. subcrenulata* Schltr., sp. nov.

Epiphytica, pusilla, 4–5 cm alta; rhizomate abbreviato; radicibus filiformibus, glabris; pseudobulbis approximatis, late ovoideis, 2-foliatis, 3–4 mm altis, supra basin 3–4 mm diametro; foliis erectis, oblongo-ligulatis, inaequaliter bilobulatis, basin versus sensim paululo angustatis, c. 1.8–2.2 cm longis, medio fere 5–6.5 mm latis; racemo gracili, sublaxe 15–25-floro, secundo, arcuato, pedunculo foliis subaequilongo, gracili, paucivaginulato; floribus parvulis, glabris; sepalis perlate ovalibus, minute apiculatis, 1.5 mm longis, lateralibus obliquis, antice bene ampliatis; petalis oblique ovatis, obtusis, 1 mm longis; labello e basi ovato-unguiculata, concavula in laminam latissime semilunato-reniformem margine subcrenulato-undulatam, obtusissimam expanso, 1.35 mm longo, lamina 0.75 mm longa, basi 1.35 mm lata; columna brevi, clinandrio rostellum superante; anthera ovato-cordata, cucullata; polliniis oblique ovoideis, stipite anguste lineari, aequilongo, glandula minuta; ovario pedicellato 3 mm longa.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the Govidjoa [Creek] (Waria District), alt. c. 1100 m—R. Schlechter no. 19798, flowering in June 1909.

This species is to be placed next to *P. albiflora* Ridl. and is distinguished by the almost-crenate labellum with a peculiar swelling at the margin. The flowers are white.

53. *P. dendrochiloides* Schltr., sp. nov.

Epiphytica, erecta, pusilla, c. 6 cm alta; rhizomate abbreviato; radicibus filiformibus, glabris; pseudobulbis c. 5 mm distantibus, ovoideis, 2-foliatis, 3–4 mm altis, infra medium 1.5–2 mm diametro; foliis oblanceolato-ligulatis, obtusis, basin versus sensim paulo angustatis, 1.5–2 cm longis, supra medium 2.5–3.5 mm latis; racemis laxe 10–18-floris, gracilibus, pedunculo gracili paucivaginulato folia aequante; bracteis lanceolatis, acuminatis, ovario brevioribus; floribus parvulis, glabris; sepalis

ovatis, obtusis, 1.75 mm longis, lateralibus obliquis, antice ampliatis; petalis oblique ovato-ligulatis, obtusiusculis, 1.25 mm longis; labello e ungue oblongo-ligulato, concavulo dimidio anteriore in laminam subquadrata, apiculata, apicem versus paulo angustata expanso; columna brevi, rostello clinandrio obtuso paulo brevior; anthera ovato-cordata; polliniis oblique ovoideis, stipite lineari aequilongo, glandula minuta; ovario cum pedicello clavato c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17989, flowering in July 1908; no. 19169, flowering in Jan. 1909.

This species is somewhat unique in the shape of the lip-disc compared with its closer relatives. The flowers are white.

54. *P. transversiloba* Schltr., sp. nov.

Epiphytica, erecta, 10–12 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis approximatis, ovoideo-conicis, 2-foliatis, 4–6 mm altis, supra basin 2.5–3.5 mm diametro; foliis suberectis, oblique ligulatis, obtusiusculis, apice inaequaliter bilobulatis, basin versus sensim paulo angustatis, 5–9 cm longis, medio 5.5–7 mm latis; racemo subdense multifloro, folia distincte superante, pedunculo gracili paucivaginulato; bracteis lanceolatis, acuminatis, ovario subaequilongis; floribus parvulis, inversis, glabris; sepalis ovatis, 1.75 mm longis, lateralibus obliquis, antice dilatatis, apiculatis; petalis oblique ovatis, obtusis, 1.25 mm longis; labello e ungue ovato-oblongo concavo, dimidio anteriore in laminam transverse oblongam apiculatam, 2 mm latam dilatato; columna brevi, clinandrio subcucullato, rostellum superante; anthera reniformi-cucullata apiculata; polliniis ellipsoideis, stipite aequilongo lineari, glandula minuta; ovario pedicellato clavato 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19632, flowering in May 1909.

Very peculiar but characteristic for the species is the conspicuous broad disc of the lip. The flowers are white.

55. *P. angustifolia* Schltr., sp. nov.

Epiphytica, gracilis, usque ad 25 cm alta; rhizomate brevi; radicibus filiformibus, glabris; pseudobulbis conicis, bifoliatis, 5–7 mm altis, supra basin 3–4 mm diametro; foliis suberectis, anguste linearibus, apice minute bidentatis, basin versus sensim paulo angustatis, 8–14 cm longis, medio fere 3–5 mm latis; racemis gracillimis, folia nunc subduplo superantibus, subdense multifloris, pedunculo foliis subaequilongo; bracteis lanceolatis, acuminatis, ovarium aequantibus; floribus parvulis, glabris; sepalis ovatis, 1.75 mm longis, lateralibus, apiculatis, antice dilatatis; petalis oblique oblongis, obtusis, c. 1.25 mm longis; labello e ungue ovato concavo dimidio anteriore semilunato, obtusissimo, lamina basi 1.85 mm lata; columna brevi, clinandrio semiorbiculari rostellum superante; anthera obreniformi-cucullata; polliniis obovoideis, stipite lineari brevior, glandula minuta; ovario pedicellato clavato, 4–5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18722, flowering in Nov. 1908.

Of the species with a short rhizome this one is recognised easily by the long narrow leaves. The flowers are white.

56. *P. Govidjoae* Schltr., sp. nov.

Epiphytica, 13–15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis ovoideis, bifoliatis, 0.6–1 cm altis, infra medium 3–5 mm diametro; foliis suberectis, ligulatis, oblique obtusis, basin versus paulo angustatis, 5–12 cm longis, medio 7–10 mm latis; racemis dense multifloris, elongatis, arcuatis, subsecundis, folia paulo superantibus, pedunculo gracili, paucivaginato, 7–9 cm longo; bracteis lanceolatis, acuminatis, ovarium aequantibus vel paulo superantibus; floribus parvulis, glabris; sepalis ovatis, obtusiusculis, 2 mm longis, lateralibus obliquis, basin versus antice dilatatis; petalis oblique ovatis, obtusis, c. 1.5 mm longis; labello e basi ovato-ligulata concava in laminam semilunatam apiculatam expanso, sepalis subaequilongo, lamina basi 1.5 mm lata; columna brevi, rostello clinandrium superante; anthera reniformi-cordata; polliniis oblique obovoideis, stipite lineari aequilongo, glandula minuta; ovario pedicellato, clavato, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range on the

Govidjoa [Creek], alt. c. 1300 m—R. Schlechter no. 19779, flowering in June 1909.

This species is related to *P. angustifolia* Schltr., but has broader leaves and denser racemes. The flowers are white.

57. *P. potamophila* Schltr., sp. nov.

[Ed.—refer 'Neue Orchidaceen Papuasiens' in Engl. Bot. Jahrb. 58 (1922-23) p. 149 as follows: "It will be necessary to rename *Phreatia potamophila* Schltr.—Orch. Dtsch. Neu-Guinea p. 937—to *P. rivularis* Schltr., as I have previously given the first name to a plant from the Celebes. For similar reasons *P. stipulata* Schltr.—Orch. Dtsch. Neu-Guinea, p. 928, must altered to *P. djamuensis* Schltr."]

Epiphytica, 13–25 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis subglobosis, 2-foliatis, c. 7 mm diametro; foliis erecto-patentibus vel suberectis, ligulatis, inaequaliter et obtuse bilobulatis, basin versus paulo angustatis, 5–14 cm longis, medio 1–1.5 cm latis; racemis folia 2–3-plo superantibus subdense multifloris, elongatis, angustis, pedunculo foliis duplo brevioribus; bracteis lanceolatis, suberectis, flores subaequantibus; floribus minutis, glabris; sepalis late ovalibus, obtusis, vix 1.5 mm longis, lateralibus obliquis, basin versus antice dilatatis; petalis oblique ellipticis, obtusis, c. 1 mm longis; labello e basi late ovali concavo medio paulo constricto et in laminam subreniformi-orbicularem sursum dilatato, sepalis subaequilongis; columna brevi clinandrio rostellum distincte superante; anthera reniformi-cucullata; polliniis obovoideis, stipite lineari aequilongis, glandula minuta; ovario breviter pedicellato, clavato, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees alongside the creeks near Kelel on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16268, flowering in July 1907; on trees on the Kaulo [River], alt. c. 250 m—R. Schlechter no. 16765, flowering in Nov. 1907; on trees on the banks of the Wabe [River], alt. c. 100 m—R. Schlechter no. 18070, flowering in July 1908.

A very characteristic species from the central part of Kaiser-Wilhelms-Land. It is recognised readily by the long narrow inflorescences and by the lip. The flowers are white.

58. *P. bracteata* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 187.

Kaiser-Wilhelms-Land: On trees of the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 14040, flowering in Jan. 1902.

A unique species which, unfortunately, I did not find again. In habit, as well as in the shape of labellum, it is very characteristic. The flowers are whitish.

59. *P. pumilio* Schltr., sp. nov.

Epiphytica, pusilla, 2.5–4 cm alta; rhizomate brevi, decumbente; radicibus filiformibus, glabris; pseudobulbis 5–10 mm distantibus, subglobosis, c. 3 mm diametentibus, unifoliatis; folio erecto, oblanceolato-ligulato, obtusiusculo, basin versus sensim paulo angustato, 1.3–2.5 cm longo, medio fere 3–6 mm lato; racemis dense plurifloris, subsecundis, usque ad 4 cm altis, pedunculo paucivaginulato, gracili, folium fere aequante; bracteis lanceolatis, acuminatis, ovarium aequantibus; floribus minutis, glabris; sepalis late ovatis, obtusiusculis, c. 1 mm longis, lateralibus obliquis, basin versus antice paulo ampliatis; petalis oblique ovatis obtusis, quam sepala paulo brevioribus; labello e ungue brevi semiovali concavo in laminam suborbicularem apiculatam expanso, sepalis subaequilongis; columna brevi, rostellum triangulo, clinandrium superante; ovario breviter pedicellato, clavato, c. 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19873, flowering in June 1909.

One of the smallest species in the section, well characterised by the shape of the lip. The flowers are white.

60. *P. leptophylla* Schltr., sp. nov.

Epiphytica, pusilla, 4–6 cm alta; rhizomate repente, radicibus filiformibus, glabris, pseudobulbis 7–12 mm distantibus, subglobosis, c. 2 mm diametentibus, bifoliatis; foliis erecto-patentibus, anguste, oblanceolato-ligulatis, subacutis, textura pro genere tenuibus, 1.5–3 cm longis, medio fere 3.5–5 mm latis, basin versus subpetiolato-angustatis; racemis gracilibus, erectis, laxe 10–15-floris, pedunculo

filiformi paucivaginulato, folia plus minusve superante; bracteis lanceolatis, acuminatis, ovario duplo fere brevioribus; floribus parvulis, secundis, glabris; sepalis late ovatis, apiculatis, 1.5 mm longis, lateralibus obliquis, antice paulo ampliatis; petalis oblique ovalibus, obtusis, sepalis brevioribus; labello e ungue subquadrato basi concavo in laminam late reniformem subapiculatam expanso, sepalis fere aequilongo, lamina c. 0.6 mm longa basi 1 mm lata; columna brevi, rostello clinandrium superante; anthera late ovato-cordata, obtusiuscula; polliniis obovoideis, stipite lineari subaequilongo, glandula minuta, oblonga; ovario pedicellato, glabro, clavato, c. 2.25 mm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17169, flowering in Jan. 1908.

This species, which is related closely to *P. bulbophylloides* Schltr., described below, is distinguished by the very thin texture of its leaves which are located in pairs on its pseudobulbs. The flowers are white.

61. *P. bulbophylloides* Schltr., sp. nov.

Epiphytica, pusilla, 6–9 cm alta; rhizomate repente; radicibus filiformibus, glabris; pseudobulbis 5–10 mm distantibus, subglobosis, c. 2 mm diametentibus, unifoliatis; folio erecto, anguste oblanceolato-ligulato, obtuso, basin versus subpetiolato-angustato, 3–5 cm longo, medio fere 3.5–6 mm lato; racemis gracilimis, laxe 10–20-floris, usque ad 9 cm altis, pedunculo filiformi, paucivaginulato, folia vulgo superante; bracteis ovato-lanceolatis, ovario duplo brevioribus; floribus parvulis, subsecundis, glabris; sepalis late ovatis, 1.25 mm longis, lateralibus apiculatis, obliquis, basin versus antice paulo ampliatis; petalis oblique ellipticis, obtusis, sepalis paulo brevioribus; labello e ungue suborbiculari, concavulo dimidio anteriore in laminam perlate reniformem, apiculatam 1.25 mm latam expanso; columna brevi, clinandrio subcucullato rostellum superante; anthera reniformi-cucullata; polliniis obovoideis, stipite sublineari brevior, glandula minuta; ovario pedicellato clavato, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19104, flowering in Jan. 1909.

As mentioned above already, the species is related closely to *P. leptophylla* Schltr., but differs from it in the smaller pseudobulbs, the slim and more open growth, the larger flowers with a broader lip-disc and in the column. The flowers are white.

62. *P. laxa* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 188.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 14340, flowering in Apr. 1902.

This very open and slim species is recognised by its small leaves. The flowers are white.

var. *perlaxa* Schltr., var. nov.

Differt a forma typica rhizomate longius repente, foliis longioribus, pedunculis longis cum racemo folium vulgo bene superantibus, floribus paulo majoribus.

Kaiser-Wilhelms-Land: On tall trees in the mountain forests of Kelel, alt. c. 600 m—R. Schlechter no. 16501 (TYPE), flowering in Sept. 1907; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18014, flowering in July 1908.

The variety later may prove to be a separate species. The flowers are white.

63. *P. mentosa* Schltr., sp. nov.

Epiphytica, c. 7 cm alta; rhizomate repente; radicibus filiformibus, glabris; pseudobulbis 1–1.5 cm distantibus suborbicularibus, c. 3 mm diametro, unifoliatis; folio erecto, lanceolato-ligulato, subacuto, basi in petiolum longum sensim attenuato, petiolo incluso 5–8 cm longo, lamina medio 7–8 mm lata; racemo erecto, subdense 15–20-floro, folia superante, pedunculo paucivaginulato, subgracili; bracteis lanceolatis, acuminatis, ovarium aequantibus; floribus parvulis, glabris; sepalis ovatis, 2 mm longis, lateralibus apiculatis, basin versus margine anteriore bene ampliata cum pede columnae mentum oblongoideum 1.75 mm longum formantibus; petalis oblique oblongis, obtusis, sepalis paulo brevioribus; labello e ungue oblongo-ligulato basi concavo in laminam subquadrato-reniformem apiculatam supra medium expanso, sepalis subaequilongo; columna brevi, rostello clinandrio aequilongo; anthera late ovato-cordata, subacuta; polliniis oblique obovoideis, stipite anguste lineari, paulo longiore, glandula oblonga parvula; ovario breviter pedicellato, clavato, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16663, flowering in Oct. 1907.

I have found only a single specimen of this obviously rare species which is distinguished from the other closely-related species by the stronger mentum of the flowers. The flowers are white.

64. *P. virescens* Schltr., sp. nov.

Epiphytica, 6–11 cm alta; rhizomate flexuoso, repente; radicibus filiformibus, glabris; pseudobulbis c. 1.5 cm distantibus, globosis, 3–4 mm diametentibus, unifoliatis; folio erecto, elliptico, obtuso, basi sensim petiolato-angustato, 2.5–3.5 cm longo, lamina medio 0.9–1.3 cm lata; racemo erecto, subdense pluri-(c. 10-)floro, arcuato, secundo, pedunculo folia 2–3-plo superante, paucivaginato; bracteis ovatis, acutis, ovario 2–3-plo brevioribus; floribus parvulis, glabris; sepalis ovatis, acutis, 2.25 mm longis, lateralibus breviter acuminatis, obliquis, basi margine anteriore valde ampliatis; petalis oblique rhombeo-ovatis, acutis, sepalis paulo brevioribus; labello e ungue oblongo-concavo dimidio anteriore in laminam subreniformem obtuse apiculatam expanso, sepalis aequilongo, lamina basi c. 1.75 mm lata; columna brevi, glabra, rostello clinandrium paulo superante; anthera reniformi-cucullata; pollinibus oblique obovoideis, stipite lineari, paulo brevior, glandula minuta; ovario pedicellato, clavato, 2.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19611, flowering in May 1909.

This species is distinguished easily in the section by the short, broad leaves. It is, in a way, a transition between the above-described and the following, somewhat aberrant species. The flowers are yellowish green, the anther white with brown ridges.

65. *P. congesta* Schltr., sp. nov.

Epiphytica, congesta, 4–7 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis late ovoideis, unifoliatis, c. 3–4 mm altis, infra medium 2.5–3 mm diametro; folio erecto, lineari-ligulato, oblique obtuso cum apiculo minuto, 1.5–6 cm longo, 3.5–7 mm lato, basin versus sensim paulo angustato; racemo erecto, subdense 8–12-floro, cum pedunculo gracili c. 4 cm longo; bracteis lanceolatis, acuminatis, ovario aequilongis; floribus pro genere mediocribus glabris; sepalis ovatis, obtusis, 2.25 mm longis, lateralibus obliquis, basin versus margine anteriore ampliatis; petalis oblique ovatis obtusis, sepalis paulo minoribus; labello e basi quadrato-unguiculata concava infra medium in laminam subreniformem obtusam basi truncatam expanso, sepalis subaequilongo, lamina 1.25 mm longa, basi 1.35 mm lata, basi maculis 2 papilloso-puberulis ornata; columna brevi, rostello clinandrium subaequante; pollinibus oblique obovoideis, stipite subduplo brevior, lineari, glandula minuta; ovario pedicellato clavato, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20328, flowering in Sept. 1909.

This species differs from all the above-described ones of the section in that the lip-disc has two hairy areas at its base. The flowers are white.

66. *P. protensa* Schltr., sp. nov.

Epiphytica, pusilla, gracilis, 6–8 cm longa; rhizomate longe repente, flexuoso; radicibus filiformibus, glabris; pseudobulbis 1.5–2 cm distantibus, oblongoideo-depressis, unifoliatis, minutis; folio erecto, oblanceolato-ligulato, obtuso, basin versus sensim petiolato-attenuato, 1.8–3 cm longo, supra medium 2.5–4.5 mm lato; racemo sublaxe 3–6-floro, pedunculo gracillimo, folio 2–3-plo longiore, paucivaginato; bracteis ovatis, acuminatis, ovario aequilongis vel paulo longioribus; floribus pro genere mediocribus, inversis; sepalis ovalibus, obtusis, glabris, 2.5 mm longis, lateralibus obliquis, basi margine anteriore conspicue dilatatis; petalis oblique oblongis, obtusis, sepalis multo minoribus; labello circuitu oblongo-concavo, dimidio anteriore in laminam suborbicularem paulo explanato, obtuse apiculato, intus dimidio anteriore pilosulo, sepalis aequilongo; columna perbrevis, rostello ovato, bidentato, bene alto; ovario breviter pedicellato, clavato, 2.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range above Dschischungari, alt. c. 1200 m—R. Schlechter no. 19581, flowering in May 1909.

A very characteristic species, both in habit and floral structure. The sparsely flowered inflorescences are conspicuous. The flowers are greenish white.

67. *P. lasioglossa* Schltr., sp. nov.

Epiphytica, pusilla, 4–5 cm alta; rhizomate longe repente, gracili, radicibus filiformibus, glabris; pseudobulbis 1.5–2.5 cm distantibus, oblongoideo-cylindraceis, minutis, unifoliatis; folio erecto, lineari-ligulato, obtuso, basin versus sensim subpetiolato-angustato, 1.5–3 cm longo, medio fere 2–4.5 mm lato; racemis subaxe paucifloris, pedunculo gracili, paucivaginulato, folium fere 2-plo superante; bracteis ovatis, acuminatis, ovarium aequantibus; floribus in genere mediocribus, inversis; sepalis ovalibus, obtusis, glabris, 2.25 mm longis, lateralibus obliquis, basi margine anteriore valde ampliatis; petalis oblique oblongo-ligulatis, obtusiusculis, glabris, sepalis bene minoribus; labello e ungue anguste cuneato dimidio superiore in laminam suborbicularem, medio excepto bipulvinatam expanso, sepalis aequilongo; columna perbrevis, rostello bidentato, clinandrium distincte superante; anthera cordato-cucullata, magniumbonata; polliniis oblique obovoideis, stipite lineari aequilongo, glandula minuta; ovario breviter pedicellato, clavato, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 1000 m—R. Schlechter no. 20284, flowering in Sept. 1909.

The species is related most closely to *P. protensa* Schltr., but is distinguished by the narrower leaves and the considerably different labellum. The flowers are white, greenish on the outside.

68. *P. pholidotoides* Schltr., sp. nov.

Epiphytica, 11–17 cm alta; rhizomate elongato, repente; radicibus filiformibus, glabris; pseudobulbis 2–3 cm distantibus, conicis, unifoliatis, 4–7 mm altis, basi 5–6 mm diametro; folio erecto, lineari, inaequaliter et obtuse bilobulato, basin versus sensim paulo angustato, 6.5–10 cm longo, medio fere 5–8 mm lato; racemis laxae 10–15-floris, distichis, pedunculo plurivaginato, erecto, folio fere aequilongo; bracteis late ovatis, acuminatis, florem amplectentibus et aequantibus vel paulo superantibus; floribus pro sectione satis magnis, inversis, subsessilibus, glabris; sepalis late ovalibus, apiculatis, 3 mm longis, lateralibus obliquis, basi margine anteriore conspicue ampliatis; petalis quam sepala subduplo minoribus, oblique oblongis, obtusis; labello obovato-spathulato obtuso supra basin paululo dilatato et carina transversa ornato, 4.5 mm longo, quarta parte apicali 2.5 mm lato; columna brevi, rostello clinandrium paulo superante; anthera late cordata, breviter acuminata; polliniis oblique obovoideis, stipite anguste oblanceolato-lineari, subduplo brevior, glandula minuta; ovario breviter pedicellato, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1200 m—R. Schlechter no. 19608, flowering in May 1908. [Ed.—probably 1909.]

This species has the largest flowers of those already known in the section, and is unique in the lip structure. The inflorescences are reminiscent of certain *Pholidota* species. The flowers are white, the anther red with white ridges.

69. *P. coelonychia* Schltr., sp. nov.

Epiphytica, erecta, 10–15 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis late ovoideis, 1–2-foliatis, 4–5 mm altis, infra medium 3–4 mm diametro; foliis suberectis, lanceolato ligulatis, acutis, basin versus sensim angustatis, 7–12 cm longis, medio vel supra 1.1–1.8 cm latis, racemo subaxe 20–25-floro, cylindraceo, suberecto, pedunculo incluso folia subaequante, bracteis patulis, lanceolatis, acuminatis, ovario pluries brevioribus; floribus cleistogamis, clausis, parvulis, patentibus, glabris; sepalis late ovatis, subacutis, 1.75 mm longis, lateralibus obliquis, margine anteriore basi ampliatis; sepalis oblique ovatis, acutis, quam sepala paulo brevioribus; labello e ungue brevi semigloboso, concavo, in laminam suborbicularem breviter acuminatam dilatato, sepalis aequilongo, lamina c. 1.25 mm longa, 1 mm lata; columna perbrevis, erostellata, clinandrio trilobato; anthera reniformi-cucullata; ovario breviter pedicellato, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 18189, flowering in Sept. 1903. [Ed.—possibly 1908.]

A cleistogamous species with a labellum-claw deeper set than with the others in the section, but not giving it the splendour and the structure of *Saccophreatia*. I imagine that the normal form has a different lip-claw. The flowers are white.

§ 6. *Saccophreatia*

In my opinion this section is very well separated from *Bulbophreatia*, not only by the peculiar structure of the lip, but also by its habit and column and should therefore

certainly not be combined with the latter, as proposed by J.J. Smith. Likewise, the glands of the pollinarium of those species known to me appear to be larger than that in *Bulbophreatia*; the teeth of the rostellum are also larger, as well as being separated by a small incision from the remaining part of the rostellum.

The number of species known at present is not very large and hardly may exceed half-a-dozen, but I have now to add a series of further new species.

The western limit of the distribution area of the section may be looked for in Sumatra, from where *P. sulcata* J.J. Sm. has been recorded. The area then extends across the other islands of the Malay Archipelago, the Philippines, Moluccas and Papuaia, then to New Caledonia, where *P. paleacea* (Rchb. f.) Schltr. occurs, and finally to Samoa, where *P. obtusa* Schltr. is its most eastern representative.

Papuaia has supplied three more species from adjacent regions besides those mentioned here as endemic. Of these, *P. nebularum* Schltr. comes from British Papua, while the other two, *P. calcarata* J.J. Sm. and *P. resiana* J.J. Sm., come from Dutch New Guinea.

All species from our Territory may be regarded as mist-forest epiphytes. I have found only one species, *P. saccifera* Schltr., below this formation where it evidently had been washed down.

70. *P. cylindrostachya* Schltr., sp. nov.

Epiphytica, erecta, 16–35 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis approximatis, subglobosis, c. 1 cm altis et latis, lateraliter paulo compressis, unifoliatis; folio erecto oblanceolato-ligulato, basin versus sensim paulo angustato, 9–15 cm longo, supra medium 1.4–1.8 cm lato, obtusiusculo; racemis dense multifloris, folia distincte superantibus pedunculo incluso usque ad 35 cm longis, pedunculo distanter 5–7-vaginato, folio vulgo fere aequilongo, racemo ipso 6–17 cm longo, cylindrico, c. 7 mm diametro; bracteis ovatis, acuminatis, ovarium aequantibus; floribus pro sectione parvulis, inversis; sepalis late ellipticis, apiculatis, glabris, c. 2 mm longis, lateralibus obliquis basin versus margine anteriore paulo dilatatis; petalis oblique ovatis, acutis vel subacuminatis, glabris, sepalis paulo brevioribus; labelli lamina exungiculata, oblongo-quadrata, obtusa, dimidio inferiore superne minute papilloso-puberula, 1.75 mm longa, 0.9 mm lata, sacco oblongoideo, obtuso, laminae parallelo, plus duplo brevior; columna brevi, rostello tenui clinandrio alto subaequilongo; anthera cordato-cucullata, magniumbonata; pollinibus oblique pyriformibus, stipite lineari brevior, glandula lineari-elliptica; ovario subsessili, glabro, c. 2.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700–800 m—R. Schlechter no. 20140 (TYPE), no. 20221, flowering in Sept. 1909; on trees in the forests of the Dischore Range, alt. c. 1300 m—R. Schlechter no. 19706, flowering in June 1909.

Initially, I considered regarding this species as *P. resiana* J.J. Sm., but the given size relationships of the vegetative parts are so very different that I changed that opinion. The flowers are white.

var. *grandifolia* Schltr., var. nov.

Differt a forma typica foliis 30–35 cm longis, usque ad 2.7 cm latis, labelli lamina latiore et brevior.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16554, flowering in Sept. 1907.

This plant later may be regarded as a separate species. The flowers are white.

71. *P. leucostachya* Schltr., sp. nov.

Epiphytica, c. 18 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis valde approximatis, ovoideis, unifoliatis, 7 mm altis, infra medium 5 mm diametro; folio erecto, anguste oblanceolato-ligulato, obtusiusculo, basin versus sensim subpetiolato-attenuato, 9–12 cm longo, supra medium 0.9–1.4 cm lato; racemo adscendente dense multifloro, cylindraco, folia subduplo superante, pedunculo tereti, c. 5-vaginato, folio fere aequilongo; bracteis ovato-lanceolatis vel lanceolatis, acuminatis, flores aequantibus; floribus illis *P. cylindrostachyae* Schltr. similibus et fere aequimagnis; sepalis late ovalibus, obtusis, lateralibus minute apiculatis, obliquis, basin versus

marginē anteriore paulo ampliatis; petalis oblique ovatis, obtusis, sepalis distincte minoribus; labelli lamina e basi perbreviter sed distincte unguiculata late quadrato-oblonga, obtusissima, dimidio inferiore papilloso-puberula, sepalis fere aequilonga, sacco labello parallelo, oblongoideo, obtusissimo, quam lamina triplo fere brevior; columna perbrevis, rostello alte bifido, clinandrio distincte brevior; anthera reniformi-cucullata, umbonata; polliniis oblique obovoideis, stipite lineari, brevior, glandula rotundata, parvula; ovario subsessili glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2200 m—R. Schlechter no. 18828, flowering in Nov. 1908.

The species is related to *P. cylindrostachya* Schltr. but differs in the blunt petals, the short but definite-clawed broader labellum-disc and the very tall clinandrium. The flowers are white.

72. *P. saccifera* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 191.

P. calcarata J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 31; in Nova Guinea VIII (1910) [1909], p. 108 t. XXXVI, fig. 121.

Kaiser-Wilhelms-Land: On a tree carried down by floodwaters in a creek near Rabo in the Minjem Valley, alt. c. 400 m—R. Schlechter no. 16937, flowering in Dec. 1907; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18228, flowering in Sept. 1908.

Neu-Mecklenburg: On trees in the forests near Punam in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14640, flowering in July 1902.

After investigating the flowers of the original specimens I am no longer in doubt that *P. calcarata* J.J. Sm. is identical with my species. The petal width evidently varies somewhat. The flowers are white.

73. *P. elata* Schltr., sp. nov.

Epiphytica, erecta, c. 40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis valde approximatis, 1.5–2.5 cm altis, medio fere 0.7–1.2 cm latis, vaginis foliatis inclusis 3-foliatis; foliis suberectis, ligulatis, apice obtuse bidentatis, basin versus sensim angustatis, 18–30 cm longis, medio fere 1.5–2 cm latis; racemo erecto, dense multifloro, cylindrico, pedunculo plurivaginato folia aequante vel subaequante; bracteis lanceolatis, acuminatis, flore paulo brevioribus; floribus in sectione satis magnis, inversis; sepalis perlate ovalibus, obtusis, 3.25 mm longis, lateralibus obliquis, basin versus margine anteriore ampliatis; petalis oblique ovatis, subacutis, quam sepala paulo brevioribus; labello e ungue ligulato brevi in laminam ovatam subacutam expanso, dimidio inferiore papilloso-puberulo, sepalis fere aequilongo, sacco ovato, obtuso porrecto, labelli lamina 3-plo brevior; columna perbrevis, clinandrio trilobato, quam rostellum brevior; anthera reniformi-cucullata, umbonata, apiculata; polliniis oblique obovoideis, stipite lineari, glandula elliptica, parvula; ovario breviter pedicellato, cylindraceo, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18779, flowering in Nov. 1908.

This species represents the one in the section with the most elegant growth. Indeed it is related closely to *P. saccifera* Schltr., but is distinguished readily by stronger growth, larger flowers and floral characters. The flowers are white.

74. *P. plagiopetala* Schltr., sp. nov.

Epiphytica, erecta, c. 30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis bene approximatis, ovoideo-cylindraceis, unifoliatis, c. 2 cm altis, infra medium c. 8 mm latis; folio erecto, elliptico-ligulato, apice inaequaliter et obtuse bilobulato, 22–28 cm longo, supra medium 2–3.2 cm lato; racemo (in specimine unico) folia subaequante, perdense multifloro, cylindraceo, pedunculo plurivaginato, c. 15 cm alto; bracteis ovalibus, acuminatis, flores aequantibus; floribus in sectione mediocribus, inversis; sepalis perlate ovatis, breviter acuminatis, glabris, 2.5 mm longis, lateralibus obliquis, basin versus margine anteriore conspicue ampliatis; petalis valde obliquis, perlate ovatis, breviter acuminatis, quam sepala distincte brevioribus; labello e basi ligulato-unguiculata dimidio anteriore in laminam quadratam apiculatam expanso, sepalis aequilongo, basin versus minute papilloso, sacco oblongoideo, obtuso, lamina 4–5-plo brevior; columna brevi, clinandrio trilobato, rostellum altum superante; anthera reniformi-cucullata, apiculata; polliniis

oblique obovoideis, stipite duplo brevior anguste lineari, glandula parvula; ovario subsessili cylindraceo, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the hill forests near Udu on the Waria [River], alt. c. 500 m—R. Schlechter no. 19902, flowering in June 1909.

This species is well characterised by the broad leaves and the shape of the lip. In other respects it is related closely to *P. elata* Schltr. and *P. nebularum* Schltr. The flowers are white.

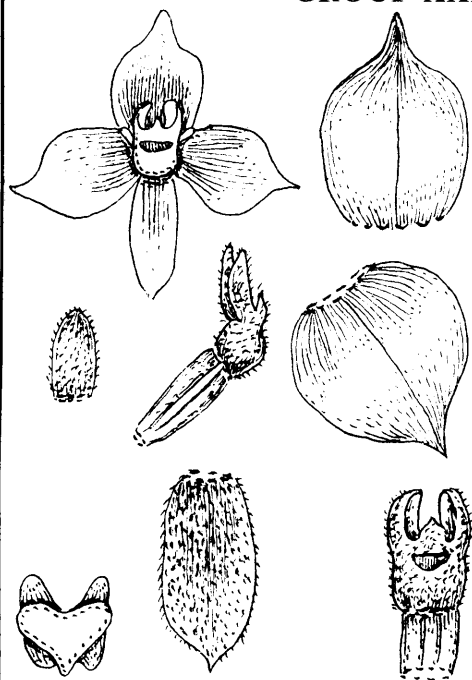
75. *P. cryptostigma* Schltr., sp. nov.

Epiphytica, erecta, 20–30 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis globosis, cum vagina foliata bifoliatis, 1.3 cm diametro; foliis ligulatis, acutis, basin versus sensim angustatis, 15–25 cm altis, medio fere 1.7–2.2 cm latis; racemis arcuatis, distichis, subaxe multifloris, pedunculo paucivaginato; bracteis late ellipticis, ovarium paulo superantibus; floribus in genere magnis, glabris; sepalis perlate ovalibus obtusissimis, 4 mm longis, lateralibus obliquis, basin versus margine anteriore valde ampliatis; petalis oblique suborbicularibus, obtusis, 2.5 mm longis; labello e ungue ligulato-cuneato in laminam semioblongam, obtusam dimidio anteriore subito dilatato, sepalis aequilongo, sacco oblongoideo obtuso, porrecto, labello fere triplo brevior; columna brevi, rostello clinandrium valde superante, stigmati lamella transversa abscondito; anthera suborbiculari, apiculata; pollinibus oblique obovoideis, stipite lineari, glandula rotunda; ovario subsessili clavato 4.5 mm longo.

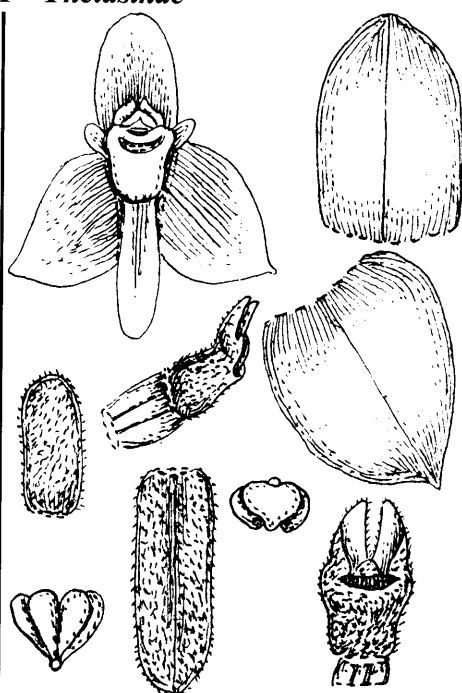
Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 900 m—R. Schlechter no. 17959, flowering in July 1908; on trees in the forests of the Bismarck Range, alt. c. 2000 m—R. Schlechter no. 18810, flowering in Nov. 1908.

This species is distinguished easily from the other species of the section by the doubled-rowed large flowers and the very broad and blunt sepals. The flowers are white.

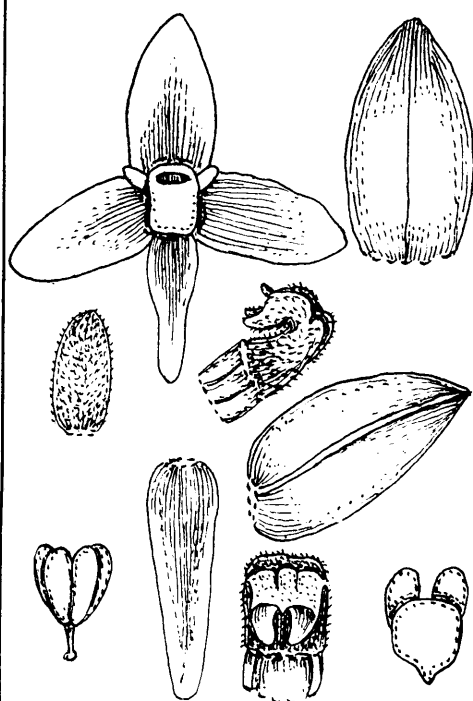
GROUP XXII *Thelasinae*



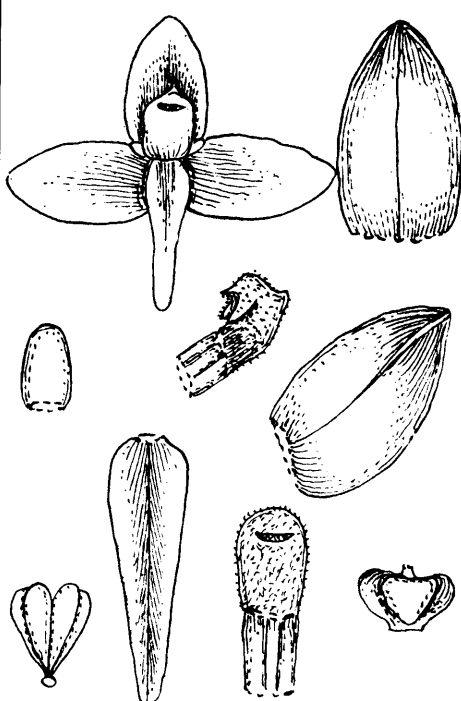
Chitonanthera podochiloides Schltr.



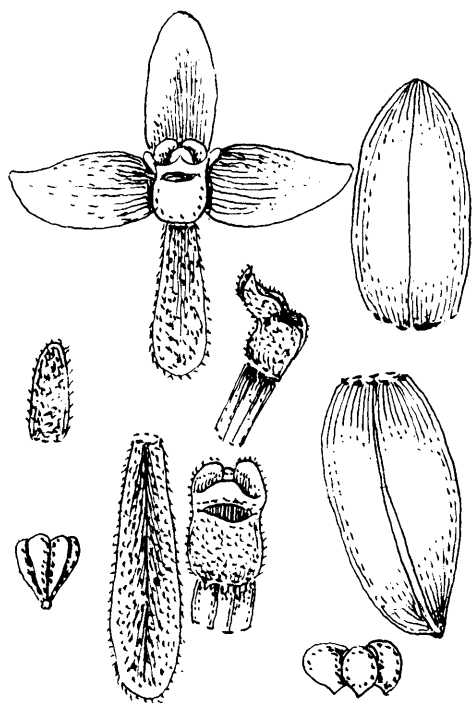
Chitonanthera angustifolia Schltr.



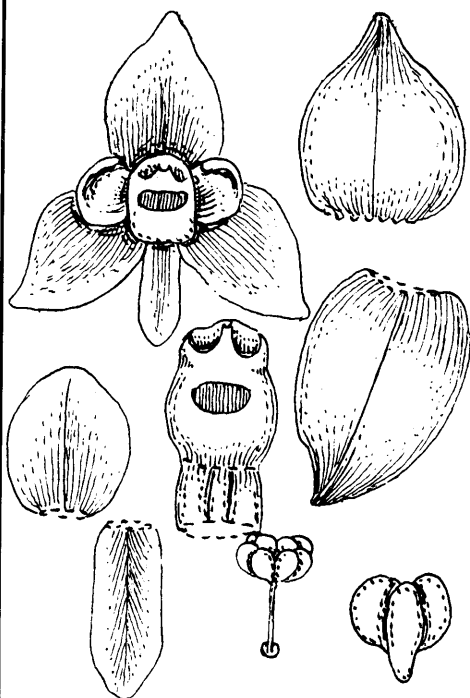
Chitonanthera aporoides Schltr.



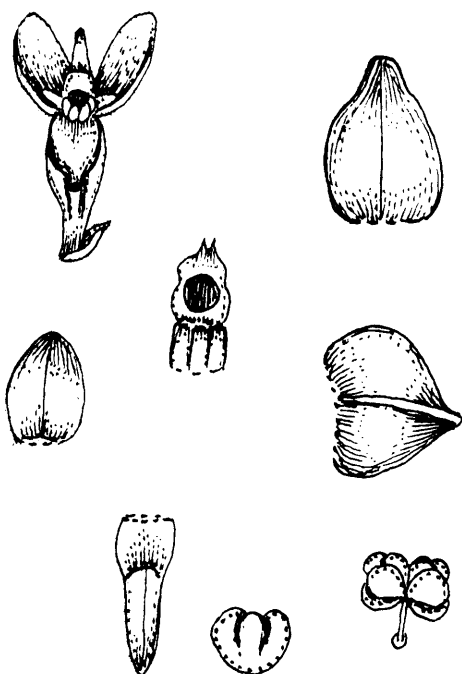
Chitonanthera oberonioides Schltr.



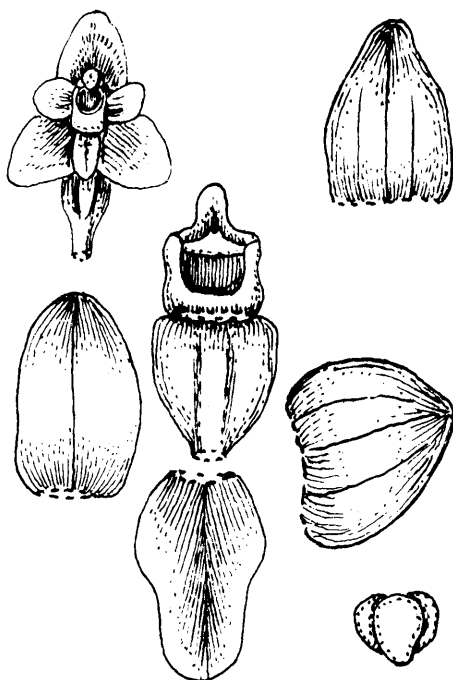
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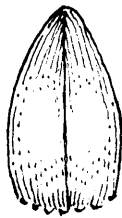
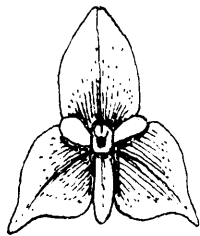
Octarrhena umbellulata Schltr.



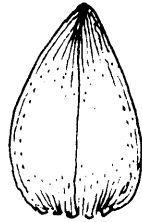
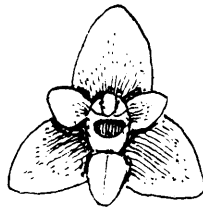
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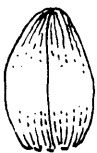
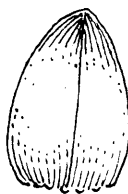
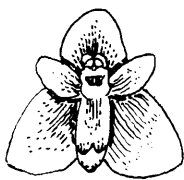
Octarrhena wariana Schltr.



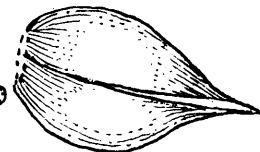
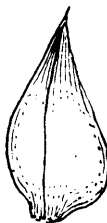
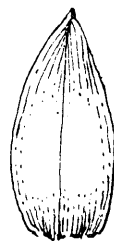
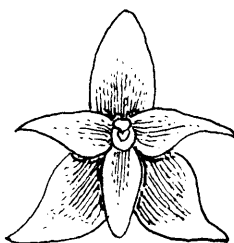
Octarrhena torricellensis Schltr.



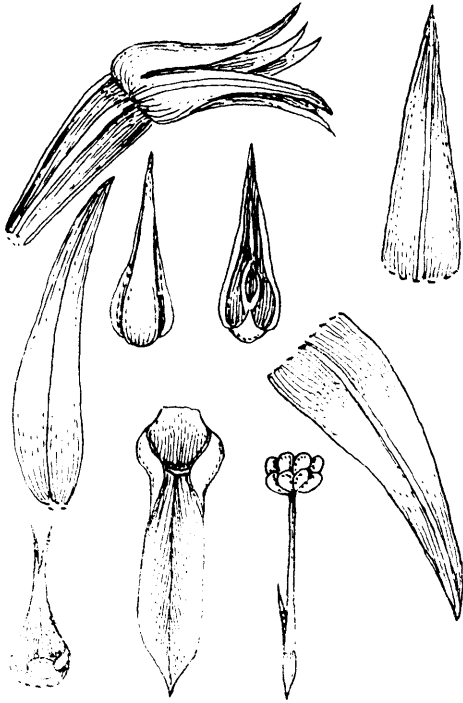
Octarrhena firmula Schltr.



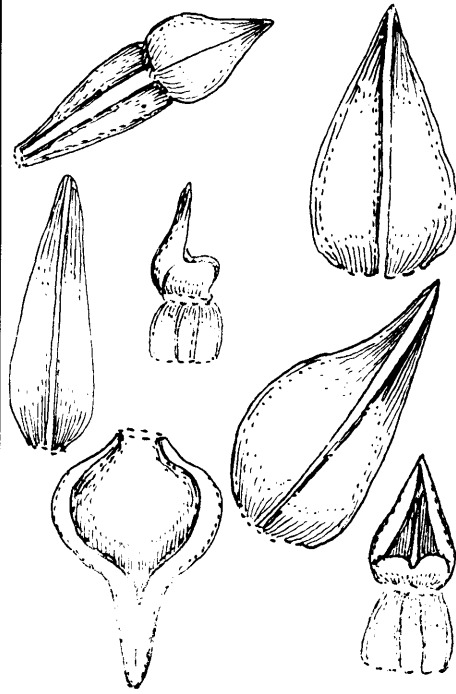
Octarrhena miniata Schltr.



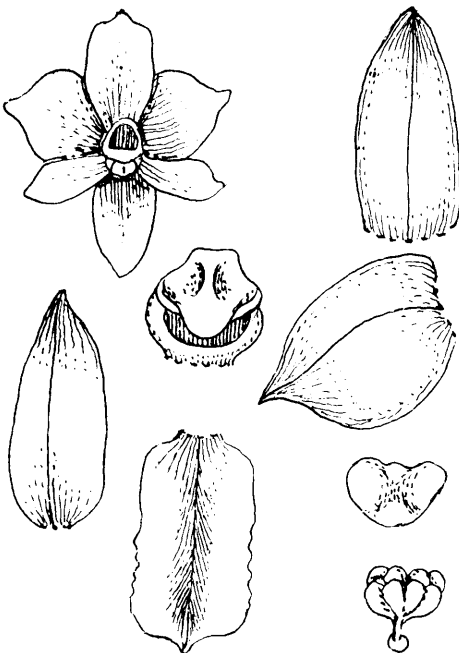
Octarrhena angraecoides Schltr.



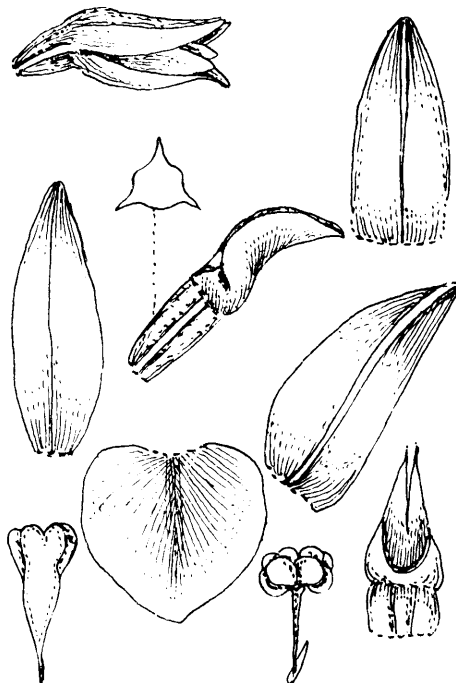
Oxyanthera papuana Schltr.



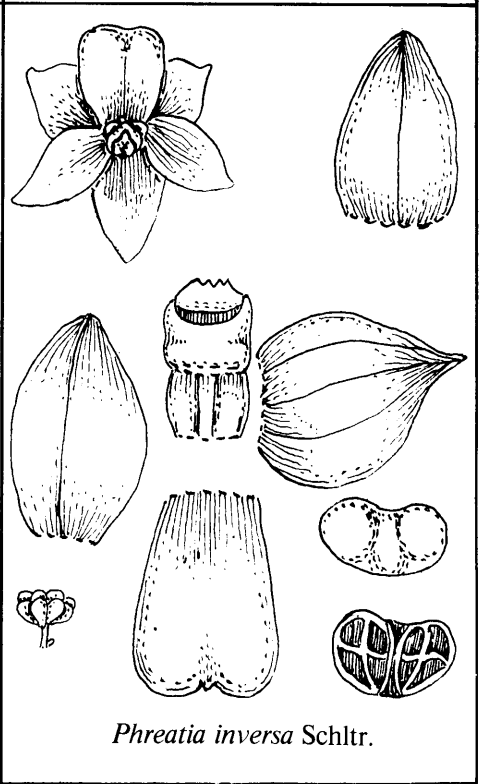
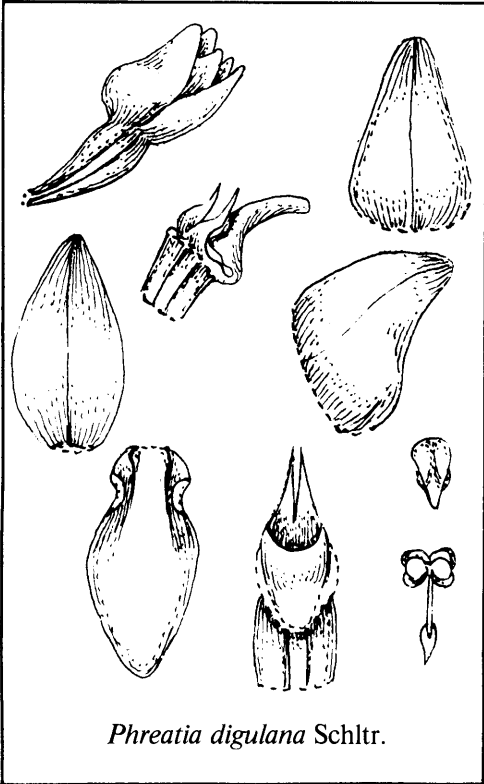
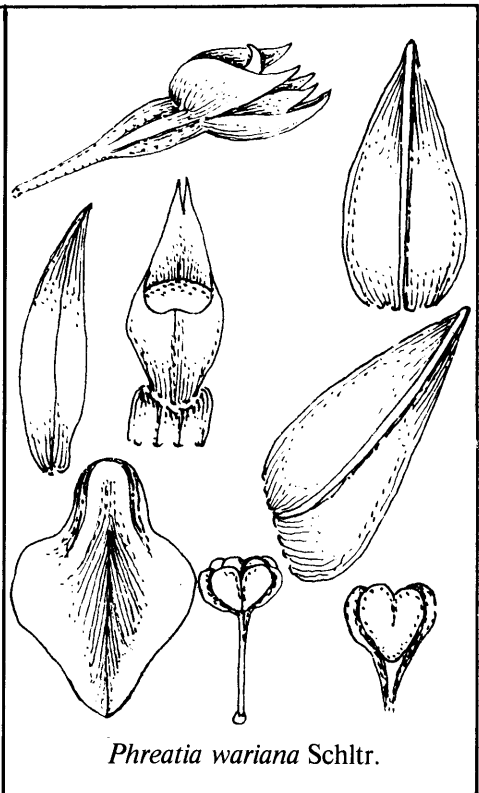
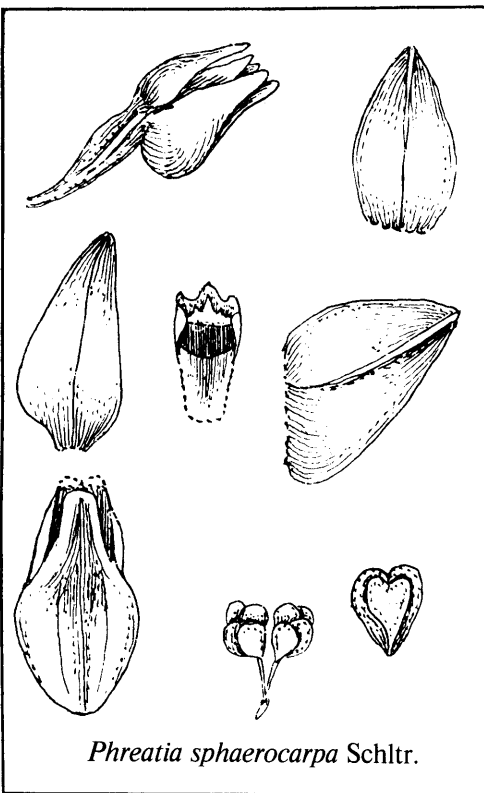
Oxyanthera abbreviata Schltr.

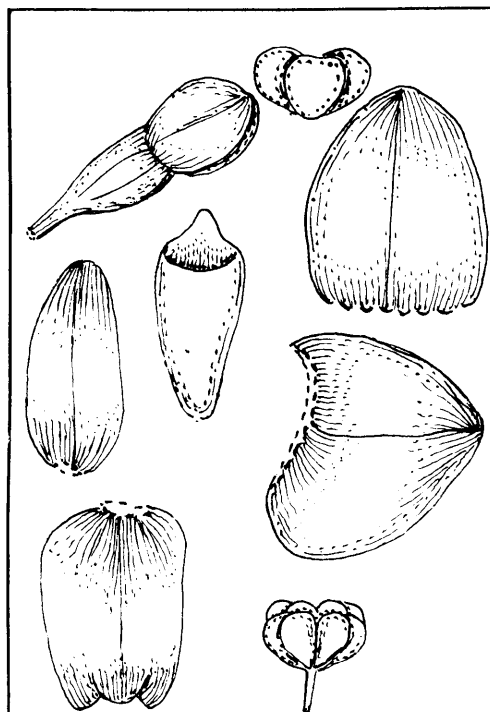


Phreatia sororia Schltr.

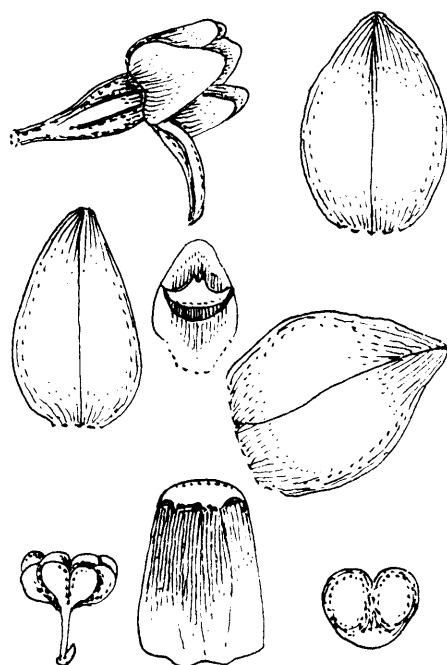


Thelasis cycloglossa Schltr.

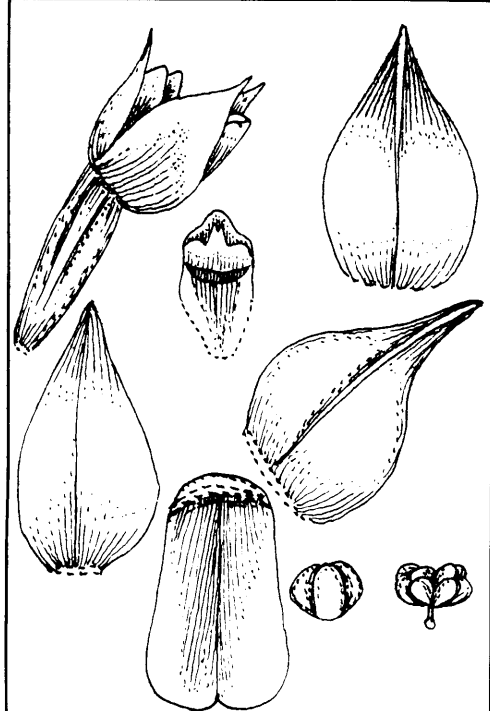




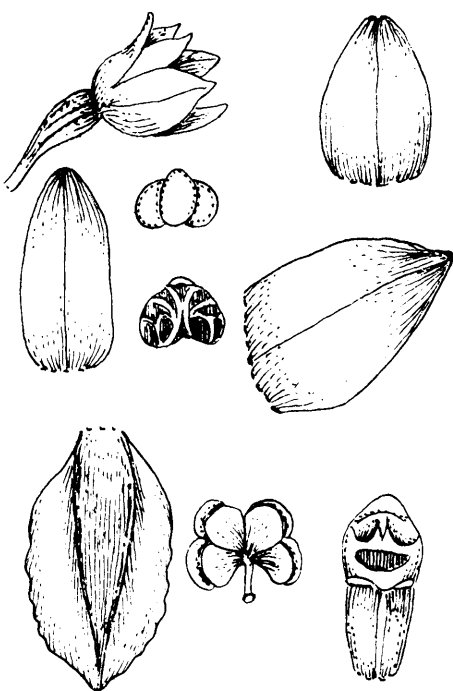
Phreatia trilobulata Schltr.



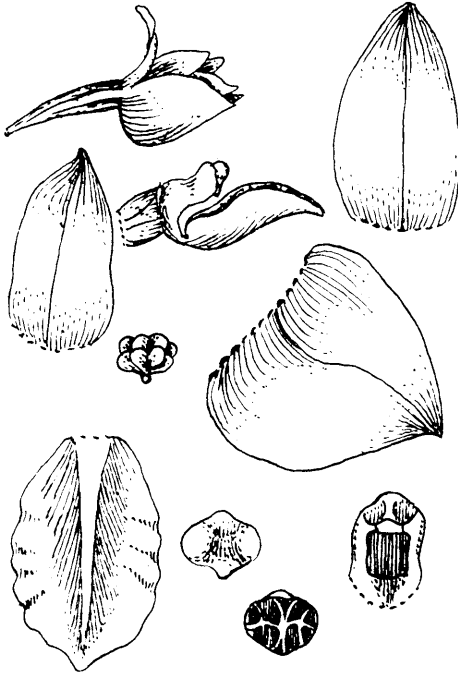
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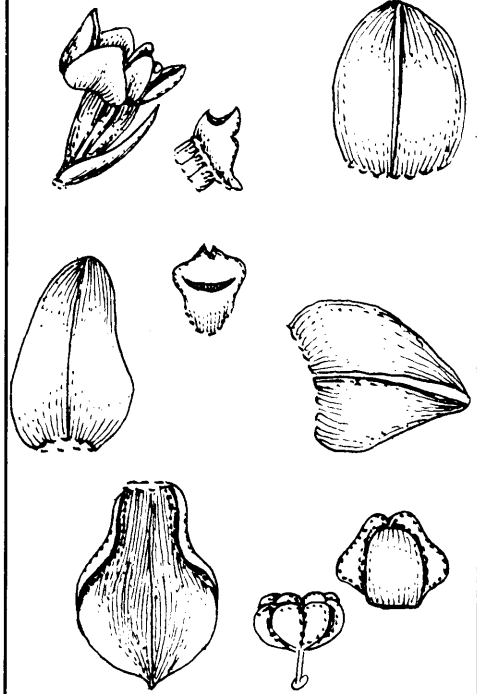
Phreatia microtatantha Schltr.



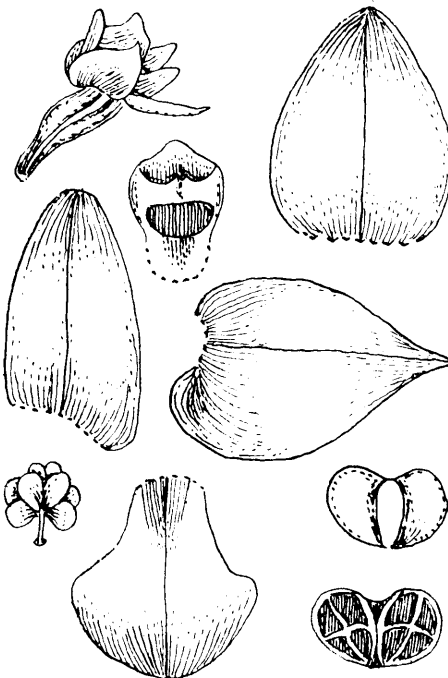
Phreatia beiningiana Schltr.



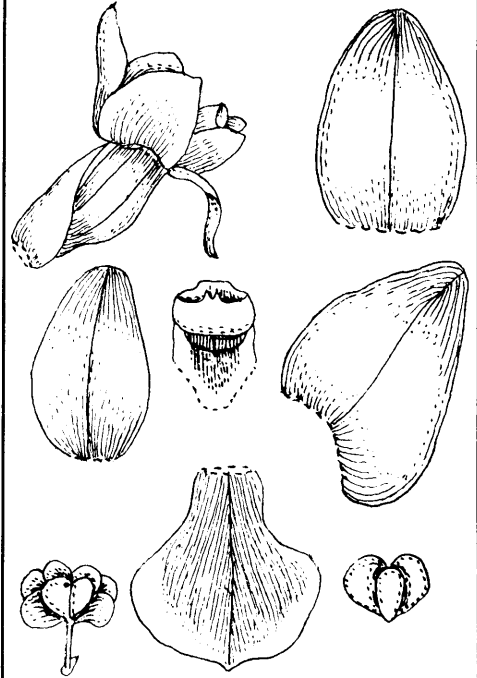
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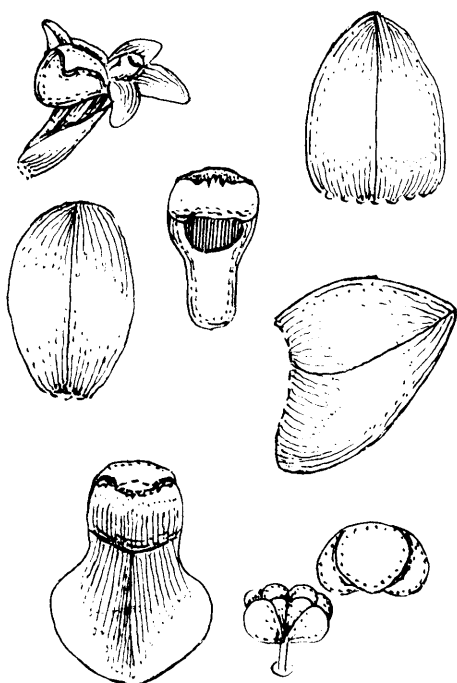
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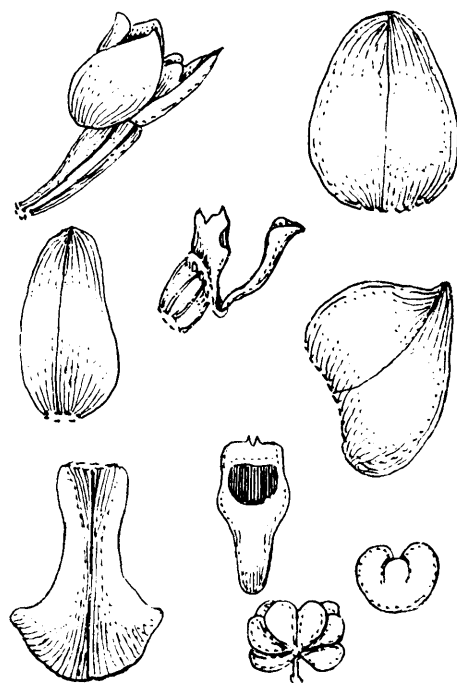
Phreatia brachystachys Schltr.



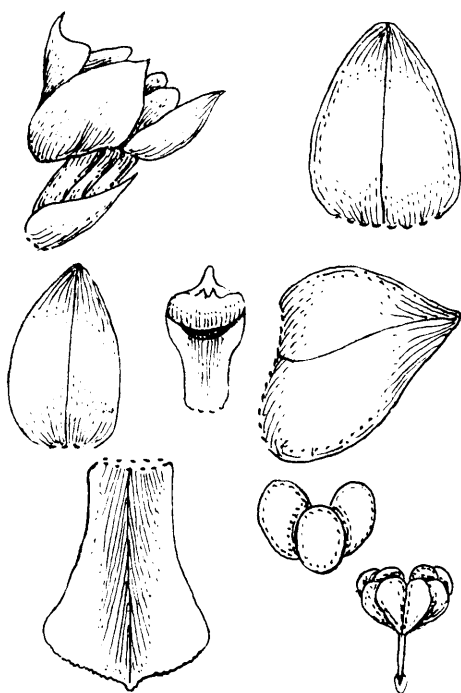
Phreatia stenophylla Schltr.



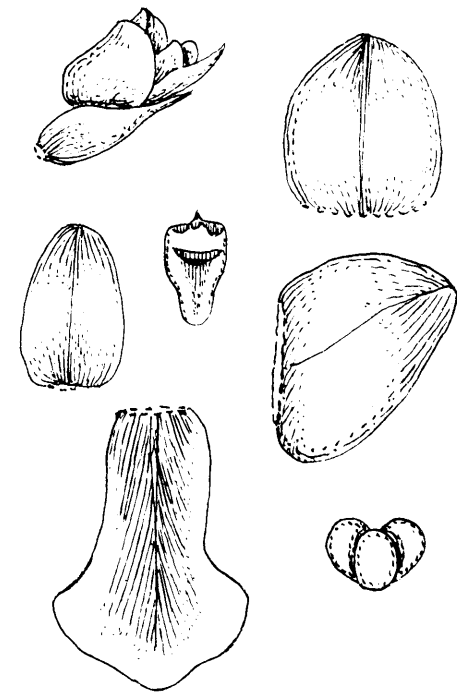
Phreatia Finisterrae Schltr.



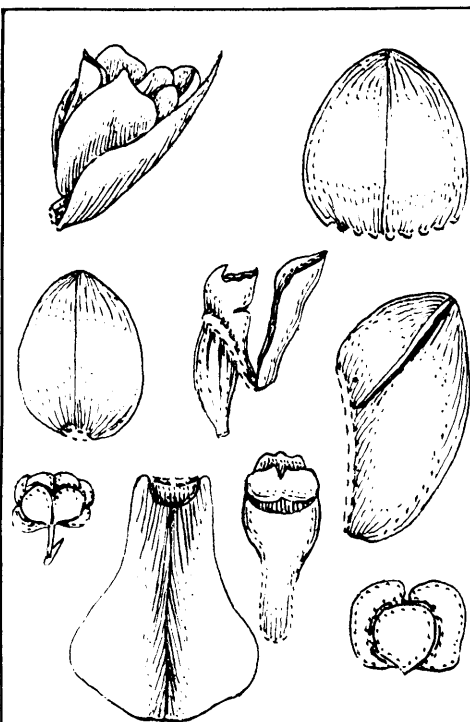
Phreatia Loriae Schltr.



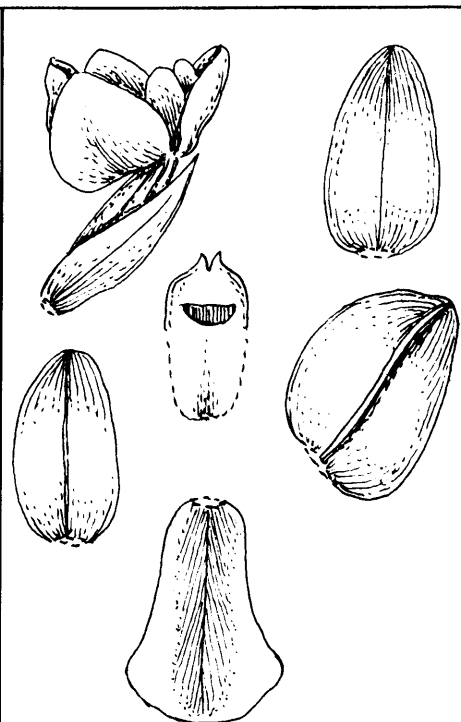
Phreatia kaniensis Schltr.



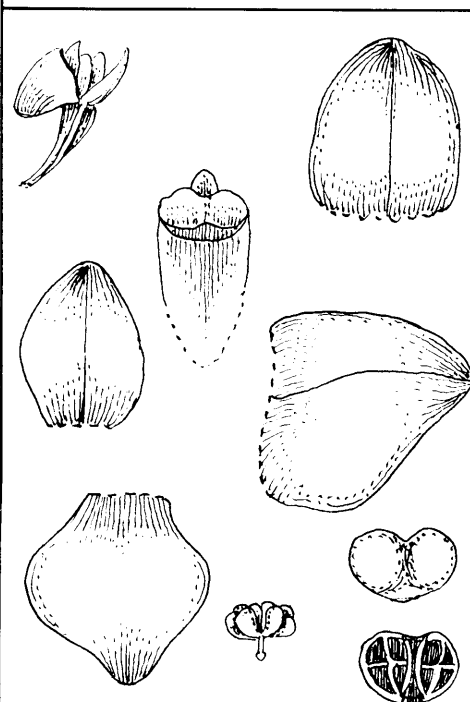
Phreatia polyantha Schltr.



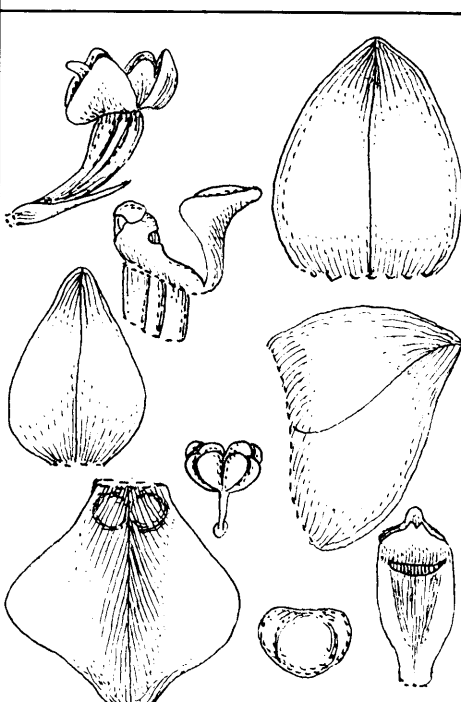
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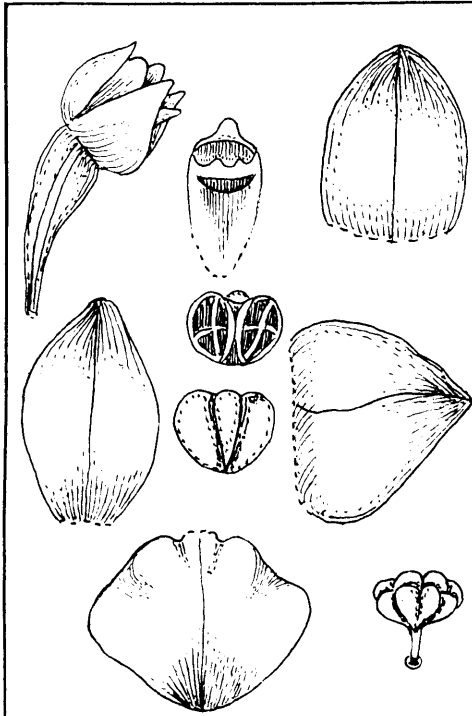
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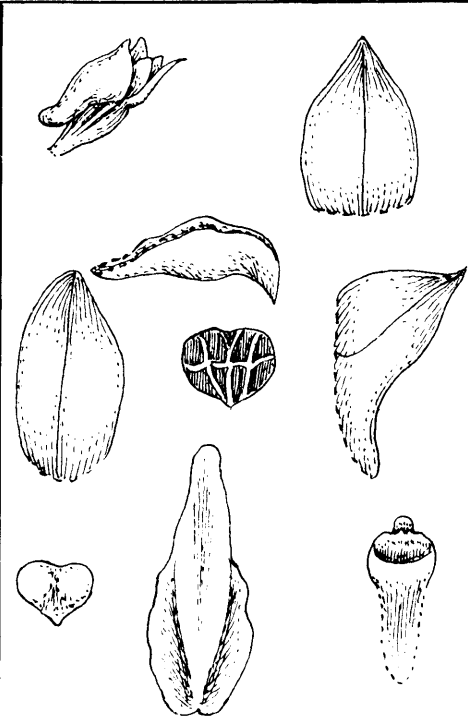
Phreatia rhomboglossa Schltr.



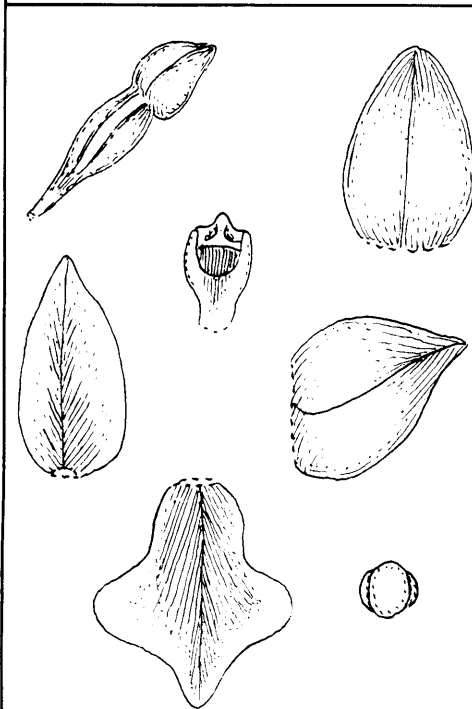
Phreatia collina Schltr.



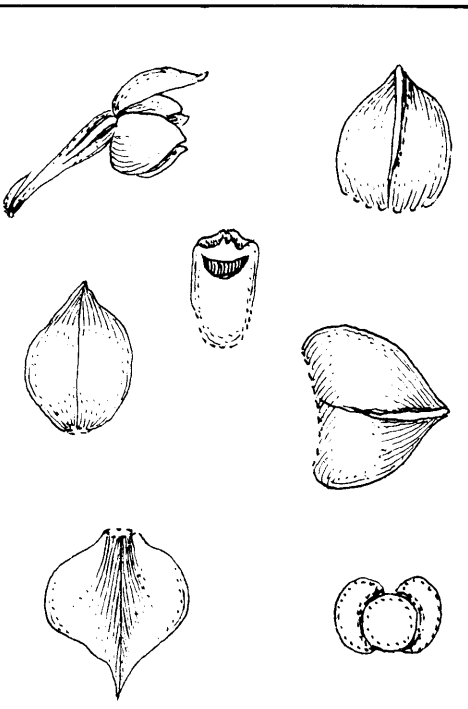
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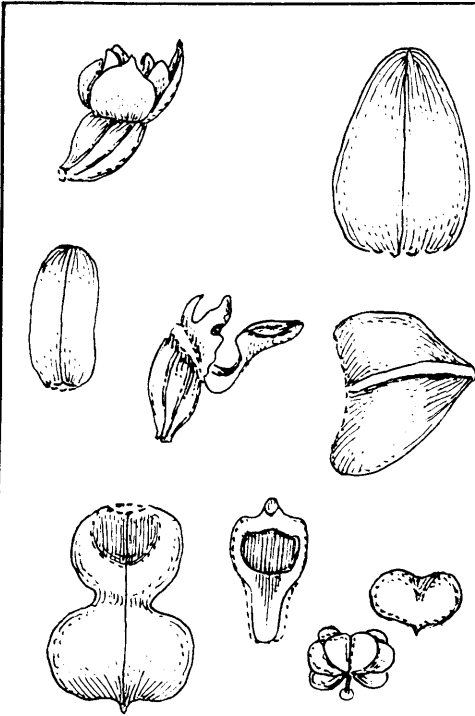
Phreatia valida Schltr.



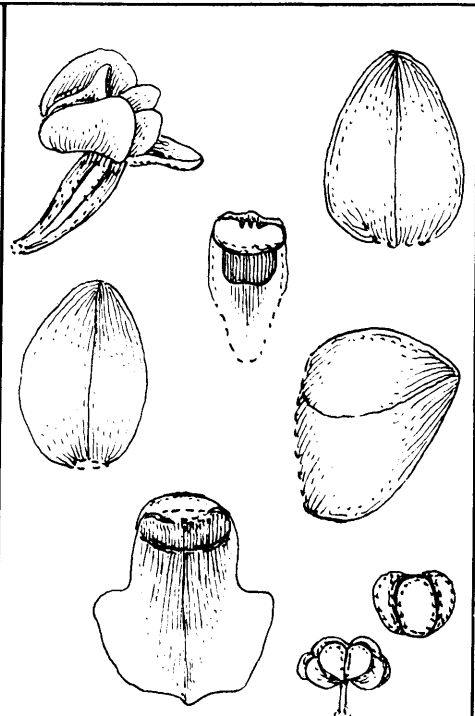
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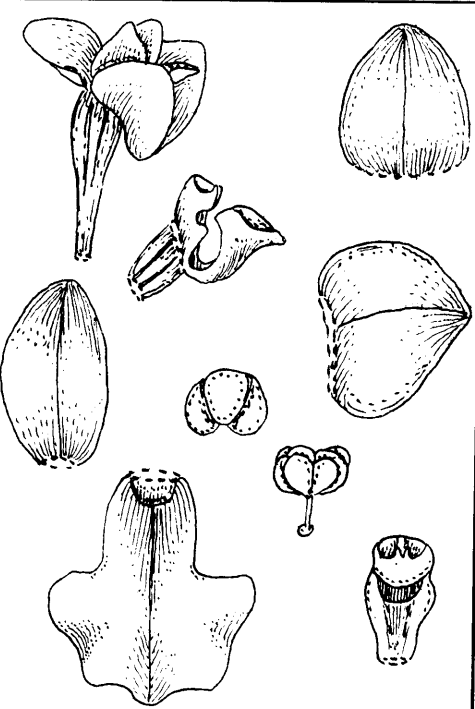
Phreatia tenuis Schltr.



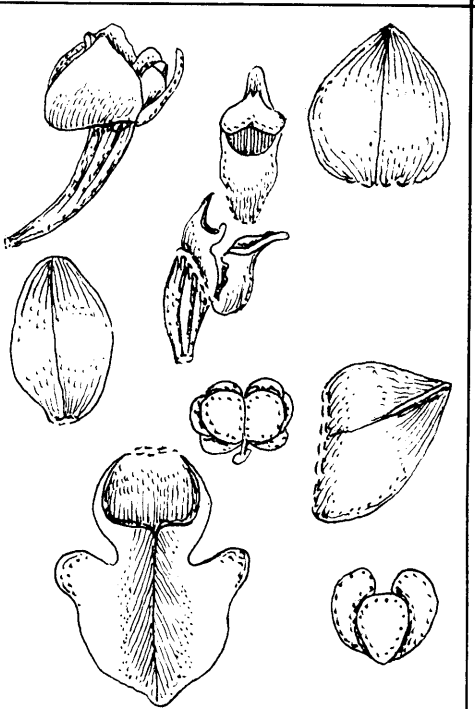
Phreatia minima Schltr.



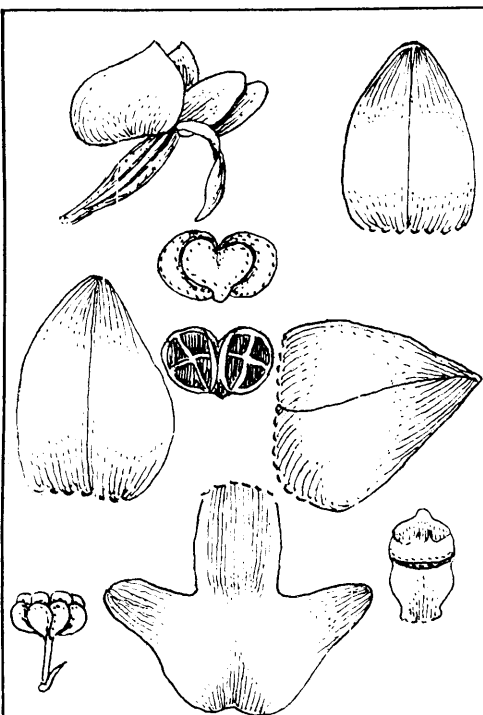
Phreatia monticola Schltr.



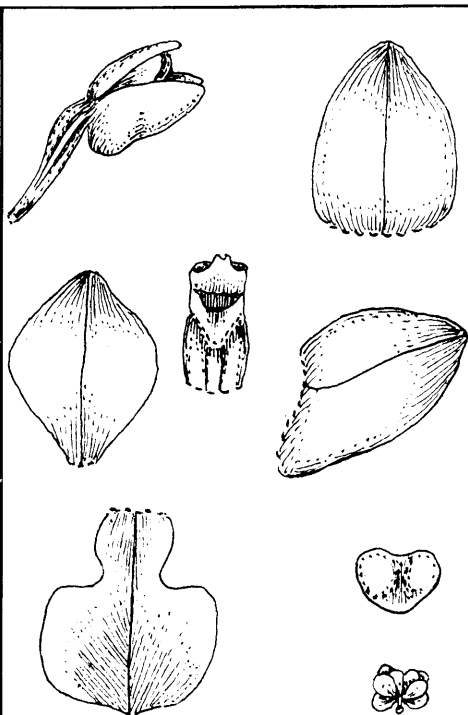
Phreatia bismarckiensis Schltr.



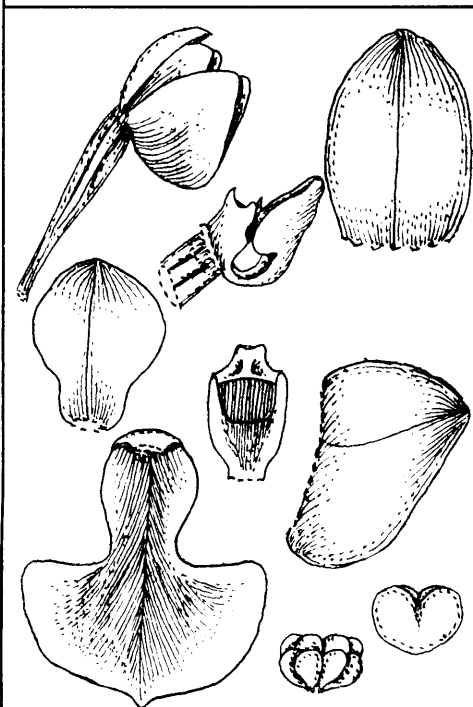
Phreatia brachyphylla Schltr.



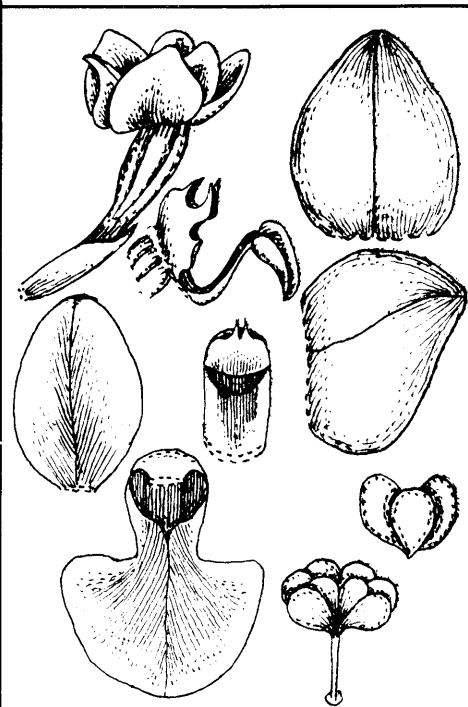
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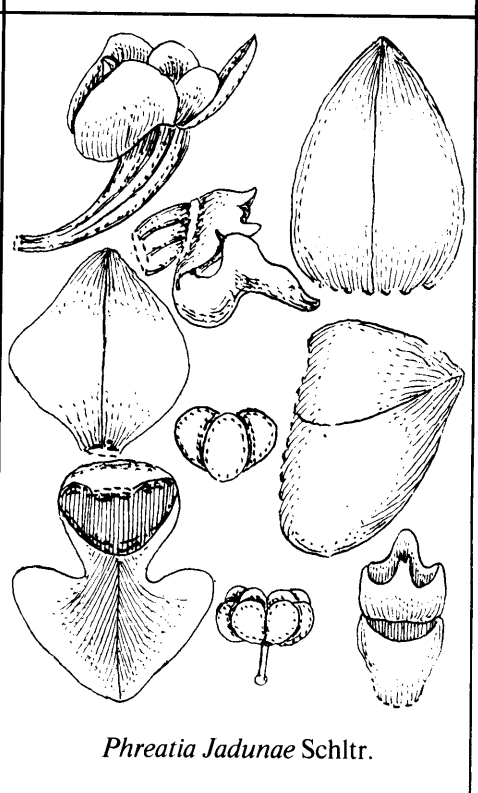
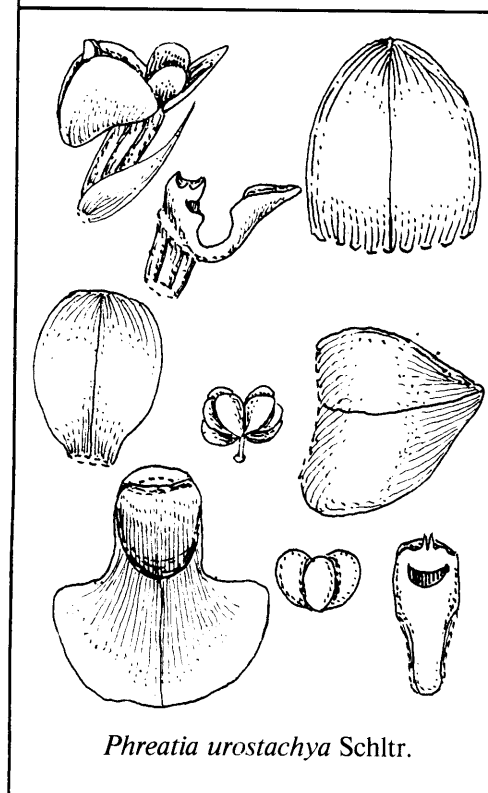
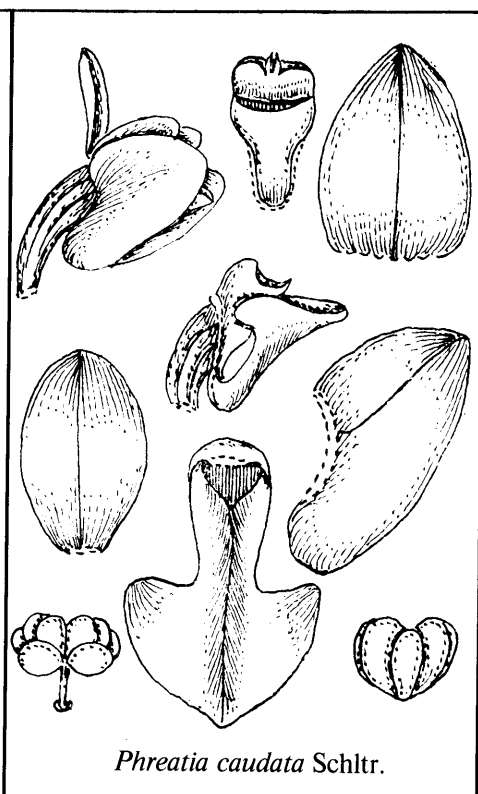
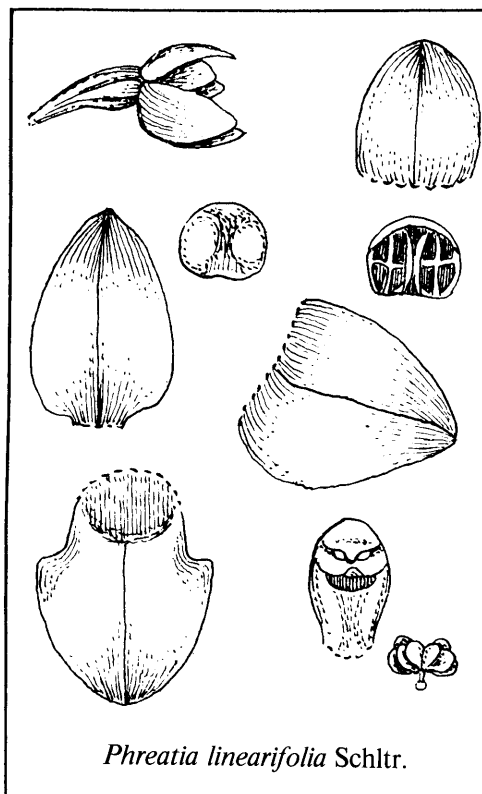
Phreatia imitans Schltr.

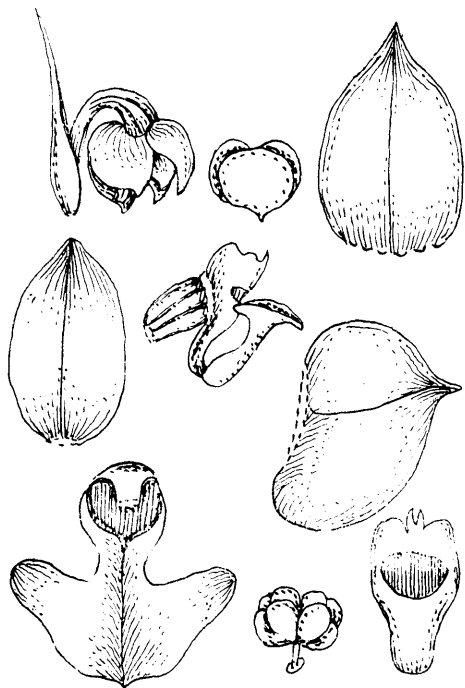


Phreatia gracilis Schltr.

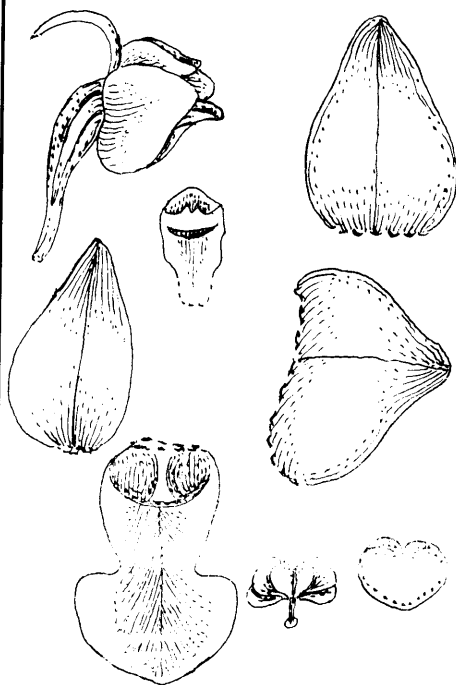


Phreatia platychila Schltr.

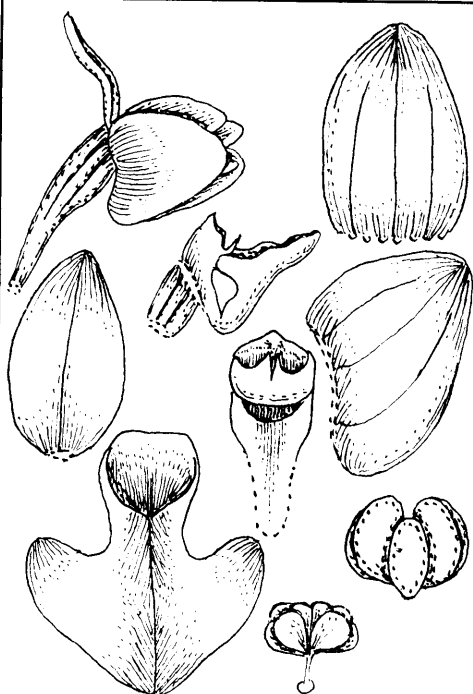




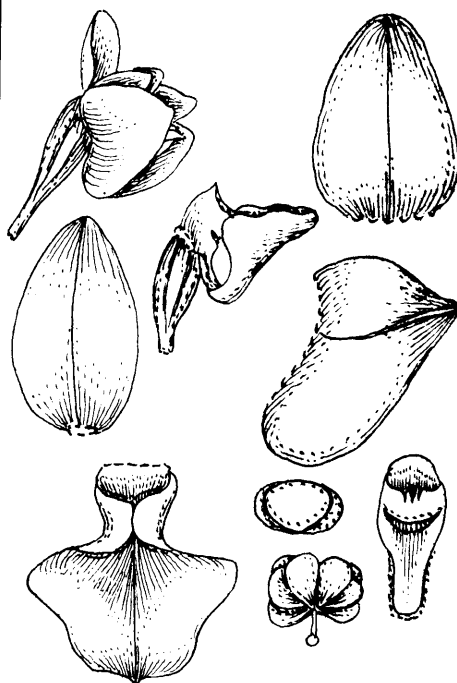
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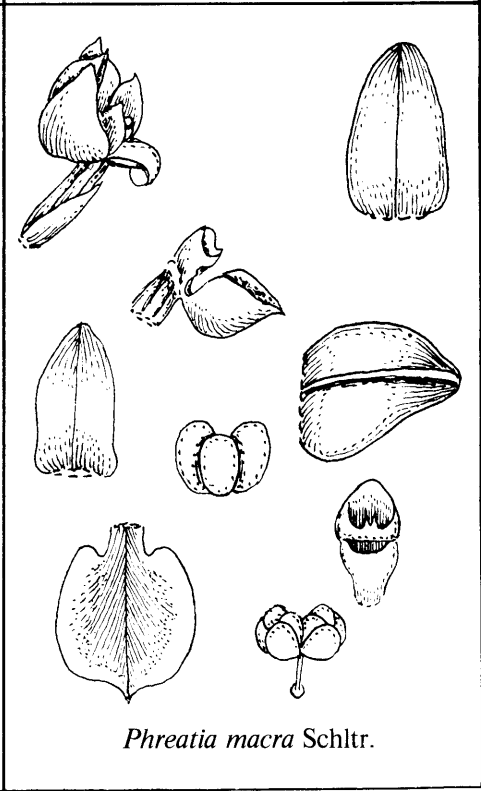
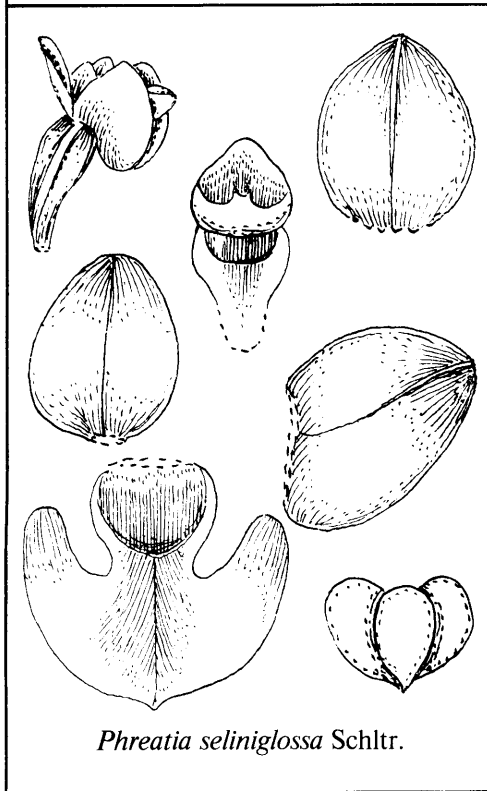
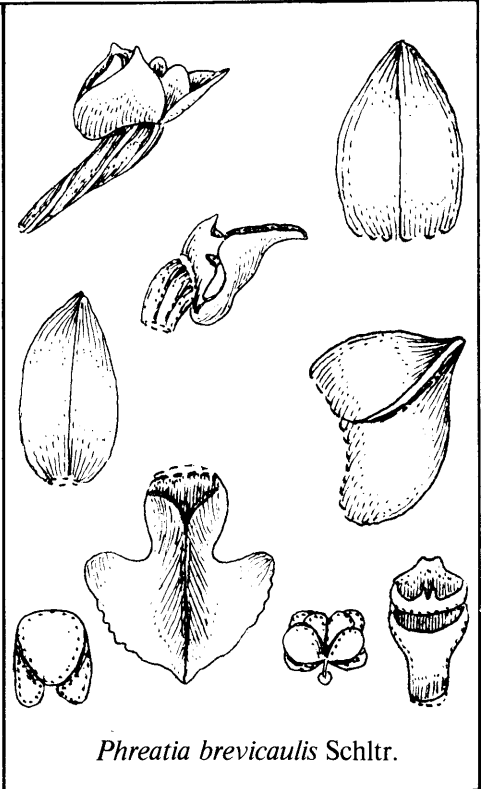
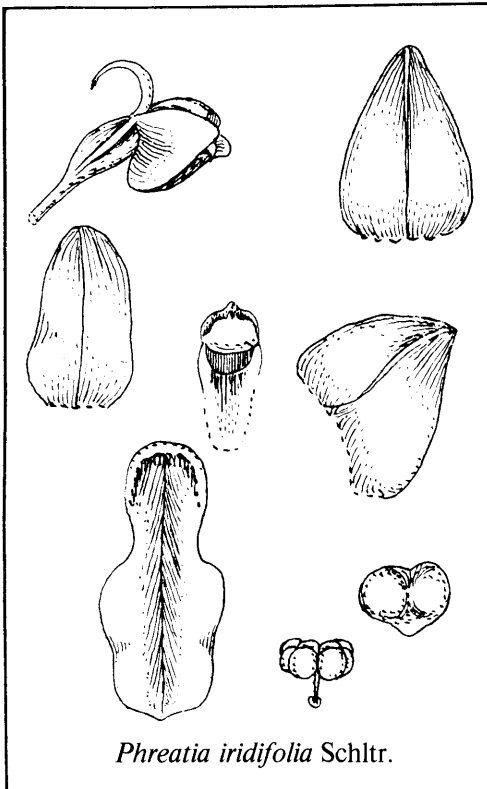
Phreatia djamuensis Schltr.

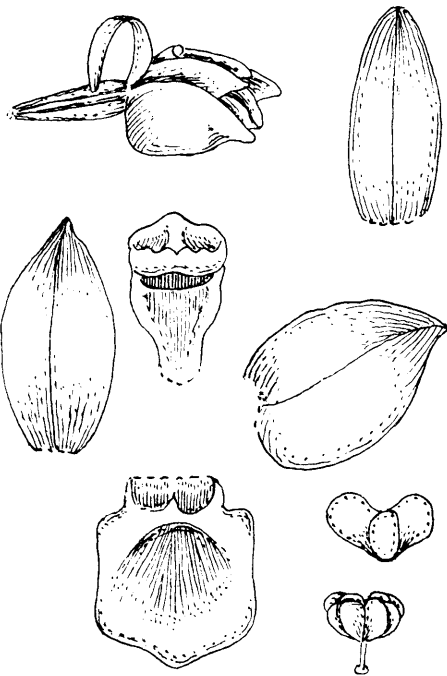


Phreatia petiolata Schltr.

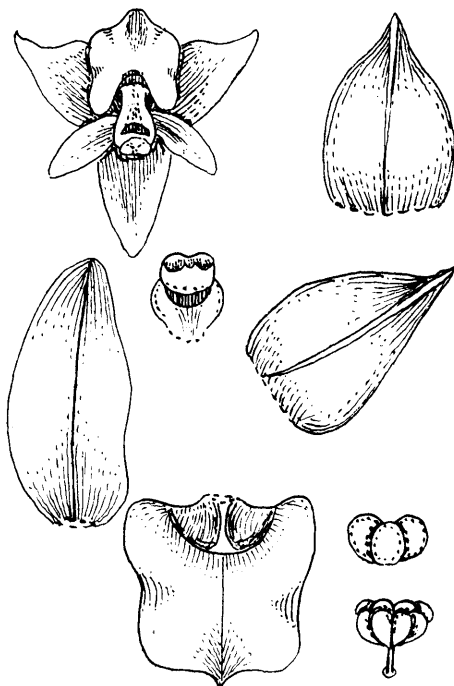


Phreatia dischorensis Schltr.

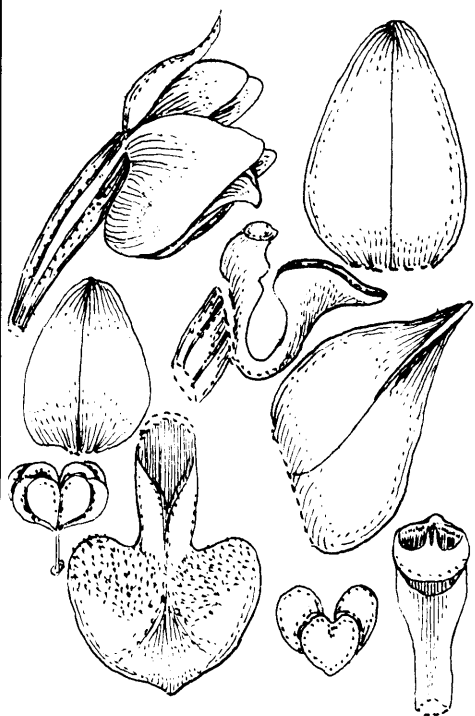




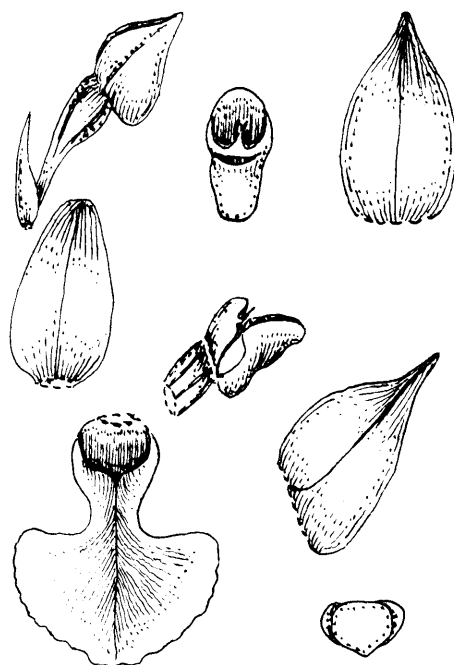
Phreatia longicaulis Schltr.



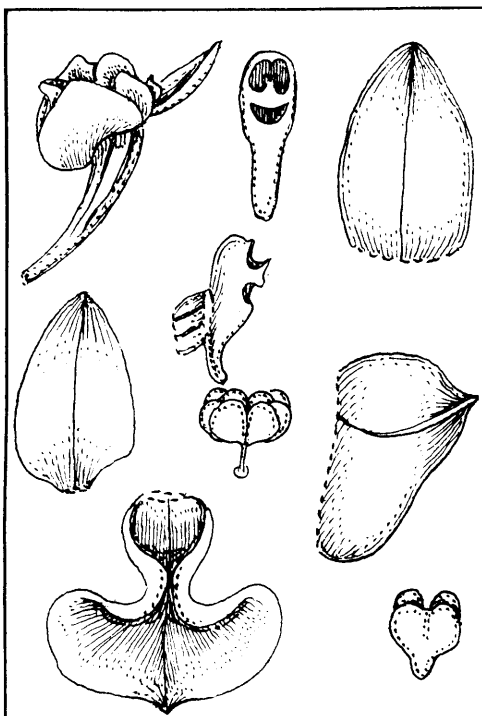
Phreatia quadrata Schltr.



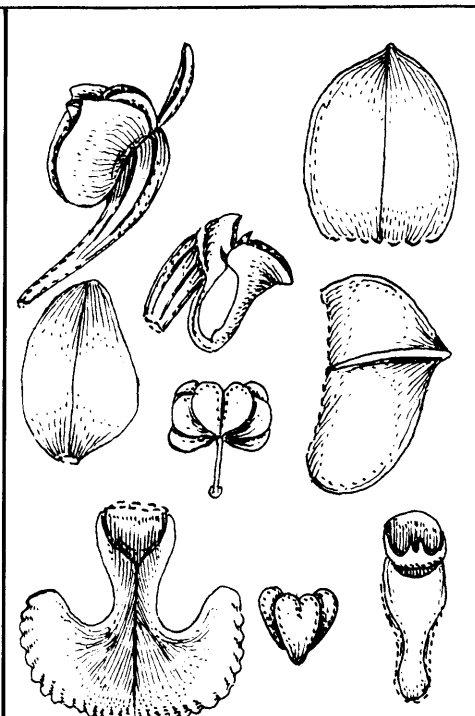
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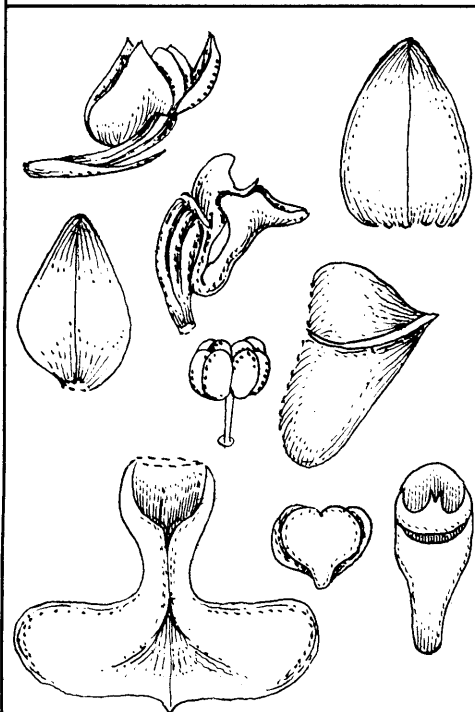
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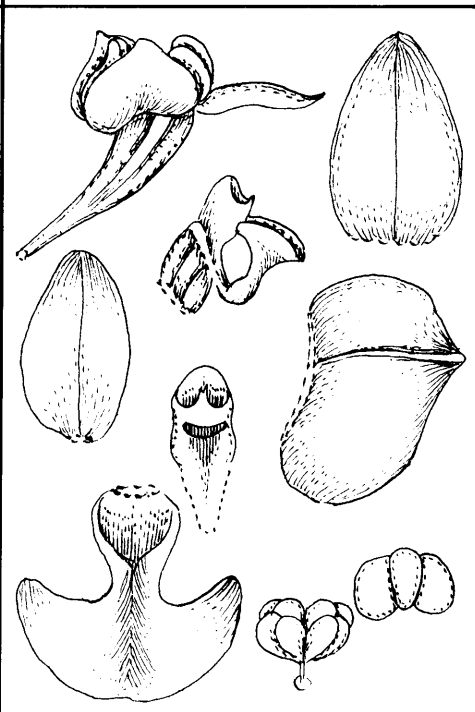
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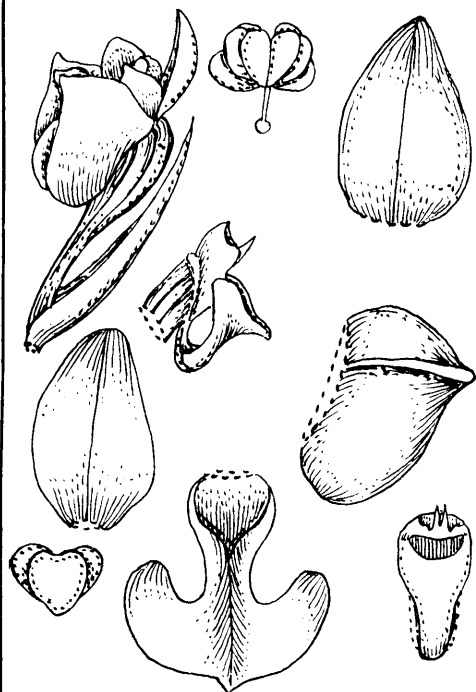
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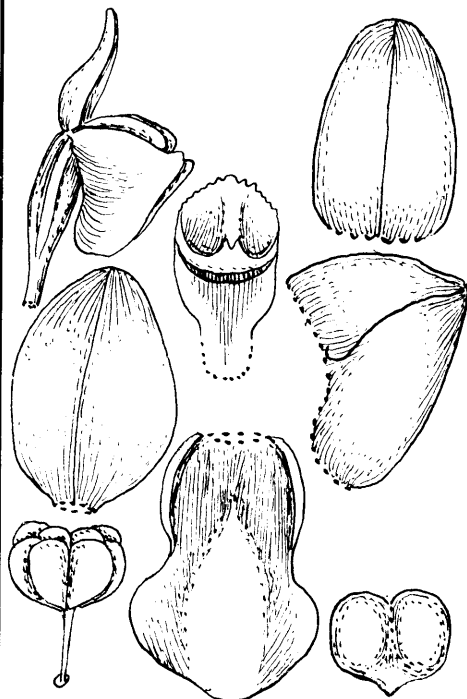
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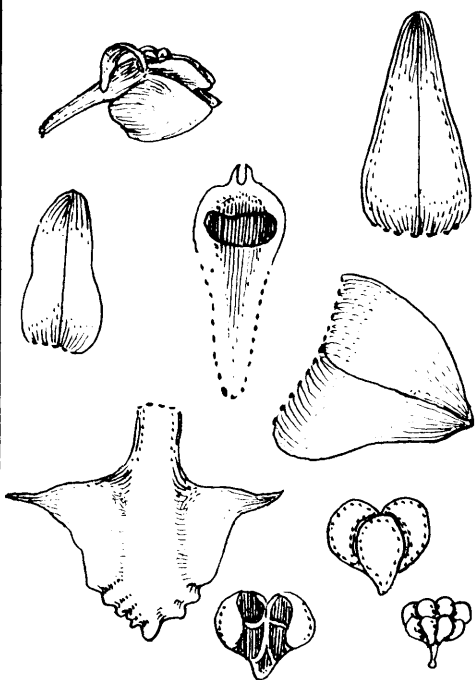
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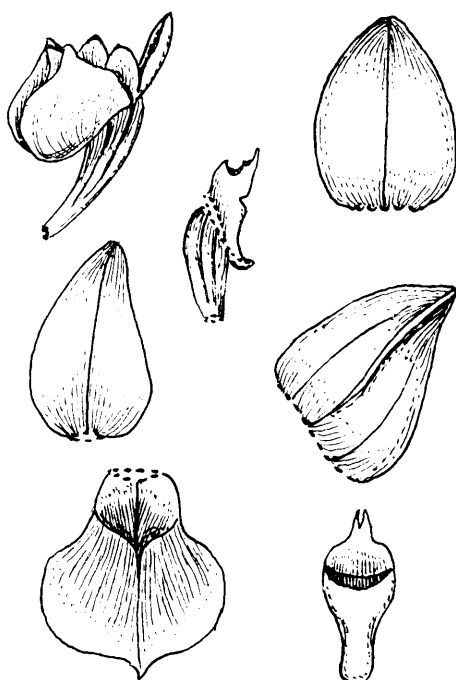
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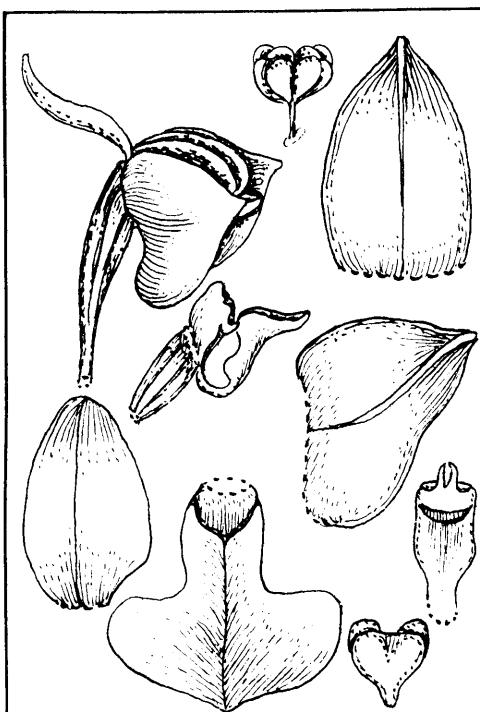
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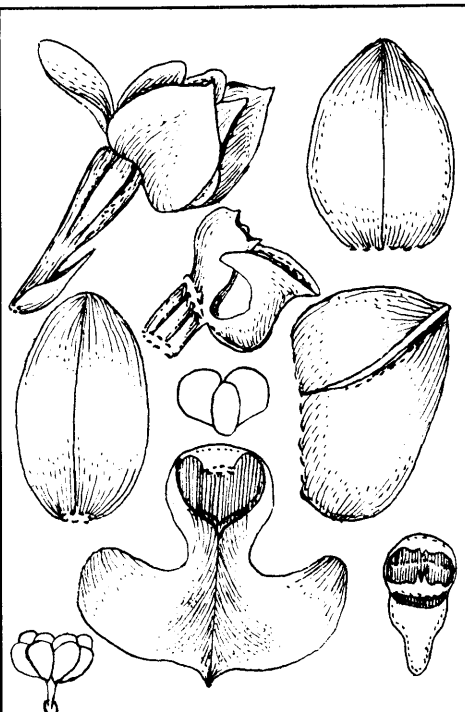
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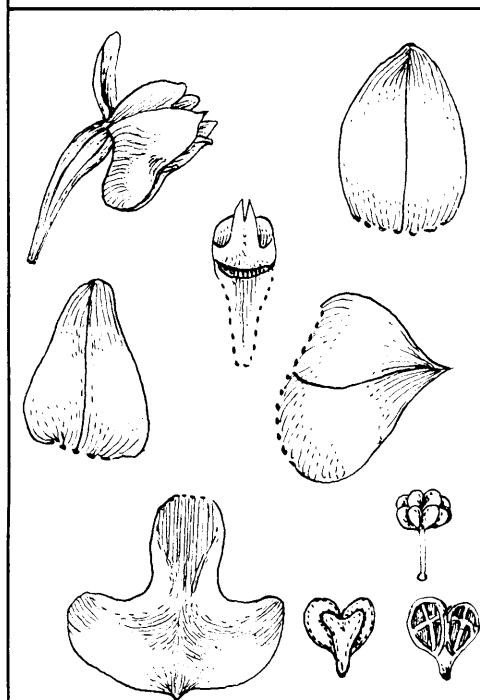
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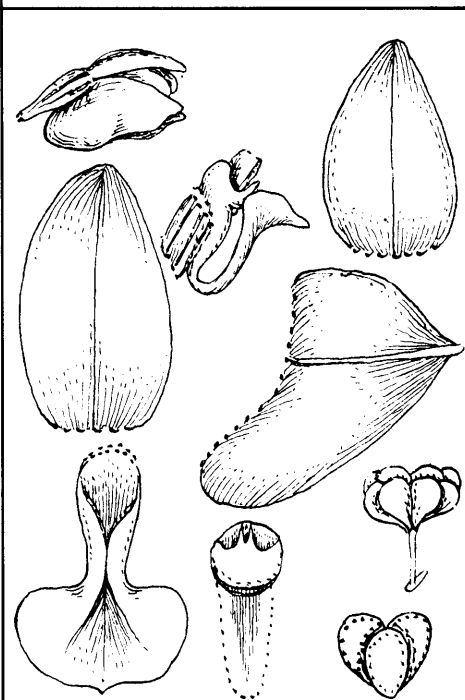
Phreatia leptophylla Schltr.



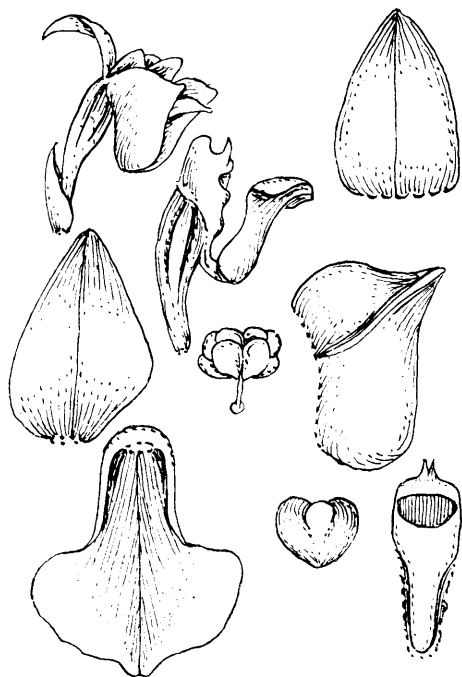
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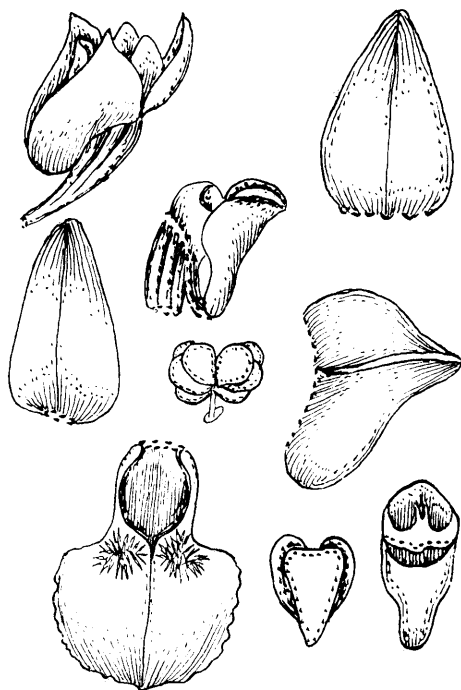
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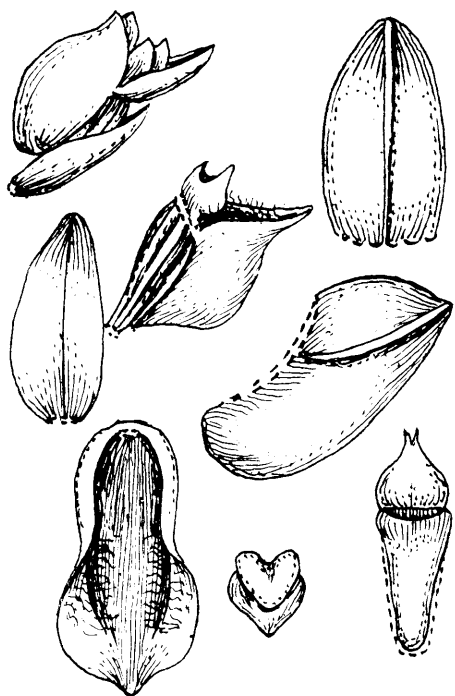
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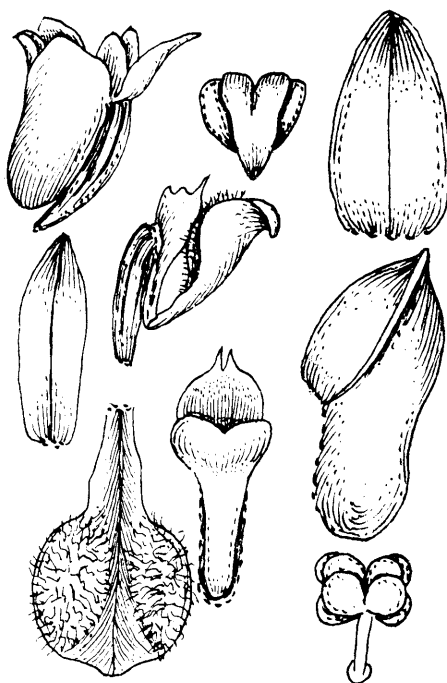
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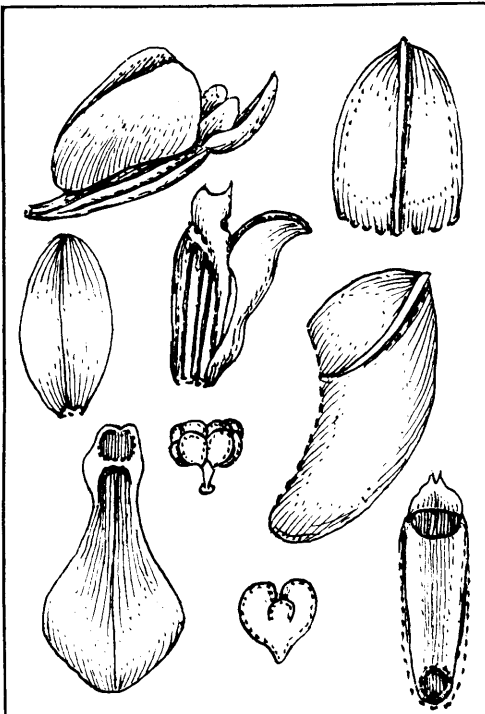
Phreatia congesta Schltr.



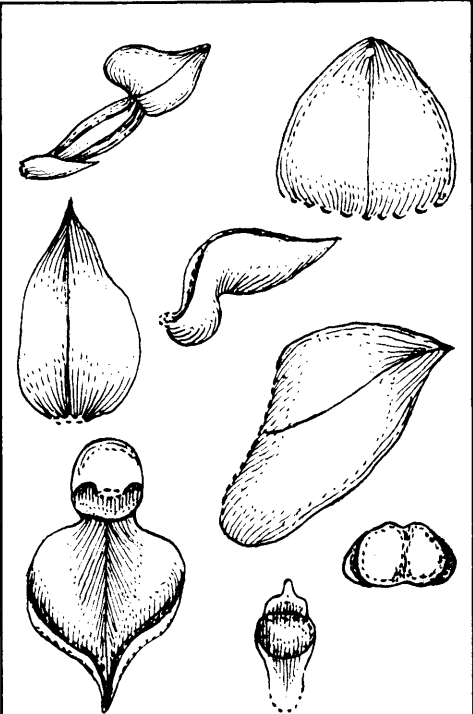
Phreatia protensa Schltr.



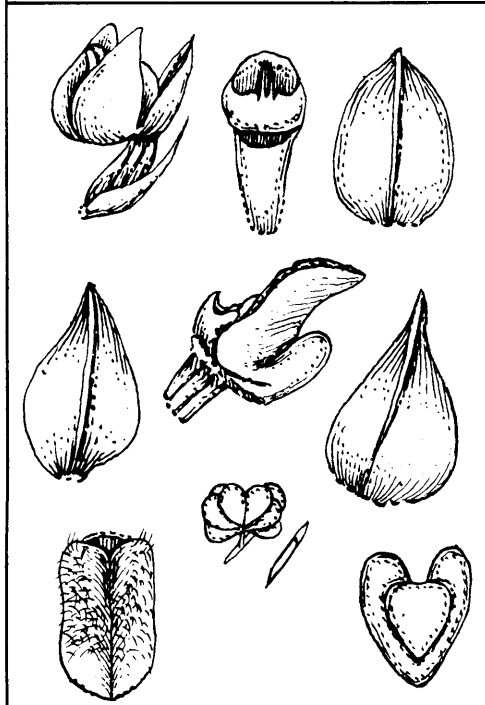
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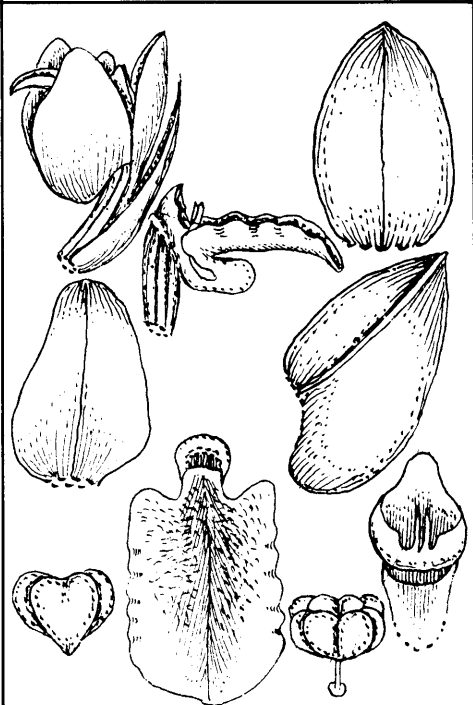
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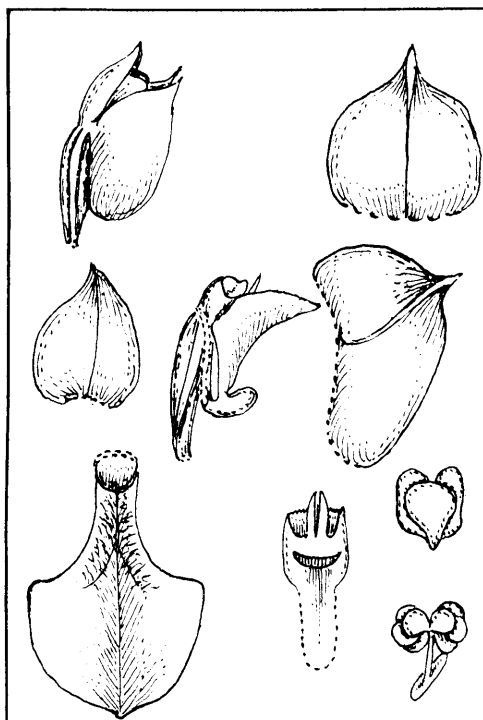
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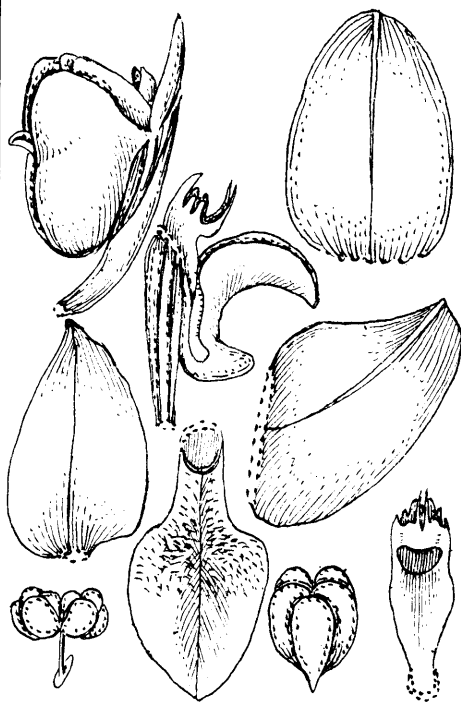
Phreatia cylindrostachya Schltr.



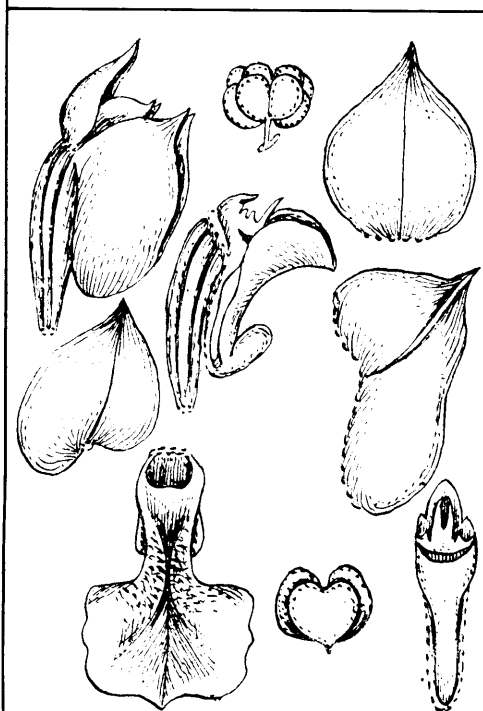
Phreatia leucostachya Schltr.



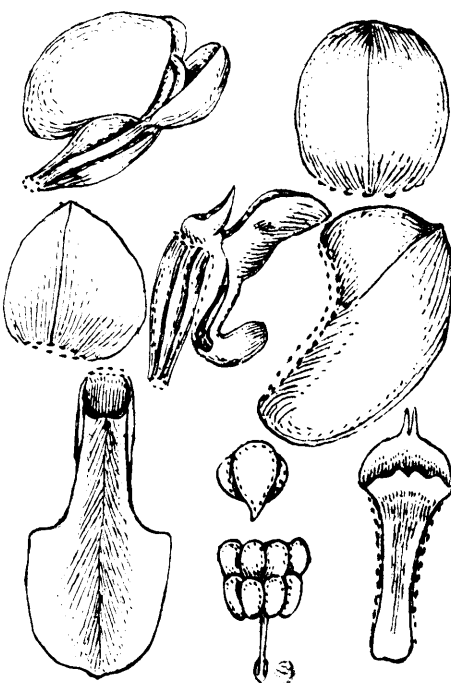
Phreatia saccifera Schltr.



Phreatia elata Schltr.



Phreatia plagiopetala Schltr.



Phreatia cryptostigma Schltr.

Group XXIII *Ridleyellinae*

Here I find it necessary to make a very remarkable plant the Type of a special group, which, in the flowers, shows a certain approach to the *Thelasinae*, while in habit it is more reminiscent of *Thecostelinae*. The plant was described by Ridley 24 years ago as *Bulbophyllum paniculatum* Ridl., but undoubtedly stands as the form of a peculiar isolated genus which I have described below as *Ridleyella*. In the structure of the flowers there can be perceived a distinct leaning to *Phreatia* Lindl., but the upper part of the column is more like that of the genus *Eria* Lindl., particularly as regards the anther and pollinarium, which possesses eight pollinia apparently cohering slightly in front. The habit accords with that of the *Thecostelinae*, *Acriopsis* Reinw. being especially noteworthy, but the structure of the flowers is entirely different.

87. *Ridleyella* Schltr.

As soon as I saw the not very good Type of *Bulbophyllum paniculatum* Ridl., I was firmly convinced that here was the Type of a very characteristic new genus. Now my recent journeys in New Guinea happily have provided me with the opportunity to study this plant in the living state and to establish its generic characters. I have dedicated this new genus to H.N. Ridley, the first author of the species whose investigations we have to thank in no small degree, that the structure and composition of orchid-groups are now tolerably well known to us, since at the time his work on the orchidology of the monsoon-regions contributed greatly to their clarification.

Ridleyella Schltr., gen. nov.

Sepala libera, late ovalia, obtusa vel apiculata, lateralia obliqua, antice paulo decurrentia et ampliata; petala obliqua, sepalis lateralibus similia sed paulo minora; labellum e ungue brevi dilatatum, antice sublobato-truncatissimum, basi callo transverso ornatum, nervo medio tenuiter carinatum, petalis aequilongum; columna brevis, semiteres, glabra, subapoda, clinandrio et rostello brevissimis; anthera perlate reniformis, cucullata, glabra, minute apiculata; pollinia 8 clavata, antice 4-nis leviter cohaerentia; ovarium graciliter pedicellatum, subgloboso-clavatum, sub anthesi vix costatum; planta epiphytica, erecta, 30–40 cm alta; rhizomate valde abbreviato; radicibus filiformibus, glabris; pseudobulbis oblongoideis, bifoliatis, bene evolutis; foliis linearibus, subcoriaceis; inflorescentia juxta pseudobulbos nata, basilari, bene ramosa, pedunculo paucivaginato, panicula laxe multiflora, gracili; floribus parvulis atro-violaceis; species singula adhuc nota papuana.

Standing as an entirely isolated genus, the solitary representative already is characterised amply. In their habitat, the otherwise well-developed pseudobulbs always are covered with a thick slimy mucus, evidently secreted by the sheaths by which they were formerly surrounded. The dark violet-blue colour of the flowers is very uncommon in this division of the family. Similarly, the almost globular, only very delicately ribbed, fruit is very noteworthy.

The plant is a true mist-forest epiphyte. It originally became known from British Papua.

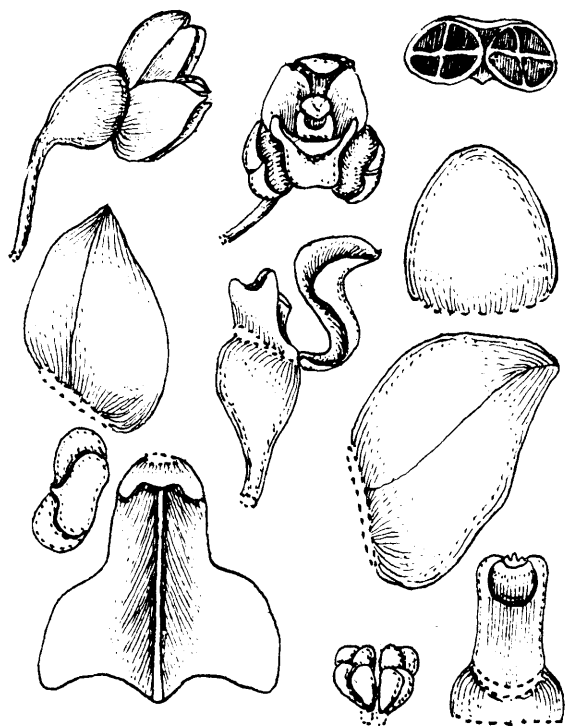
1. *R. paniculata* (Ridl.) Schltr., nom. nov. [Ed.—comb. nov.]

Bulbophyllum paniculatum Ridl., in Journ. Bot. XXIV (1889), p. 326.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17889, flowering in July 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 up to 1300 m—R. Schlechter no. 19111, flowering in Jan. 1909; no. 18230 in fruit in Sept. 1908.

I have seen this species in pod in the Waria Valley and I am also sure that the non-flowering specimens which I found in the Torricelli Range in 1902 also belong here. We can accept, rightly, that this interesting species has a broad distribution in Papua. As mentioned above, the flowers are a dark violet-blue.

GROUP XXIII *Ridleyellinae*



Ridleyella paniculata Schltr.

Group XXIV *Thecostelinae*

So far only one representative of this group is known from our Territory, and it is improbable that any species of the second genus, *Thecostele* Rchb. f., will be found, since the centre of development of the group lies further west, perhaps in the Malayan Peninsula, and New Guinea may be regarded as the eastern boundary of its distribution.

88. *Acriopsis* Reinw.

After further comparison of the distribution areas of *Acriopsis javanica* Reinw., I am now of the opinion that the Papuan plant should be separated specifically from the western one. Irrespective of the fact that the colour of the flowers is usually paler, there are differences to be noted in the floral structure, particularly in the lip and the column, which justify such a separation. I will refer to these later on. The plant evidently is distributed fairly widely in New Guinea, for it was described originally from British Papua and it may also be presumed that the specimens of '*A. javanica* Reinw.' reported by J.J. Smith from Dutch New Guinea should likewise be placed here.

1. *A. Nelsoniana* Bail., in Queensl. Agr. Journ. III (1898), p. 160.

A. papuana Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzgeb. Süds. (1901), p. 250.

A. javanica Schltr., in Österr. Bot. Zeitschr. L (1900), p. 286, p.p.

Kaiser-Wilhelms-Land: Without location details—Hollrung; on trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20198, flowering in Sept. 1909; on trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 17583, flowering in Apr. 1908; on trees in the forests on the Maijen [River], alt. c. 100 m—R. Schlechter no. 18080, flowering in July 1908; near Finschhafen—C. Lauterbach no. 1466, flowering in Jan. 1891; in primary forest on the Sattelberg [Mountain]—C. Lauterbach no. 483, flowering in July 1896.

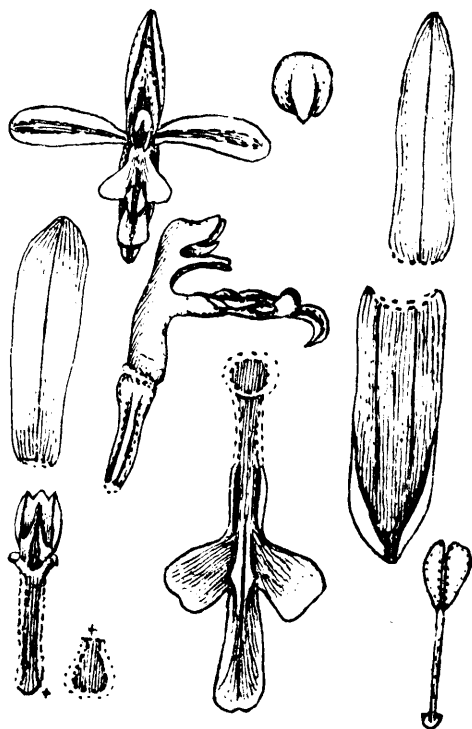
It is better to keep this species separate from *A. javanica* Reinw. since the lobes of the labellum have a different shape and the double callus is shorter; furthermore the lip-spur is longer, as are also the rostellum and the pollinia-stripes. The flowers are white, the sepals and petals have a central pink stripe.

var. *pallidiflora* Schltr., var. nov.

Differt a forma typica floribus extus pallide flavis labello et columna nivea.

Kaiser-Wilhelms-Land: On trees on the Waria [River] near Gobi, alt. c. 300 m—R. Schlechter no. 19564, flowering in May 1909.

A pallid-flowered (in a way albino) variety of the basic form.

GROUP XXIV *Thecostelinae**Acriopsis Nelsoniana* Bail.

Group XXV *Cymbidiinae*

In a general way my interpretation of this group corresponds with that published by Pfitzer, except that I would like to exclude *Grobys* Lindl., and I am a little uncertain about *Eulophiopsis* Pfitz. There is no doubt that the group possesses many connections with the *Cyrtopodiinae*, which perhaps deserves to receive more consideration in the re-arrangement of the groups than it received from Pfitzer. The delimitation of the individual genera is by no means as sharp as could be desired, and therefore many species have become known under different names.

For our Territory, three genera claim our attention, viz. *Grammatophyllum* Bl., *Dipodium* R. Br. and *Cymbidium* Sw., each of which is represented in our part of New Guinea by a single species.

89. *Grammatophyllum* Bl.

The only species of this genus known to us at present is a plant which was described by F. v. Mueller, in 'Wing's South. Sci. Record', Aug. 1883, under the name of *Cymbidium Goweri* F.v.M. In 1894 this plant was described by Kränzlin as *Grammatophyllum Guilelmi secundi* Krzl., and according to our present conception of the genus, it really belongs to *Grammatophyllum*, and should have been called '*G. Goweri*'. However, since it is not to be separated specifically from *G. scriptum* Bl., the above names should follow the latter as synonyms. The plant is a sea-shore epiphyte, and, as such, enjoys a wide distribution. The variety published as var. *celebicum* Schltr. might better be regarded as a separate species and designated as *G. celebicum* Schltr.

Besides the species known in our Territory, there is another which I have never seen in flower. This evidently belongs to the relationship of *G. speciosum* Bl. and might therefore be identical with *G. papuanum* J.J. Sm., described from Dutch New Guinea. This species is an epiphyte on tall trees in the forests of the hill-country.

1. *G. scriptum* Bl., in Orch. Arch. Ind., 47.

Cymbidium Goweri F.v.M., in Wing's South. Sci. Record, Aug. 1883.

Grammatophyllum Guilelmi secundi Krzl., in Gartenfl. 1894, p. 114.

Kaiser-Wilhelms-Land: At the beach near Bulu, alt. c. 5 m—R. Schlechter [Ed.—no number cited], not observed in flower.

Neu-Pommern: On trees near Ralum, on the Gazelle Peninsula—Dahl no. 99, flowering in Dec. 1896; on trees at the beach near Massawa, alt. c. 10 m—R. Schlechter no. 13708, flowering in Nov. 1901.

Solomon Islands: Without location details—C.A. King in 1883.

From all the specimens I have on hand I cannot differentiate this species from *G. scriptum* Bl. Otherwise it could be described only as var. *Goweri* (F.v.M.) Schltr. since the ridges on the lip are slightly shorter and the lateral lobes are somewhat smaller. The flowers are pale olive-green with brown spots and pale brown veins on the almost white lip.

2. *G. papuanum* J.J. Sm. ? in Bull. Dep. Agr. Ind. Néerl. XIV (1911), p. 11: in Nova Guinea VIII (1912) [1911], p. 596, t. C. VII.

Kaiser-Wilhelms-Land: On tall trees in the forests on the Ramu [River]—R. Schlechter, [Ed.—no number cited], observed in flowerless condition, Jan. 1901.

I include the species here since I consider that we accept with fair certainty that the plant I observed in the Ramu Valley is identical with the species of J.J. Smith. Likewise, a plant observed by L. & K. Rechinger in the Solomon Islands could also be considered as belonging here.

90. *Dipodium* R. Br.

Two species of this genus have been recorded from Papuasias up to the present, viz. *D. pandanum* Bail., which was first described from British Papua, and *D. elatum* J.J. Sm., of which, so far, there is only a single specimen from the alang-plains in the southern part of Dutch New Guinea.

In our part of the region the only species known to me is the one mentioned here, which climbs as a semi-saprophyte on the trunks of trees in the primary forests, and continues to grow, after decay of the lower part, as a semi-epiphyte like *Vanilla*. It belongs to the section *Wailesia* which is distinguished from the section *Eu-Dipodium* by its distinctly leafy stem, whereas in the latter the few leaves are reduced to scales at the base of the stem.

1. *D. pandanum* Bail., in Queensl. Agric. Journ. VI (1900), p. 287.

var. *pilotaenia* Schltr., var. nov.

Differt a forma typica lobis lateralibus minoribus, tomento in medio labelli distincte densiore in fasciam longitudinalem disposito.

Kaiser-Wilhelms-Land: On tree-trunks in the forests at the foot of the Bismarck Range, alt. c. 400 m—R. Schlechter no. 13922, flowering in Jan. 1902; on trees in the mountain forests near Jaduna, alt. c. 300 m—R. Schlechter no. 19292, flowering in Apr. 1909.

Neu-Mecklenburg: On tree-trunks in the mountain forests near Punam in the Rössel Range, alt. c. 600 m—R. Schlechter no. 14702, flowering in July 1902.

Comparing my specimens with a flower of the original, it was apparent that it differs in the characteristics given above; it is therefore appropriate to consider it a variety. The flowers are yellowish white, with red spots on the outside, the lip white with red stripes, and the tip of the column is yellow.

91. *Cymbidium* Sw.

It is remarkable that up to the present not a single species of *Cymbidium* is known in Papuasias, a fact all the more surprising since the genus is well represented in the neighbouring regions to the west as well as to the south-east. The species described here is therefore the first and only one from the Territory. It belongs to a small group of terrestrial species distinguished by their formation of a cylindrical stem, which bears at its apex one to three lanceolate leaves, and at its base petiolate leaves. The species of this group which, as section *Geocymbidium* I place in contrast to *Eu-Cymbidium* and others, generally have been referred to as *C. lancifolium* Hook., but nevertheless permit good specific separation; therefore the form *C. lancifolium* Hook. is by no means identical with *C. javanicum* Bl.

Probably, the species growing in the Malay Peninsula belongs to *C. javanicum* Bl., but this requires confirmation.

The only species which concerns us, *C. papuanum* Schltr., is one growing in the deep humus of the mist-forest, something like a saprophyte which is very scattered in its occurrence and which is only known to me from the Bismarck Range.

1. *C. papuanum* Schltr., sp. nov.

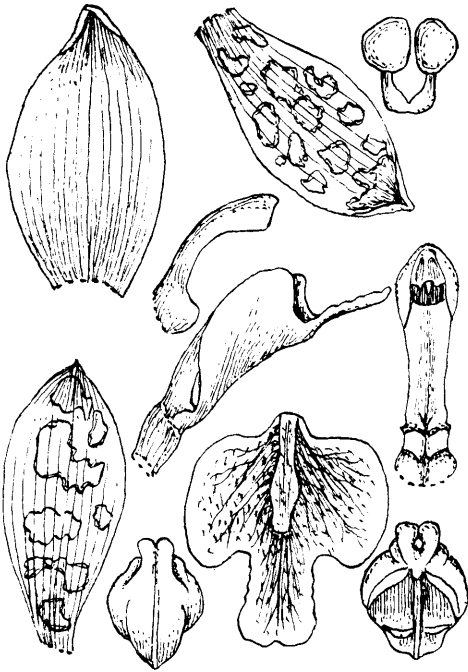
Epiphyticum, pro genere parvulum, 10–15 cm altum; radicibus flexuosis, glabris; rhizomate cauliformi; caule erecto, cylindrico, vaginis primum obecto, apice 1–2-foliato, 3–5 cm longo, 2.5–3.5 mm diametro; foliis erecto-patentibus, lanceolato-ligulatis, acutis vel acuminatis, basin versus sensim in petiolum angustatis, petiolo incluso 6–9 cm longo, lamina medio 1.3–1.8 cm lata; scapo erecto, laterali, laxe 2–3-floro, folium fere aequante, vaginis acuminatis obecto; bracteis ellipticis, acuminatis, ovario aequilongis vel paulo brevioribus; floribus erectis vel suberectis, glabris; sepalis anguste oblongo-ligulatis, acutis, 1.7 cm longis, lateralibus obliquis, petalis oblique ligulato-oblongis,

obtusiusculis, quam sepala paulo brevioribus et latioribus; labello e basi elliptica lanceolato-producto, subacuto, petalis aequilongo, infra medium 8 mm lato, carinis 2 obtusis, glabris e basi usque in medium subparallelis ornato; columna semitereti, glabra, labello paulo brevior; anthera reniformi-cucullata, papillosa; ovario cylindraceo, glabro, 1.8 cm longo.

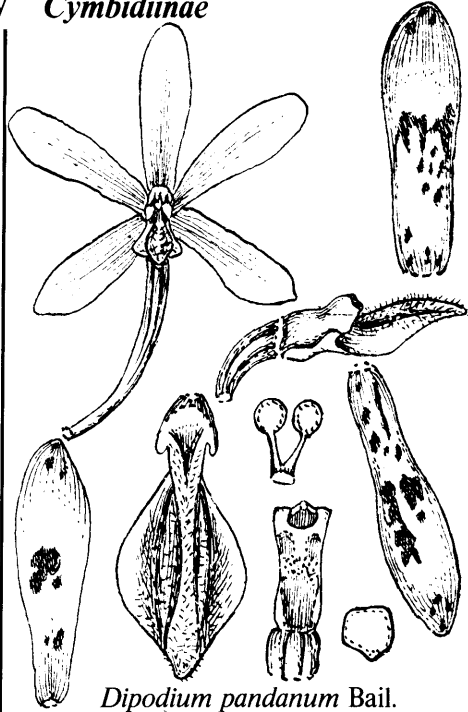
Kaiser-Wilhelms-Land: On trees [Ed.—possibly should be in humus] in the forests of the Bismarck Range, alt. c. 1600 m—R. Schlechter no. 18680, flowering in Nov. 1908.

The species is more compact than all others in the section *Geocymbidium*. It differs in the colouring of the flowers and in the labellum. The flowers are pale yellow, the petals and the labellum are adorned with small red spots and dots.

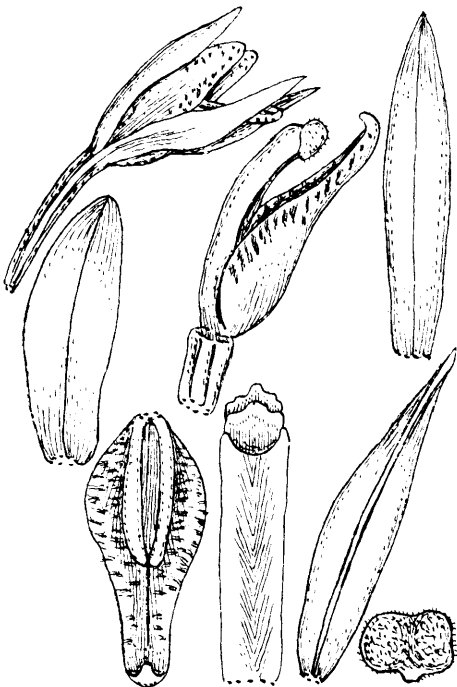
GROUP XXV *Cymbidiinae*



Grammatophyllum scriptum Bl.



Dipodium pandanum Bail.
var. *pilotaenia* Schltr.



Cymbidium papuanum Schltr.

Group XXVI *Sarcanthinae*

At present one of the most difficult problems of orchidology is to construct definite boundaries for the individual genera of *Sarcanthinae*. Opinions on this matter are so various that one might assert that every orchidologist has his own method. The difficulties of better definition of the genera are due to the fact that this group shows, on the one side, a striking similarity in general habit and on the other possesses a very remarkable diversity of form in the inflorescences and flowers.

The first division of the group was given by Lindley, who arranged the genera created by him (under an entire misconception of their vegetative characters) amongst the genera of other groups.

Reichenbach fil., who unfortunately has not expressed his views specifically, more particularly about the division of the group, separated further species and added a great many new ones to the undivided genera.

The first one to define the group correctly and to give a clearer definition of the genera was Bentham, who did much to clear up the difficulties in his far-sighted 'Notes on Orchideae.'

In general, Pfitzer adhered to Bentham's division, but was the first to define the *Sarcanthinae* in strict contrast to all the other monandrous orchids on account of their monopodial growth. Moreover, he also provided a more definite delimitation for many of the genera, which has met with more-or-less general acceptance.

Since that time there have been published a whole series of smaller works whereby many genera have been cleared up, especially by such authors as Hooker fil., Ridley, Cogniaux, Rolfe, Finet, J.J. Smith and myself. Nevertheless, the knowledge of some groups, particularly as regards their circumscription, is not really satisfactory and unanimity on these questions has not been reached by orchidologists.

In the following enumeration of the species of the group in our Territory I have established the division and delimitation of the genera that I consider as currently most useful and, where necessary, will include further details.

As regards the points of view which have influenced me in the arrangement of the genera, I would like to offer the following explanation. There seems to be no doubt that the group is adapted for division into two series which are separated fairly sharply.

The first of the two series contains the genera which have a distinctly elongated column-foot. It begins with the simple forms, such as *Chamaeanthus* Schltr., which is followed by the related forms of *Sarcochilus*, and which culminates in *Phalaenopsis* Bl. after *Doritis* Lindl. Here *Aerides* Lour. occupies an absolutely isolated position.

Equally difficult is the arrangement of the second series. I believe that three subseries may be recognised here. Of these, the first begins with simple spurless forms such as *Adenoccos* Bl. and *Luisia* Gaud. Through such forms as *Vanda alpina* Lindl., the latter (*Luisia*) is definitely connected with *Vanda* R.Br. (which I will describe more particularly later on); to these are added *Vandopsis* Pfitz., *Arachnis* Bl. and *Renanthera* Bl.

The second subseries begins with the more simple forms related to *Saccolabium* and ends in *Sarcanthus* Lindl. and its relatives.

The third subseries consists of the very delicate thin-flowered genera which are represented here by *Hymenorchis* Schltr., *Microtatorchis* Schltr. and *Taeniophyllum* Bl.

With regard to the African and some of the American *Sarcanthinae* I have not dealt with them here, but these probably form a fourth subseries by themselves, which I hope to describe at a later opportunity.

By far the greatest difficulties occur in the division of the forms related to *Vanda*,

to *Saccolabium* and to *Sarcanthus*. Since I have studied these more intensively, I believe that I have been able to contribute something towards the elucidation of this problem. Although the suggestions made by J.J. Smith in regard to *Sarcanthus* Lindl. and the related genera are appreciated and have advanced our knowledge, I cannot agree with his conclusions concerning the genera *Vandopsis* Pfitz. and *Arachnis* Bl. I will refer to these matters later on.

Genera which do not occur in our Territory are discussed here only when this is unavoidable.

92. *Calymanthera* Schltr.

This is a very interesting, small genus undoubtedly related to *Chamaeanthus* Schltr., but distinguished from it by several noticeable differences. As with nearly all new genera which I was fortunate enough to discover in New Guinea, I also found several species belonging to it, and to these must be added two more which have been described recently from Dutch New Guinea, so that the genus now comprises five species including those mentioned here.

Calymanthera Schltr., gen. nov.

Sepala lanceolata, hyalina, lateralia obliqua. Petala sepalis similia et subaequilonga, obliqua. Labellum mobile, trilobatum, sepalis subduplo brevius, lobi lateralibus basalibus parvulis, intermedio multo longiore, carnosulo, fovea parvula superne in basi labelli. Columna brevis, glabra, rostello minuto, bidentato, pede brevi. Anthera cucullata ampla, dorso in calyptram columnae dorsum obtegentem expansa. Pollinia 4 separata, aequalia, stipite singulo lineari vel spatulato, glandula vulgo satis magna. Stigma concavum amplum. Ovarium sessile cylindricum, glabrum.

Plantae epiphyticae, graciles, monopodiales; caule paulo elongato, dense foliato; foliis linalibus vel ligulatis; inflorescentiis plus minusve paniculatis, erectis vel erecto-patentibus, laxe plurimifloris; bracteis minutis; floribus minutissimis, tenuibus, glabris, flavescentibus.

Species 5 adhuc notae Novae-Guinae indigenae.

As mentioned above, the genus is related to *Chamaeanthus* Schltr., but differs in several important aspects. The lip very definitely is tri-lobed and in such a manner that the lateral lobes appear to be separated only by a narrow groove almost meeting at the front. The dorsal lobe underneath is somewhat fleshy and extends slightly above the lateral lobes. Although the foot of the column is definite, it is shorter than for *Chamaeanthus*. The very short, thick column carries a very noticeably large anther covering the back of the column like a hood, and if I have observed correctly, forms the front part of the pollinia. The four pollinia are separated clearly as for *Taeniophyllum* Bl. and are of equal size. The stigma covers almost the whole of the front of the column. Two species described from Dutch New Guinea also belong here, viz. *C. paniculata* (J.J. Sm.) Schltr. (*Chamaeanthus paniculatus* J.J. Sm.) and *C. filiformis* (J.J. Sm.) Schltr. (*Chamaeanthus filiformis* J.J. Sm.).

Of the three species known in our Territory, *C. montana* Schltr. grows as an epiphyte in the mist-forests of the ranges, whereas the others are found in the forests of the hill-country.

1. *C. tenuis* Schltr., sp. nov.

Epiphytica, pusilla, 10–15 cm alta; radicibus filiformibus glabris; caule 3–7 cm longo, dense foliato, vaginis foliorum oblecto, 1.5–2 mm diametro; foliis erecto-patentibus, anguste linearibus, acutis, 6–13 cm longis, medio fere 2.5–4.5 mm latis; inflorescentiis tenuissimis, setiformibus, flexuosis, perlace plurifloris, vulgo 1–2-rarius 3-ramosis, 3–5 cm longis; bracteis minutis, ovario multo brevioribus; floribus minutis, glabris; sepalis e basi paulo dilatata lanceolatis, obtusiusculis, 2.75 mm longis, lateralibus obliquis; petalis sepalis similibus et subaequilongis; labello trilobo, 1.5 mm longo, lobis lateralibus basalibus, oblique ovatis, obtusis, intermedio bene longiore, lanceolato, obtusiusculo, carnosulo; columna et anthera generis; polliniis 4 oblique ovalibus, stipite lineari, aequilongo, glandula mediocri rotundata; ovario cylindrico, c. 2.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of Albo in the Minjem Valley, alt. c. 100 m—R. Schlechter no. 16164, flowering in June 1907; on trees in the forests of the Gomadjidji [Mountain] alt. c. 450 m—R. Schlechter no. 19909, flowering in June 1909.

The species is very peculiar on account of the very lax inflorescences with an almost hair-width rachis. The flowers are yellowish.

2. *C. montana* Schltr., sp. nov.

Epiphytica, pusilla, 3–6 cm alta; radicibus filiformibus, glabris; caule abbreviato, 3–6-foliato; foliis erecto-patentibus, linearibus, acutis, apice valde oblique bidentatis, 2–5 cm longis, medio 2–4 mm latis; inflorescentiis laxe 10–20-floris, 1–2-ramosis, strictis, foliorum fere longitudine; bracteis minutis, ovario multo brevioribus; floribus minutis, glabris; sepalis lanceolatis, subacuminatis, 2.5 mm longis, lateralibus obliquis; petalis sepalis valde similibus, subaequilongis; labello e basi trilobato, c. 1.75 mm longo, lobis lateralibus basilaribus, suborbicularibus, intermedio multo longiore, lanceolato, subacuto, superne nervo medio carinato; columna generis; polliniis oblique obovoideis, stipite oblongo-quadrato paulo brevior, glandula ampla quadrata; ovario cylindraceo glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 19151, flowering in Aug. 1908 [Ed.—possibly Jan. 1909.]

This, probably the smallest species of the genus, is identifiable by the stiff short panicles whose few branches stand out almost horizontally. The flowers are pale yellow with a slightly darker tip.

3. *C. major* Schltr., sp. nov.

Epiphytica, pro genere valida; radicibus flexuosis, glabris; caule brevi, crassiusculo, ad 10 cm longo, c. 5 mm diametro, dense foliato, vaginis foliorum striatis oblecto; foliis erecto-patentibus, ligulatis, apice obliquis, acutatis, coriaceis, 10–13 cm longis, medio fere 1.7–2.2 cm latis; inflorescentia valde ramosa, laxe multiflora, 25–30 cm longa, pedunculo foliis aequilongo, rigidulo; bracteis minutis, ovario duplo brevioribus; floribus minutis, glabris; sepalis lanceolatis, subacutis, 2.5 mm longis, lateralibus obliquis; petalis sepalis similibus et subaequilongis; labello trilobo, 1.5 mm longo, lobis lateralibus basilaribus, quadratis, obtusissimis, intermedio ovato-lanceolato, obtusiusculo, duplo longiore; columna et anthera generis; polliniis subglobosis, stipite late spatulato, paululo longiore, glandula subquadrata polliniis aequimagina; ovario cylindrico, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On tall trees in the forests on the Djamu [River], alt. c. 400 m—R. Schlechter no. 16333, flowering in July 1907.

By far the most robust species of the five so far known. Without its flowers the plant has somewhat the appearance of a *Saccolabium*. Here too the branches and branchlets of the panicle stand out stiffly. The flowers are yellow.

93. *Chamaeanthus* Schltr.

Until now this genus has remained monotypic, represented by the single species *C. brachystachys* Schltr. which has been recorded from Java and Borneo. Three more species have been published by J.J. Smith, but one of these, *C. singularis* J.J. Sm., was referred recently to the genus *Sarcochilus* R. Br. and the two others I have arranged above under *Calymmanthera* Schltr. However, there are now two plants from German New Guinea which I must place in *Chamaeanthus* Schltr., viz. the two described below. As a fourth species I might also include here a plant which I described as *Sarcochilus Robertsii* Schltr. a few years ago, from New Caledonia, and to which I now give the name *Chamaeanthus Robertsii* Schltr. Lastly, as a fifth species I will add *C. minimus* Schltr. (*Sarcochilus minimus* Schltr.), which also comes from New Caledonia.

The two species concerned are epiphytes of the lowland forests.

1. *C. gracilis* Schltr., sp. nov.

Epiphyticus, gracilis, subpatulus, 5–12 cm longus; radicibus flexuosis, glabris; caule subnullo; foliis erecto-patentibus, 4–8, oblique ligulatis, inaequaliter et obtuse bilobulatis, basin versus sensim paulo angustatis, 2–5 cm longis, medio fere 3.5–6 mm latis; racemis patulis, gracillimis, folia subduplo

superantibus, usque supra basin floriferis, subaxe multifloris, sensim elongatis; bracteis ovatis, acutis, ovario fere aequilongis; floribus parvulis, glabris, sepalis ellipticis, obtusis, 2.5 mm longis, lateralibus obliquis, basin versus antice paulo ampliatis; petalis oblique ovato-ligulatis, obtusis, sepalis subaequilongis; labello carnosulo ovali, obtusissimo, c. 1.25 mm longo; columna brevi, pede longo, curvato; anthera reniformi-cucullata; polliniis oblique quadratis, posterioribus bene minoribus, appressis, stipite lineari vix aequilongo, glandula parvula rotundata; ovario sessili, cylindrico, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18348, flowering in Oct. 1908.

This species differs from all the others in the relatively short blunt flowers and the long column-foot. The clinandrium is raised at the rear. The inflorescence in this species develops gradually and in zones. The flowers are yellowish white.

2. *C. laxus* Schltr., sp. nov.

Epiphyticus, gracilis, subpatulus, 7–18 cm longus; radicibus flexuosis glabris; caule subnullo; foliis 4–8, erecto-patentibus, falcato-linearibus, oblique et subacute bilobulatis, 3–9 cm longis, medio fere 3–5 mm latis; racemis gracillimis, laxe 20-multifloris, patulis, pedunculo brevi; bracteis minutis, deltoideis, ovario multo brevioribus; floribus parvulis, glabris; sepalis anguste oblongis, obtusis, 3.25 mm longis, lateralibus obliquis; petalis sepalis lateralibus similibus et subaequimagnis; labello circuitu oblongo-ligulato, obtusissimo, carnosulo, c. 1.25 mm longo, tertia parte anteriore margine utrinque lobulo vel potius dente parvulo subacuto donato; columna brevi, pede medio incrassatione dentiformi donato, mediocri; anthera reniformi-cucullata, polliniis oblique ellipsoideis, posterioribus appressis minoribus, stipite lineari duplo brevior, glandula minuta; ovario cylindrico, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Maijen [River], alt. c. 100 m—R. Schlechter no. 19040, flowering in Jan. 1909; on trees in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18367 (TYPE), flowering in Oct. 1908.

The species is related clearly to *C. Robertsii* Schltr., but has appreciably smaller leaves and a differently shaped labellum. The flowers are white with a yellow anther.

94. *Thrixspermum* Lour.

About two years ago I published a review of the species of this genus in 'Orchis' V, pp. 46–48 and pp. 54–58, so that it is unnecessary to go into details here. I need to mention only that the genus, which has a fairly generally recognised circumscription, contains about 55 species.

The species occurring in our Territory belong to the sections *Orsidice* and *Dendrocolla*.

§ 1. *Orsidice*

Up to the present only one species belonging to this section has been described from the other parts of Papuasias, viz. *T. validum* J.J. Sm. from Dutch New Guinea. In our Territory, however, the genus was represented already by three species from the section, to which I now add a few more. Of these, two species are found on trees at the beach, viz. *T. neo-hibernicum* Schltr. and *T. xantholeucum* Schltr.

T. collinum Schltr. prefers the more protected forests of the hill-country. The rest are epiphytes of the mist-forest formations.

1. *T. collinum* Schltr., sp. nov.

Epiphyticum, validum, erectum vel patulum; radicibus filiformibus, glabris; caule elongato usque ad 20 cm longo, paulo compresso, bene foliato, vaginis foliorum compressis, striato-nervosis omnino oblecto, c. 5 mm lato; foliis patentibus, lingulatis, inaequaliter et obtuse bilobulatis, 8–15 cm longis, medio fere 1.5–2.5 cm latis; racemis longi-pedunculatis, ancipitibus, sensim elongatis, pedunculo apicem versus ut rachis applanatus c. 15 cm longo; bracteis conduplicatus, falcatis, apiculatis, ovario subaequilongis; floribus speciosis, illis *T. xantholeuci* Schltr. similibus, succedaneis; sepalis lineari-

lanceolatis, elongato-acuminatissimis, 3.5 cm longis, lateralibus basi subfalcatis; petalis linearibus, elongato-acuminatis, sepalis subaequilongis, glabris; labello e basi oblongoideo-saccata semiorbiculari, supra medium trilobato, 1.8 cm longo, explanato 1.1 cm medio lato, lobis lateralibus abbreviatis, falcatis; apice truncato 3-4-dentatis, lobo intermedio c. 3-4-plo longiore, cylindraneo-incrassato, obtusiusculo, ligula lineari antice retusa superne in tertia parte basali labelli, pulvino semigloboso dense papilloso intus in apice sacci; columna cylindranea, glabra; ovario gracili, glabro, c. 1.2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, in the Minjem Valley, alt. c. 150 m—R. Schlechter no. 16148 (TYPE), flowering in June 1907; on trees in the hill-forests near Jaduna, on the Waria [River], alt. c. 150 m—R. Schlechter no. 19251, flowering in Apr. 1909.

This species is characterised by the very short, falcate lateral lobes clearly toothed at the tip; and by the fleshy dorsal lobe of the labellum. The flowers are yellow-white, the labellum brown-speckled with a brown-yellow cushion at the tip of the sac.

2. *T. neo-hibernicum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 232.

Neu-Mecklenburg: On trees in the village of Lauan, alt. c. 10 m—R. Schlechter no. 14617, flowering in June 1902.

Clearly, this species is related closely to the previous one but differs in the shape of the lateral lobes of the labellum and the triangular callus at the base of the sac. The flowers are whitish, the labellum brown-flecked in the middle on the outside.

3. *T. xantholeucum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 234.

Neu-Pommern: On trees at the beach between Massawa and Cape Lambert, alt. c. 10-40 m—R. Schlechter no. 13719, flowering in Nov. 1901.

This species differs from the two previous ones in stronger growth, longer extended sepals and the labellum papillose and hirsute. The flowers are pale yellow.

4. *T. brevipes* Schltr., sp. nov.

Epiphyticum, validum, 10-20 cm longum; radicibus flexuosis, glabris; caule leviter compresso, 3-10 cm longo, dense foliato, vaginis foliorum striatis omnino obecto; foliis erecto-patentibus, oblique oblongo-ligulatis, inaequaliter et obtuse bilobulatis, 7-11 cm longis, medio 2.3-4 cm latis, basin versus paulo angustatis; racemis valde applanatis, serraformibus, vix pedunculatis, usque ad 12 cm longis; bracteis conduplicatis, obtusis, ovario duplo brevioribus; floribus illis *T. arachnitis* (Bl.) Rchb. f. similibus, erecto-patentibus; sepalis lineari-lanceolatis, acuminatissimis, 2.2 cm longis, lateralibus obliquis; petalis oblique linearibus, acutis, sepalis paulo brevioribus, glabris; labello e basi semigloboso-saccata, retusa semiorbiculari-cuneato, antice trilobato, 1 cm longo, supra medium 0.8 cm lato, lobis lateralibus parvulis, brevibus, oblique semioblongis, obtusis, intermedio paulo longiore semiorbiculari-triungulo, obtusissimo, antice incrassato, ligula quadrata, antice subtridentata superne infra medium labelli, callo subulato, dense papilloso in ima basi; columna brevi, glabra, pede satis longo; anthera galeato-cucullata, antice minute bidentata, glabra; polliniis anguste oblongoideis, stipite brevi, semioblongo, glandula minuta, transversa; ovario gracili, glabro, c. 1.5 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20174, flowering in Sept. 1909.

This species is related closely to *T. denticulatum* Schltr., but differs in the longer extended sepals and in the lip as well as in the pollinia. The flowers are pale yellowish, the labellum with a large red spot at the base.

5. *T. denticulatum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 233.

Neu-Mecklenburg: On trees in the forests near Punam in the Rössel Range, alt. c. 500 m—R. Schlechter no. 14855 [Ed.—possibly 14655], flowering in July 1902.

Initially, I thought that I would have to identify the above-described *T. brevipes* Schltr. with this species, but a comparison shows that a series of differences exists as listed above. The flowers are yellow, brown in the centre and with a purple callus at the base.

6. *T. warianum* Schltr., sp. nov.

Epiphyticum, usque ad 15 cm longum; radicibus flexuosis, glabris; caule crassiusculo, paulo compresso, usque ad 13 cm longo, dense foliato, vaginis foliorum striatis omnino oblecto; foliis subpatentibus, oblongo-ligulatis, inaequaliter et obtuse bilobulatis, 7–10 cm longis, medio fere 1.9–3 cm latis; racemis complanatis, serraeformibus, vix pedunculatis, usque ad 8 cm longis; bracteis conduplicatis, falcato-ovatis, obtusis, ovario duplo brevioribus; floribus erecto-patentibus, speciosis, glabris, sepalis anguste lanceolatis, acutis, 1.7 cm longis, lateralibus obliquis; petalis oblique lineari-ligulatis, acutis, sepalorum longitudine; labello e basi semiquadrato-saccata retusa semiobiculari, antice trilobato, 1.2 cm longo, 8 mm medio lato, lobis lateralibus oblique ovato-triangularibus, apiculatis, intermedio duplo majore semioblongo, apice incrassato incurvulo, ligula quadrata bilobulato infra medium labelli, in basi sacci pulvino semigloboso, papilloso; columna brevi, pede apice excavato; anthera cucullata antice minute bidentata; pollinis oblique et anguste oblongoideis, stipite multo brevior, ovato-triangulari, glandula minuta transversa, ovario gracili, glabro, c. 1.2 cm longo

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range (Waria District), alt. c. 900 m—R. Schlechter no. 19498, flowering in May 1909.

The species resembles the two previous ones strongly in habit. However, the much shorter and blunter buds indicate a different species, which is confirmed also by the flower characteristics. The flowers are yellowish, the lip with a broad red transverse band, the base inside has a red callus.

7. *T. aberrans* Schltr., sp. nov.

Epiphyticum, pusillum; radicibus flexuosis, glabris; caule brevi, dense foliato, 1–1.5 cm longo; foliis erecto-patentibus, ligulatis, apiculatis, 1.5–3 cm longis, medio fere 3–6 mm latis; racemis gracillime pedunculatis, 5–7 cm longis, pedunculo rigidulo, filiformi, 3.5–5 cm longo, rhachi cum bracteis compresso, serraeformi; bracteis conduplicatis, falcato-ovatis, obtusiusculis, ovario pluries brevioribus; floribus in genere inter minores; sepalis ovalibus, apiculatis, glabris, 4.5 mm longis, lateralibus obliquis, paulo latioribus; petalis oblique oblongis, obtusis, sepalis aequilongis; labello circuitu quadrato, concavo, 4 mm longo et lato, lobis lateralibus incurvis, parvulis, triangularibus obtusis supra medium labelli, intermedio antico valde abbreviato, apiculato, callo triangulari vel late conico papilloso satis magno, in basi labelli, callo altero oblongo amplo e medio usque in apicem anteposito dimidio posteriore glanduloso-puberulo; columna brevi, pede brevi; anthera cordato-cucullata, umbonata, pollinis oblique obovoideis, stipite lineari sublongiore, glandula parvula rotundata; ovario gracili, glabro, c. 3.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Pema on the Waria [River], alt. c. 800 m—R. Schlechter no. 19404 (TYPE), flowering in May 1909; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 500 m—R. Schlechter no. 19287, flowering in Apr. 1909; on trees in the forests of the Maboro Range, alt. c. 1000 m—R. Schlechter no. 19490, flowering in May 1909.

This species, which differs from most of the others, belongs together with *T. oreadum* Schltr. to form a group with *T. Graeffei* Rchb. f. The flowers are whitish with orange-yellow spots.

8. *T. oreadum* Schltr., sp. nov.

Epiphyticum, pusillum; radicibus flexuosis, glabris; caule abbreviato, dense foliato, 1–1.5 cm longo; foliis ligulatis, oblique subacutis, carnosulis, 3–3.5 cm longis, medio 4–7 mm latis; racemis gracillime pedunculatis, 4–7 cm longis, pedunculo filiformi, rigidulo, usque ad 6 cm longo, rhachi cum bracteis serraeformi, compresso; bracteis conduplicatis, falcato-ovatis, ovario pluries brevioribus; floribus in genere inter minores; sepalis ovalibus, obtusis, 5 mm longis, lateralibus obliquis; petalis sepalis lateralibus valde similibus et aequilongis; labello circuitu late quadrato-oblongo, obtusissimo, marginibus incurvis subcucullato, lobis lateralibus medio incurvis, anguste triangularibus, obtusis, parvulis, intermedio antico obtusissimo, carnosus, callo parvulo oblongo papilloso in basi labelli, callo altero semigloboso amplo apice excepto papilloso e basi usque ad apicem anteposito, linea papilloso cum callo basali conjuncto, labello toto c. 8 mm longo; medio 4 mm lato; columna brevi, glabra; anthera reniformi-cucullata, gibbosa, glabra; pollinis oblique oblongoideis, stipite ligulato, basin versus paulo angustato, glandula rotundata, parvula; ovario gracili, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range alt. c. 1000 m—R. Schlechter no. 16927 (TYPE), flowering in Nov. 1907; on trees in the

forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19064, flowering in Jan. 1909.

A flowerless specimen which I collected as no. 14086 in the Bismarck Range in Jan. 1902 probably also belongs here. The flowers are pale lemon-yellow, the lip with pale brown spots.

§ 2. *Dendrocolla*

The species described here is the first of the section in Papuaia. Like most of the species of this relationship it is an epiphyte of the mist-forests.

9. *T. adenotrichum* Schltr., sp. nov.

Epiphyticum, erectum vel adscendens; radicibus filiformibus, glabris; caule tereti, rigidulo, bene foliato, usque ad 20 cm longo, vaginis striatis foliorum oblecto, c. 3 mm diametro; foliis ligulatis oblique et obtuse bilobulatis, 5–7 cm longis, medio fere 7–12 cm latis; racemis longi-pedunculatis, erecto-patentibus, dense plurifloris, pedunculis 14–22 cm longis; bracteis lanceolato-subulatis, ovario pluries brevioribus; floribus erecto-patentibus, succedaneis; sepalis oblongo-ligulatis, apiculatis, glabris, 6–7 mm longis, lateralibus obliquis; petalis ligulatis, acutis, sepalis subaequilongis; labello cucullato-concavo, e basi breviter saccata semi-orbiculari, antice trilobato, 6–7 mm longo, explanato inter apices loborum lateralium 1 cm lato, intus ligula brevi bilobulata mediana excepta praecipue marginibus pilis glanduliferis patentibus dense oblecto, lobis lateralibus oblique oblongis, obtusis, intermedio abbreviato, lateralibus subaequilongo; columna brevi, glabra; anthera reniformi-cucullata, glabra; pollinibus oblique pyriformibus, stipite brevissimo, glandula rotundata; ovario glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Keneja [River], alt. c. 150 m—R. Schlechter no. 18923, flowering in Dec. 1908.

The species has been characterised adequately as the sole representative of the section in Papuaia. It is related most closely to *T. trichoglottis* (Hook. f.) O. Ktze. The flowers are white, the labellum white with a few brown dots.

var. *eitapense* Schltr., var. nov.

Differt a forma typica colore florum, floribus majoribus, labelli lobo intermedio lateralibus brevioribus, sacco paulo longiore.

Kaiser-Wilhelms-Land: On trees in the forests near Peso (Eitape District), alt. c. 20 m—R. Schlechter no. 19991, flowering in Aug. 1909; on trees in the forests near Pro (Eitape District), alt. c. 20 m—R. Schlechter no. 19998, flowering in Aug. 1909.

This plant may be considered later on as a separate species. The flowers are yellowish, lightly suffused with brown on the outside.

95. *Bogoria* J.J. Sm.

I have long been in doubt as to whether this genus should be retained alongside of *Sarcochilus* R. Br., for, in fact, it approaches it very closely. Certain characters, however, induced me to regard it for the time being as a genus and to leave the decision to a future monograph on *Sarcochilus* as to what is to be done with it.

The species described here is the second in the genus and evidently stands fairly close to *Bogoria Raciborskii* J.J. Sm., a small plant which I once collected in Java.

To the same genus there may also belong a small plant which I recently described as *Sarcocholis taeniorhizus* Schltr., and which I will now call *Bogoria taeniorhiza* Schltr.

1. *B. papuana* Schltr., sp. nov.

Epiphytica, pusilla, acaulis; radicibus applanatis, flexuosis, glabris; foliis 2–4, erecto-patentibus, oblique ligulatis, inaequaliter et obtuse bilobulatis, basin versus paulo angustatis, 2.5–8.5 cm longis, medio fere 0.6–1.3 cm latis; racemis gracilibus, 6–14 cm longis, laxe 5–15-floris, rhachi subincrassatulis, pedunculo filiformi stricto, pauci-vaginulato, foliis aequilongo; bracteis minutis, deltoideis, ovario multo brevioribus; floribus sensim evolutis, parvulis, glabris; sepalis patentibus,

obovato-spathulatis, obtusissimis, 3.25 mm longis, lateralibus obliquis; petalis oblique spathulato-ligulatis, obtusis, sepalis subaequilongis; labello e basi late saccata, circuitu late semiorbiculari antice trilobato, 3 mm longo, explanato antice 5 mm lato, lobis lateralibus erectis falcato-triangularibus, acutis, intermedio obtusissimo vix semiorbiculari, lateralibus brevioribus, antice incrassato et plica tenui circumdato; columna brevi, glabra, pede lato; anthera et pollinibus generis; ovario gracili, glabro, 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Finisterre Range, above Meireka, alt. c. 500 m—R. Schlechter no. 17937, flowering in July 1908.

This very interesting plant differs from *B. Raciborskii* J.J. Sm. in the smaller flowers and in the shape of the lip. It is noteworthy that both the species which I know have flattened roots similar to those of *Phalaenopsis* Bl., even though much smaller. The flowers are pale yellow, the lip white with a red-margined tip.

96. *Sarcochilus* R. Br.

In spite of the proximity of Australia, where *Sarcochilus* species are fairly plentiful, the genus is represented very poorly in Papuasias, for it is now shown that all species described from there, up to the present, belonged only to two different species, viz. *S. platyphyllus* (Rchb. f.) F.v.M. and *S. Moorei* (Rchb. f.) Schltr. The first appears to be confined to Dutch New Guinea, while *S. Moorei* (Rchb. f.) Schltr. has a very wide distribution over the whole of Papua.

The genus is divisible into three sections, which I characterise as follows:

§ 1. *Monanthochilus* with mostly short, but sometimes slightly elongated stems, which have lateral (nearly always) single-flowered inflorescences, almost sessile and at times in groups of two or three.

§ 2. *Eu-Sarcochilus* contains the majority of the species with more than one, or multi-flowered, racemose inflorescences, usually with handsome flowers, the labellum which is tri-lobed, or sometimes bi-lobed (owing to the suppression of the middle lobe) and always provided with callosities or other thickenings.

§ 3. *Ascochilus* considered a genus by Ridley, embraces small species with small flowers, the labellum of which is five-lobed, owing to the middle lobe being tripartite.

So far as is known at present, only the first two sections call for consideration in New Guinea, though it is possible that *Ascochilus* will later be found there later. This is all the more probable since this section is well represented in the Celebes, which resembles New Guinea in the richness of its flora.

S. singularis J.J. Sm. from Dutch New Guinea occupies an uncertain position and hardly can be regarded as belonging here.

§ 1. *Monanthochilus*

The four species described here are the only ones which are known to us from New Guinea. With the exception of *S. odoratus* Schltr. they are true mist-forest epiphytes, which grow by preference on rather thick vertical tree-trunks covered with moss. *S. odoratus* Schltr., on the other hand, is an epiphyte which seems to thrive by preference only in the hill-country on moss-free trees along rivers and creeks.

1. *S. odoratus* Schltr., sp. nov.

Epiphyticus, patulus, subcaulis; radicibus flexuosis, glabris; foliis patulis lineari-ligulatis, obtusiusculis, apice subbilobulatis, 14–23 cm longis, medio fere 1.2–1.6 cm latis; inflorescentiis valde abbreviatis, unifloris; pedunculo paucivaginulato, vix 1 cm longo; bractea parvula, ovario multo brevioribus; flore suavissime odorato, glabro; sepalis lanceolato-ellipticis, acutis, 1.3 cm longis, lateralibus obliquis; petalis sepalis similibus, obtusiusculis, 1.2 cm longis, obliquis; labello trilobo, carnoso, 7 mm longo, explanato inter apices loborum lateralium 1.3 cm lato, basi bigibbo, medio ostio calcaris carnosissimi donato supra medium callo conico obtuso ornato cum appendice parvulo subulato anteposito, lobis lateralibus subfalcato-oblongis obtusis, erectis, intermedio quadrato, carnoso, obtusissimo, lateralibus

paulo brevior; columna basi angustata; anthera rhombeo-cucullata apiculata; polliniis oblique oblongoideis, stipite oblanceolato-lineari, aequilongo, glandula obtriangula, satis magna; ovario sessili, cylindrico, glabro, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 16569, flowering in Sept. 1907.

Compared with the other species this one is characterised by the definite development of the dorsal lobe of the labellum. The very fragrant flowers are pale yellow.

2. *S. uniflorus* Schltr., sp. nov.

Epiphyticus, validus, patulus; radicibus flexuosis, glabris; caule usque ad 13 cm longo, dense foliato, vaginis foliorum striatis et rugulosis oblecto, c. 7 mm diametro; foliis patentibus, linearis-ligulatis, inaequaliter subbilobulatis, basin versus angustatis, 9–16 cm longis, medio fere 1.2–1.7 cm latis; inflorescentiis valde abbreviatis, fasciculatis, unifloris, vaginulis paucis circumdatis; pedunculis brevissimis, 3–5 mm longis; bractea parvula ovario bene brevior; flore glabro, erecto-patente; sepalis petalisque oblongis, obtusis, 1 cm longis, lateralibus obliquis, petalis paululo brevioribus; labello porrecto, carnoso, cum calcare sepalis aequilongo, lobis lateralibus subquadratis, obtusissimis, intermedio brevissime triangulo, obtusissimo, calcare conico, obtuso, porrecto, callo quadrato, subretuso basi ad ostium calcaris; columna perbrevis; anthera semigloboso-cucullata, obtuse apiculata; polliniis amplis ellipsoideis, stipite oblanceolato-lineari, aequilongo, glandula rotundata; ovario cylindrico, glabro, sessili, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1000 m—R. Schlechter no. 19511, flowering in May 1909.

This species is related most closely to *S. iboensis* Schltr., but has thicker leaves and marked differences in the flowers. The fragrant flowers are white with a violet-red-spotted lip.

3. *S. iboensis* Schltr., sp. nov.

Epiphyticus, erectus; radicibus flexuosis, glabris; caule c. 5 cm longo, dense foliato, vaginis foliorum striatis et rugulosis oblecto, c. 5 mm diametro; foliis patentibus, linearibus, apice bidentatis, basin versus sensim angustatis, 10–12 cm longis, medio 1.1–1.4 cm latis; inflorescentiis paucis fasciculatis, vaginulatis, unifloris; pedunculo perbrevis; bractea parvula, ovario multo brevior; flore suberecto, glabro; sepalis oblongis, obtusiusculis, 1.5 cm longis, lateralibus obliquis; petalis sepalis aequilongis, sed paulo brevioribus; labello porrecto, cum calcare conico petalis aequilongo, lobis lateralibus quadrato-oblongis obtusissimis, inter medio brevissimo, obtusissimo, callo amplo quadrato in basi labelli ante ostium calcaris; columna basi angustata, glabra; ovario cylindrico, glabro, c. 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18974, flowering in Dec. 1908.

This species is distinguished from the related *S. uniflorus* Schltr. by the thinner leaves, the larger flowers, the narrower lateral lobes of the labellum and the larger callus. The flowers are white with a violet-pink lip.

4. *S. chrysanthus* Schltr., sp. nov.

Epiphyticus, validus, patulus; radicibus flexuosis, glabris; caule usque ad 20 cm longo, dense foliato, vaginis foliorum striatis oblecto, c. 7 mm diametro; foliis falcato-ligulatis, apice inaequaliter bidentatis, 14–25 cm longis, medio fere 1.9–3 cm latis; inflorescentiis fasciculatis vel singulis, unifloris, paucivaginat, subsessilibus; bractea acuminata, ovario brevior; floribus erecto-patentibus, glabris, aureis; sepalis ellipticis, obtusiusculis, 9 mm longis, lateralibus obliquis; petalis sepalis similibus, obliquis, c. 7 mm longis; labello porrecto, cum calcare c. 5 mm longo, lobis lateralibus oblique oblongis, obtusis, intermedio subobsolet, callo obscuro cariniformi in medio ante ostium calcaris conici, obtusi; columna perbrevis, glabra; ovario cylindrico, brunneo-squamuloso, c. 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17029, flowering in Dec. 1907.

The most vigorous species in the section, distinguished from the others by the stronger growth, the scaly covering of the ovaries and bracts, the colour of the flowers and definite floral characteristics. The flowers are golden yellow.

§ 2. *Eu-Sarcochilus*

This section appears to contain predominantly Australian species. *S. falcatus* R. Br. is to be regarded as its Type. The species belonging here have more-or-less prolonged inflorescences with a thin rachis. The flowers have a tri-lobed labellum. In habit, the section shows considerable variation and later on may require further sub-division.

The only species occurring in our Territory is *S. Moorei* (Rchb. f.) Schltr. referred to here. This is distributed very widely, especially along the coast, throughout the whole Territory. It also, however, occurs further inland and appears to rise to an altitude of about 600 m.

5. *S. Moorei* (Rchb. f.) Schltr., comb. nov.

Thrixspermum Moorei Rchb. f., in Gardn. Chron. I, (1880) p. 104.

Sarcochilus Moorei hortor.

Thrixspermum Beccarii Rchb. f., in Bot. Centralbl. XXVIII (1886), p. 343.

Sarcochilus Beccarii (Rchb. f.) F.v.M., Descr. notes Pap. pl. IX (1890), p. 66.

Sarcochilus papuanum Krzl., in K. Schum. et Hollr., Fl. Kaiser-Wilhelms-Land (1889), p. 34.

Renanthera ramuana Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzgeb. Süds. (1901), p. 252.

Sarcochilus Englerianum Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzgeb. Süds. (1901), p. 252.

Sarcochilus ramuanus (Krzl.) Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 232.

Sarcochilus salomonensis Rolfe, in Kew Bull. (1908), p. 72.

Kaiser-Wilhelms-Land: On trees near the Kaulo Base, alt. c. 150 m—R. Schlechter no. 16324, flowering in June 1909 [Ed.—possibly July 1907]; on trees on the banks of the Maijen [River], alt. c. 50 m—R. Schlechter no. 17925, flowering in 1908 [Ed.—no month cited, possibly July]; on the Ramu River—Tappenbeck no. 139; Bismarck Plateau, alt. c. 100 m and 600 m—C. Lauterbach no. 2477; no. 3355; on trees in the forests at the mouth of the Waria [River], alt. c. 20 m—R. Schlechter no. 19949, flowering in July 1909; on trees in the hill forests near Udu, alt. c. 300 m—R. Schlechter no. 19897, flowering in June 1909.

Neu-Mecklenburg: On trees near Punam Village, alt. c. 300 m—R. Schlechter no. 14678, flowering in July 1902.

Neu-Pommern: Without location details—C. Moore's collector around 1880; on the beach near Herbertshöhe on *Calophyllum*—R. Schlechter, observed in Nov. 1901.

Solomon Islands: C.M. Woodford.

This species clearly is related to *S. Archytas* (Ridl.) (*Saccolabium Archytas* Ridl.) from Christmas Island. It is distributed very widely and recognised easily by the long, multi-flowered racemes which, unfortunately, have only a short life, as all species of the genus. The flowers are yellow with brown spots, the lip is white with violet-brown striped markings and the callus is yellow at the base.

97. *Phalaenopsis* Bl.

Not very long ago Rolfe published, in the 'Gardn. Chron.' II (1886), p. 212, an enumeration of 34 species of *Phalaenopsis*. Since that publication about six more species have been recorded, so that the genus may now be estimated at about 40 species. They are distributed over an area which extends from India, across the whole Malayan Archipelago and the Philippines to New Guinea and northern Australia. The genus has its centre of development in New Guinea and Borneo.

The limitation of the genus presents very few difficulties, but *Doritis* Lindl., which consists of four related species, viz. *D. Wightii* Lindl. from India, *D. philippinensis*

Ames from the Philippines, *D. Steffensii* Schltr. from the Celebes and *D. Hebe* (Rchb. f.) Schltr. (*Phalaenopsis Hebe* Rchb. f.) from Java, as well as a fifth, *D. taenialis* Hook. f. likewise from India, must be excluded.

At present we know from the Territory only the species described below. That recorded from British Papua as '*P. amabilis*' by F.M. Bailey may be identical with this taxon.

1. *P. amabilis* Bl., Bijdr. (1825), p. 294, p.44.

var. *papuana* Schltr., var. nov.

Differt a forma typica labelli callo humiliore et latiore, pollinarum glandula majore cordato-incisa.

Kaiser-Wilhelms-Land: On trees in the forests on the Malia [River] at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18409, flowering in Oct. 1908; on trees in the mountain forests near Jaduna on the Waria [River], alt. c. 250 m—R. Schlechter no. 19308, flowering in Apr. 1909.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 600 m—R. Schlechter no. 14660, flowering in July 1902.

It is possible that this beautiful plant may be separated into several species at a later stage. The flowers are snow-white, the labellum red-dotted and hatched at the base, the callus and front margins of the lateral lobes of the lip are golden yellow.

98. *Adenoncos* Bl.

Even this genus, which was monotypic from its establishment in 1825 until 1894, has increased to nine species owing to the better exploration of the Malayan Archipelago and the Malayan Peninsula. To those I now have to add a tenth.

Regarding the circumscription of this genus, one was never in doubt that evidently it was related to *Luisia* Gaud., since it is distinguished clearly both by its habit and its flowers. Only Hooker fil. [Ed.—Fl. Brit. Ind. VI., p. 77] united it with *Microsaccus* Bl., but it was re-established correctly by Ridley.

The distribution area of the genus extends, as far as is known at present, from the Malayan Peninsula across the Sunda Islands and the Celebes to New Guinea, but it is probable that further species can be expected from other parts of the Dutch possessions known as Insulinde.

Although most of the other species are epiphytes of the lowland forests and preferably of the mangrove formations, the species described here is an inhabitant of the mist-forests of the mountain ranges.

From the rest of New Guinea no species of the genus have as yet been recorded.

1. *A. papuana* Schltr., sp. nov. [Ed.—stat. nov.]

Adenoncos virens Bl. var. *papuana* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 234.

Epiphytica, humilis, 4–7 cm alta; radicibus filiformibus, glabris; caule tereti, dense foliato, vaginis foliorum rugulosis arcte oblecto; foliis patentibus, leviter falcato-curvatis, lineari-ligulatis, apice inaequaliter et acute bilobulatis, subtus carinatis, carnosus, 2–3 cm longis, medio 4–5 mm latis; inflorescentiis valde abbreviatis, sessilibus, unifloris, vaginis suborbicularibus, apiculatis basi protectis; bractea vaginis simillima ovarium paulo superante; flore in genere inter minores; sepalis ovato-lanceolatis, acutis, glabris, 4 mm longis, lateralibus obliquis; petalis oblique ligulatis, breviter acuminatis, 3.25 mm longis; labello suborbiculari-obovato, apiculato, basi callo oblongo papilloso ornato, 4.25 mm longo, supra medium 3.5 mm lato; columna brevi glabra, c. 2 mm alta; ovario sessili cylindrico, glabro, 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 19193 (TYPE) [Ed.—cannot be a Type] flowering in Jan. 1908 [Ed.—possibly 1909]; on trees in the forests of the Bismarck Range, alt. c. 1200 m—R. Schlechter no. 14066, flowering in Jan. 1902. [Ed.—probably the Type.]

What I had surmised earlier has now been verified. The species, although related closely to *A. virens* Bl., specifically is different. The flowers are yellow-green.

99. *Luisia* Gaud.

This genus, like *Adenoncos* Bl., is one where, concerning the circumscription, there has been very little diversity of opinion, but it is a different matter in respect to the species. These, and especially *L. teretifolia* Gaud. (the species on which the genus was established) often have been comprehended wrongly, and the one which goes by this name in the 'Flora of British India' is really the well-defined *L. zeylanica* Lindl., perhaps in association with other species. The genus, however, urgently requires a complete revision when, surely, much new material will be revealed. Recently, R.A. Rolfe has promoted especially its study by determining correctly many species in the Indian and Chinese flora. It would appear that Reichenbach fil. had a better comprehension of the critical species than many of the modern authors.

So far as is known, only a single species, *L. Beccarii* Rchb. f., need be considered for our Territory. This first became known from the north-western part of Dutch New Guinea. It is found in drier areas on isolated trees or at the borders of forests in the plains, but it would appear to have a wider distribution.

1. *L. Beccarii* Rchb. f., in Bot. Centralbl. XXVIII (1886), p. 334.

Kaiser-Wilhelms-Land: On trees at borders of dry forests not far from Bulu, alt. c. 40 m—R. Schlechter sine no., flowering in July 1907; on trees near the Kaulo Base, alt. c. 200 m—R. Schlechter no. 17823, flowering in June 1908; on isolated trees on the along-plains on the Malia [River], alt. c. 150 m—R. Schlechter no. 18362, flowering in Oct. 1908.

[Ed.—no species notes.]

100. *Vanda* R. Br.

Beyond question this genus is connected rather closely with *Luisia* Gaud. through certain species such as *V. alpina* Lindl. and *V. cristata* Lindl., therefore I have placed it here. The interpretation of the genus, as in use today, is sometimes not quite clear and should be modified by exclusion of markedly divergent species to afford a better delimitation of the genus.

Only one species of this rather important genus is relevant to our Territory, viz. *Vanda Hindsii* Lindl., its most eastern representative. For a very long time this species was lost from sight completely, but a comparison of my sketches with the Type in Kew, probably collected by Capt. Hinds in British Papua, proved that my specimens were certainly identical with it. From Dutch New Guinea we have another species, *V. truncata* J.J. Sm. [Ed.—which must be regarded as a synonym of *V. Hindsii* Lindl.] The species is an inhabitant of tall trees, especially in the gallery-forests along the larger rivers.

1. *V. Hindsii* Lindl., in Hook. Journ. Bot. II (1843), p. 237.

Vanda truncata J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 38; in Nova Guinea VIII (1910) [1909], p. 121, t. XLI, fig. 137.

Kaiser-Wilhelms-Land: On trees on the Minjem [River], near the Minjem Gorge, alt. c. 100 m—R. Schlechter no. 17824, flowering in June 1908; on trees in the gallery-forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18371, flowering in Oct. 1908.

The close relationship of this species with *V. furva* Lindl. is quite apparent, but I am also of the opinion that it is specifically different since the lateral lobes at the base of the lip are smaller and rounder while the dorsal lobe is broader. The number of delicate keels on the lip, if they can be described as such at all, is difficult to establish. I have seen specimens with three, five and seven such small keels. The flowers are whitish on the outside, brown inside with a brown-red or red lip with small yellowish keels and white lateral lobes as well as a white column.

101. *Vandopsis* Pfitz.

In the 'Natuurkundig Tijdschrift voor Nederl. Indie' LXXII (1912), p. 1-72, J.J. Smith has criticised my views concerning the genus *Vandopsis* Pfitz. and its relatives; [Footnote: Fedde, Repertor. X (1911), pp. 196, 197.] stating that he disagrees with my circumscription and endeavouring to show that the distinctions are quite different from those I gave and accordingly I renamed too many. Here I certainly disagree with him and am afraid that he has insisted too much on one character which may be of very secondary importance, viz. the varying degree of attachment between column and labellum, i.e. whether the latter is movable or otherwise on the column. I fear now that all possible stages of transition are found between these two extremes and that the labellum is only movable in all species if it is pressed up and down, not as in *Bulbophyllum* where it falls backwards or forwards with every movement of the flower. In presenting my views I have stated already the points on which I especially rely for the distinctiveness of the two genera, and find that by a consideration of these characters, a more natural picture of such differences is given, than by arrangement of the species as published by J.J. Smith. I would like to add that the column in *Arachnis* (as I conceive it) is on an average longer than in *Vandopsis*. Likewise *Esmeralda* Rchb. f., and especially *Armodorum* Breda, Kuhl et v. Hass, with a very peculiar and distinct spur bent forward, are so strikingly different from *Arachnis*, that I do not think it right to unite these two genera with the latter. By the union of *Stauroopsis undulata* Benth. with *Vandopsis* Pfitz. a heterogeneous element would be introduced into this genus, and therefore I have left this plant out of consideration. I feel compelled to adhere to my already enunciated views.

The genus *Vandopsis* Pfitz., as thus constituted, contains, in addition to the species already mentioned by me, *V. Parishii* (Rchb. f.) Schltr. from Siam and Burma, likewise *V. Woodfordii* (Rolfe) Schltr. (*Stauroopsis Woodfordii* Rolfe) and *V. nagarensis* (Rchb. f.) Schltr. (*Sarcanthus nagarensis* Rchb. f.) from the Viti Islands [Fiji Islands]. J.J. Smith also mentions *V. praealta* (Rchb. f.) J.J. Sm., a species from Dutch New Guinea, which will have to be clarified.

In our Territory we know, at present, three species of the genus, of which two, viz. *V. Muelleri* (Krzl.) Schltr. and *V. Warocqueana* (Rolfe) Schltr. have been reported from the English part of the island. However, there is still a species, *V. Chalmersiana* F.v.M. et Krzl. where I am not enlightened sufficiently regarding the differences from *V. Warocqueana* (Rolfe) Schltr. In Dutch New Guinea, however, we know *V. Beccarii* (Rchb. f.) J.J. Sm. and *V. praealta* (Rchb. f.) J.J. Sm. which may belong here also.

V. Woodfordii (Rolfe) Schltr. (*Stauroopsis Woodfordii* Rolfe) is only known from the British Solomon Islands.

Of the species occurring here, *V. Warocqueana* (Rchb. f.) Schltr. is observed frequently along the sea-coast on tall *Calophyllum* trees, but penetrates also further inland at low altitude. The two other species occur in the gallery-forests of larger rivers, also only at lower altitudes, as epiphytes.

1. *V. Muelleri* (Krzl.) Schltr., in Fedde, Repertor. X (1911), p. 196.

Vanda Muelleri Krzl., in Österr. Bot. Zeitschr. (1894), p. 461.

Kaiser-Wilhelms-Land: On trees on the banks of the Wabe [River] at the foot of the Finisterre Range, alt. c. 100 m—R. Schlechter no. 18067, flowering in July 1908.

One of the most peculiar orchids I have ever seen. Out of a very thick, strong stem, reminiscent of the structure and leaves of *V. gigantea* (Lindl.) Pfitz., a 5 m tall inflorescence rises. This in time lignifies completely and the panicle clearly takes several years before it finishes flowering completely. Since the flowers only appear slowly and singly at long intervals, the plant, despite the enormous size of the panicle, always gives a dry, little attractive impression. The flowers are pale yellow with pale brown-spotted sepals and petals, the lip is white with yellow spots at the base, the lateral lobes have violet and brown markings and the column is white.

2. *V. Warocqueana* (Rolfe) Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 225.

Stauroopsis Warocqueana Rolfe, in Lindenia VII (1891), p. 65.

Cleisostoma Hansemannii Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 254.

Vandopsis Hansemannii J.J. Sm., in Natuurk. Tijdschr. Nederl. Ind. LXXII (1912), p. 8.

Kaiser-Wilhelms-Land: On trees in the forests at the mouth of the Waria [River], alt. c. 15 m—R. Schlechter no. 19935, flowering in July 1909.

Neu-Mecklenburg: On trees at the beach near Kabanut, alt. c. 10 m—R. Schlechter no. 14708, flowering in July 1902.

Neu-Lauenburg: On the island of Mioko—W. Micholitz, flowering in Oct. 1893.

Neu-Pommern: On trees at the beach near Mandres, alt. c. 10 m—R. Schlechter no. 13776, flowering in Nov. 1901.

There is no doubt, on inspection of the flower of the original specimen, that *Cleisostoma Hansemannii* Krzl. is identical with *V. Warocqueana* (Rolfe) Schltr. and that *V. Chalmersiana* F.v.M. et Krzl., also, hardly is different. The species is distributed in both the British and Dutch parts of New Guinea. The flowers are yellowish on the outside, whitish on the inside with red-brown freckles and the lip is white with red dots.

3. *V. longicaulis* Schltr., sp. nov.

Epiphytica, acaulis, dependens, usque ad 2 m longa; radicibus flexuosis, glabris; caule simplici, bene foliato, vaginis arcte amplexantibus rugulosis oblecto, c. 1 cm diametro; foliis patentibus, oblongo-ligulatis, obtuse et inaequaliter bilobatis, 16–20 cm longis, medio fere 3–4 cm latis; racemis patulis, laxe plurifloris, foliis aequilongis vel paulo brevioribus, pedunculo brevi, paucivaginatis, bracteis oblongoideo-cucullatis, obtusis, recurvulis, ovario multo brevioribus; floribus c. 4–7, patentibus, in genere satis magnis, glabris; sepalis late ovalibus, obtusis, basin versus spathulato-angustatis, c. 3 cm longis, lateralibus obliquis; petalis quam sepala similibus et paulo minoribus labello parvulo, cucullato, c. 1.4 cm longo, lobis lateralibus semiquadratis, obtusissimis, intermedio antico, lanceolato, acuminato, incurvo, intus alticarinato-incrassato; columna crassa, brevi; pollinibus oblique rhombeis, stipite oblongo, acuminato, glandula triangulo-transversa, antice rotundata; ovario cylindrico, glabro, c. 2 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18420, flowering in Oct. 1908.

According to J.J. Smith's interpretation, the species would belong to *Arachnis* Bl. However, everyone who inspects the flowers in closer detail will recognise the great similarity with *V. gigantea* (Lindl.) Pfitz., both in general appearance and in the lip structure.

The species is related most closely to *V. celebica* Schltr. and *V. breviscapa* (J.J. Sm.) Schltr. The flowers are whitish with large brown-red spots, the lip violet-pink in front, the column violet-pink with a white anther.

102. *Renanthera* Lour.

This small genus would appear to have reached its most eastern limits of distribution in New Guinea.

It is represented here only by a single species which, evidently, is distributed over the whole Territory, both in close proximity to the shore and in the hill-country up to an altitude of 500 m, where we meet it singly as an epiphyte. It is evident that the species, as in the case of most other members of this genus, prefers a great deal of sun.

1. *R. Edelfeldtii* F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 460.

Kaiser-Wilhelms-Land: On trees in the hills on the upper Nuru [River], alt. c. 300 m—R. Schlechter no. 14205, flowering in Feb. 1902; on trees in the hill forests on the Waube Creek (Waria District), alt. c. 500 m—R. Schlechter no. 14449 [Ed.—possibly 19449], flowering in May 1909.

Neu-Mecklenburg: On trees at the beach near Kabanut, alt. c. 15 m—R. Schlechter no. 14709, flowering in July 1902.

The species is found also in British Papua, being described initially from the vicinity of Port Moresby. The flowers are brown-red with red spots, the lip red with three yellow spots in the front.

103. *Ascoglossum* Schltr.

It has been pointed out repeatedly what extremely heterogeneous elements are found in the genera *Cleisostoma* Bl., *Saccolabium* Bl. and *Sarcanthus* Lindl. In this respect the state of affairs was similar to *Angraecum* Thou. and induced H.N. Ridley and myself to include all species belonging to this form-circle under the name *Saccolabium*. Now J.J. Smith has taken on the task of proposing a new arrangement which has long been necessary, but which could be carried out only after much study of the living material. How far this new division will agree with my views, I will explain later on. Here I would like only to establish a new genus which, in my opinion, is related more closely to *Renanthera* Lour. than to *Saccolabium* Bl. or *Cleisostoma* Bl. in which the plant in question generally has been placed.

Ascoglossum Schltr., gen. nov.

Sepala patentia, intermedium subunguiculato-ellipticum, lateralia distincte unguiculata, valde obliqua, margine inferiore medio angulato-dentata, intermedio aequilonga. Petala oblique elliptica, sepalis subaequilonga. Labellum sacciforme vel potius uteriforme, infra medium trilobatum, lobis lateralibus erectis, intermedio parvulo, ovato-lanceolato, acuto, utero lateraliter compresso, oblongoideo, medio constricto, dimidio apicali globoso-inflato. Columna semiteres, illae generis *Renanthera* Lour. similis, apoda. Stigma triangulum parvulum. Anthera late rhomboideo-cucullata. Pollinia oblique globosa vel latiovalia bipartita cum partitione postica minore, stipite lineari, glandula ampla subquadrata. Ovarium graciliter pedicellatum glabrum.

Planta epiphytica habitu generis *Renanthera* Lour.; radicibus flexuosis, dense sublepidotogrugulosis; caule stricto, rigido, dense foliato; foliis erecto-patentibus lineari-loratis, carnosocoriaceis; inflorescentiis longe pedunculatis, paniculatis, laxe multifloris; floribus speciosis, roseis, glabris.

Species 2 adhuc notae Novae Guinea et insulae Amboina incolae.

The genus has absolutely nothing in common with *Saccolabium* Bl. as I shall define it below although it is related more closely to a group formerly included in *Saccolabium* Bl., but now regarded as a special genus called *Ascocentrum* Schltr.*

The genus described here is distinguished from the latter, *Ascocentrum* Schltr., by

*This genus included principally the following species: *A. aurantiacum* Schltr. (*Saccolabium aurantiacum* Schltr.), *A. curvifolium* (Lindl.) Schltr. (*Saccolabium curvifolium* Lindl.) *A. miniatum* (Lindl.) Schltr. (*Saccolabium miniatum* Lindl.) and *A. ampullaceum* (Roxb.) Schltr. (*Saccolabium ampullaceum* Lindl.)

its habit with a branched inflorescence, by the clawed lateral petals [Ed.—sic], by the shorter column which is absolutely truncate against the labellum, whereas it gradually merges into the lip in *Ascocentrum* Schltr., and by the pollinarium.

As far as can be envisaged, the genus contains two species, viz. the one mentioned here and *Ascoglossum purpureum* (J.J. Sm.) Schltr. (*Saccolabium purpureum* J.J. Sm.) from Ambon.

1. *A. calopterum* (Rchb. f.) Schltr., comb. nov.

Saccolabium calopterum Rchb. f., in Gardn. Chron. II (1882), 520.

Cleisostoma cryptochilum F.v.M., in Wing's South. Sci. Record n. s. I (1885).

Saccolabium Schleinitzianum Krzl., in Engl. Bot. Jahrb. VII (1886), p. 440.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 600 m—R. Schlechter no. 18484, flowering in Oct. 1908.

The location given is, as far as I know, the first from the German Territory. It is known already both in British Papua and Dutch New Guinea. The flowers are dark rose-red.

104. *Dryadorchis* Schltr.

On the mountains of New Guinea, I found two small orchids occurring as rare mist-forest epiphytes, which at first I regarded as somewhat aberrant species of *Sarcochilus*, but which, after closer examination, I have established as Types of a new genus, as follows:

Dryadorchis Schltr., gen. nov.

Sepala conniventia, ovalia, obtusa, glabra, lateralia obliqua. Petala sepalis lateralibus similia conniventia. Labellum carnosulum, tripartitum, concavum, ecalcaratum, lobis lateralibus erectis, intermedio concavo vel cucullato crasse bigibbo, orbiculari, nunc margine anteriore barbellato-ciliato. Columna brevis, basi paulo angustata, omnino apoda, rostello brevi, bidentato. Stigma amplum apertum. Anthera reniformi-cucullata. Pollinia 2 globosa ut videtur fissa, stipite lineari antice paulo angustato, glandula parvula.

Plantae humiles epiphyticae, acaules; foliis falcato-ligulatis, obtusis; racemis dense pauci-vel multifloribus, folia fere aequantibus, pedunculo carnosulo, rhachi carnosula incrassata, angulata; bracteis parvulis; floribus succedaneis pedicello in rhachim paulo immersis.

Species 2 adhuc collectae montium Papuae indigenae.

This genus reminds one a little of *Sarcochilus* R. Br., but has a completely footless column and a firmly attached lip with a different structure, without a spur or definite sac. Only two very isolated species have been found.

1. *D. barbellata* Schltr., sp. nov.

Epiphytica, parvula, acaulis; radicibus filiformibus, glabris; foliis vulgo 3, subpatulis, falcato-ligulatis, obtusiusculis vel subacutis, 4–12 cm longis, medio fere 1–1.7 cm latis; racemo dense plurifloro, foliis subaequilongo, pedunculo carnosulo, angulato, rhachi incrassata, angulata; bracteis late deltoideis obtusis, pedicello in rachi paulo immerso bene brevioribus; floribus in affinitate mediocribus, succedaneis; sepalis ovalibus, obtusis, glabris, 5 mm longis, lateralibus obliquis; petalis oblique ovalibus obtusis, glabris, quam sepala subaequimagnis; labello trilobo, cucullato-concavo, lobis lateralibus erectis, quadratis, obtusis, intermedio orbiculari, obtusissimo, antice barbellato-ciliato, lateralibus aequimagno, basi callis 2 hippocrepiformibus divergentibus, dorso confluentibus ornato; columna, anthera et pollinia generis; ovario sessili, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18550, flowering in Oct. 1908; on trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19052, flowering in Jan. 1909.

The species is distinguished easily from *D. minor* Schltr. by the bearded hirsute lip with its humps. The white flowers are violet-pink on the inside and the lip has an orange-yellow callus.

2. *D. minor* Schltr., sp. nov.

Epiphytica, parvula, acaulis; radicibus filiformibus, glabris; foliis c. 3, falcato-ligulatis, apiculatis, subtus carinatis, glabris, subpatulis, 2.5–3.5 cm longis, medio fere 7–10 mm latis; racemis dense pauci-(2–5)-floris, foliis aequilongis, pedunculo carnosulo, angulato, rhachi brevi, incrassatula; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus in affinitate vix mediocribus, succedaneis; sepalis ovalibus obtusis, glabris, 3.5 mm longis, lateralibus obliquis; petalis late et oblique obovatis, obtusissimis, quam sepala paululo brevioribus; labello subcucullato-concavo, trilobo, lobis lateralibus, erectis, oblongo-quadratis, subtruncatis, intermedio suborbiculari obtuso, basi callis 2 oblongis donato, labello toto 2.75 mm longo, explanato inter apices loborum lateralium 3.25 mm lato, basi verrucis 5 ornato; columna generis, margine basali stigmati singulari modo ciliolata; anthera et pollinibus nondum notis; ovario subsessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16914, flowering in Nov. 1907.

I have discussed already above the main differences between *D. barbellata* Schltr. and this species. I would just like to draw attention to the peculiar hairs on the column at the lower margin of the stigma. I do not doubt that the two species are co-generic. The flowers of *D. minor* Schltr. are rose-red, paler inside and with brown-red spots.

105. *Saccolabium* Bl.

It has been pointed out repeatedly in recent years by J.J. Smith and myself that only a small number of species, which approach *Sarcochilus* R. Br. in the structure of their flowers, belong to *Saccolabium* Bl., but apart from other differences they can be well distinguished readily by their completely footless column. Having followed the example of J.J. Smith in a further re-arrangement of the redundant genus *Saccolabium* Bl., I find it necessary to restrict the genus to this small group, the constitution of which I will explain later on. The question of the future of the remaining species is to some extent answered in the genera which immediately follow and partly by a report which I hope to make in another place; but a number of them have been transferred to other genera, mainly by J.J. Smith.

The genus *Saccolabium* Bl. under this new arrangement is composed of the following six species: *S. pusillum* Bl., *S. rhopalorrhachis* (Rchb. f.) J.J. Sm. and *S. odoratissimum* J.J. Sm. from Java, *S. celebicum* Schltr. from the Celebes, *S. sarcochiloides* Schltr. from the Philippines and *S. papuanum* Schltr., the only species described here, from our Territory.

1. *S. papuanum* Schltr., sp. nov.

Epiphyticum, parvulum, brevicaulis; radicibus filiformibus, glabris; caule abbreviato, usque ad 3 cm longo, dense foliato, vaginis foliorum oblecto; foliis patentibus, ligulatis, obtusis, basin versus sensim paulo angustatis, 3–6 cm longis, medio vel supra medium 8–10 mm latis; racemis valde abbreviatis, sensim paucifloris, pedunculo cum rhachi brevissimis, carnosulis; bracteis parvulis, deltoideis, acutis, ovario subsessili multo brevioribus; floribus in sectione mediocribus, glabris, succedaneis; sepalis oblongis, obtusis, 5.5 mm longis, lateralibus subapiculatis, obliquis; petalis oblique oblongo-ligulatis, obtusis, basin versus paulo angustatis, sepalis subaequilongis; labello circuitu oblongo, sepalis paulo brevioribus, lobis lateralibus vix conspicuis, apice carnosulo, obtuso, subtus paulo conico-producto, calcare vel potius sacco oblongoideo obtuso, antrorsum spectante, fere in medium labelli longitudinaliter profundius sulcati; columna brevi, crassiuscula, rostello brevi, bidentato; anthera reniformi-cucullata; pollinibus globosis, stipite lineari subduplo longiore medio paululo dilatato, glandula suborbiculari, parvula; ovario cylindrico subsessili, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17166, flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18975, flowering in Dec. 1908.

The first true species of *Saccolabium* from New Guinea. The species is related most closely to *S. sarcochiloides* Schltr. from the Philippines, but differs in the clearly separated lip-sac which, as with the other true *Saccolabium* species, is located about in the middle of the lip. The flowers are yellow with a white labellum and lip-sac.

106. *Malleola* J.J. Sm. et Schltr.

The necessary, above-mentioned closer circumscription of *Saccolabium* Bl. has, of course, as its consequence, the distribution of the numerous remaining species among new or other genera. In a letter J.J. Smith has recently given me a new suggestion concerning a small group of species for which he proposed a joint publication, and has furnished already the above name *Malleola* [Ed.—J.J. Smith in Bull. Jard. Bot. Buitenz. XLV (1914), p. 150.] of which I have also made use. The genus adjoins *Robiquetia* Gaud., which follows under it, but is well distinguished by its smaller flowers, by the structure of the short hammer-like column, the more open lip with a grey funnel-shaped spur and the pollinia with stipes much widened towards the top.

Malleola J.J. Sm. et Schltr., gen. nov.

Sepala plus minus patentia oblonga. Petala sepalis similia, erectopatentia. Labellum calcariforme plus minus distincte trilobatum, lobis lateralibus parvulis, vulgo truncatis, intermedio parvo apice vulgo plus minus recurvulo, calcare cylindraceo-conico vel conico, rarius oblongoideo, dependente. Columna brevis, malleoliformis, crassa, apoda, rostello brevissimo, bipartito. Pollinia globosa plus minus fissa, stipite e basi tenui pollinia versus valde dilatata, glandula rotundata minuta. Anthera cucullata vulgo apiculata, glabra. Ovarium subsessile vulgo glabrum, cylindricum.

Plantae epiphyticae subacaulis vel caulescentes, foliatae; radicibus filiformibus, glabris; foliis ligulatis, glabris, textura crassiusculis vel tenuioribus; racemis laxae vel dense pluri-vel multifloris, dependentibus vel erecto-patentibus.

Species plures cognitae, autoribus sub nomine *Saccolabii* melius notae, a peninsula Malakka usque Novam Guineam distributae.

Already I have referred to the differences between this genus and *Robiquetia* Gaud. I will therefore merely remark that I have extended the genus a little wider than originally intended by J.J. Smith, not only to avoid the formation of too many genera, but likewise in order to keep the Type intended by J.J. Smith more clear. I divide *Malleola* J.J. Sm. et Schltr. into two sections:

§ 1. *Micranthobotrys* contains almost stemless small species, with more conical, wide open, hardly lobed labellum, more slender column and laterally hanging pollinia, which hang from the top of two rather short caudicles.

§ 2. *Eu-Malleola* with the larger number of species, all of which may form a distinct stem and have larger flowers than the previous section, with a lip usually more cylindrical and distinctly tri-lobed, a short thick column and pollinia situated erect on knife-like broad caudicles.

Later I will refer to the species belonging to the individual sections.

§ 1. *Micranthobotrys*

Apparently, this section contains only the three species enumerated here, which, moreover, have been recorded so far only from the locations mentioned.

With the exception of *M. microphyton* Schltr., the species apparently are found only in the lower hill-country along creeks and rivers and almost solely on thin branches of shrubs or low trees. I have often found them growing on last year's shoots, which may lead to the conclusion, as in many species of *Microtatorchis* and *Taeniophyllum*, that frequently the tiny plants begin to flower at the end of the first year.

It is possible that later on this section may prove to be a separate genus.

1. *M. microphyton* Schltr., comb. nov.

Saccolabium microphyton Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 228.

Kaiser-Wilhelms-Land: On shrubs alongside the mountain creeks near Kelel, alt. c. 300 m—R. Schlechter no. 16260, flowering in July 1907; on small trees in the

Maboro Range, alt. c. 700 m—R. Schlechter no. 19530, flowering in May 1909.

Neu-Mecklenburg: On trees in the mountain forests near Punam, alt. c. 500 m—R. Schlechter no. 15741 [Ed.—number invalid], flowering in July 1902.

With the better material now available two small tooth-like lateral lobes can be recognised on the labellum. The pollinia hang, as in the case of *M. pallida* Schltr., from caudicles almost bi-partite at the apex. The flowers are greenish with a white lip.

2. *M. pallida* Schltr., comb. nov.

Saccolabium pallidum Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 229.

Kaiser-Wilhelms-Land: On small trees on the Garup [River], at the foot of the Torricelli Range, alt. c. 100–150 m—R. Schlechter no. 14578, flowering in Apr. 1902; no. 20355, flowering in Sept. 1909.

The species is related very closely to the previous one, but is recognised by the slightly bent, more conical, shorter spur, which from the front appears blunt, and by the broader lip. The flowers are pale yellow with a white lip.

3. *M. rara* Schltr., sp. nov.

Epiphytica, pusilla, subcaulis; radicibus flexuosis glabris; foliis c. 4–6, erecto-patentibus, subfalcato-ligulatis, inaequaliter et obtuse bilobulatis, basin versus sensim paulo angustatis, 2.8–4.2 cm longis, medio fere 5–8 mm latis; racemis sublaxe 12–18 floris, leviter arcuatis, folia distincte (nunc subduplo) superantibus; pedunculo paucivaginulato, gracili foliis fere aequilongo; bracteis lanceolatis, acutis, ovario multo brevioribus; floribus minutis, tamen praecedentium distincte majoribus, glabris; sepalis oblongo-subspathulatis, obtusis, 2 mm longis, lateralibus obliquis; petalis anguste oblongo-ligulatis, basin versus paulo angustatis, sepalis subaequilongis; labello sepalis aequilongo, 1.85 mm medio lato, late conico-saccato, obtuso, limbo obscure 5-lobato, sacco 1.5 mm alto, obtuso; columna brevi, ovario subsessili, 2.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On small trees on the banks of the Garup [River], at the foot of the Torricelli Range, alt. c. 150 m—R. Schlechter no. 20365, flowering in Sept. 1909.

I had the possibility of comparing the plant, of which I have only a single flowering specimen, live with *M. pallida* Schltr.; it is larger in all segments and completely different in the lip. The flowers are yellow with a white lip.

§ 2. *Eu-Malleola*

This section represents the pure Type of the genus. Independently of J.J. Smith, I had, already in my investigations, placed the same species here, but I also came to the conclusion that several other former species of *Saccolabium* Bl., likewise, belong to this section. Since there was no further opportunity of collaborating with J.J. Smith concerning these species, I arranged them under *Malleola* on my own authority, whilst as species belonging to the genus, J.J. Smith and I have agreed that they should be transferred to this section, under our joint authorship. Besides the one described here as new, e.g. *M. wariana* Schltr., the following species belong to this section: *M. batakensis* (Schltr.) Schltr. (*Saccolabium batakense* Schltr.) from Sumatra, *M. cladophylax* (Schltr.) J.J. Sm. et Schltr. (*Saccolabium cladophylax* Schltr.) from German New Guinea, *M. gracilis* (Lindl.) Schltr. (*Saccolabium gracile* Lindl.) from Ceylon, *M. insectifera* (J.J. Sm.) J.J. Sm. et Schltr. (*Saccolabium insectiferum* J.J. Sm.) from Ambon, *M. kawakamii* (J.J. Sm.) J.J. Sm. et Schltr. (*Saccolabium kawakamii* J.J. Sm.) from Java, *M. palustris* (J.J. Sm.) J.J. Sm. et Schltr. (*Saccolabium palustre* J.J. Sm.) from Dutch New Guinea, *M. penangiana* (Hook. f.) J.J. Sm. et Schltr. (*Saccolabium penangianum* Hook. f.) from the hinterland of India and Borneo, *M. rosea* (Lindl.) Schltr. (*Saccolabium roseum* Lindl.) from Ceylon, *M. serpentina* [J.J. Sm. et Schltr.] (*Saccolabium serpentinum* J.J. Sm.) from Borneo, *M. Steffensii* (Schltr.) J.J. Sm. et

Schltr. (*Saccolabium Steffensii* Schltr.) from the Celebes, *M. undulata* (Ridl.) J.J. Sm. et Schltr. (*Saccolabium undulatum* Ridl.) from Perak and *M. Witteana* (Rchb. f.) J.J. Sm. et Schltr. (*Saccolabium Witteanum* Rchb. f.) from Java.

The three species found in our German part of New Guinea always occur as epiphytes on small trees or shrubs in shady places in the forests of the hill-country. One of them, *M. palustris* J.J. Sm. et Schltr., was described originally from Dutch New Guinea.

4. *M. palustris* J.J. Sm. et Schltr., comb. nov.

Saccolabium palustre J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 35; in Nova Guinea VIII (1910) [1909], p. 130 t. XLIV, fig. 147.

Kaiser-Wilhelms-Land: On small trees alongside the mountain creeks of the Albo [Hills], in the Minjem Valley, alt. c. 400 m—R. Schlechter no. 16171, flowering in June 1907.

The species is very similar to *M. cladophylax* J.J. Sm. et Schltr., but has smaller flowers, a straight spur and broader petals. The flowers are yellowish with red stripes on the inside of the sepals and petals.

5. *M. cladophylax* J.J. Sm. et Schltr., comb. nov.

Saccolabium cladophylax Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 226.

Kaiser-Wilhelms-Land: On trees in the forests on the slopes of the Torricelli Range, alt. c. 500 m—R. Schlechter no. 14397, flowering in Apr. 1902.

Above I have commented already on the differences between this species and *M. palustris* J.J. Sm.; the difference between it and *M. wariana* will be mentioned below. The flowers are whitish with red veins, the spur yellowish.

6. *M. wariana* Schltr., sp. nov.

Epiphytica, parvula, 10–25 cm longa; radicibus filiformibus, glabris; caule dense foliato, sensim elongato, vaginis foliorum striato-nervosis oblecto; foliis patentibus linearibus, apice oblique obtusiusculis, 5.5–10 cm longis, medio fere 7–10 mm latis; racemis decurvis, breviter pedunculatis, dense multifloris, ovoideo-cylindraceis, 2–4 cm longis, c. 1.5–2 cm diametro; bracteis lanceolatis, acutis, ovario brevioribus; floribus patentibus, glabris; sepalis ellipticis, subacutis, vix 5 mm longis, lateralibus obliquis, latioribus; petalis sepalis similibus subacutis, obliquis, vix 4 mm longis; labello uteriformi, calcare a facie compresso, apicem versus attenuato et recurvo, obtuso, c. 8 mm longo, lobis labelli lateralibus semiquadratis, parvulis, intermedio lanceolato acuto, apice revolutis, sepalorum apices haud attingentes; columna subquadrata, crassa; anthera apiculata; pollinia et stipite generis; ovario cylindrico, c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Waria [River], near Gobi, alt. c. 300 m—R. Schlechter no. 19558, flowering in May 1909.

The species probably is related most closely to *M. serpentina* J.J. Sm. et Schltr.; it differs from the previous two above in the larger flowers and the spur of the lip. The flowers are yellowish; the petals and sepals striped reddish.

107. *Porphyrodesme* Schltr.

Without causing confusion in the circumscription of the various genera which has just been made, it would not be possible to arrange the plant which we are about to consider. I therefore feel it necessary to make it the Type of a separate genus, which I characterise as follows:

***Porphyrodesme* Schltr., gen. nov.**

Sepala petalaeque ovalia vix patentia, similia. Labellum superum, oblongoideo-saccatum, limbo parvulo trilobato, ostio antice incrassationibus 2 obscuris caeterum pernudo. Columna perbrevis, glabra, suborbicularis, rostello adscendente bifido, stigmate mediocri. Anthera reniformi-cucullata. Pollinia 2 oblique rhomboidea, indivisa, stipite lineari, basi paulo sed distincte dilatato cum marginibus revolutis, glandula oblonga mediocri. Ovarium sessile cylindricum glabrum.

Planta epiphytica, rigida, subpatula; caule simplici bene foliato, vaginis foliorum rugulosis

obtecto; foliis erecto-patentibus, linearibus, subacutis, apicem versus sensim paulo attenuatis, crasse coriaceis, lucidis; inflorescentia pluriramosa paniculata, foliis aequilonga vel brevior, glabra, laxius multiflora; bracteis minutis, deltoideis; floribus minutis, inversis, glabris; panicula tota cum pedunculo, ramis, floribus et bracteis laete coccinea.

Species singula adhuc nota papuana.

If one imagines a *Renanthera* with very narrow, almost pointed leaves; with very much shortened red inflorescences of tiny, shining, scarlet-red flowers, a picture of our plant is then before you. The genus stands about midway between *Renanthera* Lour. and *Robiquetia* Gaud. and it is difficult to say which of the two it resembles most; nevertheless it stands quite isolated, owing to the extremely small flowers which are hardly larger than those in most species of *Schoenorchis* Bl.

1. *P. papuana* Schltr., nom. nov. [Ed.—nom. et stat. nov.]

Saccolabium porphyrodesme Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 229.

Kaiser-Wilhelms-Land: On isolated trees on the hills on the upper Nuru [River], alt. c. 300 m—R. Schlechter no. 14206, flowering in Feb. 1902; on tall exposed trees of the hill forests on the Kaulo [River], alt. c. 300 m—R. Schlechter no. 16879, flowering in Nov. 1907.

The plant clearly stands quite isolated. It is noticeable that it selects the same locations as the majority of *Renanthera* species. It has been mentioned above that the whole inflorescence is a lustrous red.

108. *Robiquetia* Gaud.

This genus, which was known formerly only from a sketch by its author, has been re-established recently by J.J. Smith (In Natuurk. Tijdschr. Nederl. Ind. LXII (1912), p. 42.), because it became necessary to divide the extremely heterogeneous genus *Saccolabium* Bl. to prevent a confusion still greater than that already existing. I was pleased when I saw that a better grouping of the plants related to *Saccolabium* and *Sarcanthus* was possible and although the genera do not appear to be defined as closely as desirable, I have not only recognised the advantages of this new division, but have, myself, attempted to continue on the same lines in dealing with the classification of *Sarcanthinae*. So I would like to add to the list of nine *Robiquetia* species published by J.J. Smith a few more species which, in my opinion, certainly belong here. These are: *R. Bertholdii* (Rchb. f.) Schltr. (*Saccolabium Bertholdii* Rchb. f.) from the Viti [Fiji] Islands], *R. compressa* (Lindl.) Schltr. (*Saccolabium compressum* Lindl.) from the Philippines, *R. crassa* (Ridl.) Schltr. (*Saccolabium crassum* Ridl.) from Borneo and *R. Fürstenbergiana* Schltr. (*Saccolabium Fürstenbergianum* Schltr.) from Siam. Apart from the species described here the genus already comprises 13 species. Apparently, the centre of dispersion for the genus is in Papuasias, for, besides the species enumerated here, we know from that region *R. Mooreana* (Rolfe) J.J. Sm. (*Saccolabium Mooreanum* Rolfe) from British Papua and *R. squamulosa* J.J. Sm. from Dutch New Guinea.

The species known from our Territory at present are chiefly epiphytes of the mist-forests. Only a few, like *R. Mooreana* (Rolfe) J.J. Sm., have their habitats in the forests of the hill-country.

1. *R. Mooreana* (Rolfe) J.J. Sm., in Natuurk. Tijdschr. Nederl. Ind. LXXII (1912), p. 44.

Saccolabium Mooreanum Rolfe, in Kew Bull. (1893), p. 64.

Saccolabium Sayerianum F.v.M. et Krzl., in Österr. Bot. Zeitschr. XLIV (1894), p. 253.

Saccolabium Sanderianum Krzl., in Xen. Orch. III (1894), p. 134, t. 276, II.

Saccolabium Kerstingianum Krzl., in K. Schum. et Laut., Fl. Dtsch. Schutzgeb. Süds. (1901), p. 251.

Kaiser-Wilhelms-Land: On trees in the forests near Paub Village in the Eitape District, alt. c. 50 m—R. Schlechter no. 14599, flowering in Apr. 1902; on trees in the high forest on the Nuru River—Kersting no. 2399; on trees in the forests on the Djamu [River], alt. c. 250 m—R. Schlechter no. 17579, flowering in Apr. 1908; on trees in the forests on the Maijen [River], alt. c. 200 m—R. Schlechter no. 18076, flowering in July 1908.

This very characteristic species has been described as new by Kränzlin no fewer than three times, without his recognising their identity with *S. Mooreanum* Rolfe. The species stands somewhat isolated in the section, but clearly is related to *R. Fürstenbergiana* Schltr. The flowers are a dark rose-red with darker tips, whilst almost completely white varieties also are reported to occur.

2. *R. gracilistipes* (Schltr.) J.J. Sm., in Natuurk. Tijdschr. Nederl. Ind. LXXII (1912), p. 43.

Saccolabium gracilistipes Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 227.

Saccolabium squamulosum J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908), p. 35; in Nova Guinea VIII (1910) [1909], p. 131 t. XLIV, 148.

Robiquetia squamulosa J.J. Sm., in Natuurk. Tijdschr. Nederl. Ind. LXXII (1912), p. 45.

Kaiser-Wilhelms-Land: On trees on the banks of the upper Djamu [River], alt. c. 600 m—R. Schlechter no. 17343, flowering in Feb. 1908; on trees in the forests of the Bismarck Range, alt. c. 800 m—R. Schlechter no. 13948, flowering in Jan. 1902; on trees on the mountains in the Waria Valley, alt. c. 600 m—R. Schlechter no. 17420, flowering in Mar. 1908.

I do not for a moment doubt that *R. squamulosa* J.J. Sm. is identical with the species I initially described. The species is found distributed in the hill-country and reaches up as far as the lower boundary of the mist-forest. The flowers are yellow, on the inside closely spotted with brown-red; the lip is golden yellow with a paler spur.

3. *R. camptocentrum* (Schltr.) J.J. Sm., in Natuurk. Tijdschr. Nederl. Ind. LXXII (1912), p. 43.

Saccolabium camptocentrum Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 225.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14489, flowering in Apr. 1902; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17495, flowering in Mar. 1908.

The following species is related very closely to this one, but is distinguished by shorter flowers with a longer, more hooded spur, the shape of the pollinia and the still stronger growth. The flowers are yellow, with brown-red spots on the inside.

4. *R. hamata* Schltr., sp. nov.

Epiphytica, valida, patula; racicibus flexuosis, glabris; caule simplici, valido, bene foliato, paulo compresso, 1.3–1.8 cm diametro; foliis erecto-patentibus, oblongo-ligulatis, obtuse et inaequaliter bilobulatis, 20–25 cm longis, medio fere 3–3.5 cm latis; racemo pendulo, folio aequilongo vel paulo longiore, cylindrico, elongato, c. 2.2 cm diametro, pedunculo paucivaginulato, tereti, c. 15 cm longo; bracteis recurvis, lanceolatis, acuminatis, ovario bene brevioribus; floribus patentibus, glabris; sepalis oblongis, obtusis, 5.5 mm longis, lateralibus obliquis; petalis oblique ellipticis, obtusis, sepalis paululo brevioribus; labello trilobo, lobis petalis aequilongo, lobis lateralibus oblique globosis, erectis, obtusissimis, intermedio paululo tantum longiore ovato-triungulo subacuto, calcare cylindraceo, apice hamato, obtuso, c. 1.4 cm longo; columna perbrevis, subquadrata; anthera latiovato-cucullata; polliniis ellipsoideis, stipite fere fere 3-plo brevior, basin versus sensim paulo dilatato, glandula rotundata paululo latiore; ovario cylindrico minute squamuloso, c. 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17113 (TYPE), flowering in Jan. 1908; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 19026, flowering in Dec. 1908.

The species is related closely to *R. camptocentrum* (Schltr.) J.J. Sm., but is distinguished by smaller flowers with a more hook-shaped spur, and the lip with a shorter middle lobe. The flowers are red-brownish with darker spots.

109. *Schoenorchis* Bl.

After J.J. Smith had united this Blumean genus with *Saccolabium* Bl. in 1906, he found it necessary to re-establish it in a somewhat enlarged form. Since he has expressed his views so fully about the genus, it is superfluous for me to enter into detail here. I need only remark that I agree with his explanations about *Schoenorchis* Bl. Besides the ten species enumerated by him, I desire to add the following: *S. nivea* (Lindl.) Schltr. (*Saccolabium niveum* Lindl.) and *S. filiformis* (Lindl.) Schltr. (*Saccolabium filiforme* Lindl.) from Ceylon; and also *S. hainanensis* (Rolfe) Schltr. (*Saccolabium hainanense* Rolfe) from Hainan.

The only species recorded from Papuasias was *S. plebeia* J.J. Sm. from Dutch New Guinea. To this I can now add only two more species, both of which occur in the forests of the hills as epiphytes and ascend to the lower mist-forest formation.

1. *S. densiflora* Schltr., sp. nov.

Epiphytica, pusilla; radicibus filiformibus, glabris; caule simplici, arcuato, bene foliato, usque ad 15 cm longo; foliis patentibus, subulato-filiformibus, superne leviter sulcatis, apiculatis, 3–5 cm longis, 1.5–2 mm diametro; spicis dense multifloris, secundis, folia nunc aequantibus, strictis, usque supra basin floriferis; bracteis deltoideis, ovario brevioribus; floribus minutis, glabris; sepalis ovalibus, obtusis, 1.75 mm longis, lateralibus minute apiculatis, angustioribus; petalis oblique oblongis, obtusissimis, basin versus paulo angustatis, sepalis subaequilongis; labello circuitu oblongo, sepalis aequilongo, tertia parte anteriore trilobato, lobis lateralibus brevissimis, angustis, intermedio multo majore ovato, lateraliter subtus compresso, calcare oblongoideo, incurvulo, dorso medio paululo ampliato, 1.1 mm longo; columna brevi, utrinque unidentata, rostello alte bipartito, amplo; anthera antice leviter producta, obtusa; pollinibus globosis, stipite anguste lineari subduplo longiore, glandula oblonga stipiti aequilonga; ovario sessili, c. 1.5 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 600 m—R. Schlechter no. 17316 (TYPE), flowering in Feb. 1908; on trees on the Schibruba [Creek] near Toliba, alt. c. 300 m—R. Schlechter no. 18963, flowering in Dec. 1908; on trees in the forests of the Mimi [Mountain] (Waria District), alt. c. 600 m—R. Schlechter no. 19894, flowering in July [Ed.—possibly June] 1909; on trees in the forests on the Maboro Range, alt. c. 600 m—R. Schlechter no. 19502, flowering in May 1909.

The species is closest to *S. subulata* (Schltr.) J.J. Sm. from the Celebes, but is different in the flowers, particularly in the lip. The flowers are white, lightly suffused with red.

var. *abbreviata* Schltr., var. nov.

Differt a forma typica foliis magis patentibus; spicis multo brevioribus; bracteis ovarium superantibus; forsitan species distincta.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20159, flowering in Sept. 1909.

This variety may prove later to be a separate species. The flowers are white.

2. *S. sarcophylla* Schltr., sp. nov.

Epiphytica, erecta, pusilla, usque ad 8 cm alta; radicibus filiformibus, glabris; caule simplici,

crassiusculo, bene foliato, usque ad 5 cm longo, vaginis foliorum rugulosis oblecto, c. 3.5 mm diametro; foliis erecto-patentibus, anguste linearibus, obtusiusculis, semitereti-carnosis, 3–4 cm longis, c. 3–4 mm latis; inflorescentiis paniculatis, pauciramosis, folia dimidio vel plus excedentibus, laxe pluri- vel multifloris; bracteis deltoideis, minutis; floribus minutis, glabris; sepalis ellipticis, obtusis, minute apiculatis, 1.25 mm longis, lateralibus obliquis; petalis oblique ovalibus, obtusissimis, quam sepala paululo brevioribus; labello sepala paulo superante, circuitu oblongo-ligulato, ante ostium calcaris gibbo conico minuto ornato, lobis lateralibus parvulis, abbreviatis, intermedio oblongo, obtuso, calcare oblongoideo, obtuso, c. 0.5 mm longo; columna brevi, dentibus lateralibus subinconspicuis; anthera rotundato-cucullata, antice adscendente; polliniis oblique globosis, stipite subaequilongo semigloboso, glandula oblonga quam stipes duplo longiore; ovario cylindraceo, glabro, c. 1.25 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests above the Djamu Gorge, alt. c. 600 m—R. Schlechter no. 16815, flowering in Nov. 1907.

A species with branched inflorescences most closely related to *S. nivea* (Lindl.) Schltr. and *S. paniculata* Bl., but easily distinguished by the smaller dimensions in all segments. The flowers are white.

110. *Pomatocalpa* Breda

When J.J. Smith succeeded in making a better circumscription of the former genus *Cleisostoma* Bl. under the name of *Pomatocalpa* Breda, I am obliged to follow him and recognise the reinstated *Pomatocalpa* Breda as a genus.

Since he has arranged the species of the genus, it is unnecessary for me to repeat it or to deal again here with their distribution.

According to my more recent observations the genus is known to be represented in New Guinea by only four species, viz. *P. firmulum* (Rchb. f.) J.J. Sm. and *P. incurvum* J.J. Sm. from Dutch New Guinea and *P. marsupiale* (Krzl.) J.J. Sm. and *P. leucanthum* Schltr. from German New Guinea. I now have to describe two more species so that the genus in German New Guinea will then be represented by four species.

1. *P. leucanthum* Schltr., comb. nov.

Saccolabium leucanthum Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 226.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 400 m—R. Schlechter no. 17208, flowering in Jan. 1908; on trees on the banks of the upper Schumann River, alt. c. 400 m—R. Schlechter no. 13817, flowering in Dec. 1901; on trees in the forests near Kubai, in the Kenejia Valley, alt. c. 250 m—R. Schlechter no. 18933, flowering in Dec. 1908.

The species is related closely to *P. Kunstleri* (Hook. f.) J.J. Sm. and *P. Merrillii* Schltr. (*Cleisostoma Kunstleri* Ames nec Hook. f.), but specifically well distinguished from both. The flowers are white.

2. *P. potamophilum* Schltr., sp. nov.

Epiphyticum, subacaule; radicibus flexuosis, glabris; foliis ligulatis, inaequaliter et obtuse bilobulatis, glabris, erecto-patentibus, 9–17 cm longis, 1.3–1.5 cm latis; racemis valde abbreviatis, usque ad 3 cm longis, dense plurifloris; bracteis parvulis, obtusis, ovario multo brevioribus; floribus in genere inter minores, glabris; sepalis patentibus, oblongis, obtusis, 5.5 mm longis, lateralibus obliquis paulo latioribus; petalis oblique ligulatis, obtusis, sepalis subaequilongis; labello sepalis brevioribus, lobis lateralibus semiquadratis, truncatis, intermedio subreniformi-rhombeo, obtuso, nunc leviter ruguloso, calcare subgloboso obovoideo, obtuso, c. 4 mm alto, ligula in ostio lata 2–3-dentata, glabra; columna brevi, crassa; anthera reniformi-cucullata; polliniis globosis, stipite gracili dimidio longiore, glandula lanceolata, minuta; ovario cylindrico, glabro, 3 mm longo.

Kaiser-Wilhelms-Land: On small trees and shrubs on the Minjem [River], near Kelel, alt. c. 200 m—R. Schlechter no. 16312, flowering in July 1907; on trees on the Saki [River], alt. c. 250 m—R. Schlechter no. 18287, flowering in Sept. 1908.

The species is related to *P. Mannii* (Hook. f.) J.J. Sm., but has a smaller inflorescence and much broader spur. The flowers are yellow with brown spots and a white lip.

3. *P. marsupiale* (Krzl.) J.J. Sm., in *Natuurk. Tijdschr. Nederl. Ind.* LXXII (1912), p. 32.

Cleisostoma marsupiale Krzl., in K. Schum. et Holtr., *Fl. Kaiser-Wilhelms-Land* (1889), p. 34.

Saccolabium sphaeroceras Schltr., in K. Schum. et Laut., *Nachtr.* (1905), p. 230.

Pomatocalpa sphaeroceras J.J. Sm., in *Natuurk. Tijdschr. Nederl. Ind.* LXXII (1912), p. 36.

Pomatocalpa orientale J.J. Sm., in *Natuurk. Tijdschr. Nederl. Ind.* LXXII (1912), p. 36.

Kaiser-Wilhelms-Land: On *Maniltoa* near the second Augusta River Station—Hollrung no. 743, flowering in Sept. 1886; in the forests near the Kaulo Base, alt. c. 250 m—R. Schlechter no. 16976, flowering in Dec. 1907; on trees in the gallery-forests on the Ramu and Keneja [Rivers], alt. c. 150 m—R. Schlechter no. 14092, flowering in Jan. 1902; no. 18424, flowering in Oct. 1908; on trees in the forests on the Waube [Creek] (Waria District), alt. c. 400 m—R. Schlechter no. 19454, flowering in May 1909.

I have no doubt that, at least so far as the New Guinea plant is concerned, *P. orientale* J.J. Sm. belongs here. It is probable that the species will be combined with *P. firmulum* (Rchb. f.) J.J. Sm. in which case the latter would gain the priority. *P. Koordersii* J.J. Sm. is related very closely to this species. The sepals and petals are greenish yellow, frequently with delicate brownish spots; the lip is golden yellow.

4. *P. lasioglossum* Schltr., sp. nov.

Epiphyticum, brevicaulum, erectum; radicibus flexuosis glabris; caule usque ad 8 cm alto, dense foliato, vaginis foliorum substriatis obtecto, c. 4 mm diametro; foliis patentibus, ligulatis, inaequaliter et obtuse bilobulatis, carnosulis, 7–13 cm longis, 0.8–1.6 cm latis; racemis erectis nunc 1–2-ramosis, folia aequantibus vel superantibus, laxe 10–20-floris; bracteis deltoideis, acutis, ovario multo brevioribus; floribus in genere mediocribus, erecto-patentibus; sepalis oblongis, obtusis, basin versus paulo angustatis, glabris, 5 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, apiculatis, sepalis paulo brevioribus; labello circuitu subquadrato-cuneato, trilobato, petalis brevioribus, lobis lateraribus oblique quadratis, antice acutangulis, intermedio triangulo, subactuto, lateralibus vix longiore, sacco subquadrato-globo a dorso compresso, intus dorso ligula oblonga bilobulata ornato, antice (intus) dense puberulo, gibbis 2 puberulis ante ostium; columna glabra, brevi, crassa; anthera reniformi-cucullata, glabra; pollinibus oblique globosis, stipite lineari basi apiceque paulo angustato, glandula minuta, semioblunga; ovario sessili, cylindrico, glabro, c. 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20156, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17276 (TYPE), flowering in Feb. 1908; on trees in the forests of the Finisterre Range, alt. c. 1200 m—R. Schlechter no. 19148, flowering in Jan. 1909.

On account of the hairy inner lip, the species is very isolated and in a way shows a leaning, in a wider sense, towards the genus *Trichoglottis* Bl. However, it does not belong to that genus in the way that it is regarded today. The flowers are greenish with brown spots, the lip is white, and the anther yellow.

111. *Sarcanthus* Lindl.

At present, only a few species of the genus, which have been recorded from New Guinea, are available for examination, such as *S. bicornis* J.J. Sm. and *S. quinquefidus* Schltr. of which the former is distributed more widely, while the latter appears to be restricted to the Bismarck Archipelago.

From my remarks about the previous genera it will become clear as to what induced me to accept *Sarcanthus* Lindl. as a genus, especially after the exclusion of certain heterogeneous elements by the division of *Saccolabium* Bl. From a few remarks by J.J. Smith, I gather that he is inclined to approve of the revival of *Carteretia* A. Rich., but in this I cannot agree with him, for it may happen that for the sake of small deviations in individual species, many new genera would have to be established in future. At present I cannot discover any differences sufficient to justify the separation of *Sarcanthus* Lindl. and *Carteretia* A. Rich., neither indeed as regards the habit, which is subject to great variations, nor in the characters of the flowers.

To the two Papuan species of *Sarcanthus* mentioned above, I can now add two more, each of them resembling one of the first mentioned.

1. *S. bicornis* J.J. Sm., in Bull. Dep. Agr. Ind. Néerl. XIX (1908); in Nova Guinea VIII (1909), p. 123, t. XLII, fig. 139.

Kaiser-Wilhelms-Land: On trees in the forests on the Mudjene [River], near Rabo, alt. c. 400 m—R. Schlechter no. 16936, flowering in Dec. 1907; on trees in the forests on the Djamu [River], alt. c. 600 m—R. Schlechter no. 17314, flowering in Feb. 1908; on trees in the mountain forests near Jaduna, alt. c. 200 m—R. Schlechter no. 19247, flowering in Apr. 1909; on trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 800 m—R. Schlechter no. 19820, flowering in June 1909.

I do not doubt that Smith's species is present here, although my assessment of the flowers differs slightly from that of the author, thus the lateral lobes are slightly shorter and the calli in the lip are slightly different.

The flowers are white, the labellum has a violet-blue middle as well as lateral lobes.

2. *S. litoreus* Schltr., sp. nov.

Epiphyticus, pendulus, usque ad 45 cm longus; radicibus filiformibus, flexuosis, glabris; caulibus dense foliatis, vaginis foliorum dense rugulosis obtectis, c. 6 mm diametro; foliis erecto-patentibus, loratis, inaequaliter ac obtuse bilobulatis, carnosulis, 11–17 cm longis, medio fere 1.5–1.7 cm longis; racemis pendulis, graciliter pedunculatis, sublaxe 15–20-floris, foliorum longitudine vel brevioribus; bracteis deltoideis, acutis, ovario multo brevioribus; floribus in genere vix inter mediocres, glabris; sepalis patentibus, ellipticis, obtusis, 4 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, sepalis bene brevioribus, c. 3.5 mm longis; labello trilobo, petalis fere aequilongo, lobis lateralibus erectis, oblique rhombeis, margine superiore sublobulatis, intermedio oblongo, obtuso, bene longiore, calcare leviter recurvo, conico, obtuso, intus dorso callo brevi trilobulato ornato, intus fauce antice septo lamelliformi donato; anthera ovato-cucullata, subacuminata, basi subcordata; pollinibus globosis, stipite tenui, pollinia versus paulo ampliata, glandula minuta, orbiculari; ovario-cylindrico, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land; On trees at the mouth of the Waria [River], alt. c. 10 m—R. Schlechter no. 19960, flowering in July 1909.

Being endemic to New Guinea, the species can be compared only with *S. bicornis* J.J. Sm. It is not difficult to distinguish by the broader leaves and the flower characters. The flowers are greenish yellow, the lip white with a small violet spot on each lateral lobe.

3. *S. quinquefidus* (Lindl.) Schltr., comb. nov.

Carteretia paniculata A. Rich., Sert. Astrol. (1830) p. 10, t. 4.

Saccolabium quinquefidum Lindl., in Hook., Journ. Bot. II (1843), p. 238.

Gastrochilus quinquefidus O. Ktze., Rev. Gen. II (1891), p. 661.

Cleisostoma Micholitzii Krzl., in Österr. Bot. Zeitschr. XLIV (1895), p. 462.

Saccolabium paniculatum (A. Rich.) Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 228.

Neu-Mecklenburg: Near Port Carteret—Lesson; on trees at the beach near Karu, alt. c. 10 m—R. Schlechter no. 14624, flowering in July 1902.

Neu-Lauenburg-Group: On the main island—Micholitz, flowering in Oct. 1893.

There is no doubt that *Cleisostoma Micholitzii* Krzl. and Richard's plant are identical, but in my opinion it is not warranted to maintain it as a separate genus. Since a valid *Sarcanthus paniculatus* J.J. Sm. is present already, I have had to choose the second name for the species. The sepals and petals are yellow with a broad brown-red margin, the lip is white with violet markings.

4. *S. robustus* Schltr., sp. nov.

Epiphyticus, validus, erectus; radicibus flexuosis, glabris; caule crasso, dense foliato, usque ad 30 cm alto, c. 1.5 cm diametro, vaginis foliorum lucidis oblecto; foliis erecto-patentibus vel subpatentibus, late ligulatis, inaequaliter et obtuse bilobulatis, lucidis, usque ad 17 cm longis, medio fere 3.5–4 cm latis, crasse coriaceis; inflorescentiis perlonge pedunculatis, pluriramoso-paniculatis, c. 50 cm altis; pedunculo paucivaginulato; bracteis minutis, deltoideis, ovario multo brevioribus; floribus parvulis, glabris; sepalis late oblongis, obtusis, c. 4 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, subacutis, sepalis paulo brevioribus; labello sepalis aequilongo, 5-lobo, lobis lateralibus posterioribus dentiformibus acutis, parvulis, anterioribus plus duplo majoribus divaricatis subfalcato-lanceolatis, obtusiusculis, intermedio ovali apice breviter exciso, majore, porrecto, sacco late conico obtuso, c. 2.5 mm alto, intus dorso ligula apice semilunata ornato, intus facie septo satis alto medio calloso-incrassato donato; columna brevi, crassa; anthera reniformi-cucullata, subrostrata; polliniis obovoideis, stipite anguste lineari, paulo longiore, glandula suborbiculari, minuta; ovario sessili, cylindrico, glabro, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the hill-forests near the Kaulo Base, alt. c. 350 m—R. Schlechter no. 17517, flowering in Apr. 1908.

This species is related fairly closely to *S. quinquefidus* (Lindl.) Schltr., and I initially wanted to consider it as a variety, but the leaves are shorter and broader and both the lip and the pollinia show important differences. The flowers are yellow-green with pale brown-margined segments, the lip is white with red-violet longitudinal stripes.

112. *Camarotis* Lindl.

Consequent upon a more exact revision of *Sarcanthus* Lindl., King and Pantling have advocated quite rightly the reinstatement of the genus *Camarotis* Lindl. Recently, the question was treated in more detail by J.J. Smith (Footnote: In *Natuurk. Tijdschr. Nederl. Ind.* LXXII (1912), p. 26), who has given an arrangement of the species belonging to the genus, of which he enumerates eleven species. To these I would like to add a twelfth, viz. *C. macrosepala* Schltr. (*Sarcochilus macrosepalus* Schltr.).

The only species occurring in our Territory is *C. papuana* J.J. Sm., which I have collected only once, on isolated trees in the hill-country. The species has been found also under similar conditions in Dutch New Guinea.

1. *C. papuana* J.J. Sm., in *Natuurk. Tijdschr. Nederl. Ind.* LXXII (1912), p. 28.

Kaiser-Wilhelms-Land: On trees on the hills on the Waube [Creek] (Waria District), alt. c. 500 m—R. Schlechter no. 19459, flowering in May 1909.

The species is related quite closely to *C. callosa* (Bl.) J.J. Sm. but differs in the slightly less bent lip-sac. The flowers are yellow with a white lip and column.

113. *Trichoglottis* Bl.

The genus in its present form seems to me, as in the case of *Saccolabium* Bl., to contain rather heterogeneous elements and is in need of a further division. However, since we

have to deal only with species of the pure *Trichoglottis* Bl. in New Guinea, I will not consider this question any further at present. The only species known to me from New Guinea are the three mentioned here. Two of these, *T. papuana* Schltr. and *T. sororia* Schltr., have been recorded also from Dutch New Guinea.

Of the species occurring in our own Territory, *T. littoralis* Schltr. is a typical coast epiphyte, while its relative *T. papuana* Schltr. is an epiphyte of the hill-forests and reaches to the lower levels of the mist-forest formation. Similar remarks apply to *T. sororia* Schltr.

1. *T. littoralis* (Footnote: loc. cit. sphalm. 'littoralis') Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 230.

Neu-Mecklenburg: On trees at the beach between Bol and Tandes, alt. c. 5 m—R. Schlechter no. 14619, flowering in June 1902.

The species is related fairly closely to the following one, but differs in the larger leaves and in the labellum. The flowers are white with a red-dotted lip.

2. *T. papuana* Schltr., sp. nov.

T. flexuosa J.J. Sm., in Nova Guinea VIII (1909), p. 125, t. XLII, fig. 140 (nec Rolfe).

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17297, flowering in Feb. 1908; on trees in the hill forests near Pema on the Waria [River], alt. c. 250 m—R. Schlechter no. 19401, flowering in May 1909.

Since this species has been described already in detail by J.J. Smith, a new description is superfluous. It is specifically different from *T. flexuosa* Rolfe with which J.J. Smith had identified it. The flowers are white with pale brown-spotted sepals and petals, the lip with rose-red spots.

3. *T. sororia* Schltr., sp. nov.

Epiphytica, patula, usque ad 50 cm longa; radicibus filiformibus, flexuosis, glabris; caulibus simplicibus vel parum ramosis, dense foliatis, c. 3 mm diametro, vaginis foliorum striato-nervosis obtectis; foliis subpatentibus, anguste ligulato-lanceolatis, subacutis, 7–11 cm longis, medio fere 1.2–1.5 cm latis; inflorescentiis brevissimis, subsessilibus, paucifloris; bracteis deltoideis, minutis, ovario multo brevioribus; floribus medio cribus, succedaneis, glabris; sepalis patentibus, 8 mm longis, intermedio oblongo obtusiusculo, lateralibus oblique rhombeo-ovalibus obtusis; petalis oblique ligulatis, subacutis, basin versus paulo angustatis, sepalis paulo brevioribus; labello 5-lobato, sepalis fere aequilongo, lobis lateralibus posterioribus parvulis, oblique rhombeis truncatis, anterioribus duplo majoribus rhombeo-quadratis, margine plus minusve undulato-crenatis, lobo intermedio carnoso, oblongo, obtusiusculo, carinato-incrassato, calcare brevi cylindraceo-conico, obtuso, leviter incurvo, intus dorso ligula linearī, obtusa donato, intus facie calloso-incrassato; columna brevi, crassa; anthera rhombeo-cucullata, dorso 3-gibba, apice acuta; pollinii 4 aequimagnis, stipite e basi filiformi cucullato-dilatato, plus duplo longiore, glandula minuta rotundata; ovario cylindrico, glabro, breviter pedicellato, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Djamu [River], alt. c. 300 m—R. Schlechter no. 16576 (TYPE), flowering in Sept. 1907; on trees in the forests at the foot of the Bismarck Range, alt. c. 150 m—R. Schlechter no. 18483, flowering in Oct. 1908; on trees in the forests near the Saugueti Base, alt. c. 300 m—R. Schlechter no. 18885, flowering in Nov. 1908; on trees in the forests near the mouth of the Waria [River], alt. c. 30 m—R. Schlechter no. 19956, flowering in July 1909; on trees on the Dscheregi [Mountain] on the Waria [River], alt. c. 400 m—R. Schlechter no. 17426, flowering in Mar. 1908.

I am not quite sure whether perhaps several species exist under the above-listed specimen numbers, or whether only forms of a species. To maintain the purity of the Type species I have prepared the description particularly from specimen no. 16576.

The species is completely different from *T. celebica* Rolfe, even though closely related to it. It is recognised in outward appearance by the larger leaves with a different apex. I believe I am correct in assuming that the plant referred to by J.J. Smith as *T. celebica* Rolfe in 'Nova Guinea' VIII p. 125, belongs here, but I am not completely certain since I have not seen the specimens. The flowers are white with pink transverse stripes and a pure white lip.

114. *Hymenorchis* Schltr.

During my last stay in New Guinea, in January 1908, I found a small orchid evidently belonging to the *Sarcanthinae* with definitely toothed leaves and flowers of such a delicate texture that I was perplexed when asked the question 'In which genus should this species be placed?' I marked it then as 'new genus' and later on succeeded in finding some more species belonging to it, all of them bearing the same distinctive characters so that at last I left New Guinea with a prize of six different species of this peculiar genus. Later on I was able to determine in *Saccolabium javanicum* (Teijsm. et Binnend.) J.J. Sm., the only described representative of the genus, which I called *Hymenorchis* Schltr. on account of the very thin delicate nature of the flowers.

Hymenorchis Schltr., gen. nov.

Sepala subpatentia, oblonga vel ovalia, margine plus minus acute serrulata, dorso acute carinata, glabra. Petala similia serrulata, vulgo apiculata. Labellum simplex concavum, lamina parvula, calcare oblongoideo rarius sacciformi, nunc serrato-carinato. Columna brevis, crassa, apoda, rostello adscendente bipartito. Anthera cucullata, apiculata vel rostrata, glabra. Pollinia 2 globosa, stipite lineari basin versus vulgo dilatato, glandula oblonga, ampla. Ovarium acute 3-6-costatum, costis vulgo serratis.

Plantae humiles, parvulae; radicibus filiformibus, glabris; caule brevi vel rarius paulo elongato, dense foliato, vaginis verrucosis, margine fimbriato-laceratis omnino oblecto; foliis subpatentibus, oblongis vel oblongo-ligulatis, carnosius, margine dense cristallino-serratis, apice ipso apiculatis vel rarius mucronulatis; racemis abbreviatis nunc umbelliformibus, pauci-vel plurifloris; bracteis tenuibus margine vulgo serratis; floribus tenuissimis, glabris, mediocribus.

Species 7 adhuc notae, 6 montium Novae Guineae incolae, 1 montium Javae indigena.

The remarkable toothedness of the fleshy leaves and slitting of the leaf sheaths is so unique in the *Sarcanthinae*, that I would not have hesitated in establishing a new genus, even if the flowers had only differed by a few characteristics. The keeled sepals remind one of *Microtatorchis* Schltr., likewise the split leaf-sheaths (otherwise not known in the whole group) which are elongated in *Microtatorchis* (§*Geissanthera*) into stipular processes. Judging by these characteristics, it seems as though we should attach more importance to certain peculiarities of the *Sarcanthinae* (which are often regarded as of minor importance) for the natural division of the group. As emphasised above, the investigations of J.J. Smith have done much to advance our knowledge in this respect.

To return to this interesting genus, it may be mentioned that I regard it as the nearest neighbour of *Microtatorchis* Schltr. and I am of the opinion that its similarity with certain former species of *Saccolabium* Bl. may be purely an external circumstance.

So far as it has been investigated, the genus is restricted to German New Guinea, with the exception of *H. javanica* (Teijsm. et Binnend.) Schltr. (*Oeceoclades javanica* Teijsm. et Binnend.).

It is remarkable that no further species have yet been recorded from the rest of the island, but I am hopeful that more may yet follow.

All species from our Territory are typical mist-forest epiphytes. They all grow on tall exposed trees in these formations.

1. *H. saccata* Schltr., sp. nov.

Epiphytica, erecta, usque ad 4 cm alta; radicibus filiformibus, glabris; caulibus abbreviatis, usque ad 3 cm longis, vaginis foliorum rugulosis, margine fimbriato-laceratis omnino obtectis, c. 1.5 mm diametro; foliis patentibus oblongis, apiculatis, carnosius, margine minute serratis, 1–1.5 cm longis, medio fere 4–6 mm latis; inflorescentiis abbreviatis, paucifloris, pedunculo perbrevis, paucivaginulato; bracteis ovatis, apiculatis, ovario subaequilongis; floribus tenuibus, glabris; sepalis apiculatis, margine serrulatis, extus carinatis, 5.5 mm longis, intermedio oblongo, lateralibus oblique oblongo-ellipticis; petalis ovalibus, apiculatis, margine minute serrulatis, 4.5 mm longis; labello integerrimo, ovali, obtuso, 2.75 mm longo, sacco oblongoideo, obtuso, retrorso, c. 2 mm longo; columna brevi, glabra, basi contracta, rostello adscendente bifido; anthera ovato-cucullata, acuminata; pollinibus globosis, stipite lineari, glandula ampla; ovario cylindraceo-6-carinato, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17240, flowering in Jan. 1908.

This species is distinguished from all the others by the short backward-directed spur. The flowers are yellow-green.

2. *H. kaniensis* Schltr., sp. nov.

Epiphytica, parvula, erecta, 2–4 cm alta; radicibus filiformibus, glabris; caule abbreviato, dense foliato, vaginis foliorum rugulosis, margine fimbriato-laceratis oblecto, 2 mm diametro; foliis patentibus, oblongis apiculatis, margine serratis, 1–2.5 cm longis, medio fere 5–9 mm latis; racemis umbelliformi-abbreviatis, 4–7-floris, foliis brevioribus; pedunculo perbrevis paucivaginulato; bracteis ovatis, acuminatis, dentatis, ovario brevioribus; floribus erecto-patentibus, tenuibus, glabris; sepalis oblongis, obtusissimis cum apiculo minuto, carinatis, margine serratis, 8 mm longis, lateralibus obliquis, basin versus paulo angustatis; petalis sepalis similibus, obliquis, c. 7 mm longis, margine serratis; labello elliptico, apiculato, c. 2 mm longo, calcare obovoideo, obtusissimo, facie compresso, carina paucidentata longitudinaliter donato, 4.5 mm longo; columna brevi, rostello suberecto, bifido; anthera quadrato-cucullata breviter acuminata; pollinibus globosis, stipite lineari basin versus paulo dilatato fere 4-plo longiore, glandula ampla oblonga; ovario acute triangulo, angulis serrulatis, c. 8 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17744, flowering in May 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 17968, flowering in July 1908.

The species differs particularly from the previous in the larger flowers and lip. The flowers are whitish with a green lip-lamina.

3. *H. nannodes* Schltr., sp. nov.

Epiphytica, perpusilla, c. 1.5 cm alta; radicibus filiformibus, glabris; caule abbreviato, c. 5 mm longo, dense foliato, vaginis foliorum rugulosis margine fimbriato-laceratis oblecto, c. 1.5 mm diametro; foliis ovalibus, apiculatis, margine serrulatis, carnosius, 5–7 mm longis, medio fere 2.5–4.5 mm latis; racemis abbreviatis, subumbelliformibus, paucifloris, folia plus duplo superantibus, pedunculo perbrevis; bracteis ovalibus, acuminatis, margine dentatis; floribus in genere mediocribus, glabris; sepalis obovatis, obtusissimis cum apiculo minuto, dimidio superiore margine dentato-serratis, carinatis, 6 mm longis, lateralibus obliquis intermedio paulo latioribus; petalis oblique obovatis, serratis, sepalis bene similibus; labello suborbiculari, obtuso, antice subtrilobato, c. 2 mm longo et lato, calcare oblongoideo, obtuso, dorso carinato, c. 3 mm longo; columna brevi, glabra, rostello suberecto, bipartito; anthera oblongoideo-cucullata, obtusiuscule acuminata; pollinibus globosis, stipite basin versus dilatato, glandula oblonga, ampla; ovario acute 6-costato, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1100 m—R. Schlechter no. 19793, flowering in June 1909.

The smallest of the species known at present. It is characterised by the shape of the lip. The flowers are yellow-white, the lip with a green lamina.

4. *H. caulina* Schltr., sp. nov.

Epiphytica, patula, c. 15 cm longa; radicibus filiformibus, glabris; caule elongato, usque ad 14 cm longo, dense foliato, vaginis foliorum fimbriato-laceratis oblecto, vix 2 mm diametro; foliis lineariligulatis, apiculatis, apicem versus margine serrulato-dentatis, 3–4 cm longis, medio fere 4–6 mm latis; racemis abbreviatis paucifloris, foliis subduplo brevioribus, pedunculo brevi; bracteis ovatis, acutis,

ovario 3–4-plo brevioribus; floribus mediocribus, glabris; sepalis obovatis, obtusissimis, margine leviter dentatis, 6.5 mm longis, extus carinatis, lateralibus obliquis; petalis sepalis simillimis, paululo brevioribus; labello late ovato, margine leviter dentato, 2.25 mm longo et lato, calcare oblongoideo obtuso, faucem versus paulo attenuato 5 mm longo; columna brevi, basi contracta, rostello erecto, bifido; anthera oblongoideo-cucullata, acuminata; polliniis globosis, stipite lineari basin versus dilatato 3-plo longiore, glandula oblonga ampla; ovario triquetro, costis leviter dentatis, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19809, flowering in June 1909.

Compared with all other species, the present one is distinguished by the rather long stems and thinner leaves which are dentate only at the tips. The flowers are pale yellow with a green labellum-lamina.

5. *H. serrata* Schltr., sp. nov.

Epiphytica, erecta, 4–5 cm alta; radicibus filiformibus, glabris; caule simplici, dense foliato, vaginis foliorum rugulosis, margine fimbriato-laratis omnino oblecto, c. 2 mm diametiente; foliis erecto-patentibus, elliptico-lanceolatis, apiculatis, 0.8–1.5 cm longis, medio fere 3.5–4.5 mm latis, margine acute serratis; inflorescentiis abbreviatis, paucifloris, pedunculo perbrevis, paucivaginulato; bracteis ovalibus, apiculatis, serratis, ovario 3–4-plo brevioribus; floribus in genere magnis, glabris; sepalis elliptico-lanceolatis, apiculatis, margine acutissime serratis, 1.5 cm longis, lateralibus obliquis; petalis sepalis simillimis et subaequilongis; labello elliptico, profundius cordato, obtusissimo, margine acute serrato, 2.5 mm longo, 1.75 mm lato, calcare oblongoideo, fauce conspicue contracto, dependente, acute carinato, 5 mm longo; columna brevi, basi attenuata, rostello suberecto, bidentato; anthera quadrato-cucullata, apiculata; ovario acute triangulo, 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19137, flowering in Jan. 1909.

This species is recognised easily by the very large flowers with sharp, saw-toothed sepals and the petals. The flowers are whitish with a green lip-lamina.

6. *H. foliosa* Schltr., sp. nov.

Epiphytica, patula, 10–12 cm longa; radicibus filiformibus, glabris; caule elongato, dense foliato, c. 2 mm diametro; foliis erecto-patentibus, oblongis, obtusis, dense serratis, carnosulis, 1.7–3 cm longis, medio 5–10 mm latis; racemis abbreviatis, subumbelliformibus, 4–7-floris, pedunculo brevi; bracteis ovalibus, obtusis, ovario multo brevioribus; floribus in genere magnis, glabris, tenuissimis; sepalis late ovalibus, obtusissimis, margine denticulatis, 7 mm longis, lateralibus obliquis; petalis sepalis simillimis et subaequimagnis; labello suborbiculari, obtuso, c. 1.75 mm longo et lato, calcare cylindrico, oblongoideo, obtuso, 6 mm longo; columna brevi, basi angustata, rostello suberecto; anthera quadrato-cucullata, breviter acuminata; polliniis globosis, stipite 4–5-plo longiore basin versus dilatato, glandula ampla oblonga; ovario tricostato, costis serrulato, c. 1.3 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2200 m—R. Schlechter no. 18802, flowering in Nov. 1908.

Already at first sight the plant is distinguished from all the other species by the long leafy stems. The flowers are white-green with the tip of the lip grass-green.

115. *Microtatorchis* Schltr.

Some time ago (Footnote: Fedde, Repertor. IX (1911), p. 112) I found it necessary to combine under the first name the genera *Microtatorchis* Schltr. and *Geissanthera* Schltr., described by me in the year 1905. The material which I have now worked upon shows that the genus has experienced an unexpected development in New Guinea, since I had to describe no less than 19 species as new.

I divide the genus into two sections, viz. *Eu-Microtatorchis* and *Geissanthera*, corresponding to the original genera, the latter being distinguished by the possession of peculiar stipular bristles at the sides of the bracts which are absent in *Eu-Microtatorchis*.

Nearly all species dealt with here are epiphytes of the mist-forests, where they

nearly always prefer to grow at the tips of young branches. This shows that they begin to flower at an early stage of their existence, for I have found species under circumstances which proved that the specimens could not have been more than a year old.

§ 1. *Eu-Microtatorchis*

1. *M. perpusilla* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 224.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 500 m—R. Schlechter no. 14401, flowering in Apr. 1902; on shrubs alongside the forest creeks at Kelel, on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16365, flowering in Aug. 1907.

This species is distinguished easily from the others in the section by the narrow lip, almost sagittate at the base. The flowers are yellow-green.

2. *M. potamophila* Schltr., sp. nov.

Epiphytica, perpusilla, acaulis, vix 3–3.5 cm alta; radicibus filiformibus, glabris; foliis erecto-patentibus, 1–3, oblanceolatis, obtusiusculis, 0.5–1.5 cm longis, supra medium 2–3 mm latis; spicis sensim elongatis, flexuosis, folia 2–3-plo superantibus, sublaxe pauci-vel plurifloris, bracteis deltoideis, ovario 3–4-plo brevioribus; floribus minutis, glabris; sepalis petalisque usque ad medium in tubum campanulatum connatis, sepalis oblongo-ligulatis, obtusis, 2 mm longis, lateralibus subfalcato-obliquis; petalis sepalis distincte brevioribus, parte libera rhombeis, obtusis; labello margine cum sepalis et petalis usque supra medium connato, e basi cuneata in tertia parte anteriore trilobato, petalis aequilongo inter apices loborum lateralium 0.75 mm lato, lobis lateralibus patentibus, triangulis, subacutis, margine anteriore incurvis, intermedio lateralibus paulo majore antico, triangulo, marginibus incurvo, obtusiusculo, calcare e basi cylindrica apice 5-lobato-inflato, 1.25 mm longo, apice hamato-incurvo; columna brevi generis, glabra; anthera ovoideo-cucullata, obtusa; polliniis oblique pyriformibus, stipite lineari-oblanceolato polliniis aequilongo, glandula rotundata minuta; ovario subsessili, tricoato, sepalis aequilongo, glabro.

Kaiser-Wilhelms-Land: On small trees in the forests at Kelel (Minjem Valley), alongside the creeks, alt. c. 200 m—R. Schlechter no. 16310 (TYPE), flowering in July 1907; on small trees in the forests near Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter no. 19328, flowering in Apr. 1909; on trees on the Waria [River] near Gobi, alt. c. 300 m—R. Schlechter no. 19565, flowering in May 1909.

It is never difficult to identify this species of the section by the shape of the lip. The flowers are yellow-green with orange-yellow tips.

3. *M. rhomboglossa* Schltr., sp. nov.

Epiphytica, perpusilla, c. 2 cm alta; radicibus filiformibus, glabris; foliis sub anthesi ut videtur vulgo destructis, oblanceolato-ligulatis, 5–8 mm longis, supra medium 2 mm latis; inflorescentiis sensim elongatis, sublaxe plurifloris, usque ad 2.5 cm longis; bracteis deltoideis, obtusis, ovario bene brevioribus; floribus minutis, glabris; sepalis petalisque usque supra medium in tubum campanulatum connatis, sepalis oblongis, obtusis, c. 1.75 mm longis; petalis in parte libera oblique latiovatis, obtusis, quam sepala paulo brevioribus; labello e basi cuneata, late rhombeo, obtuso, antice marginibus incrassatis incurvis, petalis aequilongo, calcare subgloboso, obtusissimo, apice subretuso, labello fere triplo brevior; columna generis; ovario subsessili, cylindrico, c. 2 mm longo, glabro.

Kaiser-Wilhelms-Land: On tall trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17162, flowering in Jan. 1908.

Probably the closest kin to *M. potamophila* Schltr., but differs noticeably in the labellum and in the spur. The flowers are green.

4. *M. platyrhachis* Schltr., sp. nov.

Epiphytica, perpusilla, acaulis, c. 1 cm alta, sub anthesi aphylla; radicibus filiformibus, glabris; racemo gracilius pedunculato, rhachi ancipiti conspicue dilatato, sublaxe paucifloro, usque ad (pedunculo incluso) 1.5 cm longo; bracteis minutis deltoideis; floribus minutis, glabris; sepalis petalisque usque ad medium fere in tubum campanulatum connatis, sepalis oblongo-ligulatis, obtusis, c. 2 mm longis, lateralibus obliquis; petalis quam sepala paulo brevioribus parte libera oblique ovatis, obtusis; labello

circuitu ovato-lanceolato, apice acuminato incurvo, sepalis aequilongo, ante ostium calcaris linea transversa incrassata donato, calcare ellipsoideo, obtuso, labello duplo brevior; columna generis; polliniis oblique oblongoideis; ovario cylindrico, glabro, 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16718, flowering in Oct. 1907.

Readily distinguished from all the other species of the section by the markedly broadened rachis. The flowers are yellow-green.

5. *M. kaniensis* Schltr., sp. nov.

Epiphytica, perpusilla, 1–2.5 cm alta, acaulis; radicibus filiformibus, glabris; foliis 2–3, erecto-patentibus, oblanceolato-ellipticis, breviter acuminatis vel apiculatis, 0.5–1.25 cm longis, supra medium 2–4 mm latis; racemis subaxe plurifloris, pedunculo foliis subaequilongo, rhachi flexuosa, angulata; bracteis ovalibus acutis, ovarium superantibus; floribus minutis, glabris; sepalis petalisque dimidio inferiore in tubum campanulatum connatis, 2 mm longis, parte libera lanceolatis, acuminatis, extus carinatis; labello ovato-lanceolato, acuto, marginibus apice incrassatis, apice ipso in appendicem subulatam infractam exeunte, dimidio inferiore excavato, sepalis subaequilongo, calcare globoso, labello triplo brevior; anthera generis, alte bilobata; polliniis globosis, stipite gracili apicem versus dilatato, duplo longiore, glandula suborbiculari, satis magna; ovaria 6-costata, glabro, c. 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17236, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1100 m—R. Schlechter no. 18015, flowering in July 1908.

This and the following species show a strong approach to *Geissanthera*, but have been placed in this section because the extension of the stipule is missing. The flowers of the present species are pale green, turning later to yellowish.

6. *M. ceratostylis* Schltr., sp. nov.

Epiphytica, perpusilla, acaulis, vix 2 cm alta; radicibus filiformibus, glabris; foliis c. 4, oblanceolato-ligulatis, apiculatis, 1.5–2 cm longis, supra medium 3–4 mm latis; racemis subaxe paucifloris, foliis aequilongis; bracteis deltoideis, acutis, ovario subaequilongis; floribus minutis, glabris; sepalis petalisque usque ad medium in tubum campanulatum connatis, 2 mm longis, parte libera ovato-lanceolata, subacuta, lateralibus obliquis; labello ovato-lanceolato, subacuto, obtusiusculo, sepalis subaequilongo, concavo, calcare circuitu subgloboso, genuflexo-incurvo, labello duplo brevior; columna perbrevis, alte biloba (subbicornuta); ovario triquetro, subsessili, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17650, flowering in May 1908.

Differs from the previous species in the stronger growth, the more fleshy rachis, the lip and the ovary. The flowers are pale green, later on yellowish.

§ 2. *Geissanthera*

This section contains by far the greater number of species belonging to the genus. It is remarkable that only one species, *M. tubulosa* (J.J. Sm.) Schltr., has been recorded from the Dutch part of the island and none from the British part. We know at present that the section extends westwards to the Philippines, but nothing is known of an eastern extension beyond New Guinea. Species of *Eu-Microtatorchis*, however, have been recorded from New Caledonia, as well as from the Samoan Islands.

7. *M. collina* Schltr., sp. nov.

Epiphytica, perpusilla, acaulis, vix 2 cm alta; radicibus filiformibus, flexuosis, glabris; foliis c. 3, elliptico-lanceolatis, acuminatis, 1–1.3 cm longis, medio 2.5–3 mm latis; racemis laxius plurifloris, folia subduplo superantibus, rhachi angulata, flexuosa; bracteis ovato-delloideis, apiculatis, basi utrinque dente minuto stipulari ornatis, ovarium aequantibus; floribus minutis, glabris; sepalis petalisque usque supra medium in tubum campanulatum connatis, 1.75 mm longis, extus carinatis, apicibus liberis ovato-lanceolatis, obtusiusculis, lateralibus obliquis; labello circuitu lanceolo, subacuto, marginibus incurvulo, apice ipso appendice dentiformi, refracta ornato, ante ostium calcaris

lateribus utrinque bifevato, sepalis subaequilongis, calcare late ellipsoideo genuflexo-incurvo, labello 4-plo brevior; columna alte biauriculata, perbrevis; ovario triquetrum c. 0.8 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests on the Garup [River], alt. c. 150 m—R. Schlechter no. 20356, flowering in Sept. 1909.

One of the few species occurring in the forests of the hill-country. It is characterised by the minute teeth on the stipules and by the lip. The flowers are initially green, later on yellowish.

8. *M. musciformis* Schltr., sp. nov.

Epiphytica, perpusilla, 1–1.5 cm alta, acaulis; radicibus filiformibus, flexuosis, glabris; foliis 2–3, erecto-patentibus, ellipticis, apiculatis, 6–8 mm longis, medio fere 2.5–3.5 mm latis; racemis subaxe pauci-vel plurifloris, folia duplo vel plus duplo superantibus, pedunculo et rhachi appendicibus numerosis subulatis masculiformi-asperatis angulatis; bracteis deltoideis, acutis, ovario aequilongis; floribus minutis, glabris; sepalis petalisque in tubum campanulatum usque infra medium connatis, 1.5 mm longis, apicibus liberis lanceolatis, acuminatis, extus leviter carinatis, lateralibus obliquis; labello circuitu late elliptico, obtusiusculo, supra medium sublobato-dilatato, carnosulo, 1.25 mm longo, calcare oblique obovoideo, 0.8 mm longo, obtusissimo; ovario acute tricostato, 1 mm longo, costis serrulatis.

Kaiser-Wilhelms-Land: On trees in the forests near the Kani Base, alt. c. 1000 m—R. Schlechter no. 17841, flowering in June 1908.

A very characteristic species distinguished by the peculiar soft spiky covering of the rachis, the flowers also having characteristic features. The flowers are pale green.

9. *M. muriculata* Schltr., sp. nov.

Epiphytica, pusilla, 3–5 cm alta, acaulis; radicibus filiformibus, flexuosis, glabris; foliis erecto-patentibus, c. 4, lanceolato-ligulatis, acutis vel acuminatis, 1.3–1.7 cm altis, medio fere 2.5–3.5 mm latis; racemis erecto-patentibus folia duplo vel plus duplo superantibus, pedunculo et rhachi dense appendicibus brevibus subulatis muriculatis, laxe plurifloris, angulatis; bracteis deltoideis, acuminatis, basi utrinque dente subulato subaequilongis auctis, ovarium aequantibus; floribus minutis, glabris; sepalis petalisque usque ad tertiam partem basilem in tubum campanulatum connatis, subaequilongis, 2.25 mm longis, extus carinatis, sepalis apice libero lanceolatis, subacutis, petalis oblique ovatis, obtusiusculis; labello circuitu lanceolato, acuto, sepalis aequilongis, in tertia parte basali margine utrinque cum lobulo late triangulo incurvo incrassato, calcare late obovoideo, apice 4-gibbo, labello 3-plo brevior; columna perbrevis, alte biauriculata; anthera obovoideo-cucullata, retusa; ovario 6-costato, costis reversim dentatis, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20222, flowering in Sept. 1909.

The species is related most closely to *M. musciformis* Schltr. but is distinguished by the labellum and the larger flowers. The flowers are yellow-green.

10. *M. torricellensis* Schltr., sp. nov.

Epiphytica, pusilla, 2.5–4.5 cm alta, acaulis; radicibus filiformibus, flexuosis, glabris; foliis erecto-patentibus, lanceolato-ligulatis, acuminatis, 1–2.5 cm longis, medio fere 2–3 mm latis; racemis subdense plurivel multifloris, sensim elongatis, folia 2–3-plo superantibus, angulatis, angulis hinc et inde dentatis; bracteis deltoideis, acuminatis, ovario brevioribus, basi utrinque subula minuta auctis; floribus minutis, glabris; sepalis petalisque usque ad medium in tubum campanulatum connatis, extus carinatis, 2 mm longis, parte libera ovatis, obtusiusculis, lateralibus obliquis; labello circuitu anguste ovato, obtuso, marginibus medio incurvulis, dimidio inferiore excavato, sepalis paulo brevior, calcare obovoideo, apice 4-gibbo, labello subduplo brevior; columna brevi, subbicornuta; anthera reniformi-cucullata; pollinibus oblique oblongoideis, stipite e basi tenui obovato, aequilongis, glandula oblonga, satis magna; ovario 6-costato, costis serrulatis, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20100, flowering in Sept. 1909.

The species is related most closely to *M. muriculata* Schltr. It is distinguished by the less dentate inflorescences, smaller flowers with blunter sepals and petals, and by the labellum. The flowers are yellow-green.

11. *M. brachyceras* Schltr., sp. nov.

Epiphytica, perpusilla, acaulis, 2–3 cm alta; radicibus filiformibus, glabris; foliis 2–3, ligulatis, acutis, 1.2–1.8 cm longis, medio 2.5–3.5 mm latis; racemis erecto-patentibus laxae 4–10-floris, folia plus minusve superantibus, angulatis, angulis muriculato-asperatis, rhachi flexuosis; bracteis lanceolatis, acutis, basi utrinque dente stipulari ornatis; floribus in genere mediocribus, glabris; sepalis petalisque usque ad tertiam partem basilarem in tubum campanulatum connatis, lanceolatis, acuminatis, extus carinatis, sepalis 5 mm longis, lateralibus obliquis; petalis obliquis 4 mm longis; labello lanceolato, acuminato, basi concavo, ante ostium calcaris excavato, sepalis subaequilongis, calcare perbrevis, globoso; columna peralte biloba; anthera late ovato-cucullata, obtusa; pollinibus oblique oblongoideis, stipite e basi tenui obovato-dilatato, paulo brevior, glandula oblonga, pollinibus duplo brevior; ovario 6-costato, 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20101, flowering in Sept. 1909.

None of the species currently known to me has such a short flower spur as the present one, which otherwise is similar in habit to *M. torricellensis* Schltr. The flowers are yellow.

12. *M. carinata* Schltr., sp. nov.

Epiphytica, pusilla, acaulis, 2–4 cm alta; radicibus filiformibus, glabris; foliis ligulatis vel oblanceolatis, apiculatis, 1.5–4 cm longis medio vel supra medium 2–4 mm latis; racemis erecto-patentibus, laxae paucifloris, flexuosis, angulatis, folia vix superantibus; bracteis triangulis acutis, basi utrinque dente stipulari auctis; floribus minutis, glabris; sepalis petalisque usque ad medium in tubum campanulatum connatis, extus carinatis, parte libera lanceolatis subacutis, sepalis 3.25 mm longis, lateralibus obliquis; petalis paulo brevioribus obliquis; labello lanceolato, acuto, dimidio inferiore excavatione cum angulis 2 insilientibus donato, petalis aequilongis, calcare subgloboso, labello fere 4-plo brevior; columna perbrevis alte biloba; anthera rotundato-cucullata, praemorsa; pollinibus oblongoideis, stipite aequilongis e basi tenui latius cuneato, glandula oblonga parvula; ovario acute 6-carinato, carinis subdentato, 2.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 700 m—R. Schlechter no. 20143, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16540, flowering in Sept. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 17024, flowering in Dec. 1908. [Ed.—probably 1907.]

The species is characterised by the inflorescences and the labellum, as well as by the six-keeled ovary. The flowers are green.

13. *M. acuminata* Schltr., sp. nov.

Epiphytica, pusilla, acaulis, 2.5–5 cm alta; radicibus filiformibus, glabris; foliis c. 4, erecto-patentibus, oblique elliptico-ligulatis vel ligulatis, acutis, basin versus angustatis, 1.7–4.5 cm longis, medio fere 3.5–6 mm latis; racemis erecto-patentibus, laxae 4–10-floris; pedunculo et rhachi angulatis, folia vix vel paulo superantibus; bracteis lanceolatis, acutis, ovarium superantibus, basi utrinque dente stipulari subulato donatis; floribus parvulis, glabris; sepalis petalisque usque ad tertiam partem basilarem in tubum campanulatum connatis, parte libera lanceolatis, valde acuminatis, subaequilongis, c. 3 mm longis; labello e basi late medio utrinque subobato-angulato, valde acuminato, sepalis aequilongis, excavatione biloba in tertia parte inferiore donato, calcare subgloboso-obovoideo, labello 3–4-plo brevior; columna perbrevis, bicornuta; ovario 6-costato, glabro, 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, alt. c. 1000–1200 m—R. Schlechter no. 19699, no. 19799, flowering in June 1909.

This species is characterised by the peculiar shape of the long-pointed lip and the column. The flowers are almost white.

14. *M. pterophora* Schltr., sp. nov.

Epiphytica, pusilla, c. 5 cm alta, acaulis; radicibus filiformibus, glabris; foliis c. 3, falcato-ligulatis, apiculatis, basi angustatis; 2.5–2.8 cm longis medio fere 4.5–6 mm latis; racemis sublaxe plurifloris, folia subduplo superantibus, pedunculo et rhachi alato-angulatis, pro genere crassiusculis, bracteis deltoideis, acutis, utrinque basi dente stipulari acuto auctis, floribus in genere mediocribus, glabris; sepalis petalisque subaequilongis, anguste lanceolatis, obtusiusculis, extus carinatis, quarta parte

basali in tubum campanulatum connatis, 6 mm longis, lateralibus obliquis; labello lanceolato obtusiuscule subacuminato, dimidio inferiore marginibus incurvo, sepalis subaequilongis, calcare late obconico-subgloboso, apice 4-gibbo, ovario 4-plo brevior; columna perbrevis, alte biloba; anthera ovato-cucullata, obtusa; pollinibus oblique oblongoideis, stipite subaequilongis e basi tenui obovato, glandula oblonga, satis magna; ovario leviter 6-costato, 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 800 m—R. Schlechter no. 20065, flowering in Sept. 1909.

The species is the only one in which the rachis and the upper part of the pedicel are widened in a wing-like manner. The flowers are green, later yellowish.

15. *M. Finisterrae* Schltr., sp. nov.

Epiphytica, pusilla, acaulis, sub anthesi aphylla (an semper?), c. 5 cm alta; radicibus filiformibus, glabris; racemis laxius plurifloris, pedunculo et rhachi angulatis; bracteis ovato-triangularibus, acutis, ovario paulo brevioribus, basi utrinque dente stipulari brevi donatis; floribus in genere inter mediocres, glabris; sepalis petalisque lanceolato-ligulatis, obtusiuscule acuminatis, subaequilongis, usque infra medium in tubum campanulatum connatis, sepalis 4 mm longis, lateralibus obliquis; petalis obliquis, paululo brevioribus; labello anguste lanceolato, acuto, marginibus incurvo, basi quinta parte excavatione biloba donato, petalis aequilongis; columna perbrevis, alte bicornuta; anthera late ovato-cucullata, breviter excisa; pollinibus oblique oblongoideis, stipite subaequilongis, e basi tenui late rhombeo, glandula oblonga pollinibus subaequilongis; ovario 7-costato, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Finisterre Range, alt. c. 1300 m—R. Schlechter no. 19123, flowering in Jan. 1909.

In fresh condition this species is recognised easily by the ovary which has four sharp projecting and three shorter ribs. The cylindrical fruit are about one centimetre long and thus longer than those of most of the other species. The flowers are green.

16. *M. flaccida* Schltr., sp. nov.

Epiphytica, parvula, flaccida, acaulis, usque ad 13 cm alta; radicibus filiformibus, glabris; foliis erecto-patentibus, lanceolato-ligulatis, acutis, basin versus attenuatis, 2.5–4.5 cm longis, medio fere 4–7 mm latis; racemis usque ad 15 cm longis, flexuosis, laxe multifloris, pedunculo et rhachi angulatis; bracteis ovatis, acutis, ovario paulo brevioribus, basi utrinque dente stipulari auctis; floribus in genere inter majores, glabris; sepalis petalisque usque ad medium in tubum connatis, extus carinatis, c. 6.5 mm longis, apicibus liberis lanceolatis, acuminatis, lateralibus obliquis; labello lanceolato acuto, supra basin utrinque subangulato, marginibus incurvulo, sepalis subaequilongis, calcare subgloboso, apice obtuse 4-gibbo, labello 5–6-plo brevior; columna perbrevis, alte biloba; anthera cordato-cucullata, obtusa; pollinibus oblique oblongoideis, stipite e basi tenui late cuneato subaequilongis, glandula oblonga parvula; ovario triquetro, nunc hinc et inde subdentato, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1800 m—R. Schlechter no. 18708 (TYPE), flowering in Nov. 1908; on trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20313, flowering in Sept. 1909.

The species is distinguished above all by the very much extended inflorescences and the lax growth. In other respects it comes closest to *M. Finisterrae* Schltr. The flowers are green.

17. *M. Goidjoae* Schltr., sp. nov.

Epiphytica, perpusilla, 1.5–3.5 cm alta, acaulis; radicibus filiformibus, glabris; foliis 2–3, erecto-patentibus, oblongo-ligulatis, acutis, usque ad 1 cm longis, medio 2 mm latis, vulgo minoribus; racemis erecto-patentibus sublaxe 10–25-floris, usque supra basin floriferis; bracteis foliaceis acuminatis, ovarium superantibus, nunc flores aequantibus, basi utrinque seta stipulari auctis; floribus minutis, glabris; sepalis petalisque usque ad medium in tubum campanulatum connatis, extus carinatis, 2 mm longis, apicibus liberis ovatis, obtusiuscule acuminatis, lateralibus obliquis; labello e basi late cuneato concava antice incrassato trilobulato, petalis vix aequilongis, lobulis lateralibus rotundatis, obtusis, intermedio bene longiore triangulo, subacuto, calcare obovoideo, obtuse 4-gibbo, labello plus duplo brevior; anthera ovato-cucullata, obtusa; pollinibus oblique oblongoideis, stipite subduplo longiore e basi tenui apicem versus sensim dilatato, glandula minuta oblonga; ovario 6-costato, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, (Waria

District), alt. c. 1000–1200 m—R. Schlechter no. 19745 (TYPE), no. 19783, no. 19896, flowering in June 1909.

With this species a small group commences which is distinguished mainly by large leaf-like bracts. Within the group this is the smallest species. The flowers are green.

18. *M. bryoides* Schltr., sp. nov.

Epiphytica, pusilla, 1.5–4.5 cm alta, acaulis; radicibus filiformibus, glabris; foliis 2–3, erecto-patentibus, lanceolatis, acuminatis, 0.7–1.2 cm longis, medio 2–3 mm latis; racemis usque supra basin floriferis subaxe 7–20-floris; bracteis foliaceis, lanceolatis, setaceo-acuminatis, flores aequantibus, basi utrinque seta stipulari auctis; floribus parvulis, glabris; sepalis petalisque ovato-lanceolatis, acuminatis, quarta parte basali in tubum connatis, lateralibus obliquis, sepalis 3 mm longis, petalis paulo brevioribus; labello circuitu rhombeo, acuminato, medio trilobato, lobis lateralibus abbreviatis, obtusis, intermedio ovato acuminato apice incurvulo, petalis aequilongo, excavatione biloba e basi usque ad basin loborum, calcare obovoideo, 4-gibbo, labello duplo brevior; columna perbrevis, biloba; ovario 6-costato, costis dentato, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 19002, flowering in Dec. 1908.

This species is related closely to the previous, but has stronger growth, larger bracts and flowers and a differently shaped labellum. The flowers are green.

19. *M. bracteata* Schltr., sp. nov.

Epiphytica, pusilla, 1.5–3 cm alta, acaulis; radicibus filiformibus, glabris; foliis erecto-patentibus, 2–3, oblanceolatis, acutis, 0.8–1.2 cm longis, supra medium 2–3 mm latis; racemis erectis, folia vix duplo superantibus, laxe 4–8-floris; bracteis foliaceis, ellipticis, apiculatis, flores distincte superantibus; floribus parvulis, glabris; sepalis petalisque lanceolatis, subacutis, extus carinatis, quarta parte basali in tubum connatis, 3 mm longis, lateralibus obliquis; labello late lanceolato, acutiusculo, dimidio inferiore leviter excavato, petalis aequilongo, calcare subgloboso cum gibbo brevi apicali, labello triplo brevior; columna perbrevis, biloba; anthera late cordato-cucullata, subexcisa; pollinibus late ellipsoideis, stipite paulo longiore e basi tenui obovato, glandula oblonga pollinibus aequimagna; ovario 6-costato, glabro, c. 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1100 m—R. Schlechter no. 19791, flowering in June 1909.

The species has a position approximately intermediate between *M. bryoides* Schltr. and *M. chaetophora* Schltr., but differs from both in the spur. The flowers are yellow-green.

20. *M. chaetophora* Schltr., sp. nov.

Epiphytica, erecta, c. 8 cm alta, acaulis; radicibus filiformibus, glabris; foliis 2–3, elliptico-lanceolatis, apiculatis, c. 2 cm longis, medio c. 4 mm latis; racemis curvatis, subdense 10–15-floris, rhachi appendicibus setiformibus sparsis obsessis; bracteis foliaceis lanceolato-ellipticis, aristato-acuminatis, flores superantibus, basi utrinque seta stipulari auctis; floribus in genere inter majores, glabris; sepalis petalisque lanceolatis, acuminatis, extus carinatis, basi tertia parte in tubum connatis, lateralibus obliquis; labello lanceolato, acuminato, angulis insilientibus 2 medio donato, sepalis fere aequilongo, calcare globoso, labello fere 4-plo brevior; columna perbrevis, bicornuta; anthera cordato-cucullata, antice retusa; pollinibus oblique oblongoideis, stipite subbrevior e basi tenui perlate obovato, glandula oblonga pollinibus paulo minore; ovario 6-costato, 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20081, flowering in Sept. 1909.

Together with *M. papuana* Schltr. this species represents the largest form of the genus. It is related closely to *M. papuana* Schltr., but differs in the broader sepals and petals, the shorter globular spur and in the pollinia. The flowers are yellow-green.

21. *M. papuana* Schltr., in Fedde, Repertor. IX (1911), p. 112.

Geissanthera papuana Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 232.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1850 m—R. Schlechter no. 13996, flowering in Jan. 1902.

Unfortunately, I did not re-locate this species during my last expedition. I have discussed already in detail above the differences between it and *M. chaetophora* Schltr. The pollinia are particularly characteristic. The flowers are green.

116. *Taeniophyllum* Bl.

When the 'Index Kewensis' published its list of described phanerogams in 1885, *Taeniophyllum* Bl. was represented by 13 species, of which ten are still recognised. From this it might be supposed that we are dealing here with a small genus, in which a great increase is hardly to be expected. The better survey of the flora of the monsoon-regions, however, has shown the reverse, for the genus now contains about 50 species and about 50 more novelties are described here. Since the genus has increased to upwards of 100 species, the present division may not suffice for a review, and I have attempted therefore to undertake a further division.

In *Codonosepalum*, the section separated by me, the union of the sepals and petals is so characteristic that I have now thought it necessary to contrast it in greater detail with the rest of the species of *Taeniophyllum* Bl. by dividing the genus into two sub-genera:

Sub-genus *Codonosepalum* with sepals and petals distinctly united.

Sub-genus *Eu-Taeniophyllum* with free sepals and petals.

The first sub-genus contains only one section which I have called:

§ 1. *Sepalocodon*—

The second sub-genus contains by far the greater part of the species and is now divided into various sections of which I will now briefly characterise those represented in New Guinea.

§ 2. *Brachyanthera*—Species with undivided lip, and a shorter anther not definitely prolonged at the apex, peduncles definite and glabrous; ovaries glabrous.

§ 3. *Rhynchanthera*—Species with undivided lip and distinctly beaked anther, peduncles distinct and glabrous, ovaries glabrous.

§ 4. *Loboglossum*—Species with distinctly lobed lip, inflorescences glabrous, ovaries glabrous.

§ 5. *Trachyrhachis*—Species with almost sessile inflorescences, the twisted rachis more or less distinctly covered with warts; ovaries glabrous.

§ 6. *Trachylepus*—Species with rough, usually thickly haired inflorescences; ovaries thickly covered with hair, warts and prickles.

I would like to emphasise, that, with a closer study of species which grow outside of New Guinea, the establishment of two more sections will probably be necessary. Perhaps it will be possible then to define the boundaries between the individual sections more sharply.

In the treatment of individual sections, I will discuss their distribution further. It may suffice to state that the genus is distributed throughout the entire monsoon-region from Ceylon to the Samoan Islands. As non-tropical species, there may be mentioned *T. aphyllum* Makino from Japan, *T. Muelleri* Benth. from Australia and *T. minutissimum* Schltr. from New Caledonia.

§ 1. *Sepalocodon*

This section contains about 20 species, the distribution of which reaches from Ceylon to New Caledonia, and likewise includes the Japanese and Australian species.*

*J.J. Smith has wrongly united *T. aphyllum* Makino and *T. retrospiculatum* King et Pantl. with *T. glandulosum* Bl., which belongs here. Likewise my *T. sumatranum* Schltr. is quite different from the first two, but *T. djampangense* J.J. Sm. probably will have to be united with *T. sumatranum* Schltr.

1. *T. phaeanthum* Schltr., sp. nov.

Epiphyticum, perpusillum, aphyllum; radicibus applanatis, glabris, usque ad 7 cm longis, c. 1 mm latis; inflorescentia erecta, graciliter pedunculata, 1–2.5 cm alta, laxe pauciflora, glabra; bracteis deltoideis, minutis, ovario brevioribus; floribus minutis, glabris; sepalis petalisque usque ad medium connatis, sepalis oblongo-ligulatis, obtusis, vix 1.75 mm longis, lateralibus obliquis; petalis sepalis paululo brevioribus parte libera oblique ovatis; labello oblongo, basi margine subdilatato, apice appendice subulato infracto ornato, petalis aequilongo, ante ostium calcaris membrano transverso ornato, calcare subgloboso, ovario subtriplo brevior; columna perbrevis, rostello perbrevis; pollinibus oblique obovoideis, stipite oblanceolato basi tenui subaequilongo, glandula ovata mediocri; ovario glabro, subsessili, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in the savannah on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18491, flowering in Oct. 1908.

A species related to *T. retrospiculatum* King et Pantl., but different in the flowers. The whole stem, inclusive of bracts and flowers, is brown-red.

2. *T. kenejianum* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus applanatis, usque ad 10 cm longis, 2–2.5 mm latis; inflorescentiis gracillime pedunculatis, sensim elongatis multi-vel plurifloris, usque ad 4.5 cm altis; bracteis; minutis, deltoideis, bifariis; floribus minutis, glabris, succedaneis; sepalis et petalis usque supra medium connatis, c. 3 mm longis, apicibus liberis ovalibus obtusis, extus medio subverruculoso-incrassatulis; labello oblongo concavo, apice subacuto, incurvulo, petalis aequilongo, membrano transverso bipartito ante ostium calcaris, calcare globoso apice gibbo obtuso parvulo aucto, labello subtriplo brevior columna perbrevis, rostello brevi; pollinibus oblique obovoideis, stipite gracili apicem versus sensim paulo dilatato, fere 3-plo longiore, glandula minuta; ovario cylindraceo, subsessili, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the savannah on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18379, flowering in Oct. 1908.

The species stands almost intermediate between *T. phaeanthum* Schltr. and *T. xerophilum* Schltr., but is taller than both and is characterised by the long caudicles of the pollinia. The flowers are pale yellow.

3. *T. xerophilum* Schltr., sp. nov.

Epiphyticum, perpusillum, aphyllum; radicibus applanatis, flexuosis, usque ad 6 cm longis, c. 1.5 mm latis; inflorescentiis graciliter pedunculatis, paucifloris, vix 1 cm altis, glabris; bracteis deltoideis, minutis; floribus minutissimis, glabris; sepalis petalisque usque supra medium connatis, 1.25 mm longis; sepalis apicibus liberis oblongis, obtusis, extus medio subverruculoso-incrassatulis, lateralibus obliquis; petalis parte libera oblique latiovatis; labello ovato obtuso, apice incrassato, e medio basin versus cuneiformi-excavato, petalis aequilongo, calcare oblongoideo-conico obtuso, subrecto, labello paulo brevior; columna brevi, rostello malleoliformi; anthera rotundato-cucullato, obtuse apiculata; ovario subsessili, glabro, c. 1 mm longo.

Kaiser-Wilhelms-Land: On trees in savannah grass on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18316, flowering in Oct. 1908. [Ed.—possibly Sept. 1908.]

The smallest of all species of the section in our Territory, if not the smallest overall. The flowers are yellow-green.

4. *T. hygrophilum* Schltr., sp. nov.

Epiphyticum, perpusillum, aphyllum; radicibus applanatis, 2.5–5 cm longis, c. 1.5 mm latis; racemis erectis, paucifloris, 5–10 mm longis, graciliter pedunculatis, pedunculo et rhachi minutissime papilloso-puberulis; bracteis minutis, deltoideis, ovario multo brevioribus; floribus minutis, glabris; sepalis petalisque usque ad medium fere connatis, c. 1 mm longis; sepalis parte libera oblongis, obtusiusculis, lateralibus obliquis; petalis parte libera oblique ovatis, obtusiusculis; labello latius elliptico, breviter et obtusiuscule acuminato, sepalis subaequilongo, calcare oblongoideo, apice gibbo minuto suborbiculari coronato, labellum longitudine subexcedente; columna perbrevis, apice bilobata vel potius biauriculata, rostello brevi; ovario 6-costato, subsessili, c. 1 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20301, flowering in Sept. 1909.

We are concerned here with a somewhat divergent species, characterised by the pedicel and bracts being covered with papillose hairs. I consider it possible that this species and its nearest relatives may be considered as a separate section at a later stage. The flowers are yellow.

§ 2. *Brachyanthera*

I have chosen the above name, not because the anther is particularly shortened, but because I wanted to contrast the normal *Sarcanthinae* anther here with that of the following group in which it is presented as an elongated beak. In addition, the species arranged here would only make the circumscription of this section obscure if united with *Rhynchanthera*. Generally speaking, the species included in *Brachyanthera* belong to simple form-circles in which the formation of the spur is reduced occasionally to a small excrescence. I have placed these species first, since I presume that, in a certain way, they represent the most under-developed form of the sub-genus. It is, however, noteworthy that in *T. kaniense* Schltr. and *T. foliatum* Schltr. we have two closely related species, which, by the regular leaf-formation, represent a link with the nearest related genera of the *Sarcanthinae*, but which betray themselves as species of *Taeniophyllum* by the definite development of four pollinia.

Since the available material in many species of *Taeniophyllum* is very poor, and above all, since the anthers are often missing, it is at present hardly possible to say how far the section is distributed, but I am more and more inclined to the opinion that we are dealing with primitive Papuan forms.

The species belonging to this section are distributed fairly evenly over the forests of the hill-country and mist-forest formations.

5. *T. cochleare* Schltr., sp. nov.

Epiphyticum, pusillum, aphyllum; radicibus applanatis, valde flexuosis, usque ad 7 cm longis, c. 1.5 mm latis; racemis erectis, gracilibus, subaxe paucifloris, c. 5 mm altis; bracteis minutis, deltoideis; floribus parvulis, glabris; sepalis oblongis, obtusiusculis, c. 3 mm longis, lateralibus obliquis; petalis sepalis similibus, obtusiusculis, obliquis, sepalis subaequilongis; labello ovato-elliptico, obtuso, cochleari, marginibus apicem versus incurvulis, integerrimo, sepalis subaequilongo, basi brevissime subsaccato-concavo; columna perbrevis, rostello satis longo, rostriformi; anthera subreniformi-cucullata, obtusa; polliniis oblique obovoideis, stipite tenui apice paulo dilatato, subtriplo longiore, glandula oblonga medioeri; ovario subsessili, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17129, flowering in Jan. 1908; on trees in the forests of the Finisterre Range, alt. c. 1000 m—R. Schlechter no. 18035, flowering in July 1908.

This is probably the simplest species of the genus. It and the following ones are characterised by the reduction in the size of the lip-spur. The flowers are brown-red, the petals and the lip whitish with a red central stripe.

6. *T. concavum* Schltr., sp. nov.

Epiphyticum, pusillum, aphyllum; radicibus flexuosis valde applanatis usque ad 20 cm longis, 2–3 mm latis; racemis pluribus gracillime pedunculatis distiche 6–10-floris, 2–3 mm longis; bracteis minutis, deltoideis, ovario multo brevioribus; floribus succedaneis, parvulis, glabris; sepalis oblongo-ligulatis, obtusis, 2.25 mm longis, patentibus, lateralibus obliquis; petalis sepalis similibus, obliquis, paululo minoribus; labello circuitu elliptico-ovato, obtusiusculo, basi cucullato-concavo, vix saccato, petalis aequilongo; columna brevi, rostello brevi; anthera quadrato-cucullata, truncata; polliniis 4 oblique globosis, stipite e basi tenui oblanceolato, fere aequilongo, glandula oblonga stipite aequilonga; ovario cylindrico, glabro, c. 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Boroai, in the Ibo Range, alt. c. 600 m—R. Schlechter no. 17109, flowering in Dec. 1907; on trees in the hill forests near Jaduna, on the Waria [River], alt. c. 300 m—R. Schlechter no. 19283, flowering in Apr. 1909.

The species is unique in the simple and deep concave shape of the lip. Only *T. cochleare* Schltr. and *T. coiloglossum* Schltr. could be compared with it in a certain sense, but they are both quite different. The flowers are white-yellow.

7. *T. coiloglossum* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus subfiliformibus, leviter applanatis, valde flexuosis, usque ad 15 cm longis, 1.25–1.5 mm latis; racemis dense distichis, 6–10-floris, cum pedunculo setiformi usque ad 4 cm altis; bracteis minutis, deltoideis, ovario multo brevioribus; floribus parvulis, glabris; sepalis oblongis, subacutis, dorso nervo medio subdentato-carinatis, 2.5 mm longis, lateralibus obliquis; petalis oblique ovato-lanceolatis, acuminatis, sepalis paulo brevioribus; labello e basi subgloboso-cucullata ovato, acuto, petalis aequilongo, subtus linea media subdentata; columna perbrevis, rostello brevi; anthera reniformi-cucullata, obtusa; polliniis oblique rhomboideis, stipite duplo brevior, glandula orbiculari parvula; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees by the creeks on the upper Minjem [River], alt. c. 200 m—R. Schlechter no. 16239, flowering in July 1907.

This species is related most closely to *T. cucullatum* Schltr., described below. Initially, I considered them to be identical, but a comparison of the roots and the inflorescences shows them to be completely different. The flowers are yellow.

8. *T. cucullatum* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus valde applanatis, leviter flexuosis, c. 10 cm longis, 2–2.5 mm latis; racemis laxe 4–7-floris, pedunculo setiformi incluso usque ad 2 cm altis; bracteis deltoideis, apiculatis; floribus parvulis, glabris; sepalis anguste oblongis, obtusis, ecarinatis, 2.5 mm longis, lateralibus subfalcato-obliquis; petalis oblique lanceolato-oblongis, obtusis, sepalis subaequilongis; labello e basi semigloboso-cucullata apicem versus angustato, obtusiusculo, petalis aequilongo; columna perbrevis, rostello brevi; polliniis oblique obovoideis; ovario sessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees near the Djamu Gorge, alt. c. 350 m—R. Schlechter no. 16627, flowering in Oct. 1907.

This species is related closely in floral structure to *T. coiloglossum* Schltr., but has appreciably broader and flatter roots and a quite lax inflorescence. The flowers are whitish.

9. *T. cycloglossum* Schltr., sp. nov.

Epiphyticum, pusillum, aphyllum; radicibus applanatis, flexuosis, usque ad 10 cm longis, 1.75–2.5 mm latis; racemis flexuosis, laxe 2–6-floris, pedunculo setiformi incluso 1–3 cm alto; bracteis minutis, ovatis, ovario multo brevioribus; floribus parvulis, glabris; sepalis anguste oblongis, obtusis, extus carinatis, vix 2 mm longis, lateralibus obliquis; petalis sepalis lateralibus valde similibus sed paulo minoribus; labello orbiculari, minute apiculato, petalis aequilongo, calcare perbrevis semigloboso; columna perbrevis, rostello triangulo, bifido; anthera rotundato-cucullata, antice subexcisa; polliniis oblique obovoideis, stipite tenui apicem versus paululo dilatato, glandula oblonga minuta; ovario sessili, cylindrico, c. 1 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20175, flowering in Sept. 1909.

A very well-defined species which is similar to the following one in the shape of the labellum, but which retains the strongly reduced size of the spur shown by the previous species. The flowers are pale greenish yellow.

10. *T. orbiculare* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus applanatis, valde flexuosis, usque ad 15 cm longis, c. 1 mm latis; inflorescentiis distichis, dense 5–10-floris, sensim evolutis, pedunculo setiformi incluso 1–1.5 cm alto; bracteis deltoideis, minutis, ovario brevioribus; floribus minutis, glabris succedaneis; sepalis oblongis, obtusis, minute apiculatis, 2 mm longis, lateralibus obtusis; petalis oblique oblongis, obtusis, sepalis paulo brevioribus; labello orbiculari, apiculato, petalis aequilongo, calcare ellipsoideo, obtuso, apice subinconspicue curvato, labello paulo brevior; columna perbrevis, glabra; anthera reniformi-cucullata, apiculata; polliniis oblique obovoideis, stipite duplo longior e basi tenui oblanceolato, glandula minuta, lanceolata, dorso acuta; ovario sessili, glabro, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests on the Minjem [River], near Kelel, alt. c. 250 m—R. Schlechter no. 16397, flowering in Aug. 1907.

I have drawn attention above to the differences between this species and *T. cycloglossum* Schltr. The flowers are golden yellow.

11. *T. foliatum* Schltr., sp. nov.

Epiphyticum, minutissimum, foliatum; radicibus applanatis, flexuosis, usque ad 3 cm longis, vix 1 mm latis; foliis vulgo 2–3, erectis, lanceolato-ligulatis, acuminatis, basi attenuatis, 3–5 mm longis, medio 1–1.5 mm latis; racemis erectis, laxius paucifloris, pedunculo setiformi incluso 0.5–1.3 cm alto; bracteis minutis, ovario brevioribus; floribus minutissimis, glabris; sepalis oblongis, obtusiusculis, vix 1 mm longis, lateralibus obliquis; petalis e basi angustiore oblique ovato-lanceolatis, obtusiusculis, sepalis subaequilongis; labello suborbiculari, obtuso, apice marginibus incurvo, petalis aequilongo, calcare globoso labello subaequilongo; columna perbrevis, crassa, rostello brevi; anthera subreniformi-cucullata, obtusissima; pollinibus oblique ellipsoideis, stipite paulo longiore e basi tenui late rhombeo, glandula elliptica pollinibus dimidio minore; ovario subsessili glabro, c. 0.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19811, flowering in June 1909.

Very peculiar in this and the next species is the uniform development of the foliage leaves. I am not quite sure whether, in the present case, the sepals and petals have grown partially together, but undoubtedly the species is related very closely to the following one. The flowers are red-brown.

12. *T. kaniense* Schltr., sp. nov.

Epiphyticum, perpusillum, foliatum; radicibus paulo applanatis, filiformibus, flexuosis, usque ad 3 cm longis, vix 1 mm latis; foliis 2–3, lanceolato-ellipticis, acuminatis, 5–10 mm longis, medio fere 1–2 mm latis; racemis laxius paucifloris, cum pedunculo setiformi folia aequantibus vel paulo superantibus; floribus minutis, glabris; sepalis ovato-lanceolatis, acuminatis, 1.5 mm longis, lateralibus falcato-obliquis; petalis oblique ovato-lanceolatis, obtuse acuminatis, sepalis subaequilongis; labello suborbiculari, obtusiusculo, antice marginibus incurvo, basi concavo-foveato, petalis aequilongo, calcare globoso, c. 1 mm diametro; columna perbrevis, crassa; anthera subreniformi-cucullata, obtusa; pollinibus oblique ovoideis, stipite gracili, apicem versus sensim paululo dilatato, glandula oblonga, minuta; ovario cylindrico, subsessili, glabro, 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16963, flowering in Dec. 1907.

The species, undoubtedly, is related closely to *T. foliatum* Schltr., but is distinguished readily by the larger flowers, pointed sepals and the pollinia. The flowers are orange-red to brown.

13. *T. pachyacris* Schltr., sp. nov.

Epiphyticum, aphyllum, perpusillum; radicibus applanatis, valde flexuosis, usque ad 3 cm longis, c. 1 mm latis; racemo dense paucifloro, disticho, pedunculo setiformi incluso c. 1 cm alto; bracteis minutis, deltoideis, ovario multo brevioribus; floribus minutis, succedaneis, glabris; sepalis oblongis, obtusis, 1.25 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusis, sepalis paulo brevioribus; labello perlate rhombeo-ovali, apice obtusissimo carnosissimo-incrassato, petalis aequilongo, infra medium 1 mm lato, calcare subgloboso, obtuso, labello subtriplo brevior; columna perbrevis, crassiuscula, rostello brevi, bidentato; ovario subsessili, glabro, 1.25 mm longo.

Kaiser-Wilhelms-Land: On trees in the hill forests near Kelel on the Minjem [River], alt. c. 600 m—R. Schlechter no. 16374, flowering in July [Ed.—probably Aug.], 1907.

This species is somewhat isolated in the section. It may best be compared with the otherwise considerably different *T. album* Schltr. The flowers are golden yellow.

14. *T. album* Schltr., sp. nov.

Epiphyticum, pusillum, aphyllum; radicibus applanatis, leviter flexuosis, usque ad 10 cm longis, 1.25–1.5 mm latis; racemis perdense 4–8-floris, distichis, cum pedunculo setiformi c. 3 cm altis; floribus parvulis, succedaneis, glabris; sepalis ovalibus obtusis, 1.5 mm longis, lateralibus obliquis; petalis sepalis similibus, obtusiusculis, subaequilongis; labello suborbiculari in apicem brevem

incrassatum, obtusum exeunte, petalis aequilongo, medio fere 1.35 mm lato, calcare oblongoideo subrecto, obtuso, labello paulo brevior; columna perbrevis, crassiuscula, rostello brevi; anthera reniformi-triangulari, cucullata, obtuse apiculata; pollinibus oblique ellipsoideis, stipite fere 4-plo longiore, apicem versus sensim paululo dilatato, glandula lanceolata retrorsa; ovario glabro, subsessili, c. 1.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, above Dschischungari (Waria District), alt. c. 900 m—R. Schlechter no. 19837, flowering in June 1909.

Outwardly, one could almost consider this a species of the *Rhynchanthera* section, but the rostellum and the short anther deny it. The flowers are white.

§ 3. *Rhynchandra* [Ed.—*Rhynchanthera*—epithet misspelt in original text]

Whereas in the remaining sections of the genus, the distinction between the individual species is fairly easy, here it presents considerable difficulty with the majority of the species even with careful analysis of the flowers. I have found that the otherwise very underrated form of the root development, which here plays a doubly important role biologically, is very constant for the species. The nature of the flattening and width of the roots should be noted particularly. The inflorescences are very similar for most of the species, but often of different lengths. The size of the flowers is, likewise, of importance, as are the breadth of the petals and, above all, the shape of the lip and the spur.

The group has experienced a very important development, especially in our Territory, so that one may accept this as its centre of distribution. The species extend westwards to Java, but in an eastern direction, no species of the section are known to me.

From British Papua only *T. rhomboglossum* Schltr. has been recorded, while from Dutch New Guinea, *T. fimbriatum* J.J. Sm. [Ed.—on page 1091, Schlechter places *T. fimbriatum* J.J. Sm. in the section *Trachylepus*.] and *T. paludosum* J.J. Sm. may be accepted here.

The species of our Territory are distributed fairly evenly but they do not appear to ascend very far up the mountains, i.e., rarely up to the mist-forest formations, where they are replaced by species of the section *Trachylepus*. The forests of the hill-country are particularly rich in species.

15. *T. macranthum* Schltr., sp. nov.

Epiphyticum, aphyllum, gracile; radicibus applanatis, usque ad 40 cm longis, 2–3.5 mm latis, flexuosis; racemis pro genere laxis, gracillimis, plurifloris, rhachi flexuosis, pedunculo filiformi incluso 12–20 cm longis; bracteis deltoideis, acutis, ovario multo brevioribus; floribus in genere permagnis, glabris; sepalis petalisque lanceolatis, acuminatissimis, 2.5 cm longis, lateralibus obliquis; labello e basi ovali acuminatissimo, c. 2 cm longo, medio 0.85 cm lato, calcare oblongoideo obtuso, c. 2.5 mm longo; columna brevi, glabra, rostello elongato bifido; anthera ovato-cucullata breviter rostrata; pollinibus oblique obovoideis, stipite tenui, apicem versus paulo dilatato, fere 3-plo longiore, glandula ovata, subacuta; ovario cylindraceo, subsessili, gracili, 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Udu, on the Waria [River], alt. c. 200 m—R. Schlechter no. 17403, flowering in Mar. 1908; on trees in the mountain forests near Jaduna, on the Waria [River], alt. c. 200 m—R. Schlechter no. 19307, flowering in Apr. 1909.

The largest-flowered species of the genus known. As far as I can see, it is quite unique. I collected a very close relative of it, but without flowers, as specimen no. 20008, on the Djemur [River] in the Eitape District. The flowers are yellow.

16. *T. conoceras* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus applanatis, flexuosis, usque ad 25 cm longis, 1.5–2 mm

latis; racemis dense paucifloris, cum pedunculo setiformi usque ad 3.5 cm longis; bracteis deltoideis, minutis, ovario multo brevioribus; floribus parvulis, succedaneis, glabris; sepalis petalisque ellipticis, acutis, 5 mm longis, lateralibus obliquis, labello cucullato-concavo, ovato, obtusiuscule acuminato, supra medium cuneiformi-foveato, sepalis aequilongo, calcare conico obtuso, recto, labello triplo brevior; columna brevi, rostello corniformi; anthera ovato-cucullata, rostrata; polliniis oblique oblongoideis, stipite duplo longiore e basi tenui obovato, glandula retrorsa, lanceolata, acuta; ovario subsessili, 4 mm longo, glabro.

Kaiser-Wilhelms-Land: On bushes in the forests of Kelel, on the Minjem [River], alt. c. 150 m—R. Schlechter no. 16318, flowering in July 1907.

This species is distinguished easily from the others in the section by the shape of the spur. The flowers are pale yellow.

17. *T. neo-pommeranicum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 220.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16241, flowering in June 1907. [Ed.—possibly July 1907.]

Neu-Pommern: On trees in the forests at the foot of the Beining Range, between Massawa and Cape Lambert, alt. c. 40 m—R. Schlechter no. 13687, flowering in Oct. 1901.

I believe I am correct if I temporarily include all the plants from Kaiser-Wilhelms-Land here, even though they are distinguished by a narrower and pointed labellum. The flowers are pale yellow.

18. *T. pectiniferum* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus applanatis, flexuosis, 2 mm latis, usque ad 25 cm longis; racemis petiniformibus, dense 10–15-floris, pedunculo setiformi incluso usque ad 4 cm longis; bracteis deltoideis, acuminatis, ovario bene brevioribus; floribus parvulis, succedaneis, glabris; sepalis; ligulatis, obtusis, 3.75 mm longis, lateralibus obliquis; petalis oblique lanceolato-ligulatis, obtusiusculis, sepalis paulo brevioribus; labello e basi late rhombea dimidio anteriore lanceolato-subulato, basi foveato cum gibbis 2 obtusis ante ostium calcaris, petalis aequilongo; columna perbrevis, rostello malleoliformi; anthera ovato-cucullata rostrata, obtusa; polliniis oblique obovoideis, stipite subtriplo longiore, tenui, apicem versus paulo dilatato, glandula oblonga, polliniis aequilonga; ovario subsessili, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19762, flowering in June 1909.

This species is distinguished by a very characteristic lip. It is one of the few in the section that is restricted to the mist-forest formations. The flowers are yellowish white.

19. *T. kompsopus* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 220.

Kaiser-Wilhelms-Land: On trees in the vicinity of the Nuru [River], alt. c. 400 m—R. Schlechter no. 12812, [Ed.—possibly no. 13812], flowering in Dec. 1901; on trees in the forests of the Kani Range, alt. c. 600–800 m—R. Schlechter no. 16752, flowering in Nov. 1907; no. 17861, flowering in June 1908; on trees in the forests of the Finisterre Range, alt. c. 700 m—R. Schlechter no. 19188, flowering in Jan. 1909; on trees in the mountain forests near Pema, on the Waria [River], alt. c. 300–450 m—R. Schlechter no. 17404, flowering in Mar. 1908; no. 19369, flowering in May 1909.

Perhaps the species is set too broadly here and may be separated later. It is related closely to the following one, but is recognised by the larger flowers. The flowers are white.

20. *T. pallidum* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus applanatis, leviter flexuosis, 1.5–2.5 mm latis, usque ad 25 cm longis; racemis pluribus, dense 4–15-floris, distichis, pedunculo setiformi incluso 1–2 cm altis; bracteis minutis, deltoideis, ovario pluries brevioribus, floribus parvulis, succedaneis, glabris; sepalis

ligulatis, obtusis, c. 3 mm longis, lateralibus obtusiusculis; petalis anguste lanceolatis, acutis, sepalis distincte brevioribus; labello ovato-lanceolato, apicem versus paulo angustato, obtuso, apice incrassatulo, calcare oblongoideo-cylindraceo, longitudine dimidium labelli excedente; columna perbrevis, rostello lineari, bidentato; anthera rotundato-cucullata, lineari-rostrata; polliniis oblique obovoideis, stipite lineari basin versus sensim angustato, subduplo longiore, glandula lanceolata, retrorsa, polliniis aequilonga; ovario subsessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests at the foot of the Albo Hills, alt. c. 250 m—R. Schlechter no. 16179, flowering in June 1907.

This represents one of the smallest-flowered species in the section. It is recognised easily by the rather narrow lip, which is thicker in the front. The flowers are a very pallid yellow.

21. *T. cylindrocentrum* Schltr., sp. nov.

Epiphyticum, aphyllum, gracillimum; radicibus leviter applanatis, flexuosis, 1.25 mm longis, usque ad 25 cm longis; racemis dense plurimifloris, serraeformibus, pedunculo setiformi incluso usque ad 6 cm longis; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus in genere mediocribus, succedaneis, glabris; sepalis oblongo-ligulatis, obtusis, c. 3 mm longis, lateralibus obliquis; petalis sepalis similibus sed paulo brevioribus, obliquis; labello latissime ovato, apicem versus attenuato et marginibus incrassato, obtusiusculo, medio fovea cuneata donato, petalis aequilongo, calcare cylindrico, obtuso, labello aequilongo; columna perbrevis, crassa, rostello malleoliformi; anthera ovato-cucullata, longe rostrata; polliniis oblique obovoideis, stipite gracillimo apicem versus dilatato, glandula lineari-lanceolata ampla; ovario subsessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17873, flowering in June 1908.

The cylindrical shape of the spur is infrequent in this section, and is very characteristic for this species, as is the broad labellum. The flowers are white-yellow.

22. *T. subtrilobum* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus applanatis, flexuosis, 2–2.5 mm latis, usque ad 30 cm longis; racemis dense 10–15-floris, distichis, serraeformibus, cum pedunculo filiformi incluso usque ad 2 cm longis; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis oblongo-ligulatis, obtusis, 2.5 mm longis, lateralibus obliquis; petalis oblique lanceolatis, obtusiusculis, sepalis paululo brevioribus; labello circuitu rhombeo, supra medium subtrilobato-angustato, apice incrassato obtuso, e medio basin versus excavatione oblonga donato, petalis aequilongo, medio fere c. 1.75 mm lato, calcare oblongoideo, obtuso, recto, labello subaequilongo; columna perbrevis, crassa, rostello malleoliformi; anthera e basi reniformi-cucullata lineari-rostrata; polliniis oblique ellipsoideis, stipite tenui apicem versus paulo dilatato duplo longiore, glandula anguste rhombea mediocri; ovario subsessili, glabro, c. 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 900 m—R. Schlechter no. 17299, flowering in Feb. 1908.

This species, likewise, is related closely to *T. kompsopus* Schltr. in floral structure, but has an almost trilobate labellum, and smaller flowers of a different colour. The flowers are yellow-green.

23. *T. dischorensis* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus leviter applanatis, flexuosis, 1–1.5 mm latis, usque ad 30 cm longis; racemis dense 5–12-floris, serraeformibus, distichis, pedunculo filiformi incluso usque ad 3.5 cm longis; bracteis deltoideis, ovario multo brevioribus; floribus parvulis, succedaneis, glabris; sepalis oblique ligulato-oblongis, obtusis, extus carinatis, 2.5 mm longis, lateralibus obliquis, petalis sepalis similibus, obliquis, paulo brevioribus; labello late rhombeo, obtuso, e medio basin versus excavatione cuneata donato, petalis aequilongo, medio 2.25 mm lato; calcare decurvo subgloboso, superne bifoveato, labello plus duplo brevior; columna perbrevis, crassa, rostello malleoliformi; anthera e basi subreniformi-cucullata longius rostrata; polliniis oblique ellipsoideis, stipite tenui apice dilatato, glandula anguste oblonga satis magna; ovario subsessili, glabra, c. 2.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range near Dschischungari, alt. c. 900 m—R. Schlechter no. 19835, flowering in June 1909.

Whilst the previously described species of the section showed a spur directed

backwards, in this case it is clearly directed downwards. The species is distinguished, otherwise, by the broad rhombic lip. The flowers are pale yellow.

24. *T. leucanthum* Schltr., sp. nov.

Epiphyticum, aphyllum, gracillimum; radicibus applanatis, filiformibus, flexuosis, vix 1 mm latis, usque ad 30 cm longis; racemis dense 10–20-floris, serraeformibus, pedunculo incluso usque ad 2 cm longis; bracteis deltoideis, ovario multo brevioribus; floribus parvulis, succedaneis, glabris; sepalis 2 mm longis, intermedio ovato, obtuso, lateralibus oblique et anguste oblongis, obtusis; petalis oblique ovatis, obtusis, sepalis subaequilongis; labello ovato, apice marginibus incrassato, obtuso, excavatione oblanceolata e medio basin versus donato, calcare ellipsoideo, obtuso, c. 1.25 mm longo; columna brevi, crassa, rostello magno malleoliformi; anthera e basi subreniformi lineari-rostrata; polliniis oblique ellipsoideis, stipite tenui, apicem versus bene dilatato, glandula oblonga, parvula; ovario subsessili, glabro, c. 2 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests near Toliba, alt. c. 300 m—R. Schlechter no. 18952, flowering in Dec. 1908.

This species is recognised easily by the thin, very long roots. The pure white colour of the flower is also unusual in the section.

25. *T. iboense* Schltr., sp. nov.

Epiphyticum, aphyllum, pusillum; radicibus valde applanatis, flexuosis, 3–4 mm latis, usque ad 20 cm longis; racemis dense pauci-plurifloris, pedunculo filiformi incluso usque ad 3 cm longis; bracteis deltoideis, minutis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis oblongo-ligulatis, obtusis, 3 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusiusculis, sepalis subaequilongis; labello late rhombeo, e medio obscure trilobato, apice ovato incrassato, obtuso, medio foveato, petalis aequilongo, medio 3 mm lato, calcare oblongoideo, obtuso 2 mm longo; columna perbrevis, glabra, rostello amplo malleoliformi; anthera e basi rotundato-cucullata lineari-rostrata; polliniis oblique obovoideis, stipite e basi tenui anguste oblanceolato duplo longiore, glandula retrorsa, lanceolata, stipite tertia parte brevior; ovario subsessili, cylindrico, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 800 m—R. Schlechter no. 17810, flowering in May 1908.

A species with noticeably broad roots and hence easily recognised among its relatives. The flowers are yellow.

26. *T. brachypus* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus applanatis, flexuosis, usque ad 30 cm longis, 2–3 mm latis; racemis dense plurifloris, serraeformibus, brevissime vel breviter pedunculatis, glabris, 0.7–1.5 cm altis; bracteis deltoideis, minutis, ovario multo brevioribus; floribus in genere mediocribus, glabris; sepalis oblongo-ligulatis, obtusis, 4 mm longis, lateralibus obliquis; petalis sepalis similibus, obtusiusculis, obliquis, paulo brevioribus; labello ovato, obtuso, apice carnosio-incrassato, fovea e medio usque ad basin cuneata ornato, petalis aequilongo, calcare oblongoideo, obtuso, basi paulo attenuato, labello paulo brevior recto; columna perbrevis, glabra, rostello malleoliformi; anthera rotundato-cucullata, lineari-rostrata; polliniis oblique ellipsoideis, stipite 4-plo longiore tenui, apice dilatato, glandula lineari ampla; ovario glabro, subsessili, 3 mm longo.

Kaiser-Wilhelms-Land: On trees at the Minjem Gorge, alt. c. 100 m—R. Schlechter no. 17826, flowering in June 1908; on trees in the forests of the Kani Range, alt. c. 600 m—R. Schlechter no. 17855, flowering in June 1908; on trees on the banks of the Wabe [River], alt. c. 200 m—R. Schlechter no. 18071, flowering in July 1908; on trees in the gallery-forests on the Kenejia [River], alt. c. 150 m—R. Schlechter no. 18349, flowering in Oct. 1908.

On account of the noticeably short peduncle, I initially considered including the species in the section *Trachyrhachis* but the whole construction of the flower favours this relationship. The flowers are golden yellow with a whitish spur.

27. *T. malianum* Schltr., sp. nov.

Epiphyticum, aphyllum, gracile; radicibus leviter applanatis, flexuosis, 1–1.75 mm latis, usque ad 20 cm longis; scapis dense 10–15-floris, serraeformibus, pedunculo filiformi incluso usque ad 2.5 cm altis; bracteis deltoideis, minutis, ovario multo brevioribus; floribus in genere mediocribus, glabris,

succedaneis; sepalis petalisque oblongo-ligulatis, obtusis, subaequilongis, 4.5 mm longis, lateralibus obliquis; labello ovato, obtuso, medio foveato, sepalis aequilongo, calcare cylindraceo supra medium paulo dilatato, labello sublongiore; columna perbrevis, rostello malleoliformi; anthera rotundato-cucullata lineari-rostrata; polliniis oblique ellipsoideis, stipite subtriplo longiore, e basi tenui apicem versus dilatato, glandula lineari, ampla; ovario subsessili, glabro c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the alang-plains on the Malia [River], near the Saugueti Base, alt. c. 150 m—R. Schlechter no. 18364, flowering in Oct. 1908.

This species is distinguished from all the others described above by the spur which is longer than the lip. The flowers are yellowish white.

28. *T. stenosepalum* Schltr., sp. nov.

Epiphyticum, aphyllum, gracile; radicibus applanatis, flexuosis, 1.5–1.75 mm latis, usque ad 25 cm longis; racemis dense pauci-plurifloris, serraeformibus, pedunculo setiformi incluso 1.5–2 cm altis; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis anguste linearibus, obtusis, carinatis, 3 mm longis, lateralibus obliquis; petalis oblique lanceolato-oblongis, obtusiusculis, sepalis paulo brevioribus; labello latius ovato, apice attenuata carnosocrassato, obtusiusculo, petalis aequilongo, calcare cylindrico, apicem versus paulo dilatato, labello sublongiore; columna perbrevis, rostello malleoliformi; anthera e basi late ovato-cucullata, lineari-rostrata; polliniis oblique oblongoideis, stipite subduplo longiore, e basi tenui apicem versus dilatato, glandula lineari-oblonga, obtusa; ovario cylindraceo, glabro, subsessili, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20155, flowering in Sept. 1909.

One of the few species in the section found in the mist-forest. It is related closely to the previous one, but has broader roots, smaller flowers with narrower sepals and a different labellum. The flowers are pale yellow with a whitish spur.

29. *T. Jadunae* Schltr., sp. nov.

Epiphyticum, aphyllum, gracile; radicibus applanatis, flexuosis, 1.5–2 mm latis, usque ad 30 cm longis; racemis dense pauci-vel plurifloris, serraeformibus, pedunculo filiformi incluso usque ad 6 cm longis; bracteis minutis, deltoideis, ovario multo brevioribus; floribus in genere mediocribus, glabris, succedaneis; sepalis ligulato-oblongis, obtusis, carinatis, 5.5 mm longis, lateralibus obliquis; petalis sepalis similibus, sed paulo brevioribus; labello late ovato-concavo, obtuse apiculato, e medio usque ad basin foveato, petalis aequilongo, c. 4 mm medio lato, calcare cylindrico, apicem versus subclavato, recto, c. 6.5 mm longo; columna perbrevis, rostello permagno malleoliformi; anthera e basi rotundato-cucullata longe lineari-rostrata; polliniis oblique obovoideis, stipite tenui, apicem versus dilatato, glandula retrorsa lineari perampla; ovario subsessili, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, alt. c. 300 m—R. Schlechter no. 19278, flowering in Apr. 1909.

This species is noticeable amongst its relatives by the length of the spur. The anther has a longer beak than the others. The flowers are yellow, with a whitish spur.

30. *T. carnosiflorum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus valde applanatis, flexuosis, 4–5.5 mm latis, usque supra 30 cm longis; racemis dense pauci-vel pluri-floris, pedunculo gracili incluso c. 3 cm longis; bracteis deltoideis, acuminatis, ovario multo brevioribus; floribus in genere inter mediocres, glabris, pro genere carnosis; sepalis petalisque oblongis, obtusis, extus obuse carinatis, subaequilongis, 5.5 mm longis, lateralibus obliquis; labello circuitu ovali, apice carnosocrasso obtuso, infra medium margine utrinque sublobato-dilatato, sepalis aequilongo, e medio usque in basin foveato, calcare cylindraceo supra medium paululo dilatato, lateraliter paulo compresso, labello subaequilongo; columna perbrevis, crassa, rostello peramplum malleoliformi; anthera e basi rotundato-cucullata longe rostrata; polliniis oblique obovoideis, stipite duplo longiore e basi tenui cucullato-dilatato, glandula lineari utrinque acuta, satis magna; ovario subsessili glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, near Akur, alt. c. 700 m—R. Schlechter no. 20110, flowering in Sept. 1909.

The species is characterised by the broad long roots and the fleshy flowers. The flowers are golden yellow with a whitish spur.

§ 4. *Loboglossum*

The delimitation of this section is not yet sufficiently sharp, but it may be improved considerably when all the species belonging to the section are examined carefully. At present it still contains elements which may have to be excluded later.

As I have already stated above, the section is to be distinguished chiefly from *Rhynchanthera* by the conspicuous lobing of the labellum.

In addition to the species enumerated here from our Territory, the only ones recorded from Papuaia are *T. arachnites* J.J. Sm., *T. crenatum* J.J. Sm. and probably also *T. maximum* J.J. Sm., all from Dutch New Guinea.

With the exception of two, all species of our Territory are epiphytes of the hill-country. The two exceptions, *T. cardiophorum* Schltr. and *T. nephrophorum* Schltr., are inhabitants of the mist-forests of the mountains.

31. *T. trilobum* Schltr., sp. nov.

Epiphyticum, aphyllum, parvulum; radicibus applanatis, flexuosis, 2–3.5 mm latis, usque ad 20 cm longis; racemis subaxe vel subdense plurifloris, pedunculo filiformi incluso usque ad 2.5 cm longis; bracteis deltoideis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis ligulatis, acutis, dorso carinatis, c. 4 mm longis, lateralibus obliquis; petalis sepalis similibus sed paulo brevioribus; labello e basi semiorbiculari infra medium trilobato, petalis aequilongo, excavato, inter apices loborum lateralium 3.5 mm lato, lobis lateralibus falcatis acutis, intermedio multo majore, ovali, acuto, calcare brevissimo semioblongo; columna perbrevis, rostello brevi, bifido; anthera rotundato-cucullata, breviter rostrata; ovario subsessili, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On shrubs by creek edges not far from Kelel, in the Minjem Valley, alt. c. 150–200 m—R. Schlechter no. 16319, flowering in July 1907; no. 16511, flowering in Sept. 1907.

This species always is recognised easily by the shape of the very short-spurred lip. The flowers are pale yellow.

32. *T. aureum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus applanatis, flexuosis, 2.5–4 mm latis, usque supra 30 cm longis; racemis subdense plurifloris, serraeformibus, pedunculo gracili incluso usque ad 3 cm longis; bracteis parvulis deltoideis, ovario multo brevioribus; floribus in genere inter majores, glabris, succedaneis; sepalis anguste oblongis, obtusis, 1 cm longis, lateralibus obliquis; petalis sepalis bene similibus sed distincte brevioribus; labello e basi late cuneata medio trilobato, petalis aequilongo, medio fere 6 mm lato, lobis lateralibus triangularibus subacutis, brevibus, intermedio ovato, obtuso, marginibus incrassato, multo majore, calcare subrecto cylindrico, obtusiusculo, supra medium leviter dilatato, 1 cm longo; columna perbrevis, rostello malleoliformi, permagno; anthera e basi late rhomboideo-cucullata lineari-rostrata; pollinibus oblique obovatis, stipite plus duplo longiore e basi tenui apicem versus dilatato, glandula anguste lineari, utrinque acuta, stipite aequilonga; ovario subsessili, glabro, c. 7 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 800 m—R. Schlechter no. 17629, flowering in Apr. 1908; on trees in the forests of the Ibo Range, alt. c. 700 m—R. Schlechter no. 18994, flowering in Dec. 1908; on trees in the forests of the Dischore Range, alt. c. 700 m—R. Schlechter no. 19679, flowering in June 1909.

A very characteristic species which is recognised easily by the colour of the rather large flowers, the shape of the lip, and by the long spur. The flowers are golden yellow with a paler spur.

33. *T. cardiophorum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus valde applanatis, flexuosis, c. 5 mm latis, usque supra 40 cm longis; racemis dense pauci-vel plurifloris, pedunculo gracili incluso c. 2 cm longis; bracteis deltoideis, parvulis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis oblongis, obtusis, extus carinatis, 5 mm longis; petalis oblique oblongis, obtusis, extus carinatis, sepalis subaequilongis; labello trilobo petalis aequilongo, lobis lateralibus semiquadratis, obtusis, intermedio cordiformi, carnosus, incrassatus, distincte majore, excavatione cuneata e basi lobi intermedii in basin labelli

decurrente, calcare recto, cylindrico, obtuso, labello paulo brevior; columna perbrevis, rostello malleoliformi, amplo; anthera e basi rotundato-cucullata lineari, obtusa; ovario sessilibus, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Maboro Range, alt. c. 1200 m—R. Schlechter no. 19508, flowering in May 1907 [Ed.—possibly 1909.]

Undoubtedly this species, together with the next two, is closely related to *T. aureum* Schltr. All three are distinguished easily by the lip callus. The flowers are golden yellow.

34. *T. lamprorhizum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus valde applanatis, flexuosis, superne lucidis, 2.5–3.25 mm latis, usque ad 15 cm longis; racemo dense paucifloro, pedunculo gracili incluso c. 1 cm alto; bracteis minutis deltoideis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis petalisque oblongo-ligulatis, obtusis, extus obtuse carinatis, subaequilongis, c. 4 mm longis, lateralibus obliquis; labello circuitu ovali, supra medium trilobo, petalis aequilongo, medio fere 2 mm lato, lobis lateralibus rotundatis, brevibus, intermedio bene majore ovato, obtuse acutato, basi medio excepto callo V-formi omnino obecto; calcare anguste oblongoideo, lateraliter compresso, labello aequilongo; columna brevi, rostello peramplo; anthera e basi rotundato-cucullata, longe oblongo-rostrata, apice tridentata; pollinibus obovoideis, stipite subtriplo longiore anguste oblanceolato, glandula lineari, stipite aequilonga; ovario cylindrico, glabro, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1100 m—R. Schlechter no. 18983, flowering in Dec. 1908.

The lip, with the spur compressed laterally and the anther, are very characteristic for the species. The flowers are golden yellow with a pale yellow spur.

35. *T. trichopus* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus applanatis, flexuosis, 2–2.75 mm latis, usque supra 50 cm longis; racemis subdense 10–20-floro, serraeformi, pedunculo setiformi incluso 3.5–10 cm longo; bracteis deltoideis, minutis, ovario multo brevioribus; floribus in genere mediocribus, glabris, succedaneis; sepalis petalisque ligulatis, subacutis, subaequilongis, 6 mm longis, lateralibus obliquis; labello e basi semiovali medio trilobato, petalis aequilongo, lobis lateralibus brevibus, obtusis, incurvulis, intermedio multo majore, lanceolato-triungulo, obtuso, e basi usque supra medium callo triangulo cordato ornato, calcare cylindrico recto apice ampliato, 7 mm longo; columna brevi, rostello malleoliformi, amplo; anthera e basi late rhombo-cucullata rostrata; pollinibus subglobosis, stipite tenui apice rhombo-dilatato, glandula ampla, lineari, acuta, retrorsa; ovario sessilibus, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, alt. c. 200 m—R. Schlechter no. 19228, flowering in Apr. 1909.

Likewise, a very characteristic species with long roots and rather large flowers. The flowers are yellowish with a pale orange-yellow spur tip.

36. *T. quadratum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus applanatis, flexuosis, 1.5–2.5 mm latis, usque ad 25 cm longis; scapis dense plurifloris, cum pedunculo setiformi usque ad 8 cm longis; bracteis deltoideis, minutis; floribus in genere mediocribus, glabris; sepalis petalisque oblongis, obtusis, subaequilongis, lateralibus obliquis, c. 5 mm longis; labello e basi semiorbiculari trilobo, lobis lateralibus truncatis, antice irregulariter subdentatis, intermedio quadrato, antice truncato, margine irregulariter subdentato, basi callo rotundato, antice evanescente donato, labello toto petalis aequilongo, inter apices loborum 4.5 mm lato, calcare cylindrico recto, apice subinflato, 4.5 mm longo; columna perbrevis, rostello brevi, malleoliformi; anthera e basi rotundato-cucullata rostrata; pollinibus inaequimagnis, stipite e basi tenui dilatato, subduplo longiore, glandula lineari, ampla; ovario sessilibus, glabro, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the gallery-forest on the Keneja [River], alt. c. 150 m—R. Schlechter no. 18354, flowering in Oct. 1908.

This species, probably, is related most closely to *T. crenatum* J.J. Sm., but is distinguished easily by the lip. The flowers are yellow.

37. *T. nephrophorum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus applanatis, flexuosis, 1.5–2 mm latis, usque ad 40 cm longis;

racemis dense plurifloris, pedunculis setiformibus inclusis usque ad 5 cm longis; bracteis deltoideis, minutis, ovario multo brevioribus; floribus parvulis, glabris, succedaneis; sepalis petalisque ovalibus obtusis, subaequilongis, c. 2.25 mm longis, lateralibus obliquis; labello e basi late cuneata, medio trilobo, petalis aequilongo, inter apices loborum lateralium 2.5 mm lato, lobis lateralibus oblique oblongis, obtusis, subcrenulatis, intermedio longiore obovato, exciso, basi excepta omnino callo magno reniformi oblecto, calcare late ellipsoideo, suborbiculari, obtuso, 0.75 mm longo; columna perbrevis rostellum brevi, anthera subreniformi-cucullata breviter rostrata; pollinibus oblique obovoideis, stipite tenui apicem versus sensim paulo dilatato, glandula parvula oblonga; ovario subsessili, glabro, c. 1.75 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, on the Govidjoa [Creek] (Waria District), alt. c. 1200 m—R. Schlechter no. 19823, flowering in June 1908. [Ed.—probably 1909.]

This species, which is related to *T. pulvinatum* Schltr., is well characterised by the large reniform callus. The flowers are pale yellow.

38. *T. pulvinatum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 222.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Ramu [River], alt. c. 150 m—R. Schlechter no. 13881, flowering in Jan. 1902.

This, as well as the two previous species described above, together with *T. crenatum* J.J. Sm., belong to a small group characterised by the shape of the lip.

39. *T. grandiflorum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 221.

Kaiser-Wilhelms-Land: On trees in the forests on the upper Djamu [River], alt. c. 600 m—R. Schlechter no. 17318, flowering in Feb. 1908; on trees on the upper Schumann River, alt. c. 300 m—R. Schlechter no. 14171, flowering in Feb. 1902; on trees in the forests near Jaduna on the Waria [River], alt. c. 200 m—R. Schlechter [Ed.—no number cited], flowering in Apr. 1909.

Since I have often had the opportunity of observing this interesting species, I should now like to add to my first description of the dorsal lobe, which is slit in the front like a fringe. These fringes escaped my observation in the strongly wilted single flower of the original specimen. I believe that *T. maximum* J.J. Sm. also belongs to this relationship. The flowers are pale green-yellow.

§ 5. *Trachyrhachis*

I have drawn attention already to the principal characters of this section. They are found in the shortened inflorescences and the more-or-less warty covering of the rachis and bracts. However, these are not the only habit-characters which induce me to establish the section, for there are also certain floral characters very difficult to describe at present of which perhaps the most pronounced, on superficial observation, is found in the labellum, which is convex and usually thickened in front. The spur also is always short and sac-like. In the colouring of the flowers, white predominates.

The section is distributed from the Himalayas across the entire monsoon-region as far as Samoa.

From Dutch New Guinea, *T. breviscapum* J.J. Sm. belongs here. No further species of the section, except those enumerated below, appear to have been recorded from Papuasia.

All species found in our Territory are epiphytes of the forests of the hill-country.

40. *T. palmicola* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 221.

Neu-Mecklenburg: On trunks of coconut palms in Lauan Village, alt. c. 10 m—R. Schlechter no. 14681, flowering in June [Ed.—probably July] 1902.

I have drawn attention earlier to the relationship of this plant with *T. obtusum* Bl.

Amongst the Papuan species of the section, it is distinguished by the labellum which reminds me chiefly of *T. obtusum* Bl. The flowers are pale yellow.

41. *T. oblongum* Schltr., sp. nov.

Epiphyticum, pusillum, aphyllum; radicibus applanatis, flexuosis, usque ad 8 cm longis, 1.5–2 mm latis; racemis epedunculatis, flexuosis, usque ad 2 cm longis, subdense pauci-vel plurifloris; bracteis ovatis apiculatis, ovario multo brevioribus; floribus parvulis, glabris; sepalis ligulato-oblongis, apiculatis, extus subdentato-carinatis, 3.75 mm longis, lateralibus obliquis; petalis oblique linearibus obtusis, sepalis subaequilongis; labello carnosulo, oblongo, obtusissimo, marginibus incrassatulo, sepalis aequilongo, calcare ellipsoideo, labello plus duplo brevior; columna perbrevis, rostello recto, permagno; anthera lanceolato-cucullata, obtusa; polliniis oblique ovoideis; stipite e basi tenui apicem versus dilatato, 3–4-plo longiore, glandula lanceolata, parvula, retrorsa; ovario 6-costato, c. 3 mm longo, glabro.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, on the Minjem [River], alt. c. 200 m—R. Schlechter no. 16387 (TYPE), flowering in Aug. 1907.

Of the remaining species of the section, this one is distinguished easily by the very uniform long labellum. Clearly we are dealing here with a very rare species, having found only a single specimen, despite my long stay in the Minjem Valley. The flowers are white-yellow, the lip with red markings, the column with a red margin.

42. *T. mangiferae* Schltr., sp. nov.

Epiphyticum, pusillum, aphyllum; radicibus flexuosis, applanatis, 4–8 cm longis, 1.5–2 cm latis; racemis subepedunculatis, flexuosis, laxe paucifloris, leviter verruculosi; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus parvulis, glabris; sepalis oblongis, apiculatis, c. 3 mm longis, lateralibus obliquis; petalis oblique ligulatis, acutis, sepalis subaequilongis; labello circuito oblongo, basi dilatata truncato, apicem versus marginibus incrassato, apice ipso apiculo conico incurvo donato, petalis aequilongo, calcare duplo brevior oblongoideo, obtuso apiculato; columna brevis, crassa, rostello brevis; anthera rotundato-cucullata, obtuse apiculata; polliniis oblique obovoideis, stipite e basi tenui dilatato, aequilongo, glandula rotundata, minuta; ovario cylindrico, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On *Mangifera* [tree] trunks on the Minjem [River], near Djawer, alt. c. 100 m—R. Schlechter no. 16317, flowering in July 1907.

I have observed this species, which is well characterised by the labellum, only on *Mangifera* trees. The flowers are yellowish with a white lip.

43. *T. orthorhynchum* Schltr., sp. nov. [Ed.—same epithet used on p. 1096].

Epiphyticum, pusillum, aphyllum; radicibus applanatis, leviter flexuosis, usque ad 15 cm longis, 1.25–1.75 mm latis; racemis epedunculatis, subaxe 5–8-floris, leviter verruculosi, 5 mm altis, flexuosis; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus pro sectione magnis, glabris; sepalis oblongis, apiculatis, 4.5 mm longis, lateralibus obliquis; petalis subfalcatis, lineari-ligulatis, obtusis, sepalis subaequilongis; labello late ellipsoideo-cucullato, apice exciso cum apiculo medio interjecto, linea media intus incrassata, petalis aequilongo, medio 4 mm lato, calcare late ellipsoideo obtusissimo 2.5 mm longo; columna perbrevis, rostello magno recto; anthera oblongo-cucullata, antice angustiore, obtusa; ovario cylindraco, glabro, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of Kelel, on the Minjem [River], alt. c. 250 m—R. Schlechter no. 16404, flowering in Aug. 1907; on trees in the forests of Toliba, alt. c. 300 m—R. Schlechter no. 18953, flowering in Dec. 1908.

One of the large-flowered species of the section. It is characterised excellently by the shape of the labellum. In common with *T. oblongum* Schltr., it has a long straight rostellum. The flowers are yellow with a white lip, the column red in front.

44. *T. physodes* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, usque ad 20 cm longis, c. 1.5 mm latis; racemis subepedunculatis, laxe 5–10-floris, flexuosis, densius et minute verruculosi; bracteis deltoideis, ovario multo brevioribus; floribus in sectione mediocribus, glabris; sepalis ellipticis, obtusis, nervo medio obtuse carinato subverruculosi, 3 mm longis; petalis oblique oblongis, obtusiusculis, extus carinatis,

sepalis subaequilongis; labello semigloboso-cucullato, antice sublobulato apiculato, sepalis aequilongo, medio 3 mm lato, calcare e basi attenuata subgloboso-inflato, obtusissimo, sepalo aequilongo, supra medium 2.5 mm lato; columna perbrevis crassa; anthera rotundato-cucullata, obtuse apiculata; ovario cylindraceo, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the mountain forests near Jaduna, alt. c. 400 m—R. Schlechter no. 19303, flowering in Apr. 1909.

Likewise a very distinctive species. It is characterised by the open inflorescences and the spur inflated almost to a globule. The flowers are sulphur-yellow with a paler spur.

45. *T. leptorhizum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus subfiliformibus, flexuosis, leviter applanatis, usque ad 30 cm longis, 0.75–1.25 mm latis; racemis epedunculatis, dense 15–20-floris, dense verruculosi; bracteis deltoideis; ovario multo brevioribus; floribus in sectione mediocribus, glabris; sepalis latius lanceolatis, acutis, extus carinatis, 3.75 mm longis, lateralibus falcato-obliquis; petalis subfalcato-lanceolatis, acutis, sepalis subaequilongis; labello oblongoideo-concavo, dimidio anteriore paulo angustato, antice apiculato, superne medio foveato, latere utrinque cum gibbo obtuso, petalis aequilongo, calcare brevi semioblongo, obtuso, labello 3-plo brevior; columna perbrevis, rostello permagno curvato; anthera reniformi-cucullata, obtuse et breviter rostrata; pollinibus oblique obovoideis; ovario cylindraceo, glabro, c. 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Gomadjidji [Mountain], on the Waria [River], alt. c. 450 m—R. Schlechter no. 19387, flowering in May 1909.

Amongst the species of the section described here, this one has the slimmest roots. Particularly in the flowers it is completely different from the others. The flowers are white.

§ 6. *Trachylepus*

This section is distinguished chiefly from the preceding one by its flowers, which possess an ovary more-or-less thickly covered with warts, prickles or hairs. In addition very considerable differences exist in habit. In the main, species with distinct peduncles which are thickly covered with hair or other excrescences (with the exception of a few species) are dealt with here. In their structure the flowers are usually more complicated, and display a peculiar multiplicity in form.

As far as I can ascertain, this section is distributed from Java across the Sunda Islands, the Moluccas and Papuasias as far as New Caledonia.

Only one species, *T. fimbriatum* J.J. Sm. [Ed.—see earlier note under Section *Rhynchanthera*], is described from Dutch New Guinea. All of the specimens enumerated below therefore appear to be endemic, unless *T. fimbriatum* J.J. Sm. must be united with *T. platyrhizum* Schltr.

With the exception of *T. fragrans* Schltr., all species known from our Territory at present are epiphytes of the mist-forest formations. Some species are found even up to an altitude of more than 2000 m.

46. *T. pubicarpum* Schltr., sp. nov.

Epiphyticum, aphyllum, perpusillum; radicibus flexuosis, applanatis, usque ad 7 cm longis, 1–1.25 mm latis; racemis apice dense paucifloris, vix 1 cm altitudine excedentibus, pedunculo hispidulo; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus parvulis, ovario excepto glabris; sepalis oblongis, obtusis, 2 mm longis, lateralibus obliquis; petalis oblique oblongis, obtusis, sepalis subaequilongis; labello reniformi, exciso cum apiculo minuto interjecto, 3.5 mm longo, supra basin 4.5 mm lato, calcare oblongoideo, obtuso, labello duplo brevior; columna perbrevis, rostello amplo malleoliformi; anthera oblongoideo-cucullata, acute rostrata; pollinibus oblique oblongoideis, stipite duplo longiore e basi tenui apicem versus paulo dilatato, glandula anguste lanceolata, acuta, retrorsa; ovario clavato minute hispidulo, 2 mm longo; capsula oblique oblongoidea, puberula, c. 4 mm longa.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c.

900 m—R. Schlechter no. 20251, flowering in Sept. 1909; on trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16542 (TYPE), flowering in Sept. 1907; on trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18993, flowering in Dec. 1908.

This is the smallest of the species in the section. Probably it is related most closely to the following one, but has quite a different labellum. The very delicate flowers are white with four to six, small, violet-red spots on the lip.

47. *T. ovale* Schltr. sp. nov.

Epiphyticum, aphyllum; radicibus plus minus flexuosis, 6–12 cm longis, vix 1 mm latis, applanatis; racemis pedunculatis, laxe paucifloris, pedunculo hirtulo incluso usque ad 2 cm altis; bracteis deltoideis, ovario multo brevioribus; floribus in sectione inter minores, ovario excepto glabris; sepalis ovato-oblongis, obtusiusculis, c. 2 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusis, sepalis subaequilongis; labello ovali, obtuso, integerrimo, petalis aequilongo, medio 1.5 mm lato, calcare oblongoideo-clavato, recto, obtuse apiculato, labello aequilongo; columna brevi, rostello mediocri, maleoliformi; polliniis oblique subglobosis, stipite e basi tenui apice rhombeo-dilatato, polliniis 3–4-plo longiore, glandula parvula, oblonga; ovario puberulo, cylindraceo, 2.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 16964, flowering in Dec. 1907.

This species is distinguished from *T. pubicarpum* Schltr. by the upwards-growing roots and the very characteristic flowers with an oval lip-lamina. The flowers are greenish sulphur-yellow.

48. *T. macrotænium* Schltr., sp. nov.

Epiphyticum, pro genere validum, aphyllum; radicibus flexuosis, valde applanatis, usque ad 50 cm longis, 6 mm latis; racemis dense plurifloris, pedunculo dense hispido incluso usque ad 7 cm altis; bracteis ovatis acuminatis, ovario plus duplo brevioribus; floribus in genere magnis; sepalis lanceolatis, acutis, extus basi sparsim muricato-asperatis, 1.5 cm longis, lateralibus obliquis; petalis anguste falcato-lanceolatis, acutis, glabris, sepalis subaequilongis; labello ovato, acuto, glabro, 1.3 cm longo, infra medium 6 mm lato; calcare subclavato, leviter decurvo, 1.7 cm longo; columna perbrevis, glabra, rostello adscendente, perlongo; anthera cucullata longius rostrata; polliniis oblique obovoideis, stipite c. 6-plo longiore e basi tenui sensim paulo dilatato, glandula retrorsa acuta, angusta, lineari, ampla; ovario cylindrico, dense muricato, 9 mm longo.

Kaiser-Wilhelms-Land; On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20252, flowering in Sept. 1909.

I know of no species with which this one could be compared, since it differs considerably in floral structure from the other vigorously growing ones. The flowers are pale yellow, the spur is whitish with a yellow tip.

49. *T. proboscideum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, applanatis, usque supra 30 cm longis, c. 3 mm latis; racemis subdense plurifloris, cum pedunculo usque ad 9 cm longis, densissime muricato-hispidis; bracteis deltoideis, ovario multo brevioribus; floribus in sectione vix inter majores; sepalis ligulato-oblongis, apiculatis, extus carinatis et dimidio inferiore sparsim muriculatis, 7 mm longis, lateralibus obliquis; petalis sepalis similibus et subaequimagnis, glabris; labello perlate ovato apiculato, concavo, dimidio anteriore margines versus utrinque toro longitudinali ornato, ante apicem fovea brevi donato, 6 mm longo, infra medium 5 mm lato, calcare subpatulo cylindraceo, apicem versus subincrassato, 7 mm longo; columna perbrevis, rostello peramplo proboscideo; anthera cucullata breviter et obtuse rostrata; polliniis oblique obovoideis, stipite 6–7-plo longiore, e basi tenui apicem versus dilatato, glandula oblonga parvula; ovario dense muricato, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Mimi [Mountain], on the upper Waube Creek (Waria District), alt. c. 900 m—R. Schlechter no. 19445, flowering in May 1909.

A very peculiar species easily recognised by the flowers. The labellum is very characteristic. The flowers are white, with soft violet barbs outside; the lip has a red spot in the front and the tip of the spur is red.

50. *T. brunnescens* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, applanatis, usque ad 15 cm longis, 1.5–2 mm latis; racemis dense 2–4-floris, pedunculo gracillimo, dense muricato-hispido, usque ad 6 cm longo; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus in sectione vix inter majores, ovario excepto glabris; sepalis petalisque patentibus, oblongo-ligulatis, obtusis, 5 mm longis, lateralibus obliquis, petalis paulo brevioribus; labello circuitu perlate ovato, obtusiusculo, antice incrassato, infra apicem margine utrinque lobulo dentiformi, triangulo ornato, sepalis aequilongo, 3.5 mm infra medium lato, calcare cylindraceo, recto, supra medium paululo dilatato, 9 mm longo, ostio supra basin labelli, foveiformi; columna perbrevis, rostello magno proboscideo; anthera quadrata, apiculata; polliniis oblique obovoideis, stipite 3-plo longiore e basi tenui apice dilatato, glandula oblonga parvula; ovario cylindrico, dense muricato-papilloso, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Ibo Range, alt. c. 1000 m—R. Schlechter no. 18922, flowering in Dec. 1908.

This species is the first of a group of closely-related forms. Amongst these, the present species is characterised by a straight spur. The flowers are yellowish brown.

51. *T. latipetalum* Schltr., sp. nov.

Epiphyticum, aphyllum, pro genere validum; radicibus leviter flexuosis, applanatis, 30 cm et ultra longis, 2.5–3.5 mm latis; racemis densissime plurifloris, quaquaversis, perlonge pedunculatis, cum pedunculo 6–20 cm longo densissime muricato-hispidis; bracteis lanceolatis, acuminatis, ovario brevioribus; floribus mediocribus, succedaneis, ovario excepto glabris; sepalis anguste oblongis, obtusis, apice extus leviter incrassatis, 3 mm longis, lateralibus obliquis; petalis perlate rhombeo-ellipticis, apice obtuso extus paulo incrassatis, sepalis subaequilongis; labello circuitu late ovato obtuso, quarta parte anteriore sublobato-angustato, apice incrassato medio excavato, petalis aequilongo, calcare leviter decurvo cylindrio apicem versus paulo ampliato, obtuso, c. 1 cm longo; columna perbrevis, rostello satis longo adscendente; polliniis oblique obovoideis, stipite duplo longiore, e basi tenui apicem versus dilatato, glandula retrorsa anguste lanceolata, acuta, ampla; ovario pedicellato, clavato, muricato-papilloso, 4.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range (Waria District), alt. c. 1200 m—R. Schlechter no. 19693, flowering in June 1912. [Ed.—possibly 1909.]

This and the following four species are characterised not only in the section, but also in the genus, by a dense spiral inflorescence, whilst the racemes are strictly distichous. *T. brunnescens* Schltr. should also belong to this group, but the arrangement of the flowers cannot be recognised with the specimens available, since the inflorescences carry only two to three flowers. Perhaps it should be recommended to treat these species later on as a separate section. The flowers of the present species are pale yellow with golden yellow tips.

52. *T. quaquaversum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus leviter flexuosis, applanatis, usque ad 30 cm longis, c. 2 mm latis; pedunculis cum racemo perbrevis quaquaverso, densissime plurifloro, usque ad 17 cm longo, dense muricato hispido; bracteis lanceolatis, acuminatis, ovario subaequilongis; floribus ovario excepto glabris, mediocribus; sepalis oblongo-ligulatis, obtusis, 4 mm longis, lateralibus obliquis; petalis oblique ellipticis, obtusissimis, sepalis paulo brevioribus; labello circuitu ovali, sepalis aequilongo, tertia parte anteriore trilobo, lobis lateralibus brevibus, triangulis, obtusis, intermedio semioblongo, obtuso, fovea lineari e basi labelli usque in medium lobi intermedii decurrente, calcare cylindrico, dimidio anteriore paulo ampliato, subacuto, 8.5 mm longo; columna perbrevis, rostello amplo malleoliformi; anthera quadrato-cucullata, rostrata; polliniis illis praecedentis simillimis; ovario pedicellato muricato-papilloso c. 6 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20109, flowering in Sept. 1909.

This species is well distinguished from the previous one and the three following ones by its labellum. The flowers are golden yellow with a paler spur.

53. *T. clavatum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus leviter flexuosis, applanatis, usque ad 40 cm longis, 3.5–4 mm latis;

pedunculo cum racemo brevi quaquaverso, densissime plurifloro usque ad 15 cm longo, dense muricato-hispido; bracteis lanceolatis, acuminatis, ovario brevioribus; floribus ovario excepto glabris, mediocribus; sepalis oblongo-ligulatis, obtusis, 4 mm longis, lateralibus obliquis; petalis oblique ovatis, obtusis, sepalis subaequilongis; labello circuitu ovali, tertia parte anteriore trilobo, petalis aequilongo, lobis lateralibus parvulis rotundatis, intermedio reniformi, obtuso, carnosus, medio labelli aequilato, fovea oblonga e medio labelli usque in ostium calcaris decurrente, calcare subrecto, lateraliter paulo compresso, cylindrico, apice clavato-dilatato, c. 1 cm longo; columna perbrevis, rostello amplo malleoliformi; anthera rotundato-cucullata, rostrata, obtusa; polliniis illis *T. latipetali* Schltr. simillimis; ovario papilloso-puberulo, pedicellato, c. 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 1300 m—R. Schlechter no. 18562, flowering in Oct. 1908.

By the shape of the lip, this species is related most closely to *T. robustum* Schltr., which is, however, larger in all segments. The flowers are golden yellow.

54. *T. robustum* Schltr., sp. nov.

Epiphyticum, aphyllum, robustum; radicibus flexuosis, valde applanatis, usque supra 50 cm longis, 4–6 mm latis; pedunculis cum racemo brevi, densissime multifloro, quaquaverso, densissime muricato-villosis, usque ad 30 cm longis; bracteis lanceolatis, acuminatis, ovario brevioribus; floribus inter majores, ovario excepto glabris; sepalis oblongis, obtusis, c. 7 mm longis, lateralibus obliquis; petalis oblique suborbiculari-ellipticis, obtusis, sepalis paulo brevioribus; labello circuitu quadrato-ovalis, tertia parte anteriore trilobo, petalis aequilongo, lobis lateralibus brevibus semiquadratis, obtusis, intermedio reniformi, obtusissimo, carnosus-incrassatus, medio labelli paulo angustiore, fovea angusta sensim evanescente e ostio calcaris versus medium decurrente, calcare cylindrico, curvato, deflexo, infra apicem paulo ampliato, subacuto, 1.8 cm longo; columna perbrevis, rostello malleoliformi; anthera subcordato-cucullata, longirostrata; polliniis oblique obovoideis, stipite triplo longiore, e basi tenui sensim dilatato, glandula ligulata, obtusa, retrorsa, ampla; ovario dense muricato-villoso, pedicellato, c. 1 cm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Bismarck Range, alt. c. 2400 m—R. Schlechter no. 18755, flowering in Nov. 1908.

By far the most vigorous species in this relationship. It is not difficult to distinguish from *T. clavatum* Schltr., by the longer hairs, the larger flowers and by the spur. The flowers are orange-yellow.

55. *T. torricellense* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 223.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14317, flowering in Apr. 1902; no. 20049, flowering in Sept. 1909.

Of all the above described, this species is recognised by the broad, blunt and almost regular trilobate labellum, as well as by the shape of the uniformly broadened pendant spur. The flowers are greenish.

56. *T. platyrhizum* Schltr., in K. Schum. et Laut., Nachtr. (1905), p. 222.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 600 m—R. Schlechter no. 14318, flowering in Apr. 1902; no. 20035, flowering in Sept. 1909.

With this species, those with distichous inflorescences re-commence. These which now close the genus are, in general, isolated forms of this peculiar polymorphic section. All occur only very locally. It is, however, possible that *T. fimbriatum* J.J. Sm. from Dutch New Guinea and *T. platyrachis* Schltr. could be identical. The flowers of the above species are pale yellow, darker towards the base; the lip is white with seven short red longitudinal stripes in the centre.

57. *T. macrorhynchum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus leviter applanatis, flexuosis, usque ad 30 cm longis, 1–1.5 mm latis; racemis subaxe 8–25-floris, serraeformibus, cum pedunculo densissime muricato-tomentosis, usque ad 5 cm altis; bracteis deltoideis, apiculatis, ovario multo brevioribus; floribus mediocribus; sepalis

lanceolatis, subacutis, extus carinatis et sparsim muricatis, 7 mm longis, lateralibus obliquis; petalis oblique lineari-lanceolatis, subacutis, extus carinatis, sepalis subaequilongis, glabris; labello oblongo, subacuto, dimidio inferiore excavato, petalis aequilongo, calcare sacciformi ellipsoideo, obtusissimo, extus sparsim muriculato, dimidium labelli longitudine excedente; columna perbrevis, rostello recto, lanceolato, peramplum; anthera ovoideo-cucullata, obtusa; pollinibus oblique obovoideis, stipite 6-plo longiore oblanceolato-ligulato, glandula ovali, parvula; ovario subsessili, densius muriculato 5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20328, flowering in Sept. 1909.

A species standing quite on its own, which is noticeable by the short sac-like spur, covered on the outside with short soft thorns. The flowers are yellowish with a white lip.

58. *T. asperatum* Schltr., sp. nov.

Epiphyticum aphyllum; radicibus flexuosis, leviter applanatis, c. 30 cm longis, 1.5–2.25 mm latis; racemis epedunculatis, brevibus dense 10–15-floris, usque ad 1.3 cm altis, cum bracteis densissime et breviter brunneo-muricatis; bracteis deltoideis; ovario multo brevioribus; floribus parvulis; sepalis oblongis, obtusis, extus carinatis, minute muriculatis, 3.5 mm longis, lateralibus obliquis; petalis oblique lanceolato-ovatis, obtusiusculis, extus carinatis; glabris, sepalis paulo brevioribus; labello quadrato, antice obtuse sublobato-apiculato, medio concavo, 3 mm lato, calcare subgloboso, labello duplo brevior; columna perbrevis, glabra, rostello magno adscendente; anthera e basi cordato-cucullata longirostrata; pollinibus oblique obovoideis, stipite 4–5-plo longiore anguste oblanceolato, glandula lanceolata, acuta, retrorsa, stipite 3-plo brevior; ovario muriculato, sessili, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 800 m—R. Schlechter no. 20189, flowering in Sept. 1909.

Particularly characteristic of this species, which has the habit of *Trachyrhachis*, is the dense brown soft spiky covering of the inflorescence and the exactly square labellum. The flowers are white.

59. *T. muricatum* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, applanatis, c. 15 cm longis, 2–3 mm latis; racemis dense plurifloris, cum pedunculo muricato-hispido, c. 1.5 cm longo; bracteis muricatis, acutis, ovario multo brevioribus; floribus mediocribus; sepalis oblongis, apiculatis, extus carinatis et sparsim muriculatis, c. 3 mm longis, lateralibus obliquis, intermedio paulo angustioribus; petalis oblique ligulatis, obtusis, nervo medio incrassatulo extus sparsim muriculato, sepalis subaequilongis; labello circuitu suborbiculari, petalis aequilongo, e medio trilobato, lobis lateralibus oblique triangulis, obtusis, intermedio duplo majore triangulo-ovato, obtuso, excavatione cuneata e medio labelli usque in basin decurrente, calcare oblongoideo obtuso, paucidentato-carinato, ovario aequilongo; ovario dense muricato, cylindraco, sessili, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Dischore Range, by the Govidjoa [Creek], alt. c. 1200 m—R. Schlechter no. 19746, flowering in June 1909.

Unfortunately, I found only a single flower of this species which did not suffice to establish either the structure of the column or the anther. Its closest relative is probably the following species. The flowers are yellow.

60. *T. exotrachys* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, applanatis, usque ad 15 cm longis, c. 3 mm latis; racemo dense paucifloro, pedunculo dense muriculato-hispido incluso usque ad 2.5 cm longo; bracteis deltoideis, ovario multo brevioribus; floribus in sectione mediocribus; sepalis ligulato-oblongis, obtusis, extus muricatis, 5.5 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, nervo medio extus incrassatulo hinc et inde dentato, sepalis paulo brevioribus; labello e basi semiorbiculari supra medium trilobato, petalis aequilongo, inter apices loborum lateralium 4.5 mm lato, lobis lateralibus oblique oblongis, obtusis, brevibus, intermedio duplo majore, semiquadrato, retuso cum apiculo minuto, lineis 2 semilunatis, incrassatis e basi labelli usque in basin lobi intermedii decurrentibus, antice conjunctis, calcare ellipsoideo obtuso, linea media hinc et inde dentato, labello aequilongo; columna perbrevis, rostello longissimo, curvato, proboscideo; ovario subsessili dense muricato, c. 4 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Torricelli Range, alt. c. 900 m—R. Schlechter no. 20137, flowering in Sept. 1909.

This species is approximately intermediate between *T. ferox* Schltr. and *T. muricatum* Schltr. but is distinguished easily from both by the very long rostellum and the labellum. The flowers are pale yellow.

61. *T. ferox* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, valde applanatis, usque ad 30 cm longis, 4–5 mm latis; racemis cum pedunculo dense muricato-hispido usque ad 3.5 cm longis, dense paucifloris; bracteis lanceolatis, acutis, ovario multo brevioribus; floribus mediocribus; sepalis oblongis, obtusis, extus muricatis, 5 mm longis, lateralibus obliquis; petalis oblique subspathulato-ligulatis, obtusis, glabris, sepalis subaequilongis; labello e basi semiorbiculari supra medium trilobato, petalis aequilongo, inter apices loborum lateralium 4 mm lato, lobis lateralibus triangulis obtusis, intermedio duplo longiore semiorbiculari, apiculato, incrassatione trapezoidea e medio labelli usque in basin lobi intermedii, calcare obovoideo obtusissimo, labello subaequilongo; columna brevi, rostellum peramplo proboscideo; anthera quadrato-cucullata, breviter rostrata; polliniis obovoideis, stipite 5-plo longiore, tenui, apice dilatato, glandula minuta rotundata; ovario dense muricato, subsessili, c. 3.5 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1100 m—R. Schlechter no. 17145, flowering in Jan. 1909. [Ed.—possibly 1908.]

The species is related to *T. muricatum* Schltr., described above, but is distinguished easily by the broad roots, larger flowers and by the labellum. The flowers are greenish with white tips.

62. *T. orthorhynchum* Schltr., sp. nov. [Ed.—same epithet used on p. 1090].

Epiphyticum, aphyllum; radicibus flexuosis, applanatis, usque ad 15 cm longis, 3 mm latis; racemis dense paucifloris, cum pedunculo dense et breviter muriculato-papilloso, usque ad 3.5 cm longis; bracteis deltoideis, ovario multo brevioribus; floribus in sectione vix inter mediocres; sepalis oblongis, obtusis, extus dimidio inferiore submuriculato-papilloso, 3 mm longis, lateralibus obliquis; petalis oblique oblongo-ligulatis, obtusis, sepalis paulo brevioribus; labello circuitu orbiculari, obtusissimo, intus fere omnino quadra obscure trilobata antice truncata oblecto, basi incrassatione ampla semiovali minute papillosa depressa ornato, calcare late conico-saccato, obtuso, labello paulo brevior; columna perbrevis, rostellum suberecto, recto; anthera late ovato-cucullata, acuta; polliniis oblique obovoideis, stipite 3-plo longiore, tenuissimo, apicem versus paulo dilatato, glandula minuta; ovario subsessili, muricato, 3 mm longo.

Kaiser-Wilhelms-Land: On trees in the forests of the Kani Range, alt. c. 1000 m—R. Schlechter no. 17244, flowering in Jan. 1908.

This species is very well distinguished from all others by the labellum structure. The flowers are green-yellow, the lip with a white tip.

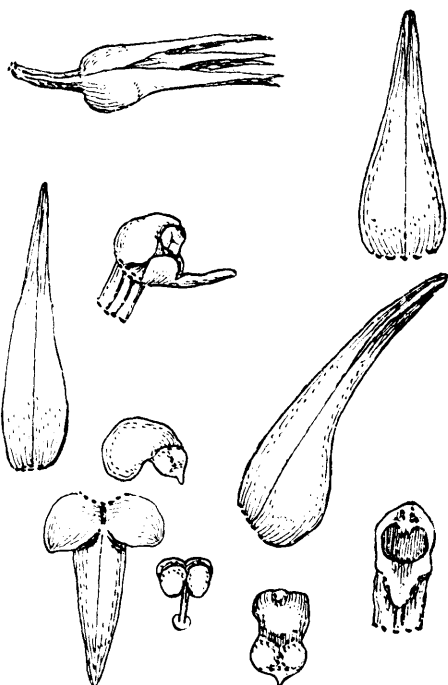
63. *T. fragrans* Schltr., sp. nov.

Epiphyticum, aphyllum; radicibus flexuosis, valde applanatis, usque supra 60 cm longis, 2.5–3 mm latis; racemis graciliter pedunculatis, sublaxe 3–5-floris, pedunculo minute et dense hispidissimo incluso usque ad 6 cm longo; bracteis deltoideis, ovario multo brevioribus; floribus in genere magnis, ovario excepto glabris; sepalis oblongis, apiculatis, basin versus paulo angustatis, 1.4 cm longis, lateralibus obliquis; petalis sepalis lateralibus similibus, obliquis, subacutis, paulo brevioribus; labello circuitu oblongo, e medio subtrilobo, petalis aequilongo; lobis lateralibus abbreviatis, brevissimis, intermedio antico, angusto, oblongo, dimidio anteriore medio foveato, infra apicem carnosocrassato, calcaris ostio in medio labelli depresso, calcare cylindraceo, supra medium paulo incrassato, c. 1 cm longo; columna perbrevis, rostellum curvato, proboscideo, perlongo; anthera cucullata breviter rostrata; polliniis oblique obovoideis, stipite 6-plo longiore, tenuissimo, apice subito poculiformi-dilatato, glandula minuta; ovario minute papilloso sessili, cylindraceo, c. 7 mm longo.

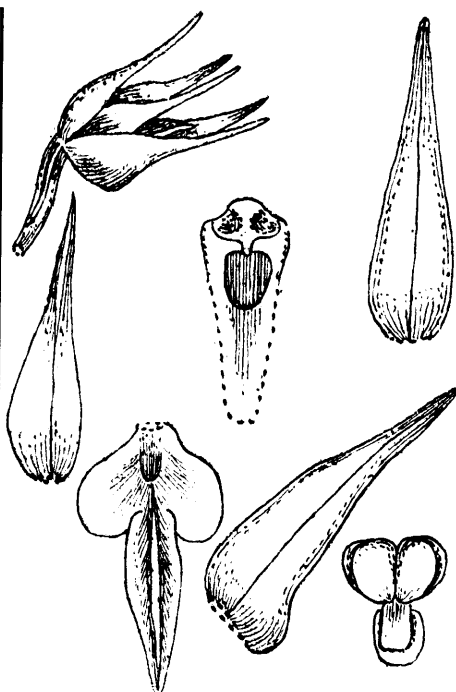
Kaiser-Wilhelms-Land: On trees in the forests on the upper Mudjene [River], alt. c. 500 m—R. Schlechter no. 17819, flowering in May 1908.

This species is not related to any previously described and is at present quite unique. The fragrant flowers are white with four, pale violet elongated spots.

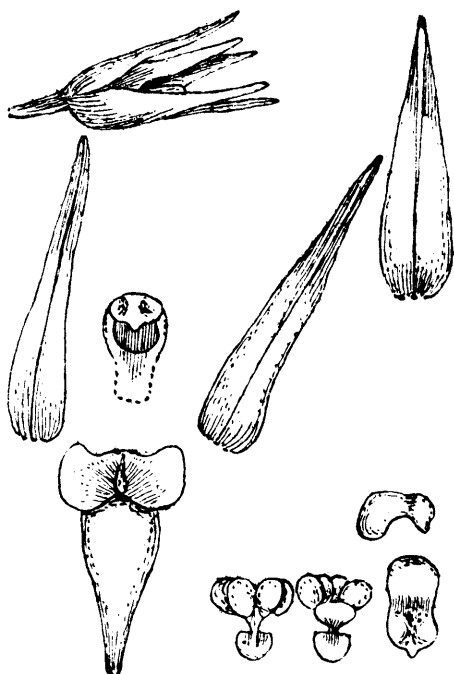
GROUP XXVI *Sarcanthinae*



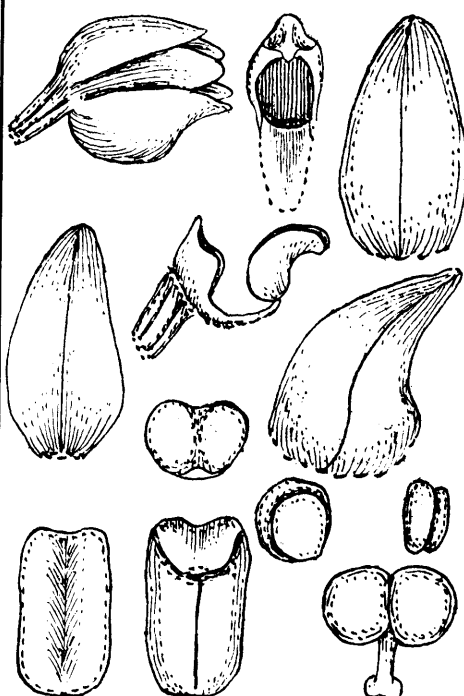
Calymmanthera tenuis Schltr.



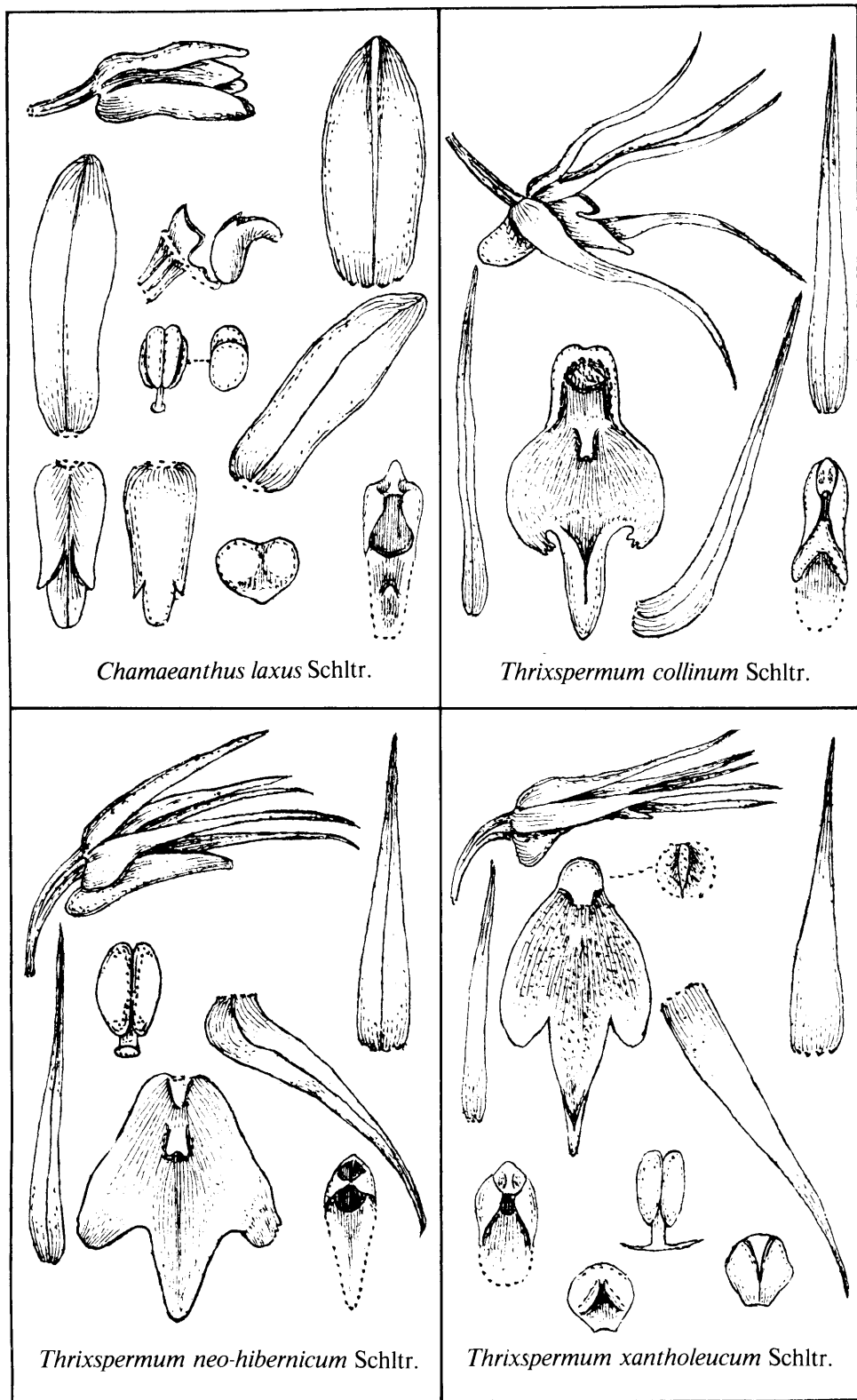
Calymmanthera montana Schltr.

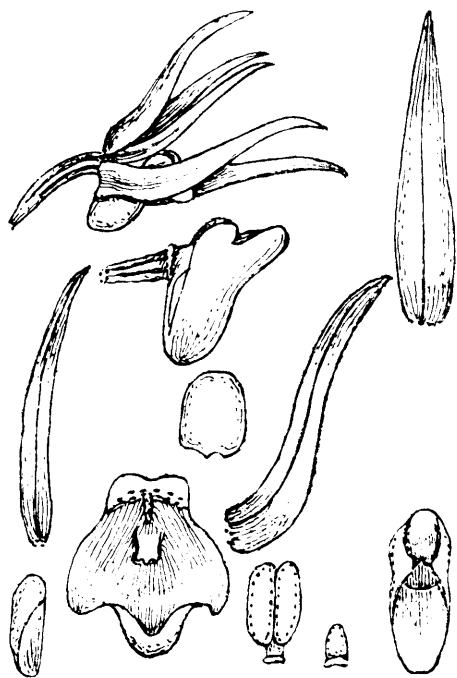


Calymmanthera major Schltr.

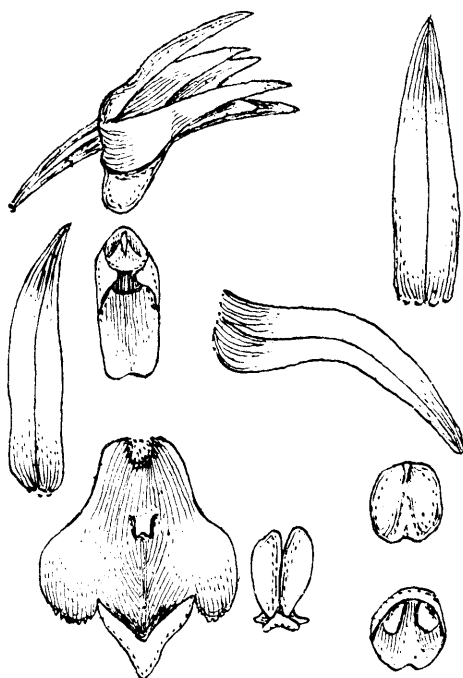


Chamaeanthus gracilis Schltr.

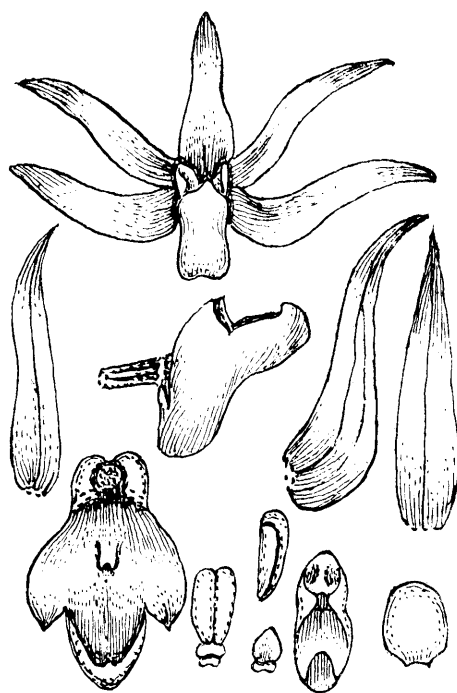




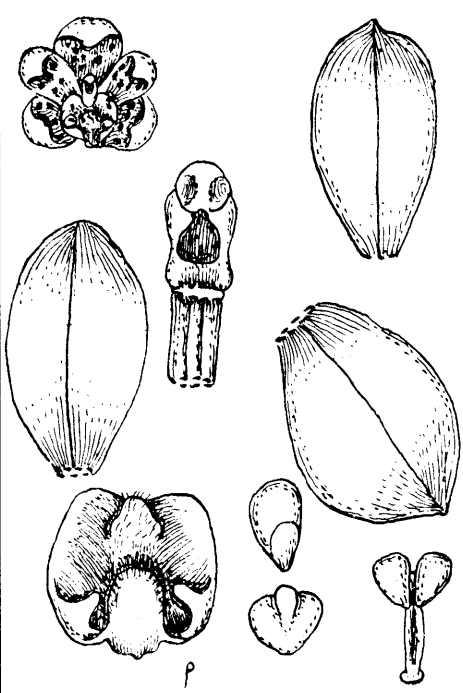
Thrixspermum brevipes Schltr.



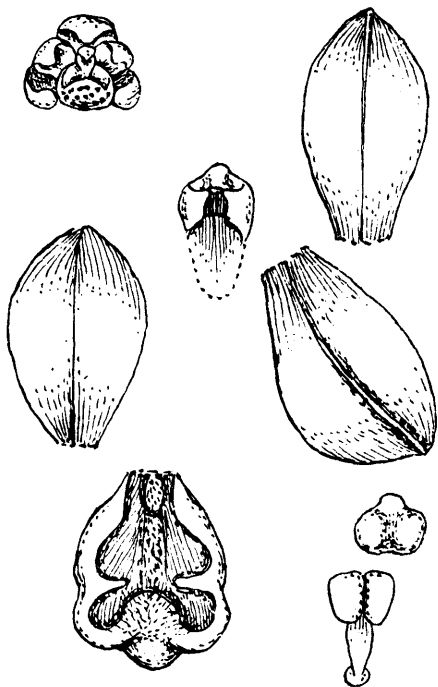
Thrixspermum denticulatum Schltr.



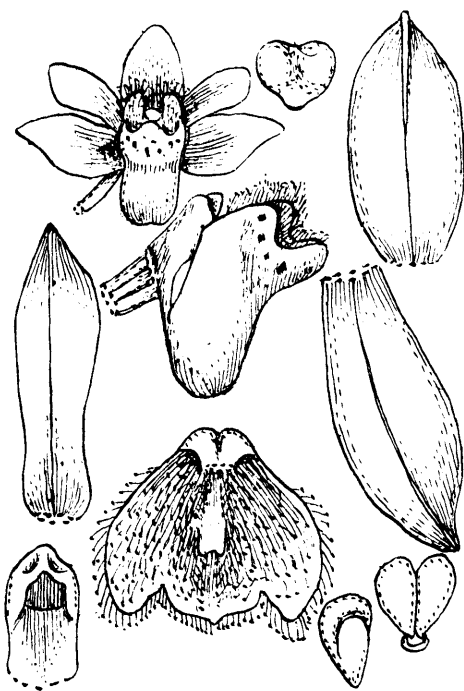
Thrixspermum warianum Schltr.



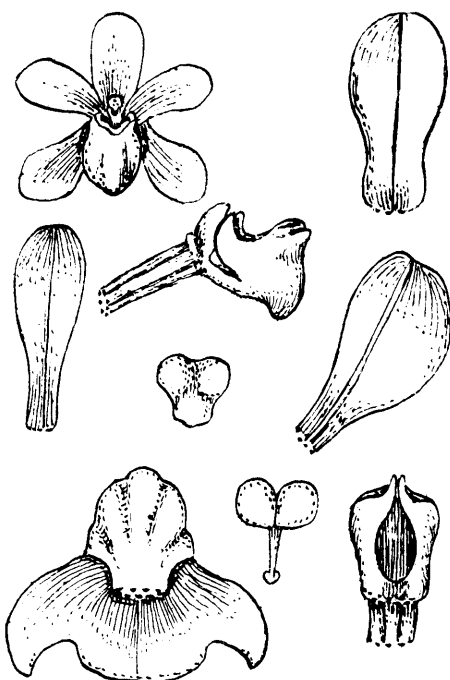
Thrixspermum aberrans Schltr.



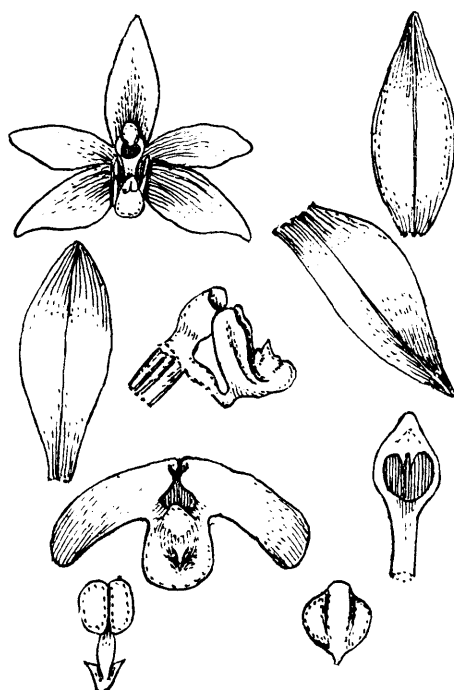
Thrixspermum oreadum Schltr.



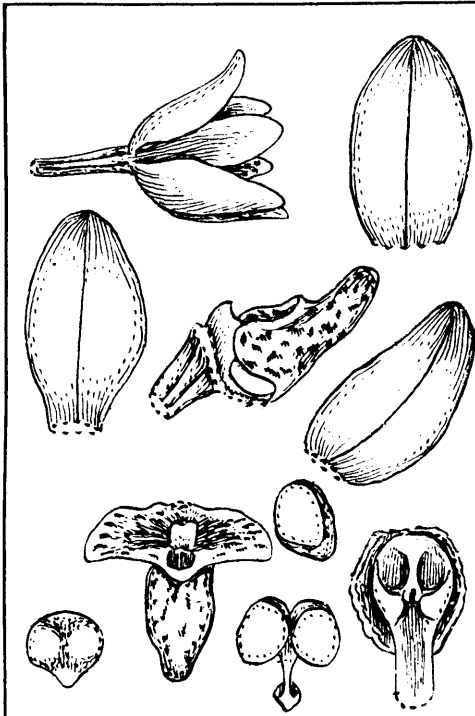
Thrixspermum adenotrichum Schltr.



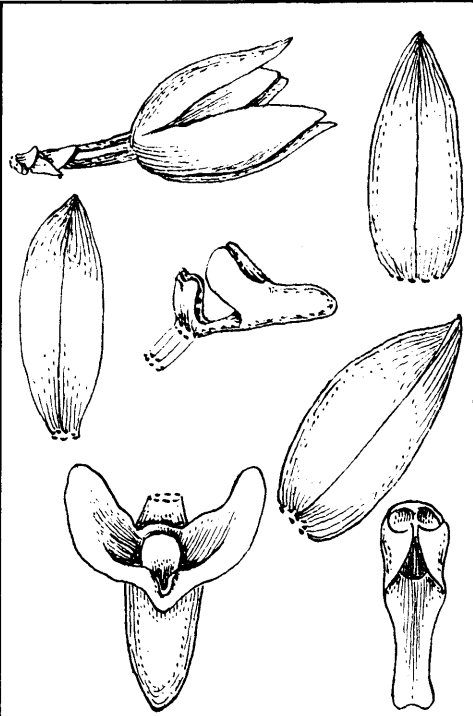
Bogoria papuana Schltr.



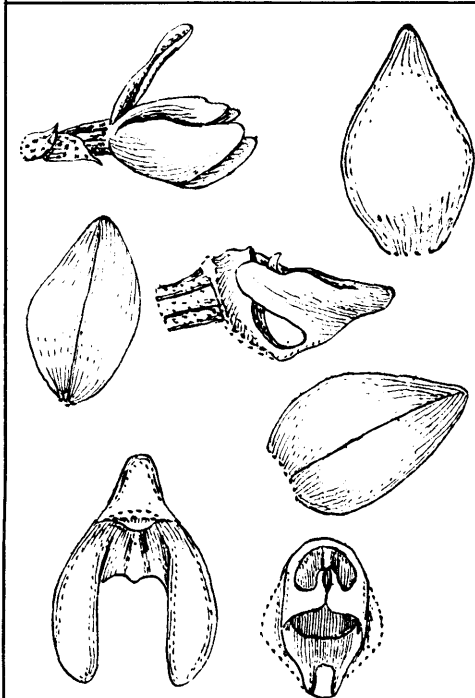
Sarcochilus odoratus Schltr.



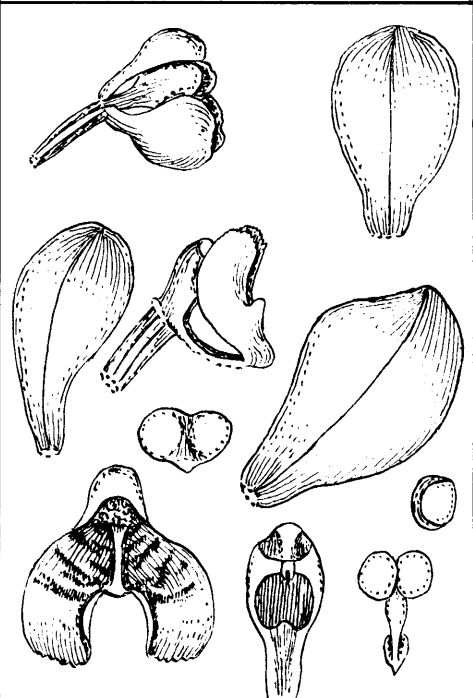
Sarcophilus uniflorus Schltr.



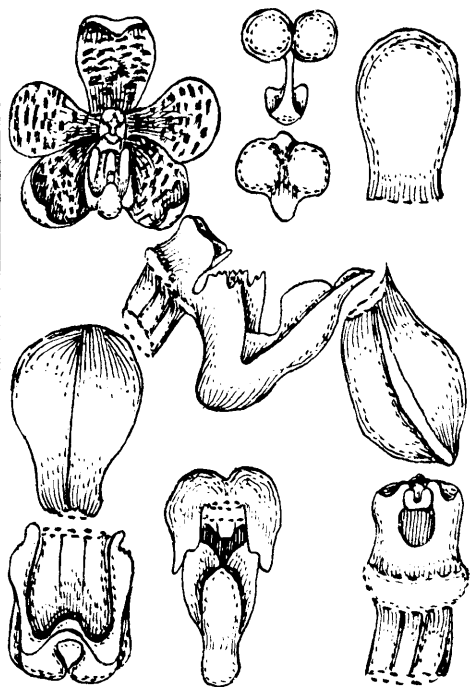
Sarcophilus iboensis Schltr.



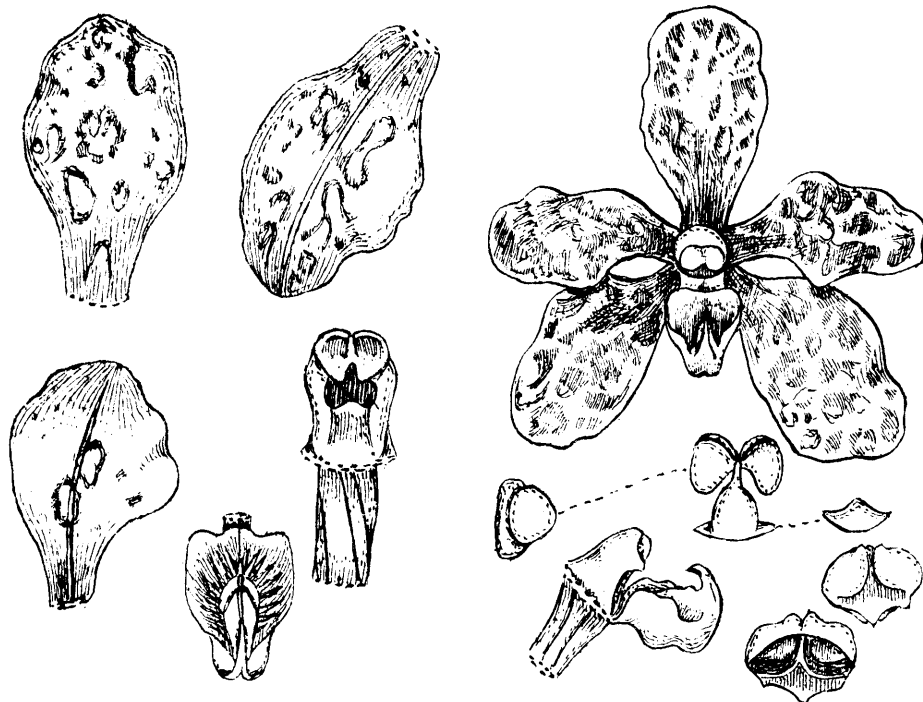
Sarcophilus chrysanthus Schltr.



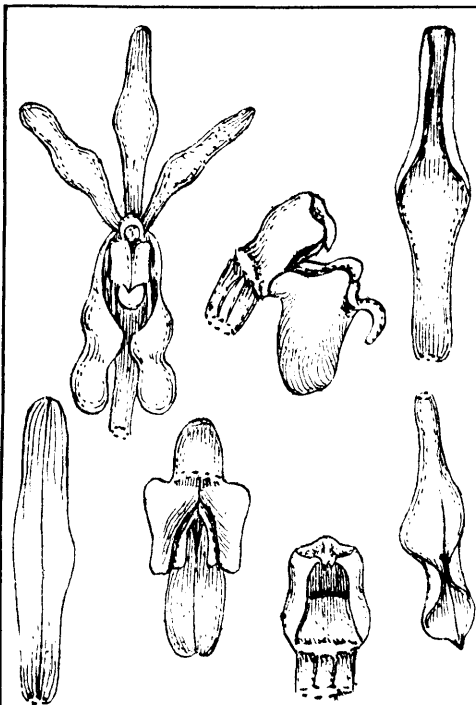
Sarcophilus Moorei (Rechb. f.) Schltr.



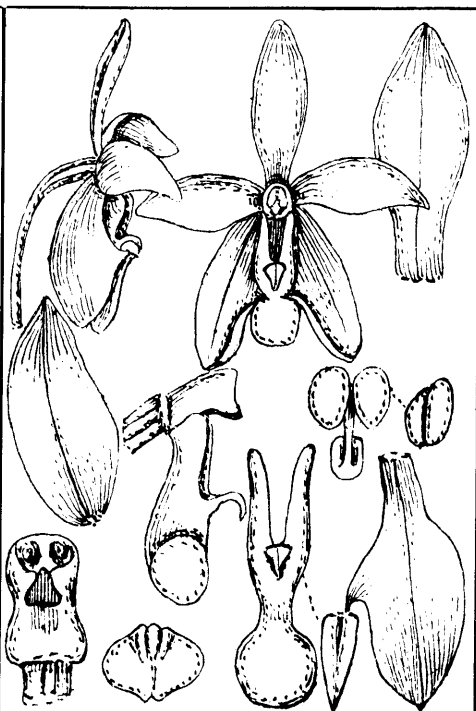
Vandopsis Warocqueana (Rolfe) Schltr.



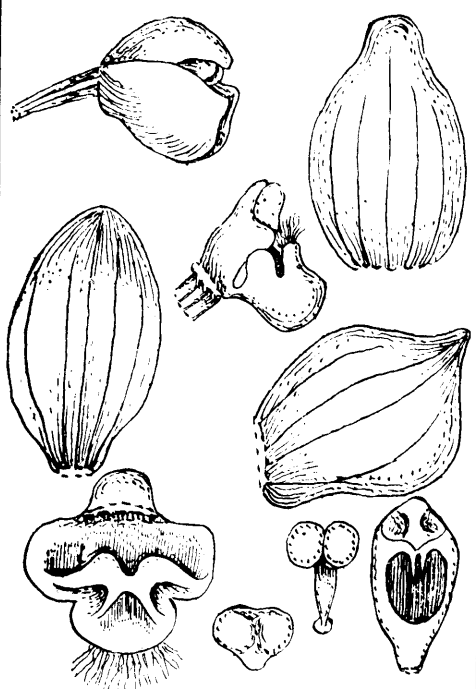
Vandopsis longicaulis Schltr.



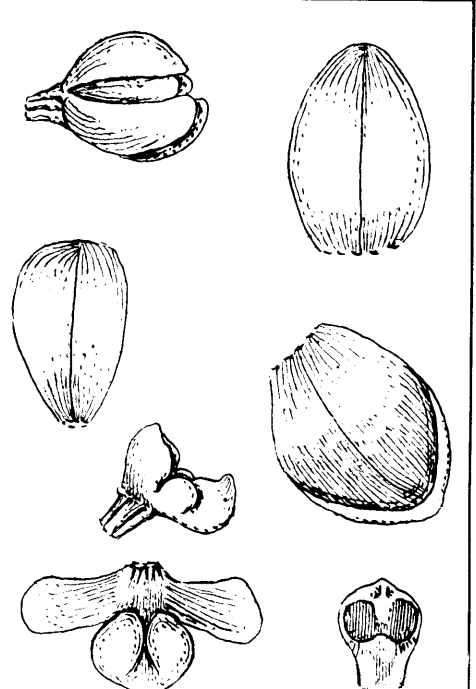
Renanthera Edelfeldtii F.v.M.
et Krzl.



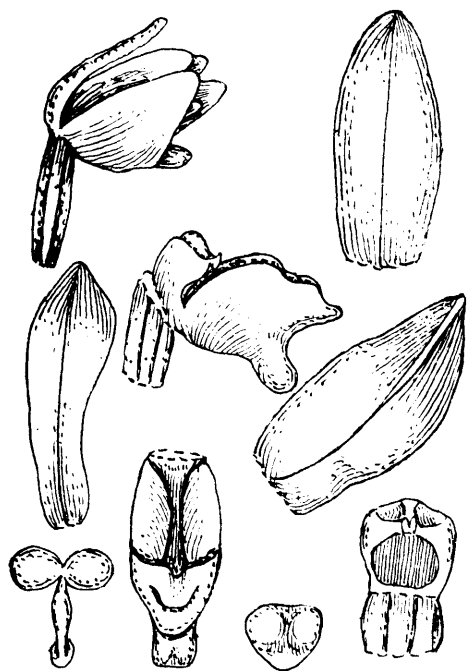
Ascoglossum calopterum
(Rchb. f.) Schltr.



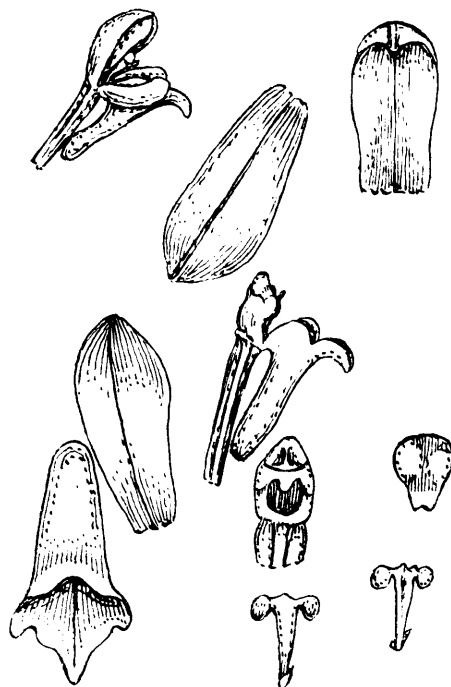
Dryadorchis barbellata Schltr.



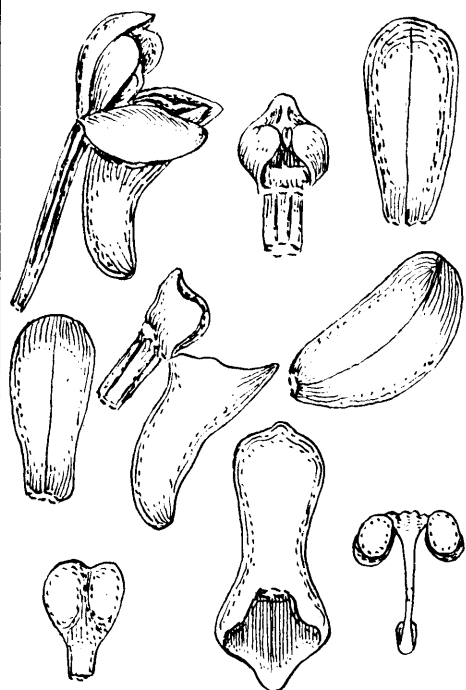
Dryadorchis minor Schltr.



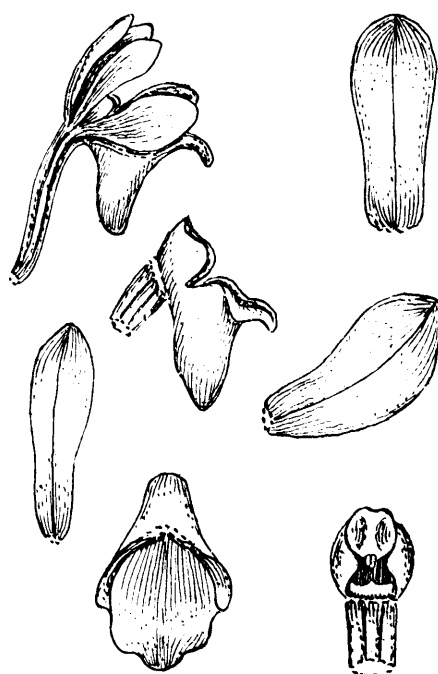
Saccolabium papuanum Schltr.



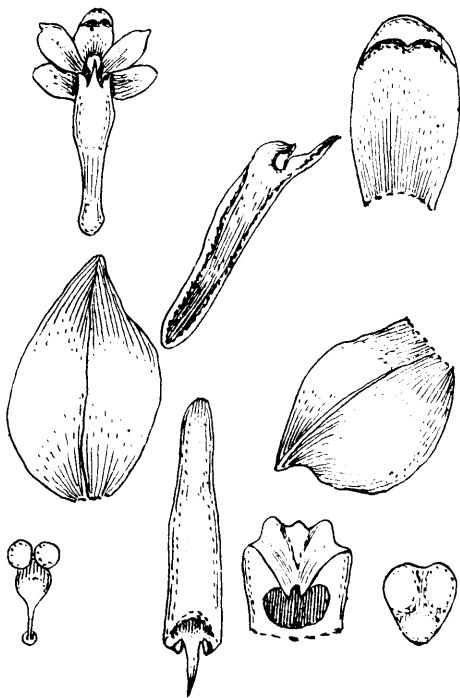
Malleola microphyton Schltr.



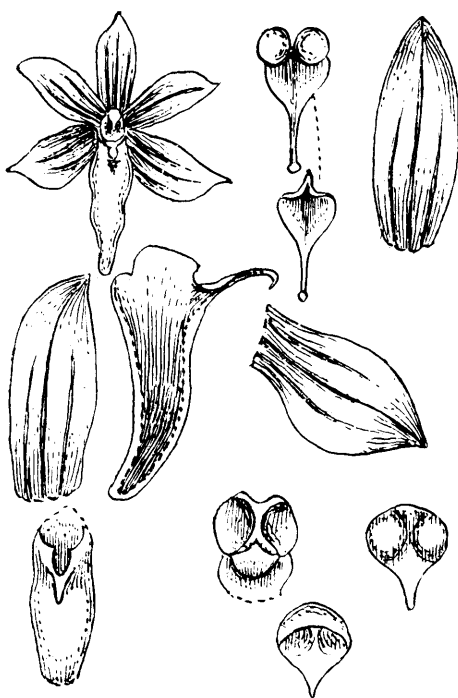
Malleola pallida Schltr.



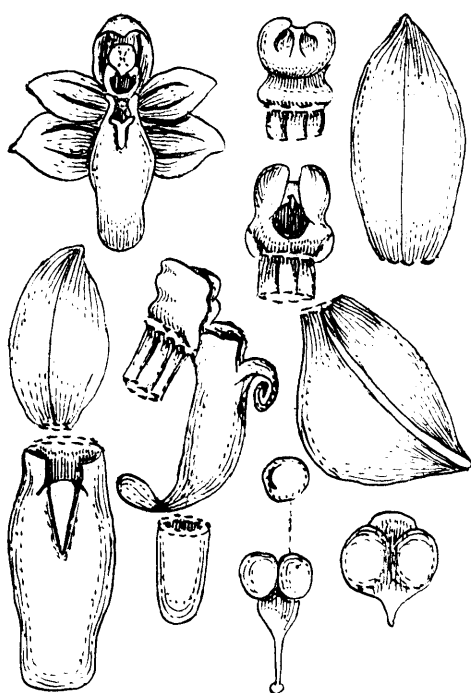
Malleola rara Schltr.



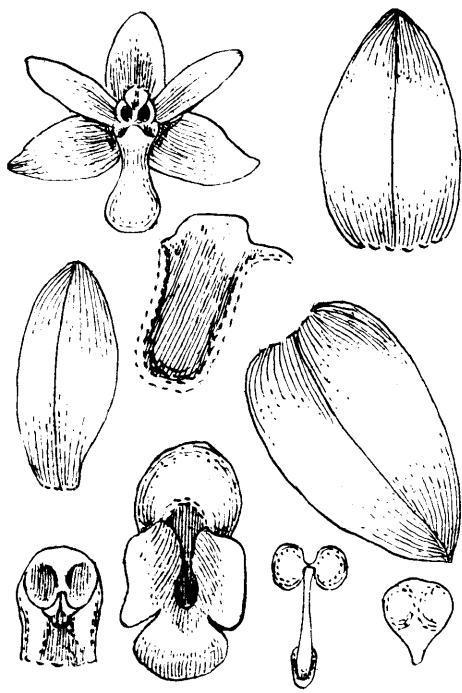
Malleola palustris J.J. Sm. et Schltr.



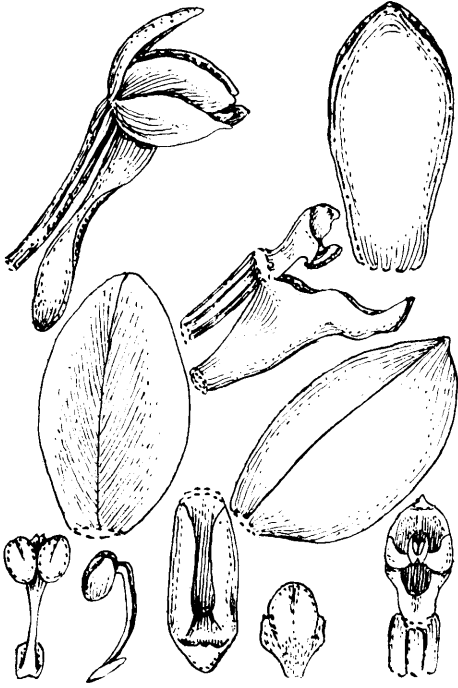
Malleola cladophylax J.J. Sm. et Schltr.



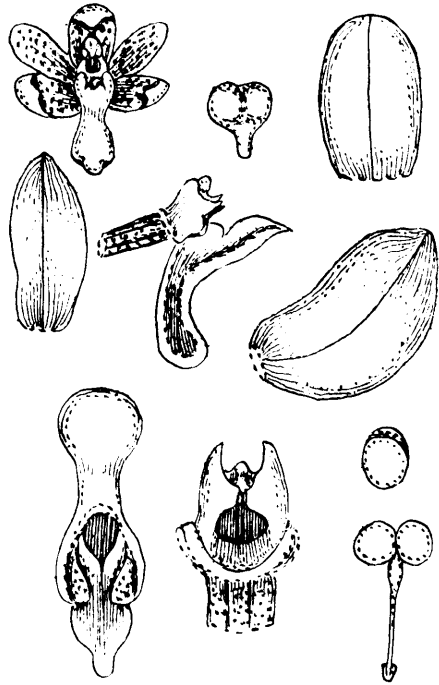
Malleola wariana Schltr.



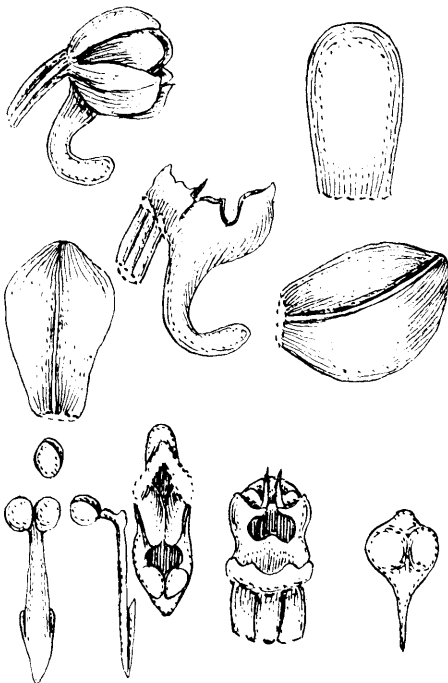
Porphyrodesme papuana Schltr.



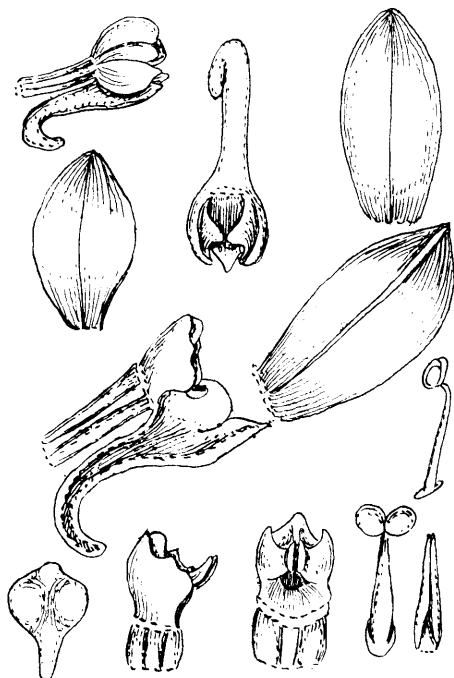
Robiquetia Mooreana (Rolfe) J.J. Sm.



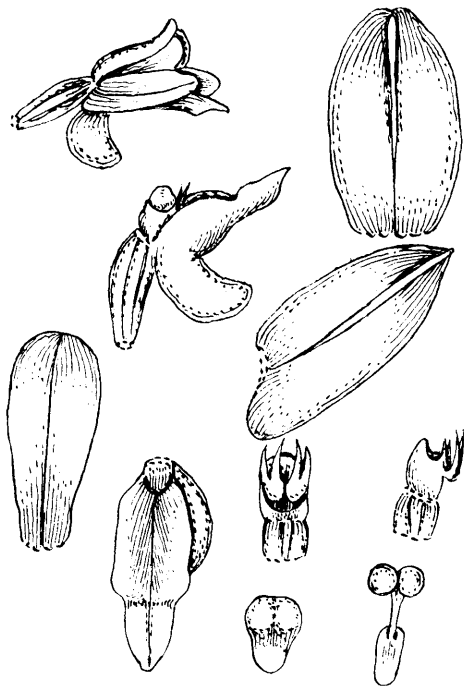
Robiquetia gracilistipes (Schltr.) J.J. Sm.



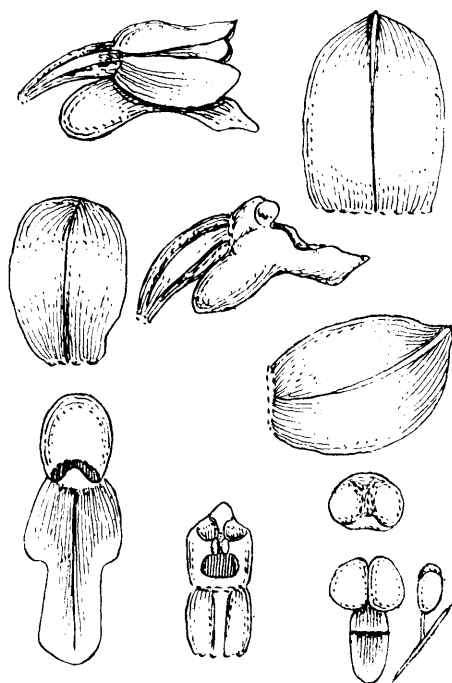
Robiquetia camptocentrum
(Schltr.) J.J. Sm.



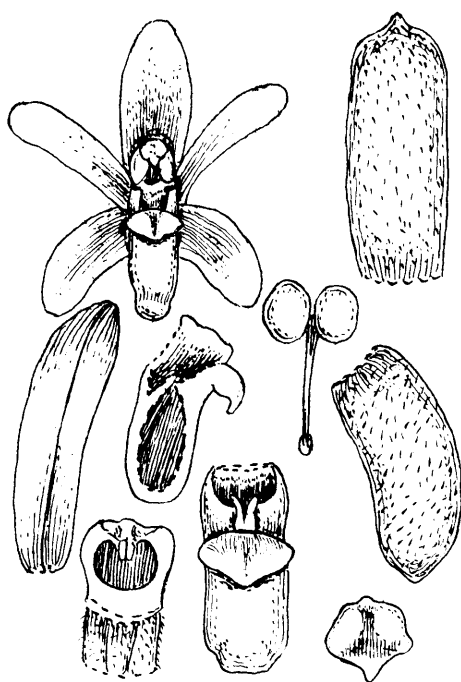
Robiquetia hamata Schltr.



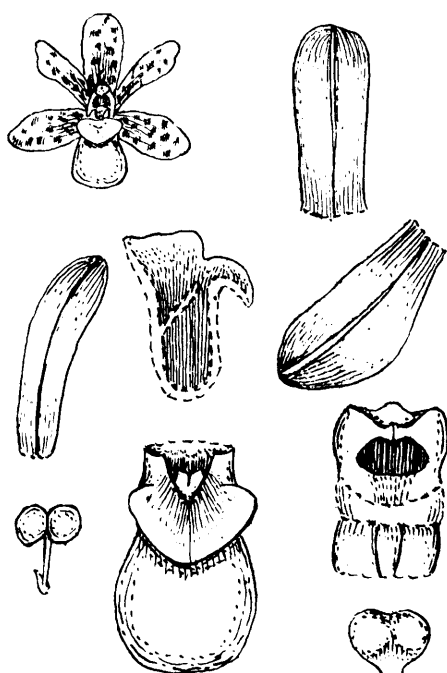
Schoenorchis densiflora Schltr.



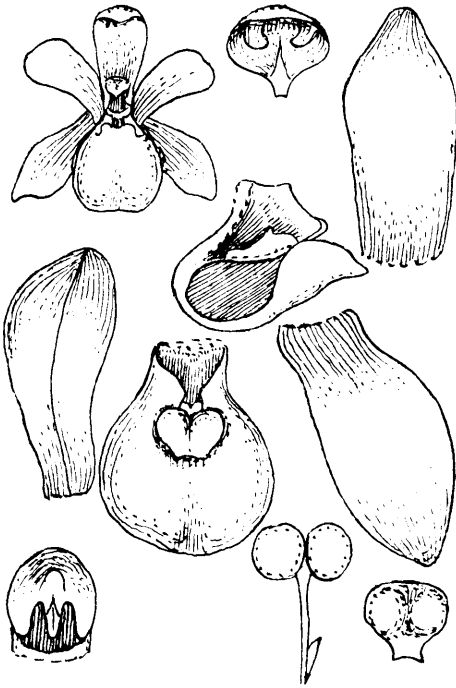
Schoenorchis sarcophylla Schltr.



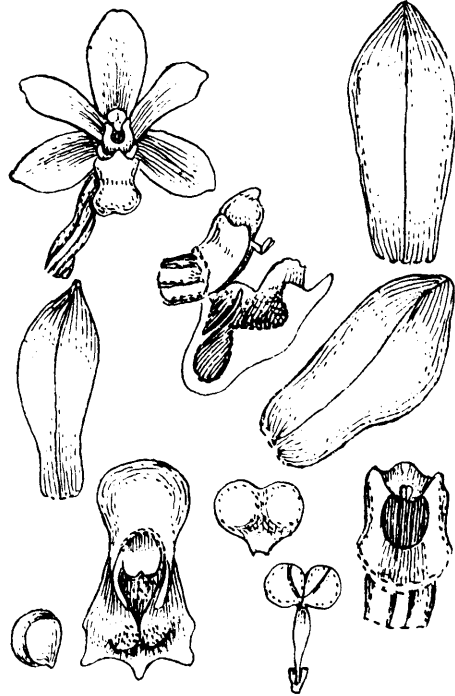
Pomatocalpa leucanthum Schltr.



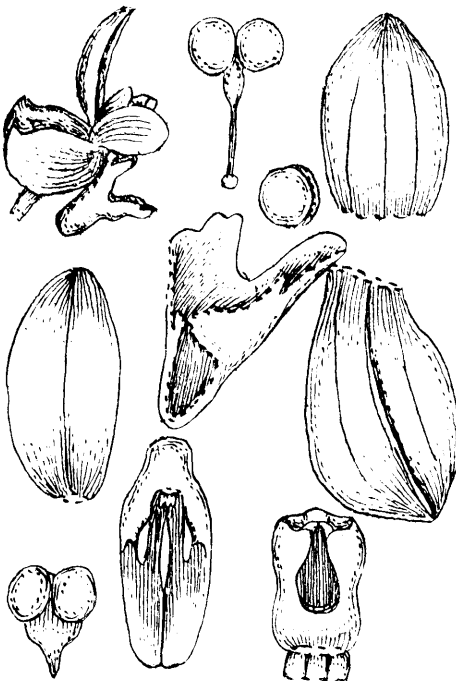
Pomatocalpa potamophilum Schltr.



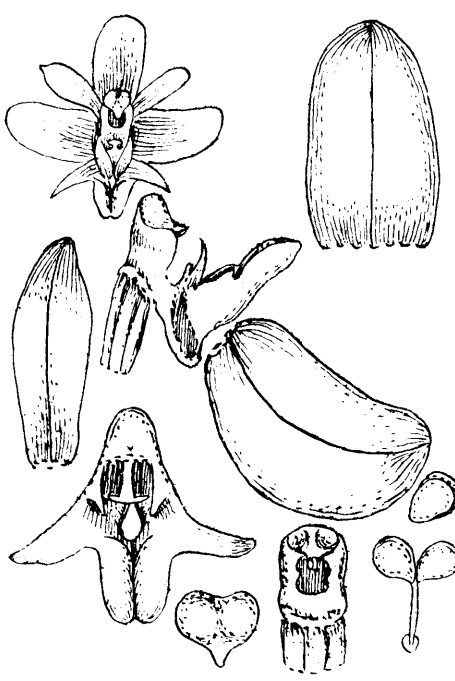
Pomatocalpa marsupiale (Krzl.)
J.J. Sm.



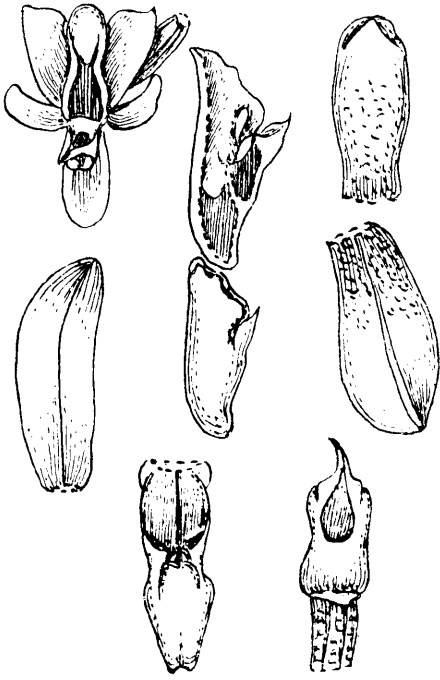
Pomatocalpa lasioglossum Schltr.



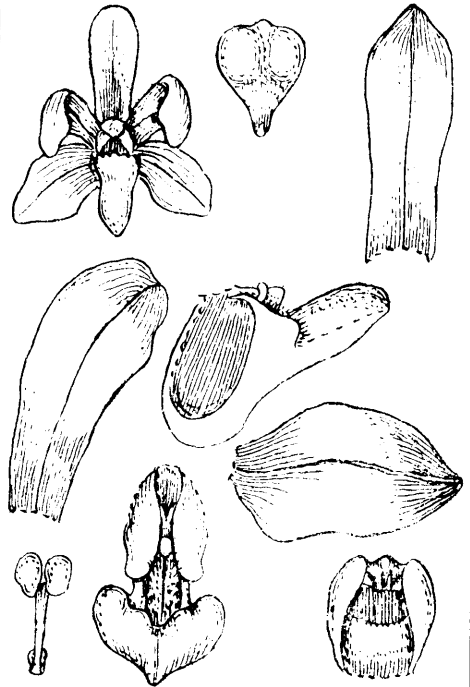
Sarcanthus litoreus Schltr.



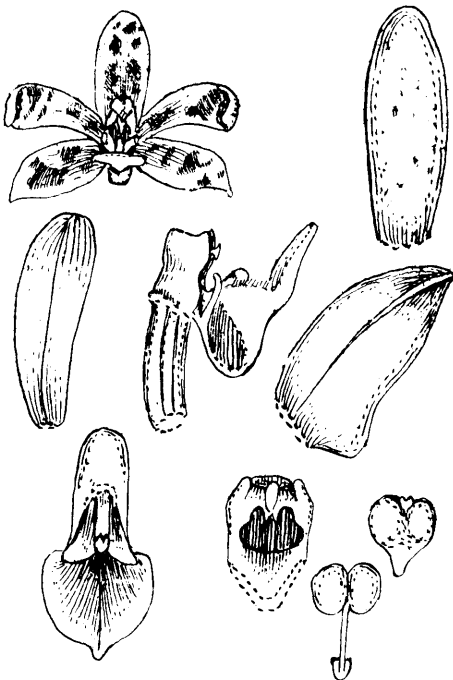
Sarcanthus robustus Schltr.



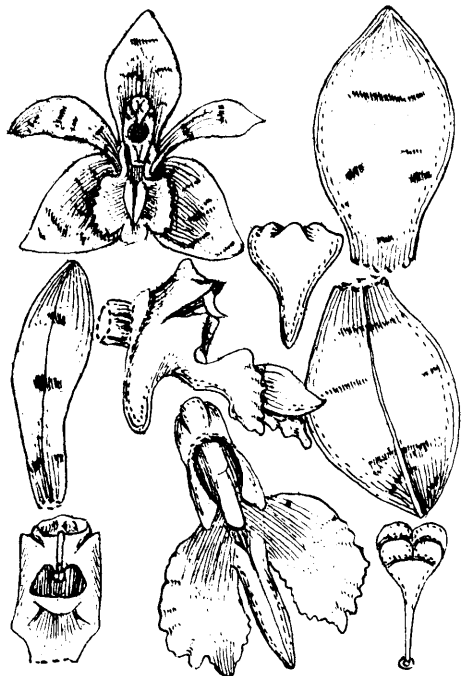
Camarotis papuana J.J. Sm.



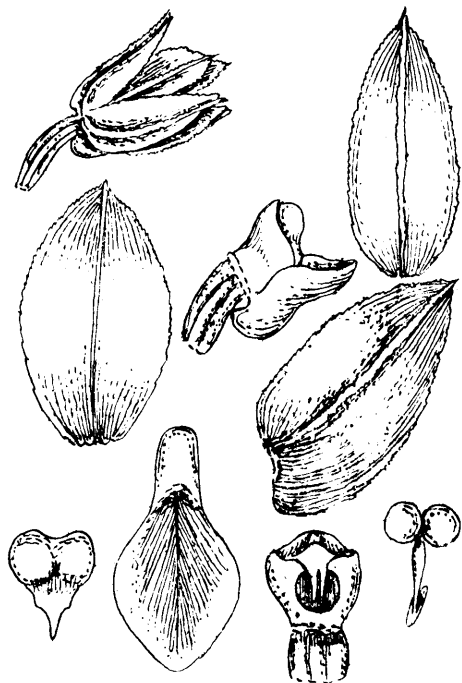
Trichoglottis litoralis Schltr.



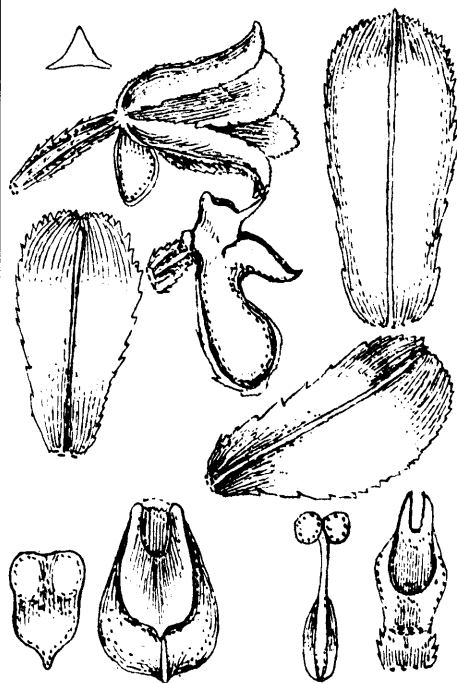
Trichoglottis papuana Schltr.



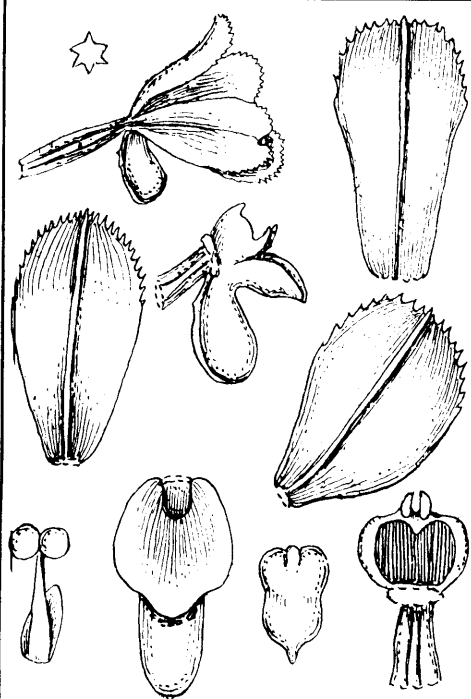
Trichoglottis sororia Schltr.



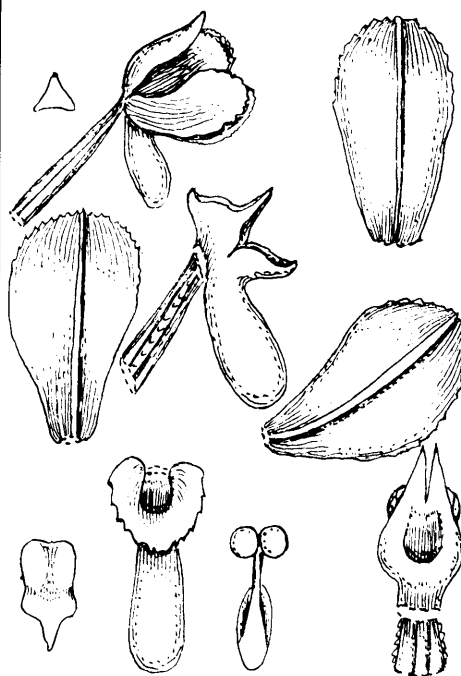
Hymenorchis saccata Schltr.



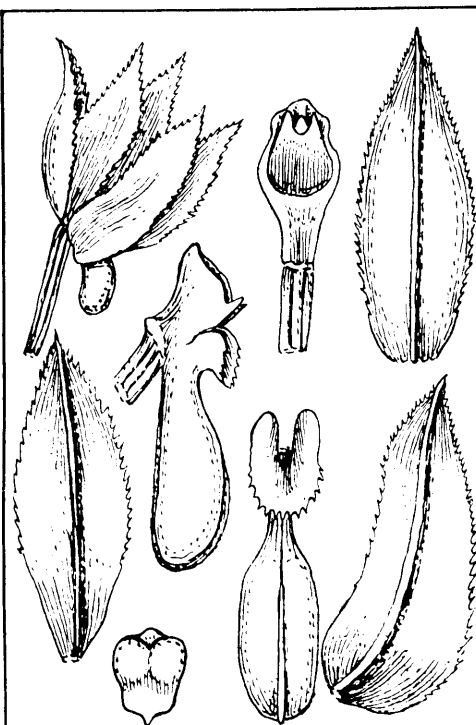
Hymenorchis kaniensis Schltr.



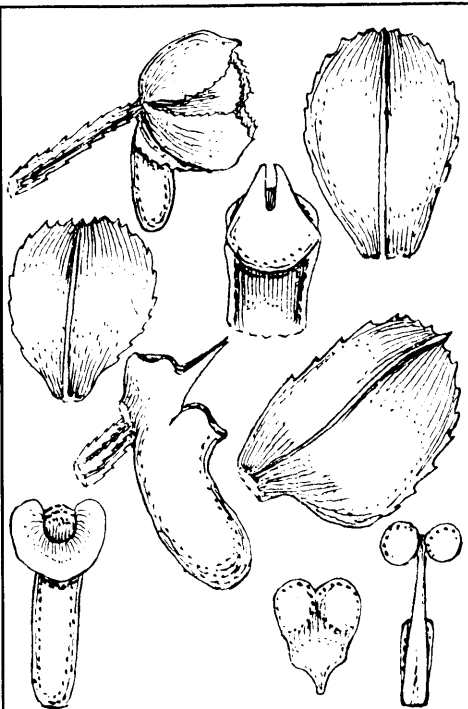
Hymenorchis nannodes Schltr.



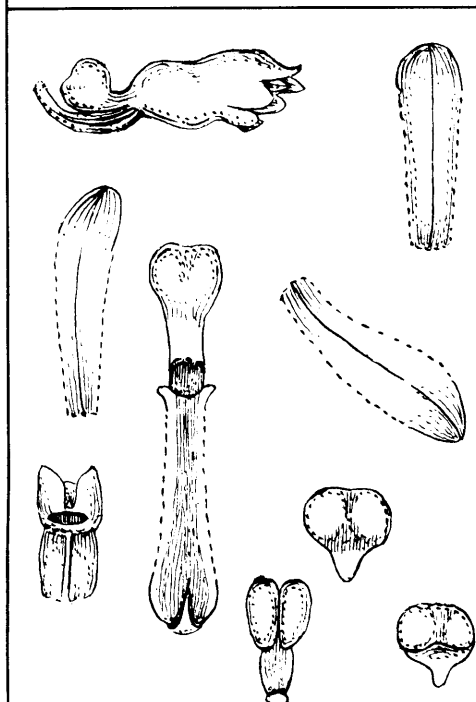
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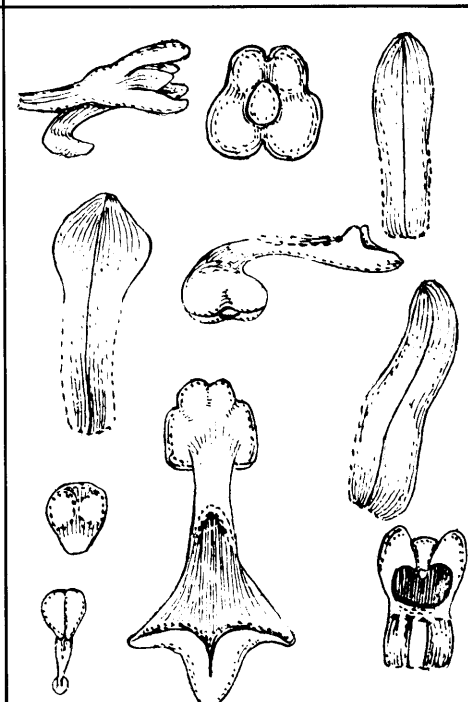
Hymenorchis serrata Schltr.



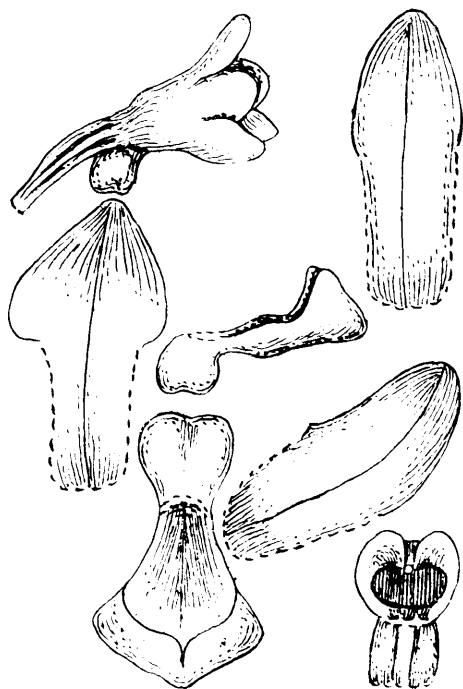
Hymenorchis foliosa Schltr.



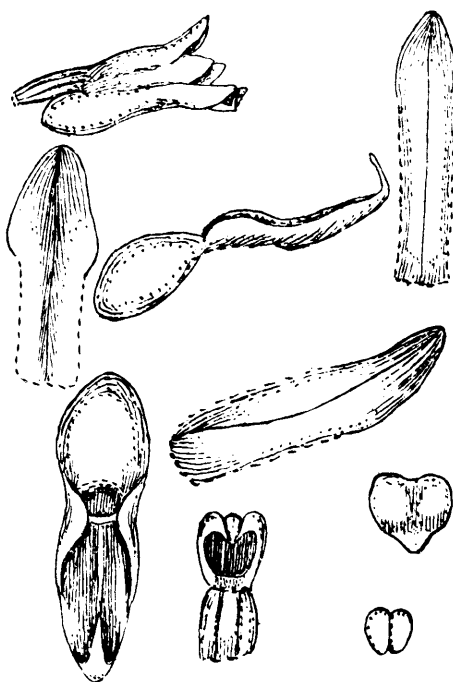
Microtatorchis perpusilla Schltr.



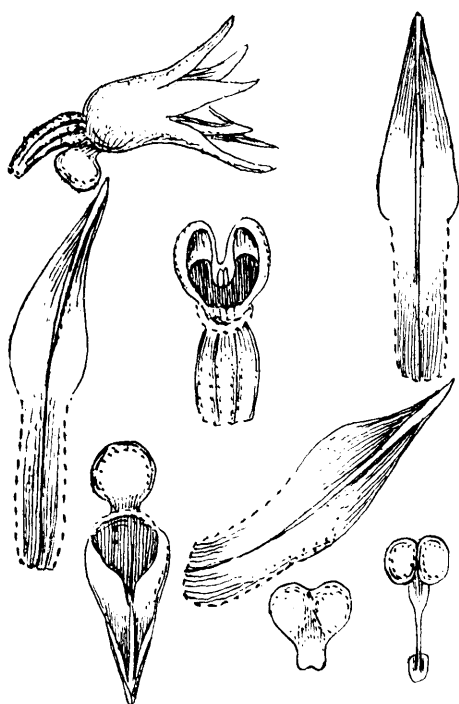
Microtatorchis potamophila Schltr.



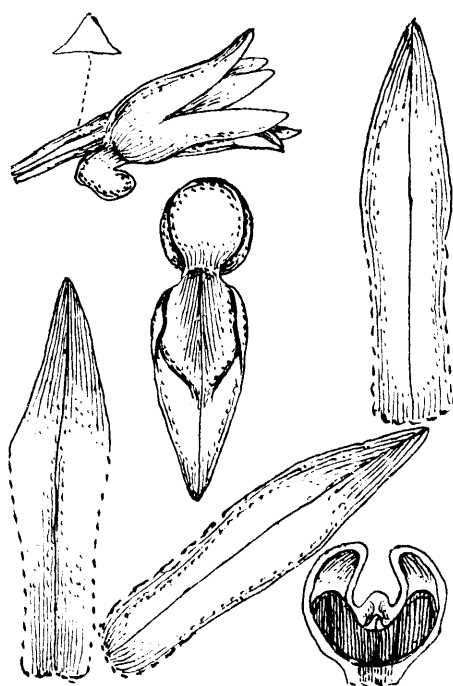
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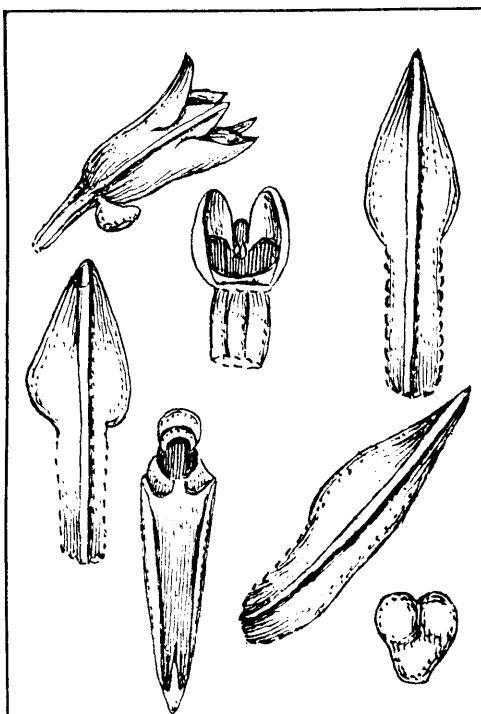
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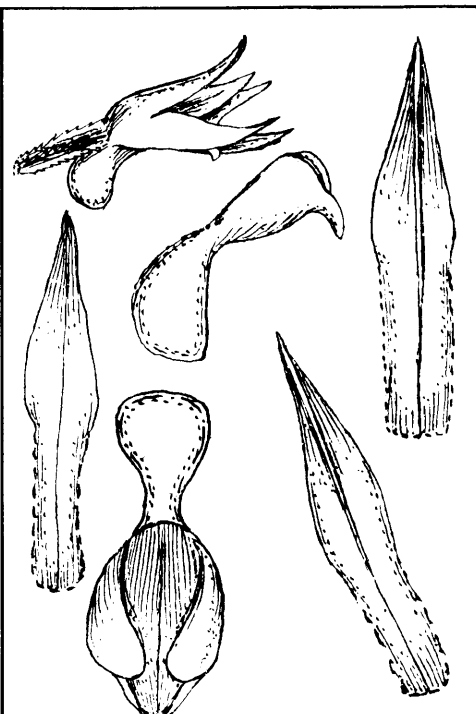
Microtatorchis kaniensis Schltr.



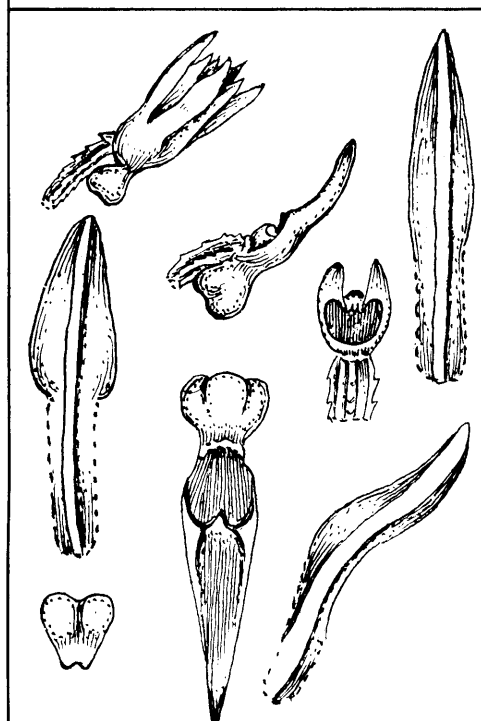
Microtatorchis ceratostylis Schltr.



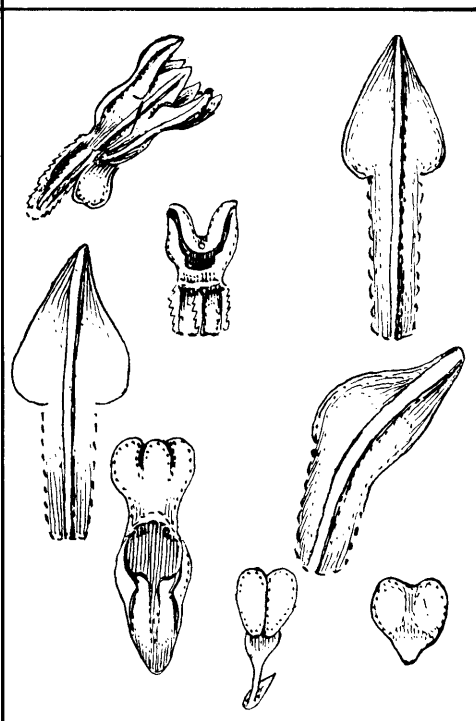
Microtatorchis collina Schltr.



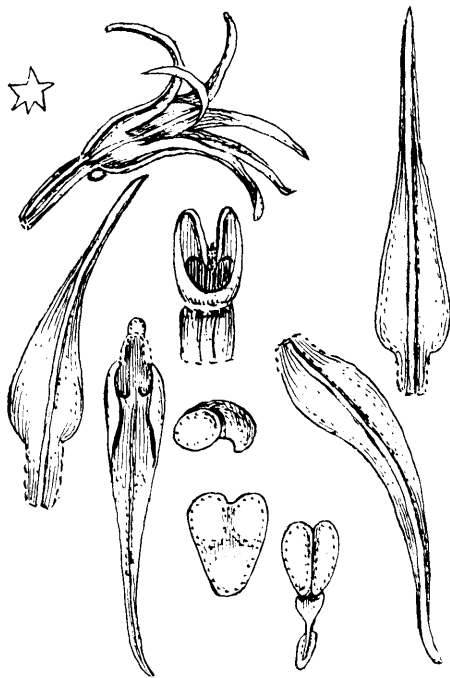
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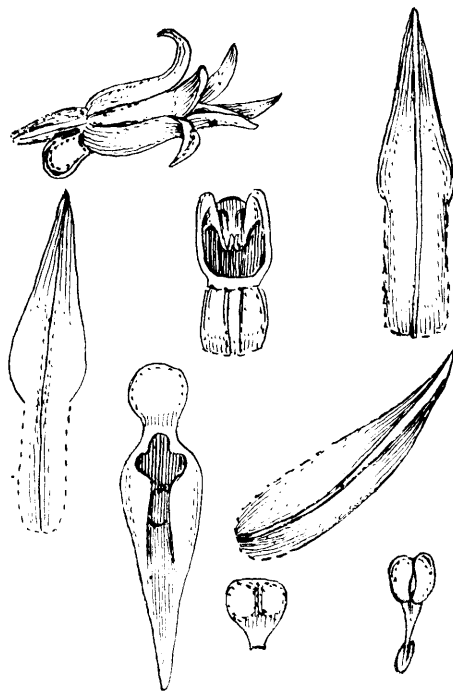
Microtatorchis muriculata Schltr.



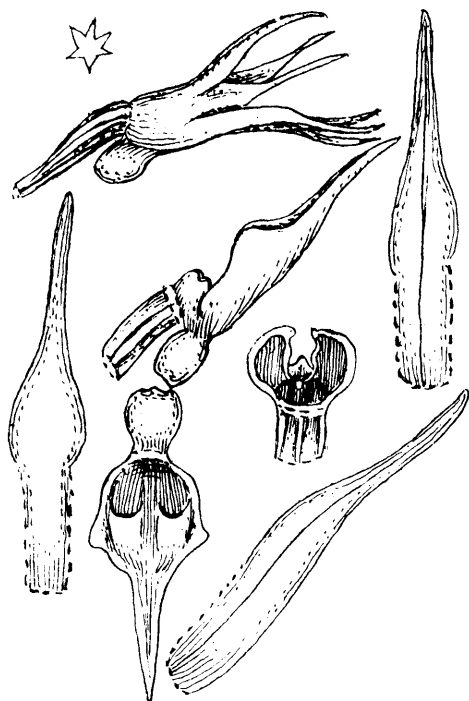
Microtatorchis torricellensis Schltr.



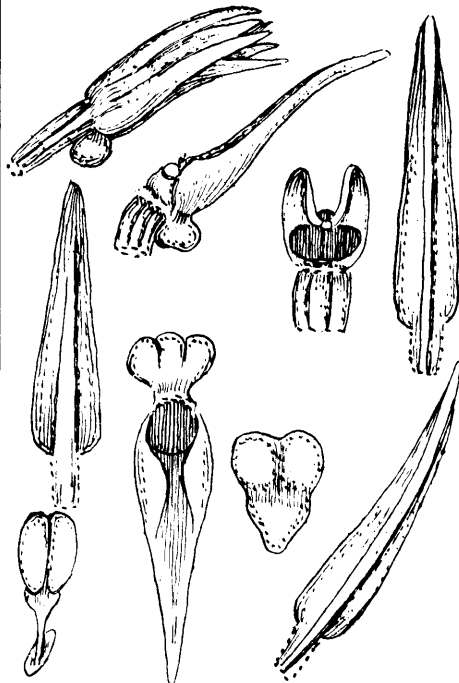
Microtatorchis brachyceras Schltr.



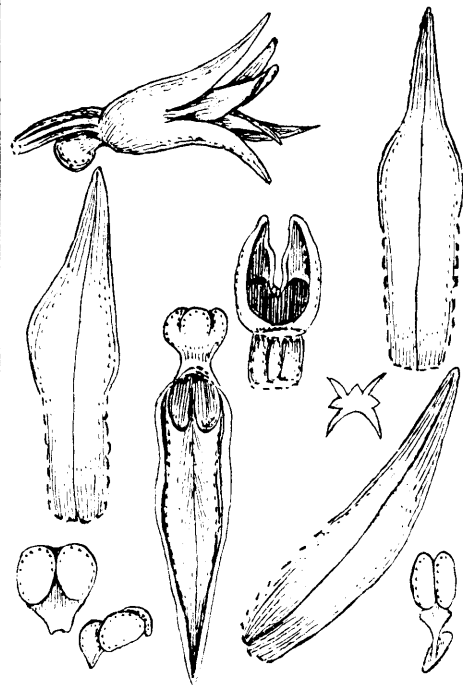
Microtatorchis carinata Schltr.



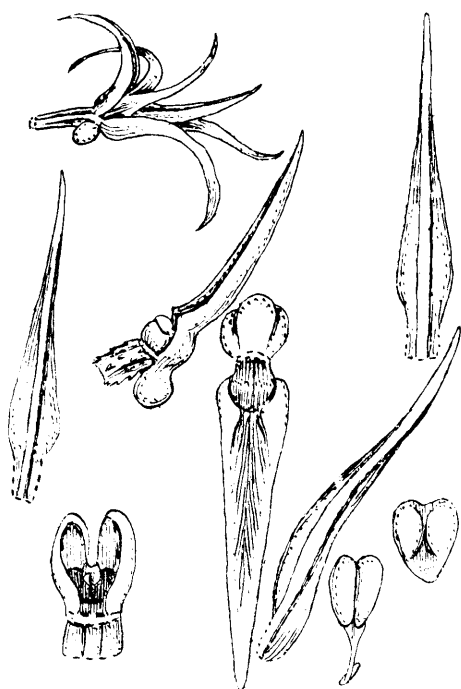
Microtatorchis acuminata Schltr.



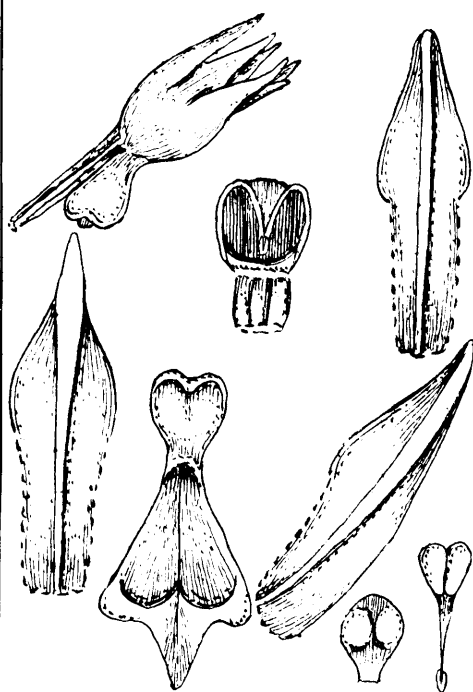
Microtatorchis pterophora Schltr.



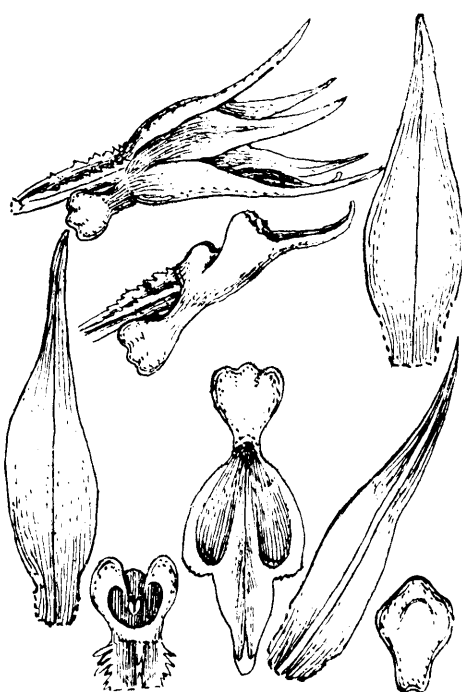
Microtatorchis Finisterrae Schltr.



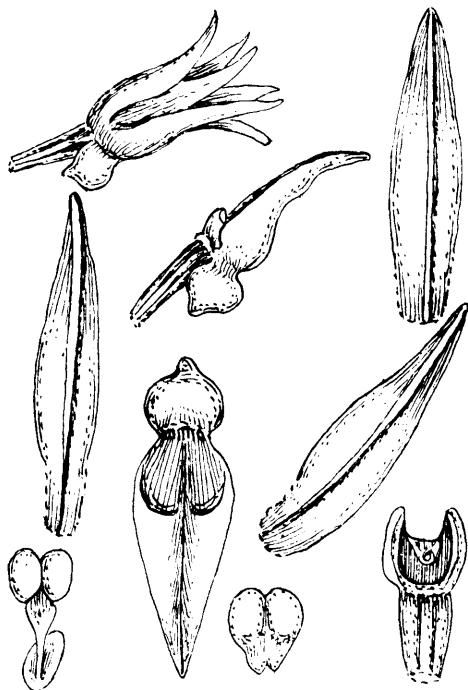
Microtatorchis flaccida Schltr.



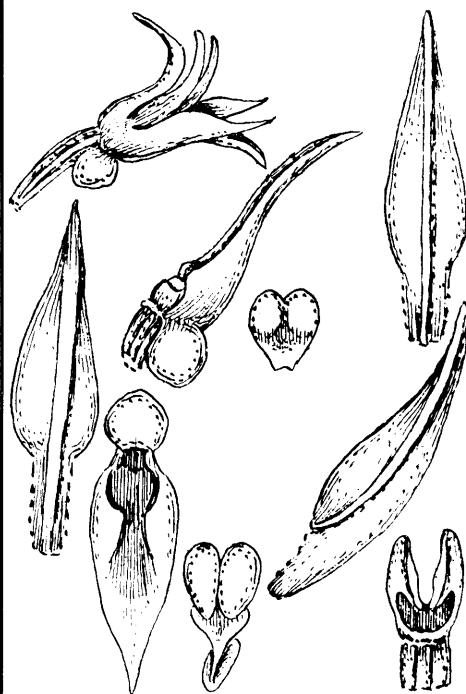
Microtatorchis Govidjoae Schltr.



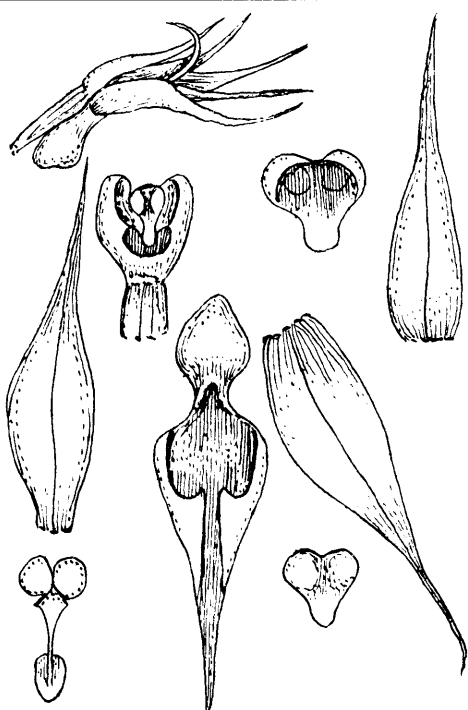
Microtatorchis bryoides Schltr.



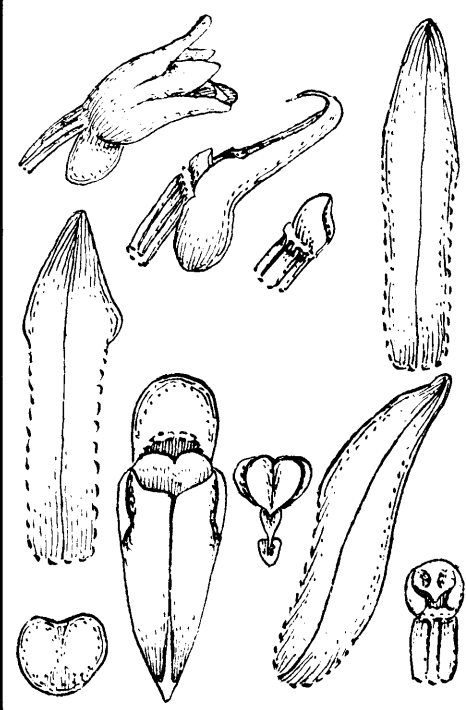
Microtatorchis bracteata Schltr.



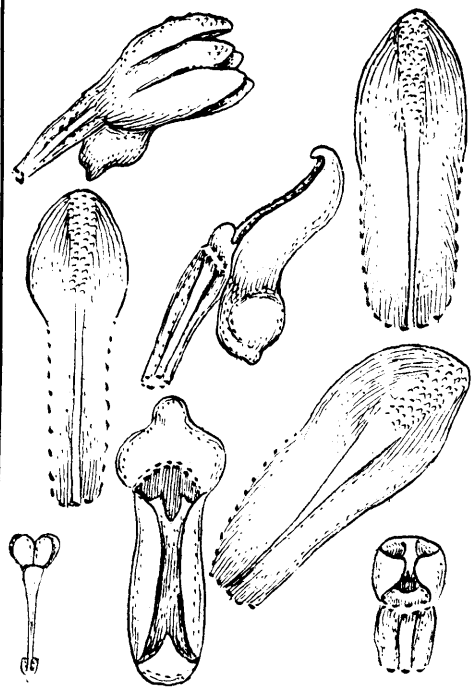
Microtatorchis chaetophora Schltr.



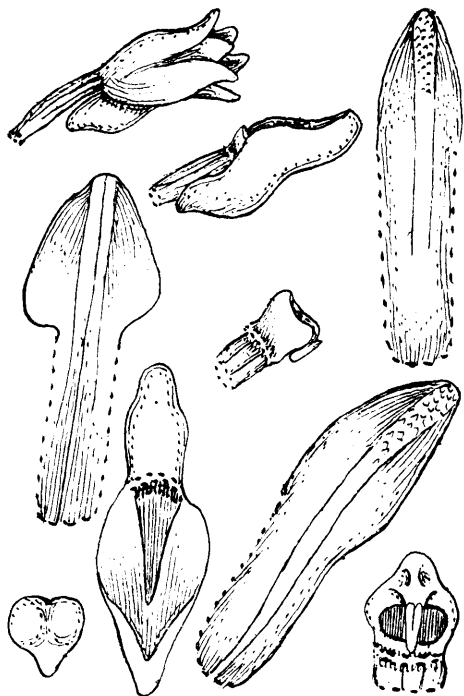
Microtatorchis papuana Schltr.



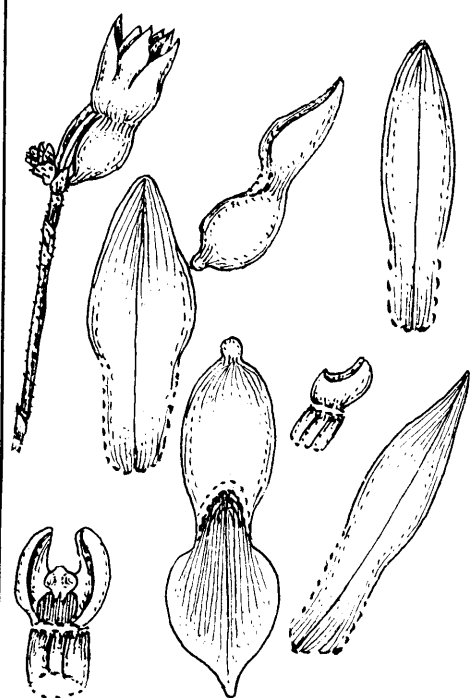
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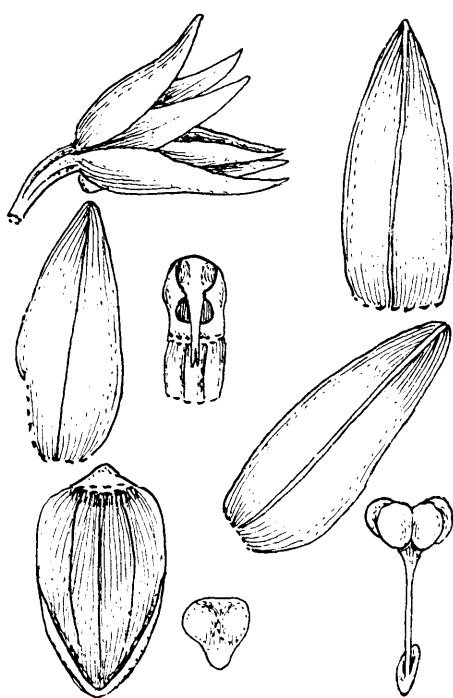
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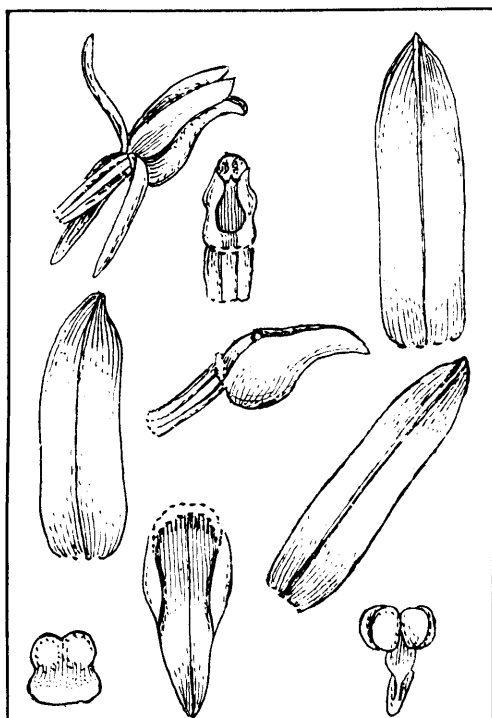
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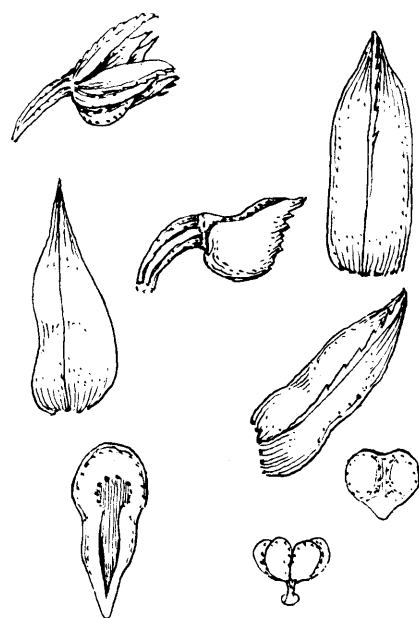
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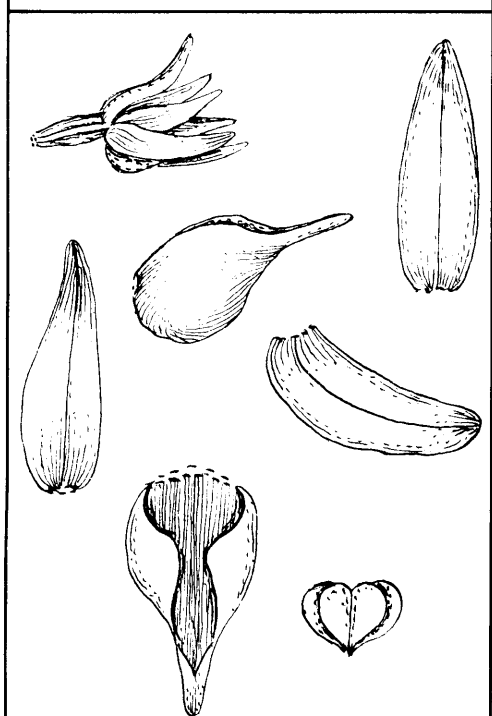
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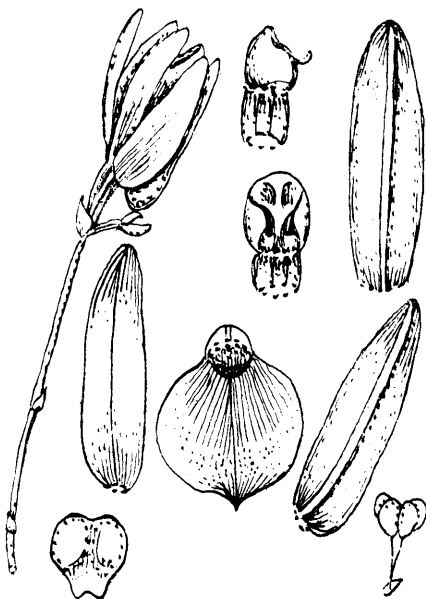
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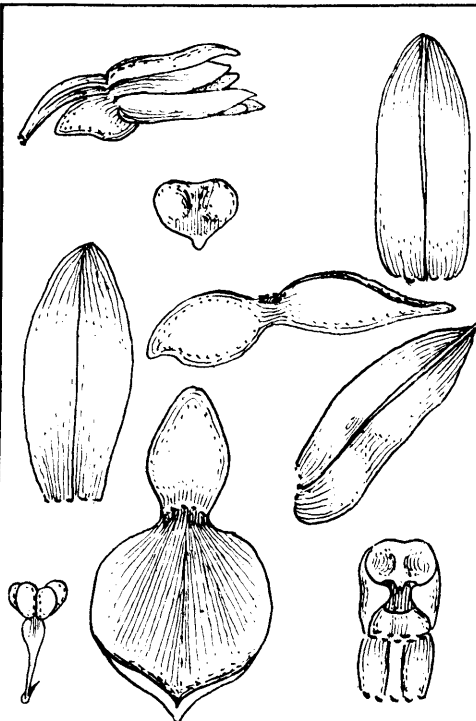
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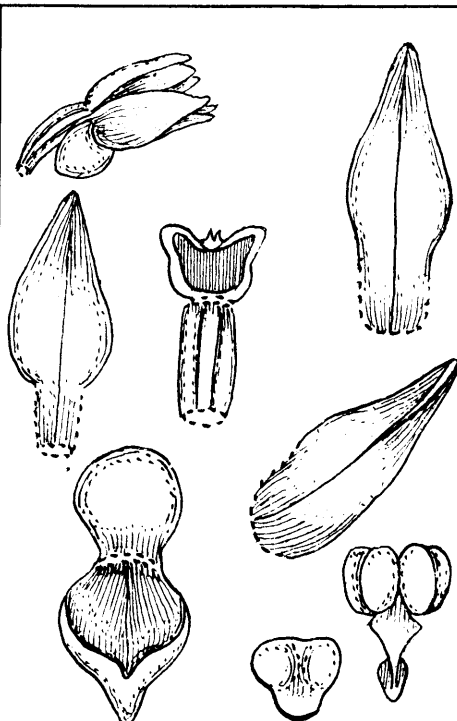
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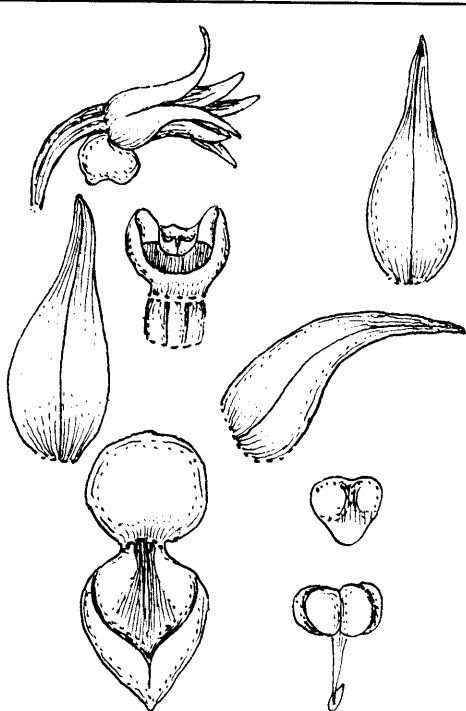
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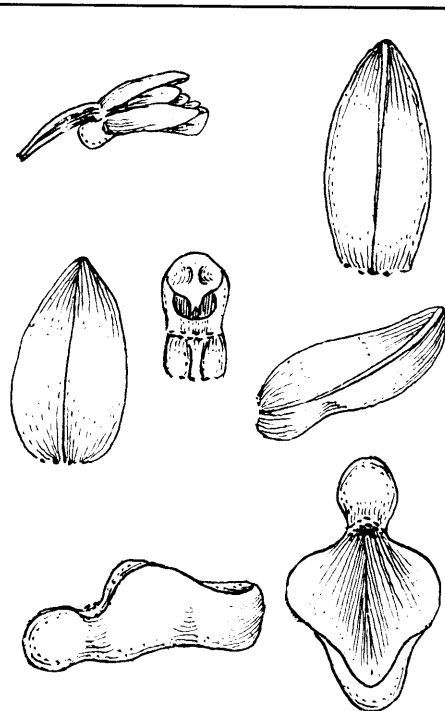
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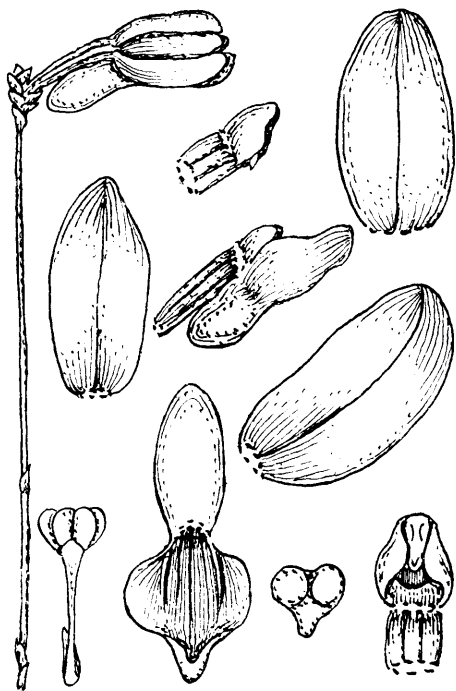
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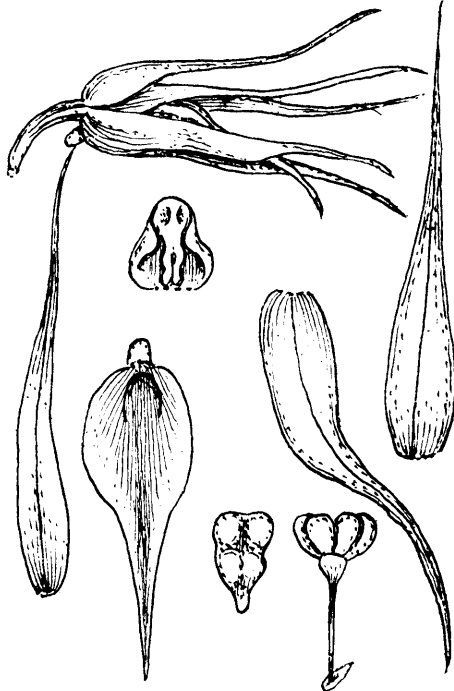
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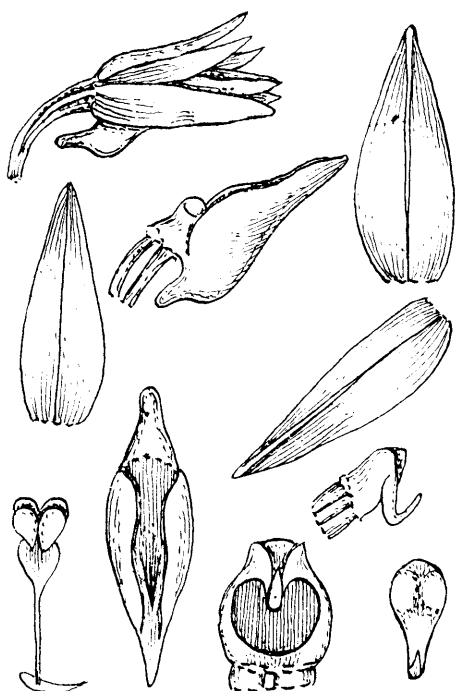
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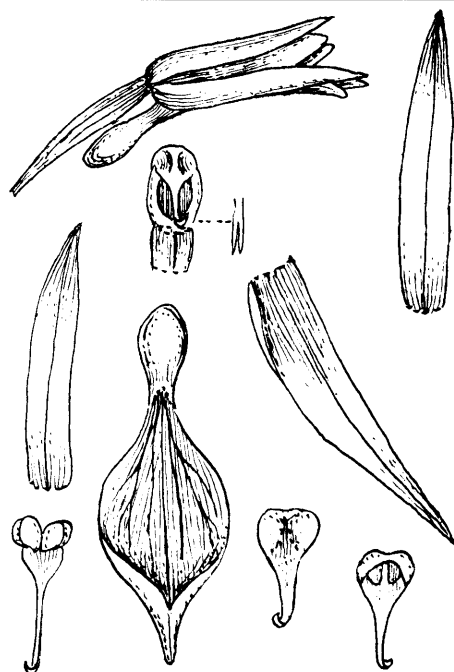
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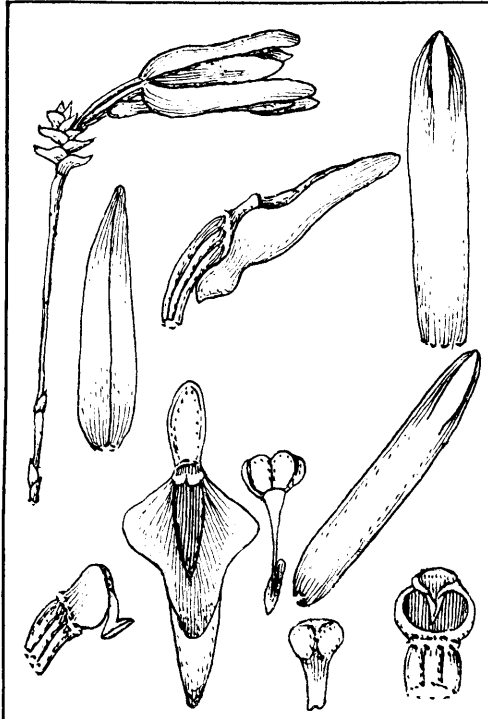
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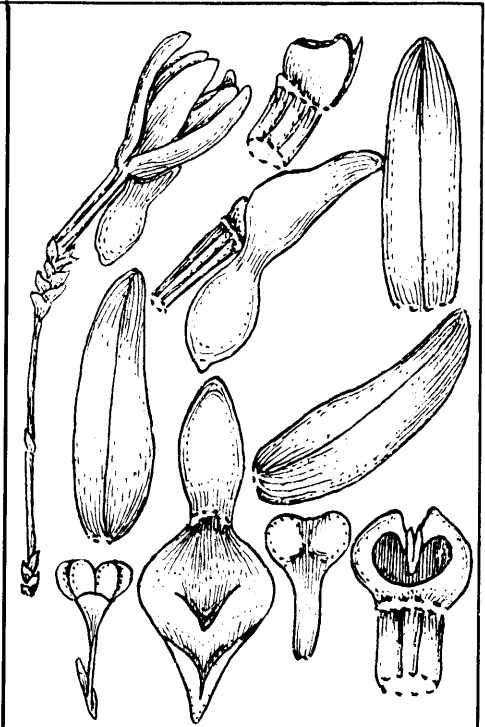
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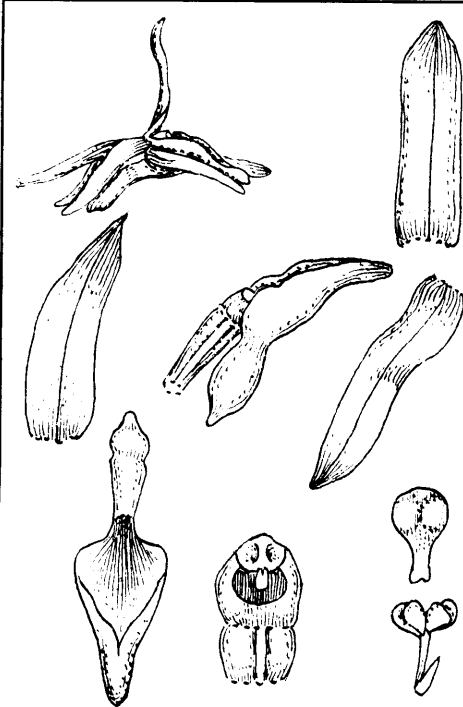
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Schltr.



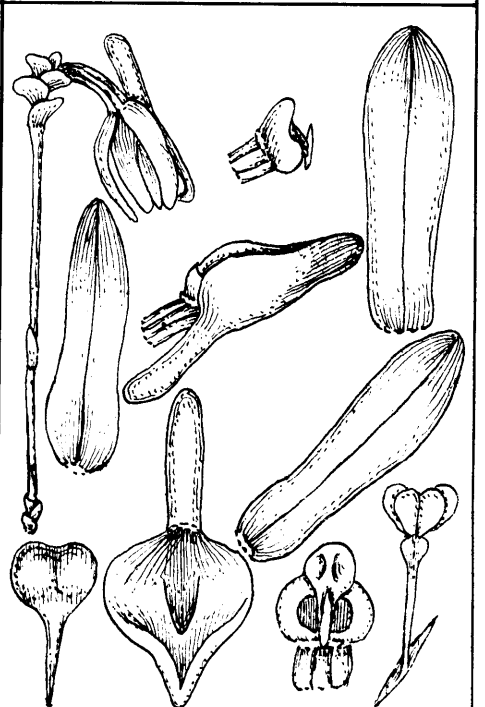
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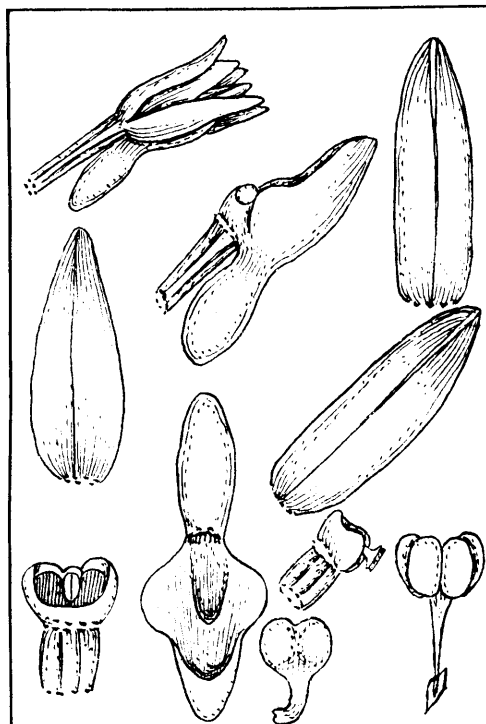
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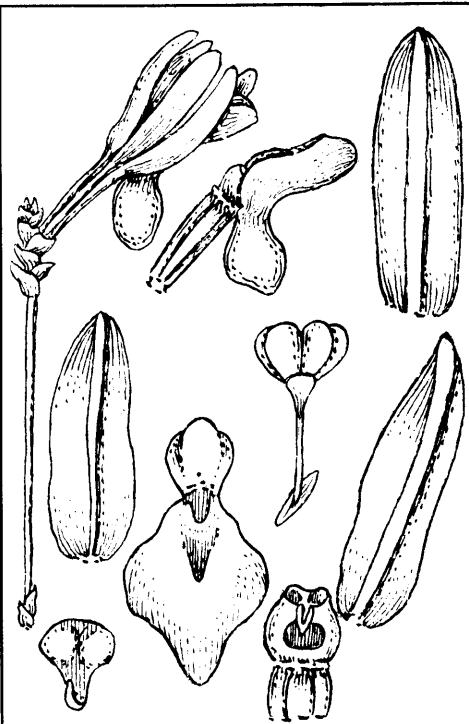
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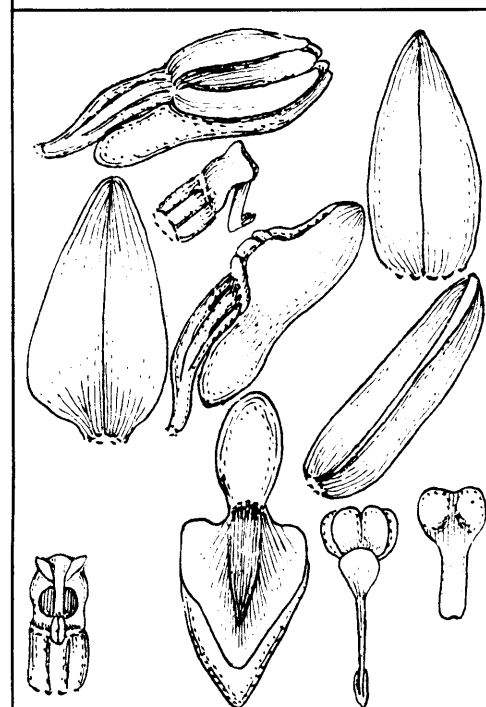
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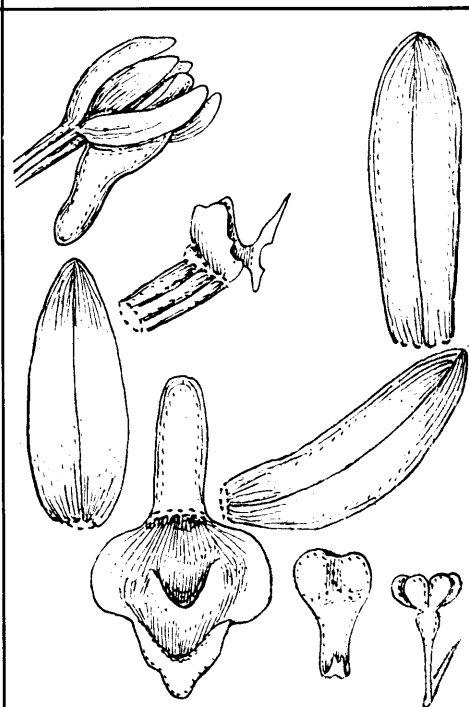
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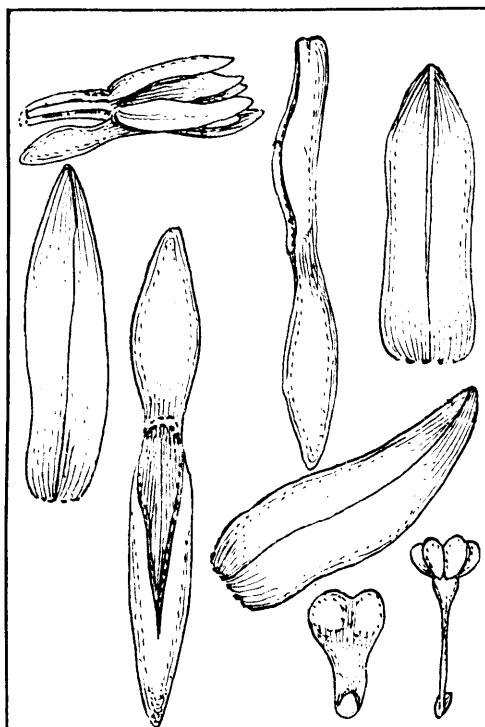
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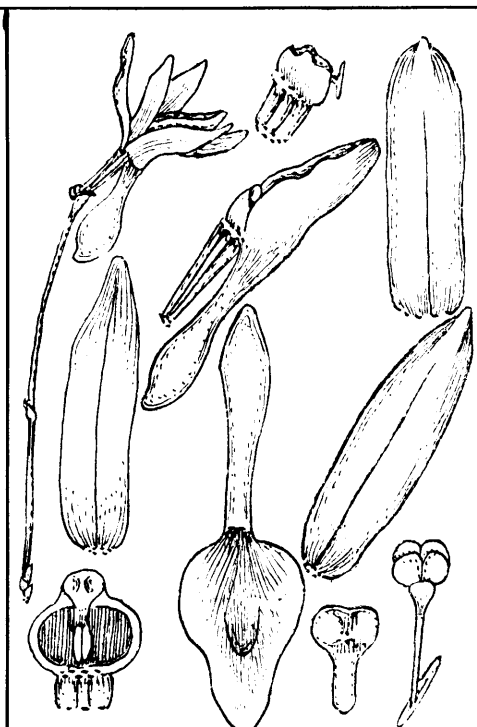
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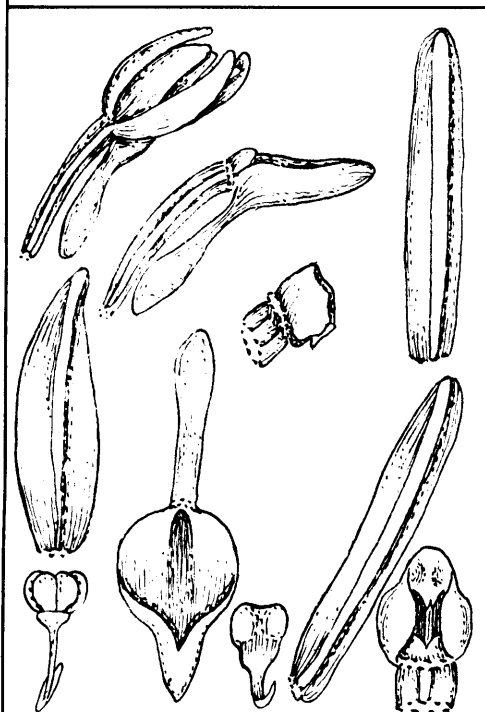
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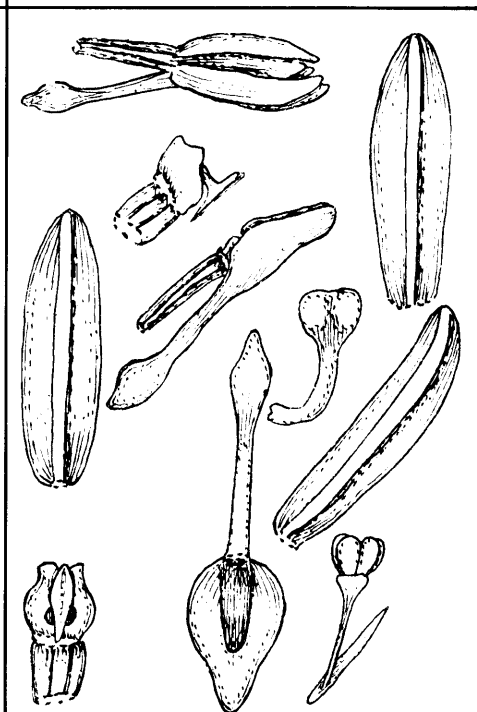
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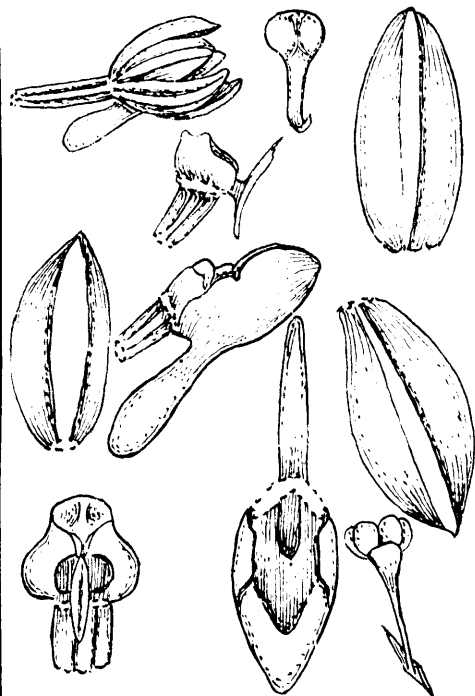
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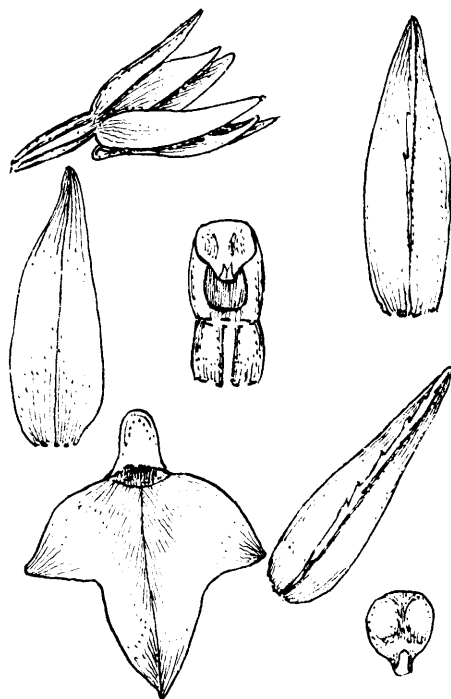
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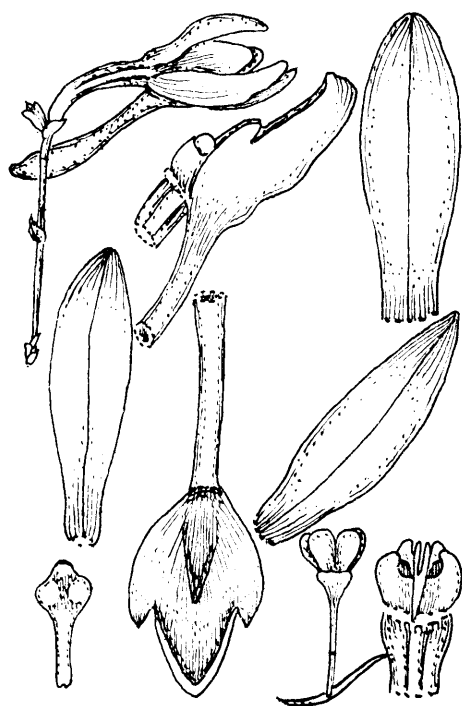
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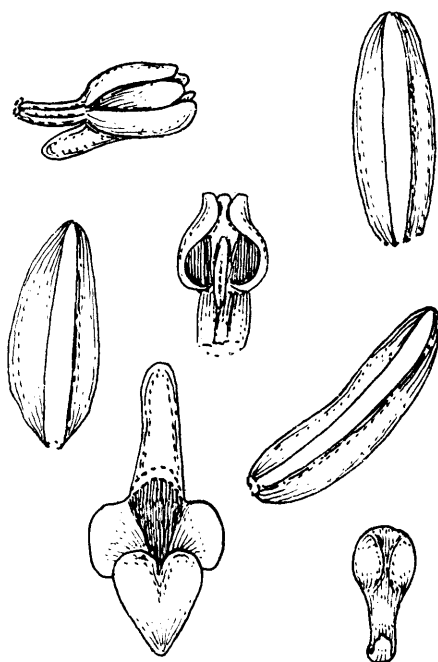
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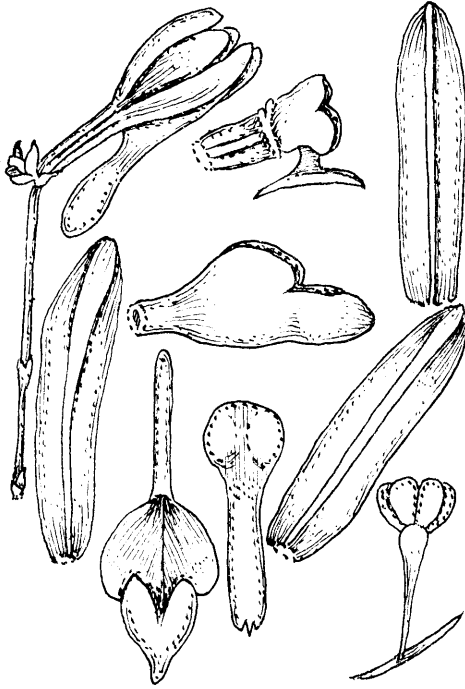
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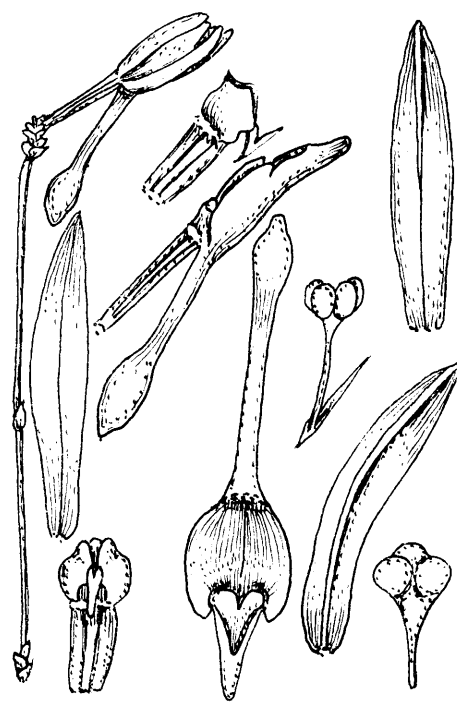
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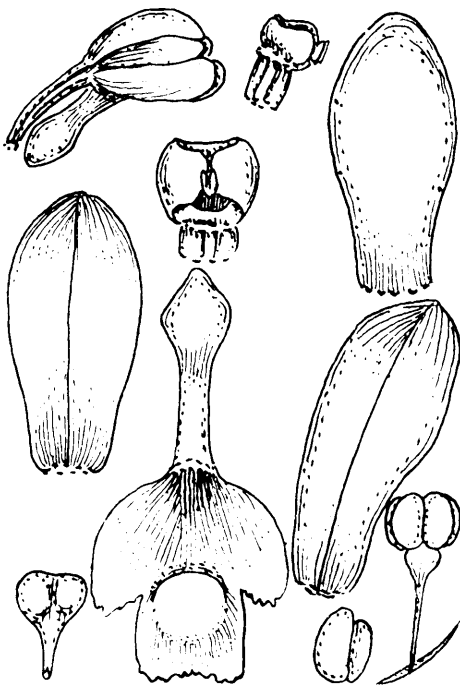
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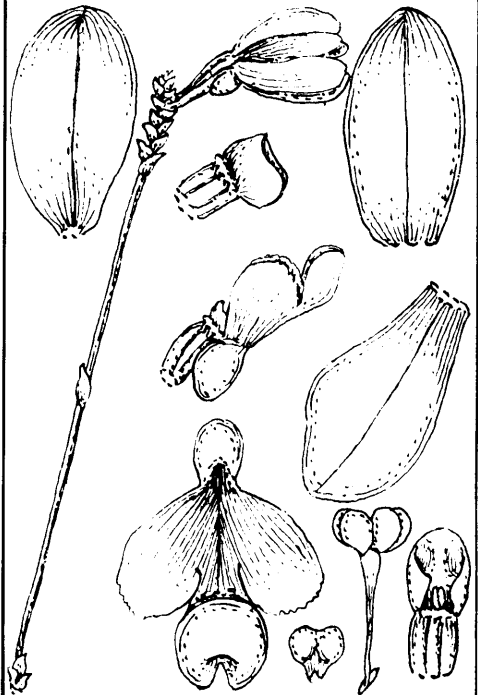
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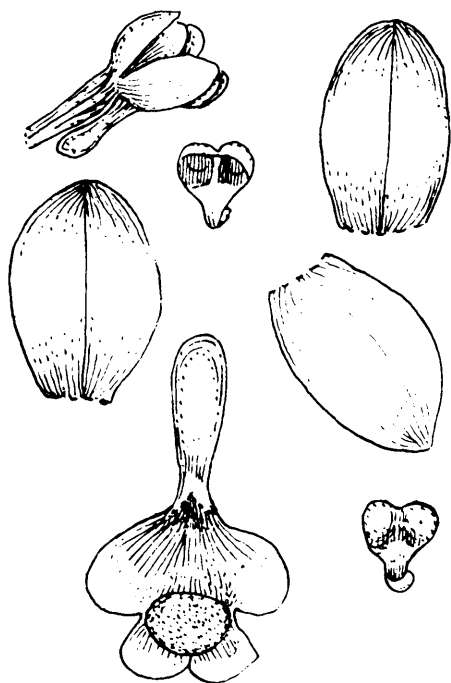
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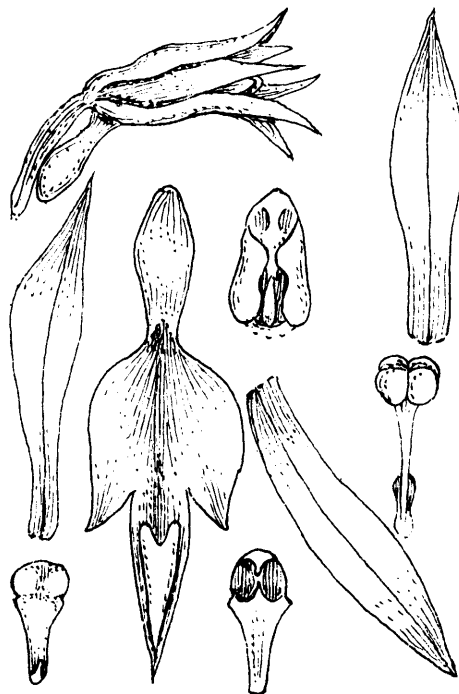
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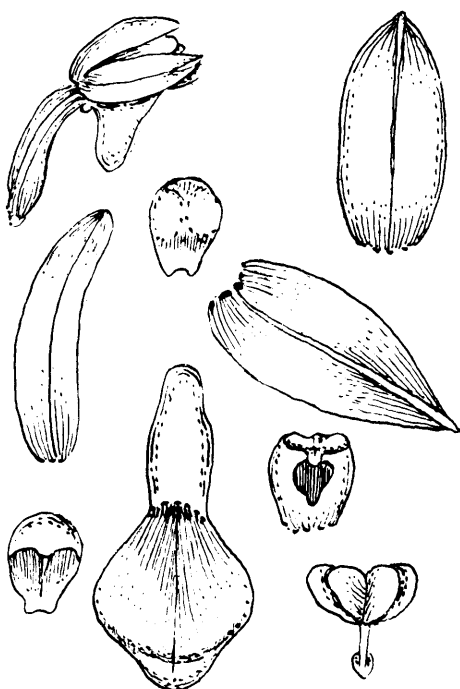
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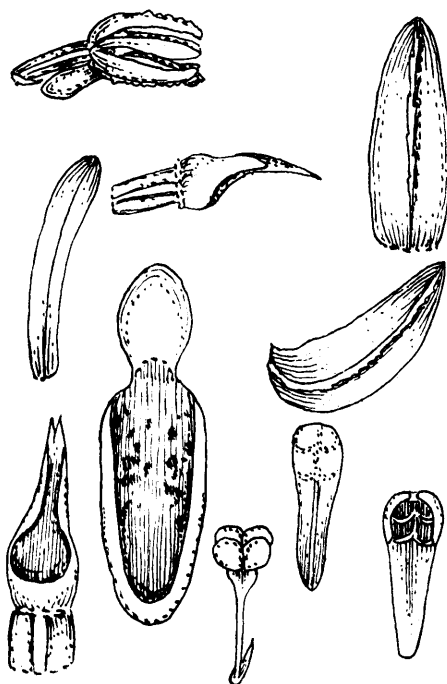
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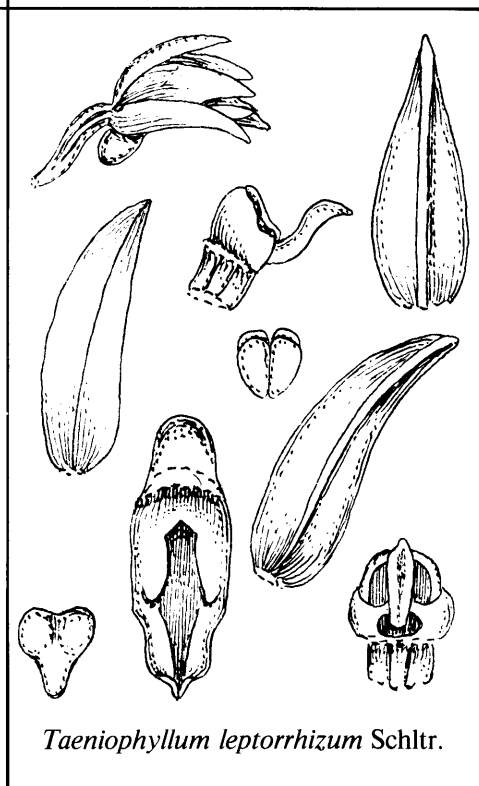
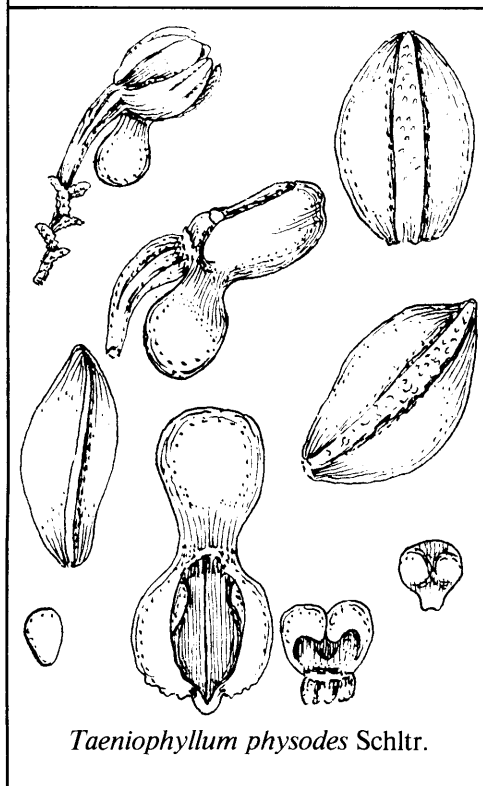
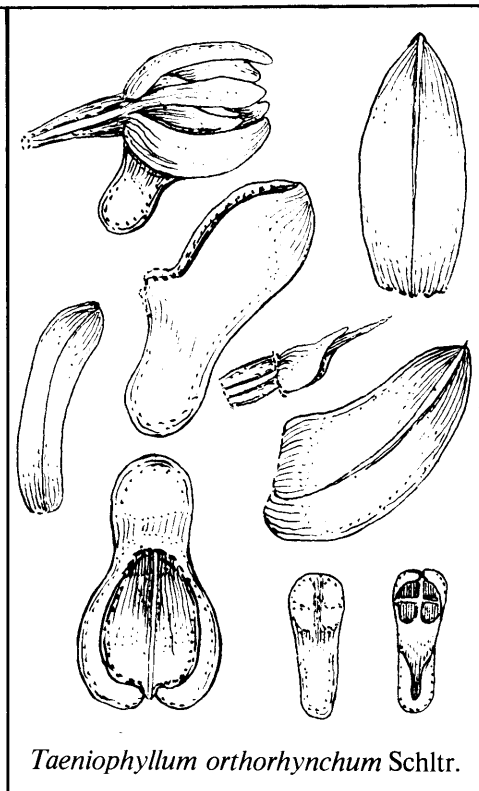
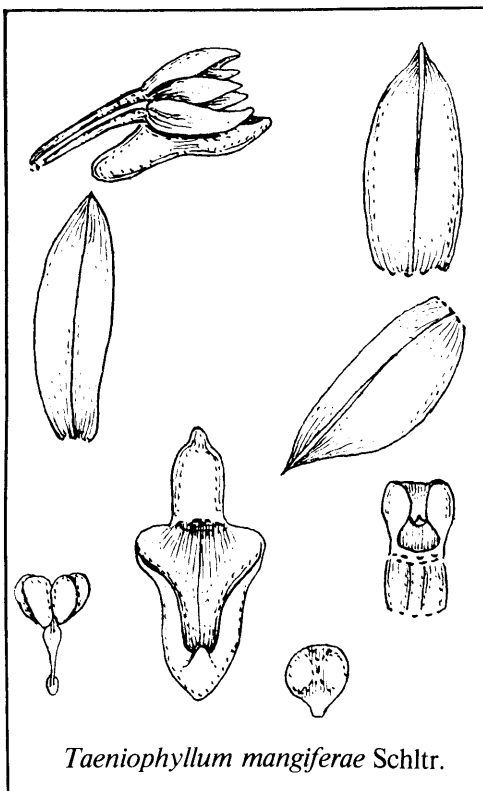
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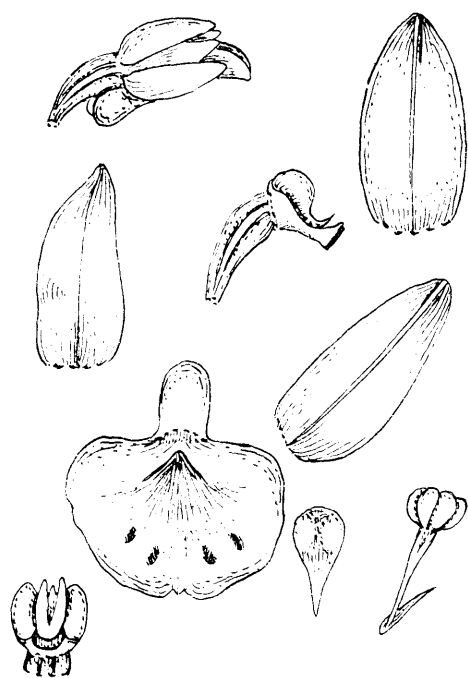


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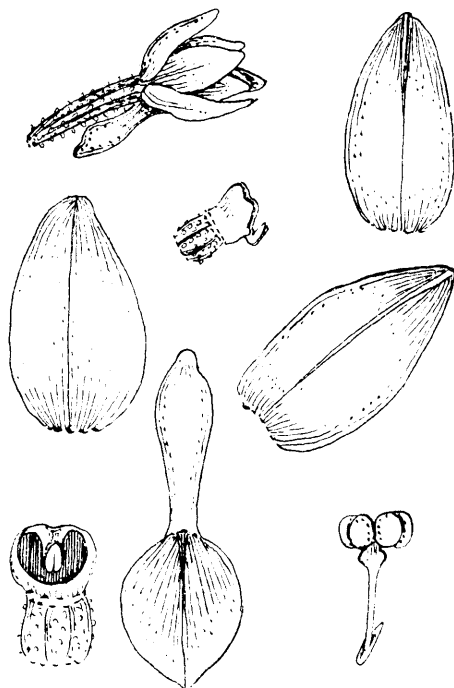


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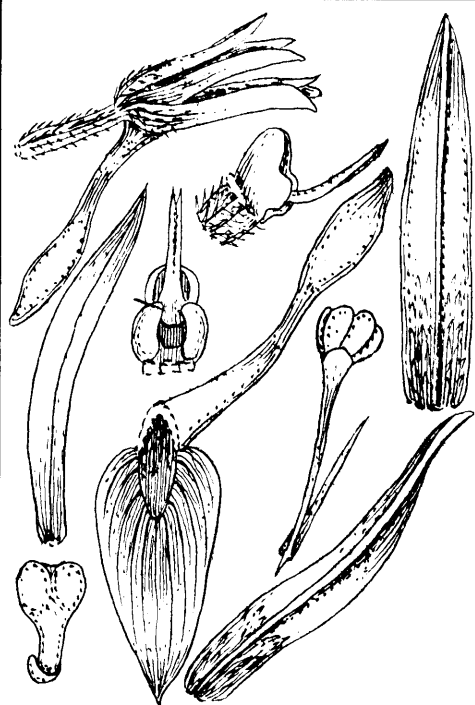




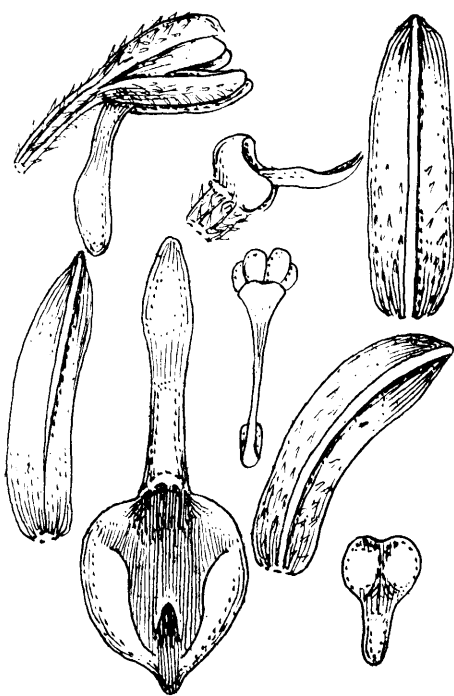
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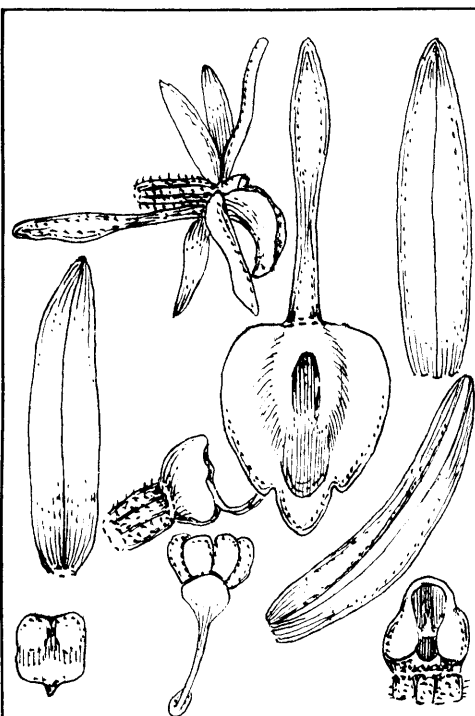
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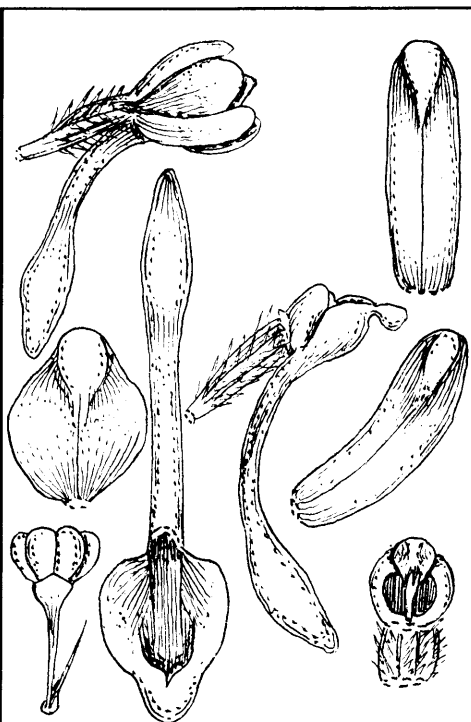
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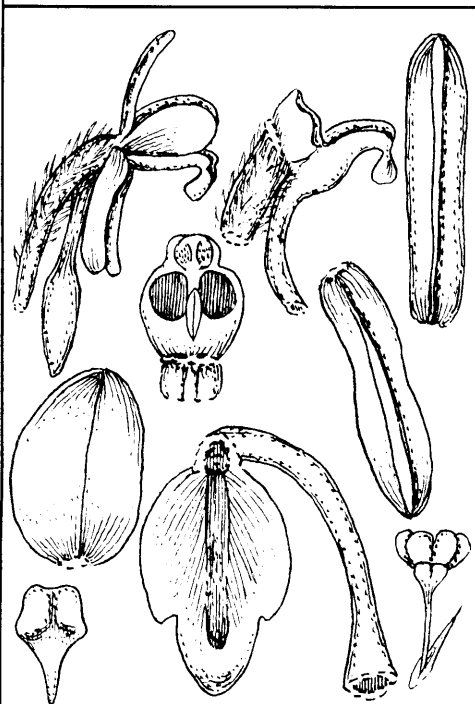
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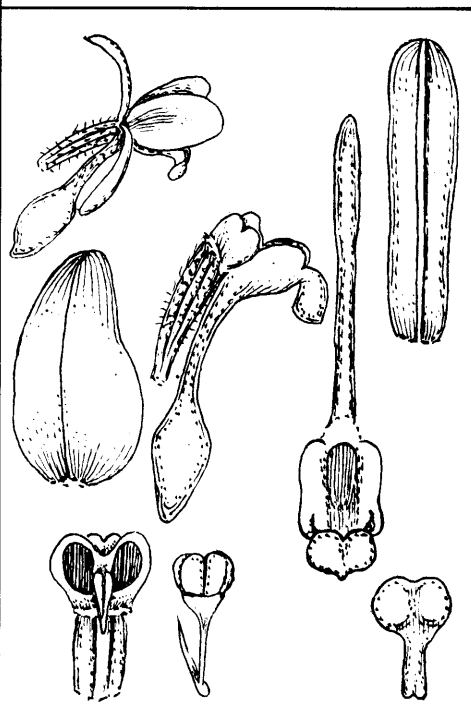
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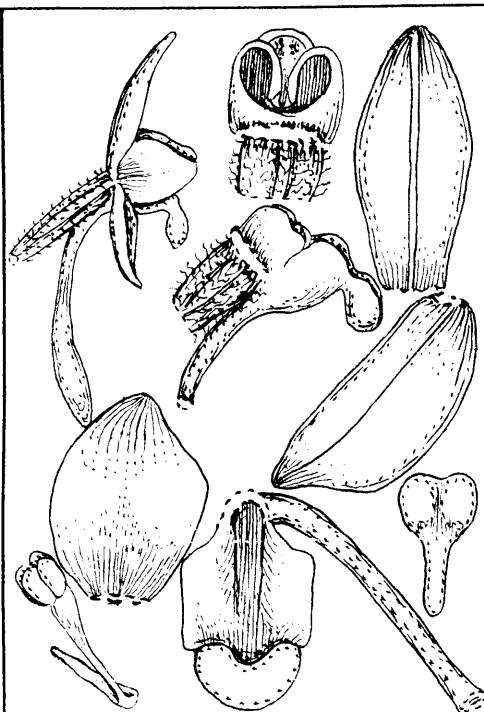
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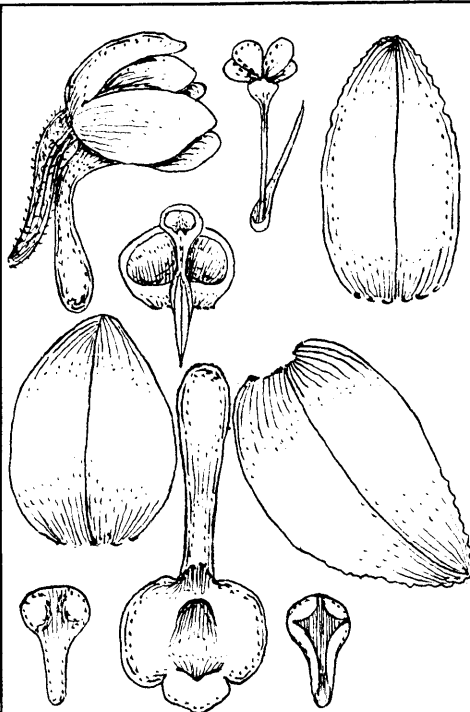
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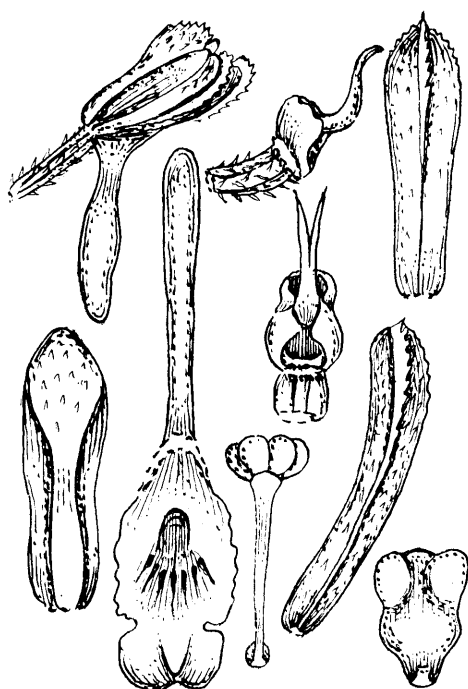
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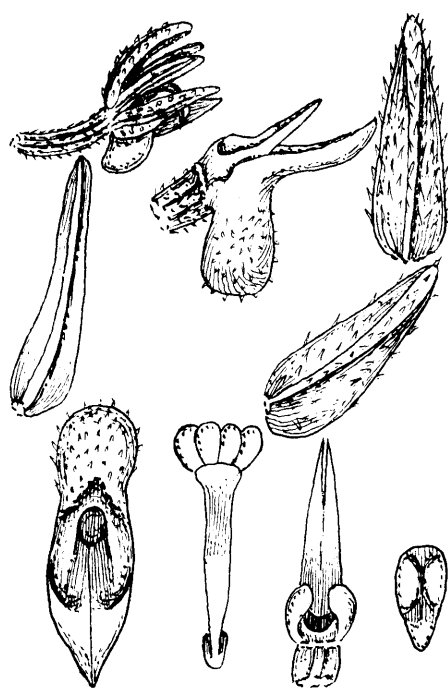
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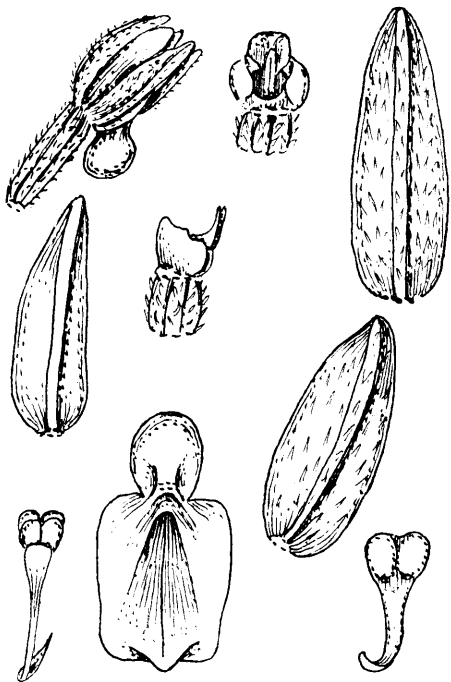
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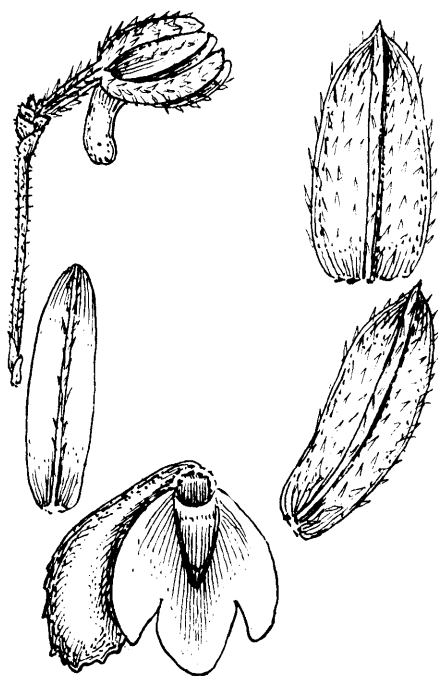
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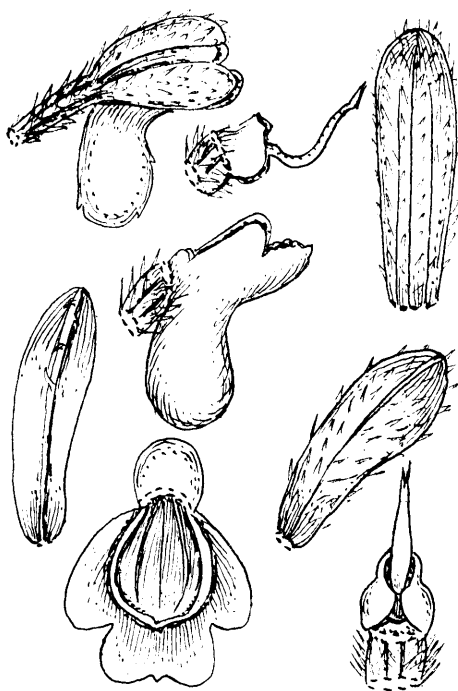
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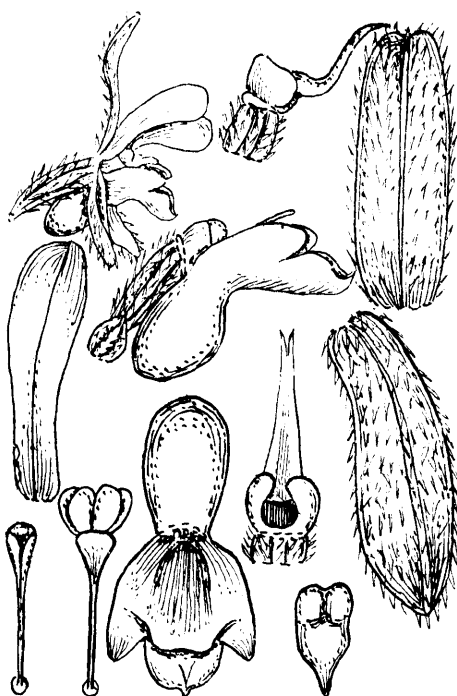
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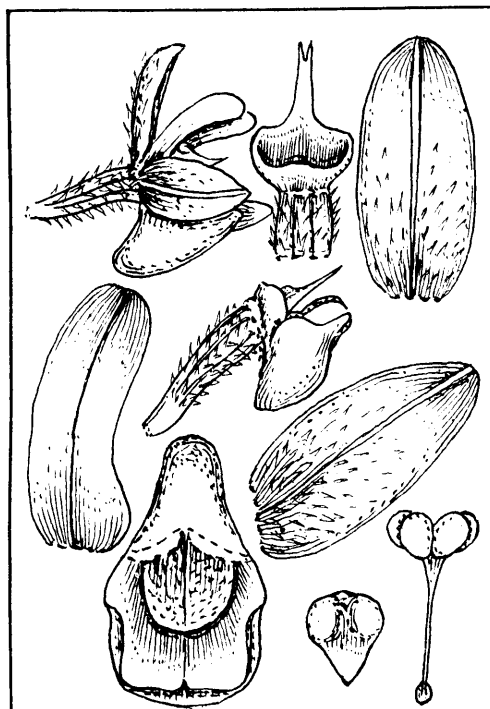
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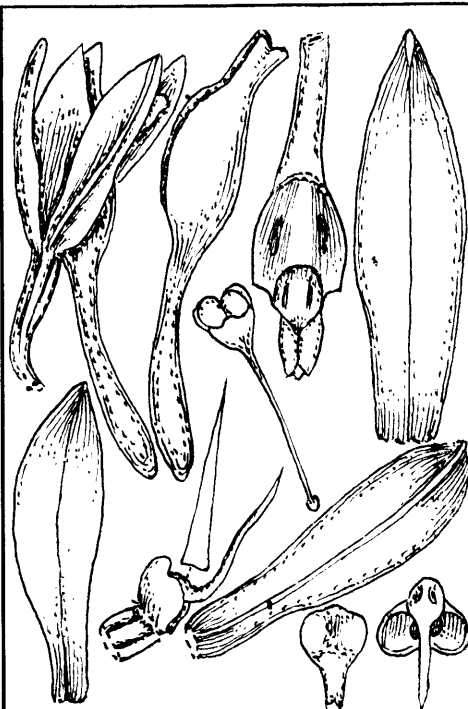
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APPENDICES

The following seven appendices are included to aid the user of this edition. Some are self-explanatory (e.g. Appendix 1 — List of Authors) but others (e.g. Appendix 7 — Schlechter Collection Numbers) have an introductory note of explanation.

Appendix 1—Authors and their abbreviations used by Schlechter.

Bailey , Frederick Manson	1827-1915	Bail.
Barbose Rodrigues , João	1842-1909	Rodr.
Bentham , George	1800-1884	Benth.
Bidwell , John Carne		Bidw.
Binnendijk , Simon	1821-1883	Binnend.
Blume , Carl Ludwig von	1796-1862	Bl.
Brown , Robert	1773-1858	R.Br.
Breda , Jacob Gijsbert Samuel van	1788-1867	Breda
Brongniart , Adolphe Théodore	1801-1876	Brogn.
Burbidge , Frederick William Thomas	1847-1905	Burb.
Cheeseman , Thomas Frederic	1846-1923	Cheesem.
Commerson , Philibert	1727-1773	Comm.
Cunningham , Allan	1791-1839	A.Cunn.
Decaisne , Joseph	1807-1882	Dcne.
Don , George	1798-1856	Don
Finet , Achille Eugène	1863-1913	Finet
Fitzgerald , Robert Desmond	1830-1892	Fitz.
Fleischmann , Andreas	1805-1867	Fleischm.
Gamble , James Sykes	1847-1925	Gamble
Gaudichaud-Beaupré , Charles	1789-1854	Gaud.
Gmelin , Samuel Gottlieb	1745-1774	Gmel.
Griffith , William	1810-1845	Griff.
Hance , Henry Fletcher	1827-1886	Hance
Hasskarl , Justus Carl	1811-1894	Hassk.
Hemsley , William Botting	1843-1924	Hemsl.
Hooker , William Jackson	1785-1865	Hook.
Hooker , Joseph Dalton	1819-1911	Hook.f.
Jackson , George	1790-1811	Jacks.
King , George	1840-1909	King
König , Carl Dietrich Eberhard	1774-1851	Koen.
Kränzlin , Fritz Wilhelm Ludwig	1847-1934	Krzl.
Kuntze , Carl Ernst Otto	1843-1905	O.Ktze.
(Linnaeus) Linné , Carl von	1707-1778	L.
Lauterbach , Carl Adolf Georg	1864-1937	Laut.
Lindley , John	1799-1865	Lindl.
Lourero , João de	1717-1791	Lour.
Maiden , Joseph Henry	1859-1925	Maid.
Makino , Tomitarō	1861(2)-1957	Mak.
Maximovicz , Carl Johann	1827-1891	Maxim.

Miquel , Friedrich Anton Wilhelm	1811-1871	Miq.
Moon , Henry George	1857-1905	Moon
Moore , Spencer le Marchant	1850-1931	S. Moore
Mueller , Ferdinand Heinrich Jacob von	1825-1896	F.v.M.
Nuttall , Thomas	1786-1859	Nutt.
O'Brien , James	1842-1930	O'Brien
Pantling , Robert	1856-1910	Pantl.
Parish , Samuel Bonsall	1838-1928	Par.
Pavón , José	1750-1844	Pav. (or P.)
Paxton , Joseph	1803-1865	Paxt.
Persoon , Christiaan Hendrik	1761-1836	Pers.
Pfitzer , Ernst Hugo Heinrich	1846-1906	Pfitz.
Rafinesque-Schmaltz , Constantine Samuel	1783-1840	Rafin.
Rechinger , Karl	1867-1952	Reching.
Rees , Abraham	1743-1825	Rees
Reichenbach , Heinrich Gottlieb Ludwig	1793-1879	Rchb.
Reichenbach , Heinrich Gustav	1824-1889	Rchb.f.
Reinwardt , Casper George Carl	1773-1854	Reinw.
Richard , Achille	1794-1852	A.Rich.
Rolfe , Robert Allen	1855-1921	Rolfe
Roxburgh , William	1751-1815	Roxb.
Ruiz-Lopez , Hipólito		R.
Salisbury , Richard Anthony	1761-1829	Salisb.
Schlechter , Friedrich Richard Rudolf	1872-1925	Schltr.
Schumann , Karl Moritz	1851-1904	Schum.
Smith , Johannes Jacobus	1867-1947	J.J.Sm.
Steudal , Ernst Gottlieb von	1783-1856	Steud.
Swartz , Olaf Peter	1760-1818	Sw.
Teijsmann , Johannes	1809-1882	Teijsm.
Thouars , Abel Aubert du Petit	1793-1864	Thou.
Thwaites , George Henry Kendrick	1812-1882	Thw.
Trimen , Henry	1843-1896	Trimen
Wallich , Nathaniel	1786-1854	Wall.
Wight , Robert	1796-1872	Wight
Zahlbruckner , Johann Baptist	1782-1851	Zahlbr.
Zollinger , Heinrich	1818-1859	Zoll.

Appendix 2 — Geographical Names in German New Guinea (Kaiser-Wilhelms-Land, Bismarck Archipelago) and in the German Solomon Islands (Bougainville Island)

	Grid Ref.	Co-ordinates °S °E	Map Ref.	Comments
Adolfhafen, harbour	F5	7.45 147.39	4	now Morobe
Akur, village	A1	3.25 142.30	1,4	
Albo, village and hills	D3	5.32 145.43	2	now Alibu
Alexishafen, harbour	D3	5.06 145.50	4	
Ambo, village	D3	(5.38) (145.59)	3	
Apur, village	A1	3.27 142.33	1,4	
Asai; hills, district	D3	(5.35) (145.42)	2	
Baube Creek				refer Waube Creek
Beining Range	Y3	4.23 151.44		
Berlinhafen, harbour	A1	3.09 142.25	4	now Aitape Roadstead
Bismarck Archipelago				refer small map
Bismarck Range	C3-D4		4	
Bo, village	Z2	3.39 152.25	4,6	
Bogadjim, town	D3	5.28 145.46	2,4	previously Stephansort
Boja River, (mouth of)	F4	6.31 147.52	4	
Bol, village	Y1	3.00 151.44	5	now probably Bolegila
Bolobo, district	D3	5.34 145.42	2	near Minjem River Valley
Boroai, district	D3	5.36 145.50	2	near Ibo Range
Bougainville Mountain	—	2.39 141.02	5	near Vanimo
Bubui River, (mouth of)	F4	6.35 147.51	4,10	now probably Mape River
Bulu, village	D3	5.29 145.49	2,4	Operations Base, 1907-09
Bussim, village	F4	6.30 147.52	4	
Bussum, village	F4	6.32 147.50	10	now probably Buangi
Butaueng, village	F4	6.35 147.49	4,10	now Butaweng
Carteret, Port	Z3	4.41 152.43	4	now Lemassa Bay
Constantinhafen, harbour	D3	5.29 145.50	2	refer Konstantinhafen
Damum, village	D3	5.32 145.48	2	near Kabenau River
Danip, village	D3	5.06 145.46	5	near Alexishafen
Deinzerhöhe, village	F4	6.46 147.31	4	Huon Gulf area
Dischore Mountain, Range	F5	7.57 147.27	8	
Djamu Creek, River	D3	(5.35) (141.42)	2	flows into Minjem River
Djawan, village	D3	not located	—	in Minjem River Valley
Djemur River	A1		—	see Rin-Jemur River
Djup, village	—	not located	—	on Bougainville Island
Dscheregi Mountain	F6	8.00 147.30	8	also known as Tscheregi
Dschischungari, village	F5	not located	—	below Dischore Range
Eitape, town	A1	3.09 142.23	4	now Aitape
Erimahafen, harbour	D3	5.25 145.45	4	
Essimbu, village	F4	not located	—	Sattelberg area
Finisterre Range	D/E3		4	
Finschhafen, harbour	F4	6.33 147.52	4,5	
Finschhafen, town		6.36 147.51	5	
Fortifikations Spitze, point	F4	6.19 147.50	4	now Kitumala Point
Friedrich-Wilhelmshafen, harbour	D3	5.13 145.49	4	now Madang
Garup (Garub) River, (mouth of)	A1	3.15 142.35	1	now probably Koromal Creek
Gati Mountain	D3	(5.32) (145.43)	2	in Minjem River Valley
Gazelle Peninsula	Y2/3			N.E. extremity of Neu Pommern
Gelu Mountain	D3	5.37 145.57	12	Finisterre Range area
Giagoro River	D3	(5.41) (145.34)	2	flows into Ramu River

Gobi, village	F6	8.01	147.29	8	now probably Gobe
Gogol River, (mouth of)	D3	5.19	145.47	4	
Gomadjidgi Mountain	F5	7.59	147.36	8	also Kometidia Mountain
Goromia Village?	F5	7.59	147.36		identical with Gomadjidji
Gorum	—			—	native name for Bismarck Range
Govidjoa Creek	F5	(7.57)	147.27)	—	Dischore Range area
Hatzfeldthafen, harbour	D2	4.24	145.09	4	
Herbertshöhe, town	Z3	4.20	152.17	4	now Kokopo
Hokrocho, village	D3	5.45	145.30	11	
Huon Gulf	F4/5	7.00	147.30	4	
Ibo Range	D3	5.43	145.40	2	near Mudjene River
Jaduna, village	F5	7.58	147.41	4	now probably Gomena
Jawer, village	D3	not located			see also Djawer
Kabanut, village	Z2	3.51	152.29	5	
Kabenau River, (mouth of)	D3	5.29	145.43	2	flows into Astrolabe Bay
Kaiser-Wilhelms-Land	—				N.E. New Guinea & adjacent islands, refer large map
Kaiserin-Augusta River, (mouth of)	C1	3.51	144.35	4	now Sepik River
Kako, village	F4	not located		—	near Finschhafen
Kalueng, village	F4	6.25	147.51	10	now probably Bonga
Kambaran River, (mouth of)	D3	5.29	145.56	3	now Kambara River
Kamudu, village	F5	not located		—	Waria River area
Kanebo, village	Z2	3.16	152.03	4	now probably Kanabu
Kani Range and Base	D3	(5.36)	(145.27)	2	near Djamu Creek
Kannawit, village	Z2	3.32	152.21	5	now Kanapit
Kao, village	F4	not located		—	near Finschhafen
Karo River, (mouth of)	Y3	4.13	151.40	5	mouth is at Massawa
Karu, village	Z2	3.28	152.14	4,6	
Kaulo River and Base	D3	(5.34)	(145.42)	2	Minjem River Valley area
Kāwieng, town	X1	2.34	150.49	4	now Kavieng
Kelana, harbour	F4	6.03	147.33	4,7	
Kelel, village and district	D3	(5.34)	(145.51)	2	now probably Kulel
Kenejia Base	D3	(5.42)	(145.34)	2	
Kenejia River	D3				original name for upper reaches of Ramu River
Kerawara Island	Z3	4.15	152.25	4	Duke of York group of islands
Kieta, town	—	6.13	155.39	—	on Bougainville Island
Konstantinhafen, harbour	D3	5.29	145.50	2	now Melamu Harbour
Kubai, village	D3	5.42	145.35	2	Ramu River-Giagora River area
Lambert Cape	Y3	4.12	151.30	4	
Lauan, village	Y1	2.46	151.08	4	
Lesson Volcano	C1	3.37	144.50	4	or Bam Island (Schouten Islands)
Loasere, village	Y2	3.12	151.55	5	now probably Lasigi
Maboro Range	F5	7.58	147.27	8	
Maclay Coast	E/F3	6.00	146.15	4	now Rai Coast
			-147.00		
Maijen River	D3	(5.29)	(145.54)	3	
Malapau, village	Z3	4.20	152.14	—	near Kokopo
Malelum, village	Y2	3.12	151.53	5	now probably Malom
Malia River	D3	(5.48)	(145.33)	2	now possibly Oija River
Manam Island	D2	4.07	145.03	4	or Vulcan Island
Mandres, village	Y3	4.19	151.54	4	
Mangrove Creek	Z3	(4.19)	(152.14)	—	near Ralum
Markham River, (mouth of)	E/F4	6.50	147.00	4	
Massa, village	F4	(6.32)	(147.48)	10	near Boja River (Uassa)
Massawa, village	Y3	4.13	151.48	4	now Massava

Meireka, village	D3	(5.32)	(145.54)	3	near Maijen River
Melamu, village	D3	5.29	145.50	2	identical with Konstantinshafen
Mimi Mountain	F5	8.00	147.29	8	
Minjem River, (mouth of)	D3	5.28	145.41	2,4	now Mindjim River
Mioko Island	Z3	4.14	152.28	4	Duke of York Group of Islands
Morowe, town	F5	7.45	147.39	4	now Morobe
Moyo River	D3	5.37	145.50	12	confluence with Kabenau River
Mudjene River	D3	5.34	145.41	2	flows into Minjem River
Mutter Volcano	Z3	4.13	152.12	5	now The Mother or Kombiu Mountain
Nares Bay	—	1.56	146.40	4	Manus Island, Admiralty Group
Neu Lauenburg	Z3				now Duke of York Group of Islands
Neu Mecklenburg					now New Ireland, refer small map
Neu Pommern					now New Britain, refer small map
Ngoye Creek	D3	(5.38)	(145.59)	3	near Ambo
Njonge Creek	D3	(5.38)	(145.59)	3	near Ambo
Nord Tochter Mountain	Z3	4.11	152.10	5	now North Daughter or Toyanumbati Mountain
Nuru River	D3	5.22	145.43	4	confluence with Gogol River
Nusa Island	X1	2.34	150.48	4	near Kavieng
Oertzen Range	D3	5.32	145.48	4,12	near Stephansort
Otto Mountain	D3	6.00	145.26	4	in Bismarck Range, 3546 m alt.
Panebo, village	D3	5.36	145.42	2	Minjem River area
Paub, village	A1	3.15	142.35	1,8	now Paup
Pema, village	F5	8.00	147.33	4,8	
Peso, village	A1	(3.09)	(142.23)	—	near Aitape
Portweber, harbour	Z3				refer Weberhafen
Potsdamhafen, harbour	C2	4.15	144.57	4	now Monumbo Harbour
Praslin Port	Z3	4.50	152.54	4,7	now Kambotorosch Harbour
Pro, village	A1	3.11	142.26	5	
Punam, village	Z2	3.47	152.32	5	
Rabo, village	D3	(5.36)	(145.42)	2	Minjem River-Mudjene River area
Ralum village	Z3	4.19	152.14	4	
Ramu River, (mouth of)	C2	4.01	144.37	4	
Rin-Jemur River	A1	3.15	142.37	1	now probably Drinumor River
Rin-Tejao River	A1	(3.30)	(142.30)	1,4	now possibly Kiang River
Rössel Range	Z2	4.10	152.50	4	
Saki River	D3	(5.43)	(145.33)	2	flows into Ramu River swamps, possibly Solu River
Sattelberg Mountain	F4	6.29	147.47	4	
Saugueti Base	D3	(5.43)	(145.35)	2	close to Malia River
Saugueti Mountain	D3				refer Mount Otto
Schibruba Creek	D3	(5.38)	(145.35)	2	near Toliba, flows into Ikau or Saki River
Schumann River	D3	not located			flows into Ramu River
Seleo Island	A1	3.08	142.31	4	now Selio Island
Silello, village	F4	(6.29)	(147.47)	10	Sattelberg area
Silum, village	Z2	3.19	152.06	5	now Silom
Simbang, village	F4	6.35	147.51	4	
Siu, village	F5	7.53	147.41	4,5,8	
Stephansort, town	D5	5.28	145.46	2,4	now Bogadjim
Tamara Island	A1	3.08	142.26	4	now Tumleo Island
Tamie Island	F4	6.45	147.56	4	now Tami or Cretin Island
Tandes, village	Y1	3.01	151.34	4	
Toliba, village	D3	(5.38)	(145.35)	2	in Saki River Valley
Torricelli Range	A1				
Udu, village	F5	(8.00)	(147.33)	8	same as Utu?

Umbili, village	D3	not located	—		Djamu River-Minjem River area
Unu, village	F5	7.51	147.42	4,8	
Vatom Island	Z3	4.06	152.05	4	now Watom Island
Vulkan Island	D2	4.07	145.03	4	now Manam Island
Wabe River	D3	5.29	145.54	3	now Gaube River
Wakeak Creek	D3	(5.36)	(145.58)	3	flows into Kambaran River
Warapussa River	D3	not located			Ramu River area
Waria River, (mouth of)	F5	7.50	147.44	4	
Waube Creek	F5	8.00	147.31	4,8	also Baube Creek. Flows into Waria River
Weberhafen, harbour	Z3	4.15	152.03	4	now Kambeira Bay
Wengi, village	D3	5.31	145.43	2	now Wenge
Wittens' Store	F6	8.00	147.27	9	near Dschischungari
Wobbe, village	D3	(5.34)	(145.51)	—	Mudjene River-Minjem River area

Note: Bracketed co-ordinates are estimations only from maps without co-ordinates. Many village localities are not recorded on current maps, nor in gazetteers, due probably to population drift.

Map References:

- *1. Torricelli Range area, 1:75,000 in: R. Schlechter (1911) *Die Guttapercha-und Kautschuk-Expedition . . . nach Kaiser-Wilhelms-Land 1907-1909*. Berlin.
- *2. Central Kaiser-Wilhelms-Land, 1:75,000. idem.
- *3. Finisterre Range area, 1:75,000. idem.
4. Provisional List of Geographical Names. Parliament of the Commonwealth of Australia. Report to the League of Nations on the Administration of the Territory of New Guinea. Appendix D. June 27, 1923.
- **5. Current maps of Papua New Guinea, Surveyor General, Series T601, 1:100,000
 - a) West Sepik area: Vanimo 7192.
 - b) Torricelli Range area: Aitape 7391, Suain 7491.
 - c) Astrolabe Bay, Bismarck Range foothills and Finisterre Range areas: Madang 8087, Dumpu 8086, Sidor 8196.
 - d) Waria River area: Morobe 8482, Ioma 8481.
 - e) Finschhafen area: Finschhafen 8484, Ago 8485.
 - f) New Britain (Neu Pommern), Gazelle Peninsula area: Lassul 9289, Rabaul 9389.
 - g) New Ireland (Neu Mecklenburg) area: Kavieng 9092, Fangalawa 9192, Konos 9291, Karu 9391, Namatanai 9490, Dolomakas 9390.
6. Grosser Deutscher Kolonial Atlas, compiled by Springade & Moisel, Reichs Kolonial Amt (1909), 1:2,000,000.
7. Reichs Marine Amt (1891) *Kaiser-Wilhelms-Land, Bismarck Archipelago und Salomon Inseln*. 1:2,000,000.
- *8. Skizze des deutsch-britischen Grenzgebietes in Neu Guinea langs des 8. Grades südl. Breite. (östl. Hälfte) c. 1909, Ketzler & Moisel, 1:100,00. [Eastern Half of the Waria River Border Area.]
- *9. Idem. westl. Hälfte. [Western Half of the Waria River Border Area.]
- *10. Sattelberg, 1:100,000. *Mitteilungen aus den deutschen Schutzgebieten*, vol. 20 (1907).
11. Australian Aeronautical Map B.8, Lae, 1:1,000,000 (1944) R.A.A.F. Cartography Section.
12. Werner, E. (1911) Map in: *Kaiser-Wilhelms-Land. Beobachtungen und Erlebnisse in den Urwäldern Neuguineas*. [Observations and Experiences in the Jungles of New Guinea.] Freiburg i. Br.

Note: * Prints are available from the New Guinea Collection, University of Papua New Guinea, Box 319 University P.O., Papua New Guinea. Price on application.
The three Schlechter maps (1-3) cover only parts of the areas traversed. The fine detail of place names, etc. is confused by contour lines, co-ordinates are lacking.

** Available from: National Mapping Bureau, Dept. of Lands, Surveys and Environment, PO Box 5665, Boroko, Papua New Guinea. Price on application.

Appendix 3 — Geographical Names outside German New Guinea and the German Solomon Islands

Ambon, Amboina Island	Moluccas, Indonesia
Arafura Sea	South-west of PNG
Arfak Range	Irian Jaya, Indonesia
Aru Islands	Indonesia
Boneta	Solomon Islands (not located)
Borneo Island	now Kalimantan, Indonesia
Bourawarri	Papua, PNG (not located)
Buitenzorg	now Bogor, Java, Indonesia
Bukit-Timah Mountain	Singapore
Celebes (Island)	now Sulawesi, Indonesia
Christmas Island	Pacific Ocean
Florida (Island ?)	(Solomon Islands)
Fly River	Papua, PNG
Formosa Island	now Taiwan
Goliath Mountains	Irian Jaya, Indonesia
Hainan Island	Peoples Republic of China
Hellwig Range	Irian Jaya, Indonesia
Insulinde	East Indies, Sunda Islands
Khasya	Himalayan foothills, India
Louisiade Archipelago	Papua, PNG
Malacca Peninsula	Malaysia
Mascarene Islands	Mauritius, etc., Indian Ocean
Melbourne	Victoria, Australia
Milne Bay	Papua, PNG
Minahassa Peninsula	Sulawesi, Indonesia
Mou Mountain	New Caledonia
Obree Mountain	Papua, PNG
Owen Stanley Range	Papua, PNG
Padang	Sumatra, Indonesia
Pahang	Malaysia
Perak	Malaysia
Port Moresby	Papua, PNG
Sandwich Islands	now Hawaiian Islands, USA
Seychelles (Islands)	Indian Ocean
Society Islands	Tahiti, etc., Pacific Ocean
Sterling Range	Irian Jaya, Indonesia
Sunda Islands, Greater	Main Indonesian Islands
Sunda Islands, Lesser	Indonesian Archipelago
Sydney Heads	Sydney, New South Wales, Australia
Tanimbar Islands	Indonesia
Tidore	Moluccas, Indonesia
Timor Laut	see Tanimbar Islands
Toli-Toli	Sulawesi, Indonesia
Torres Strait,	Queensland, Australia
Vanikoro Islands	Solomon Islands
Viti Islands	Fijian Islands

Appendix 4— The Itineraries of Schlechter's Travels in German New Guinea, 1901-02 and 1907-09, being an extract of Part 2 of: R. Schlechters Reisewege und Sammlungen nach seinen Tagebüchern zusammengestellt. [The Itineraries and Collections of R. Schlechter, compiled from his Diaries] from: Rudolf Schlechters Leben und Wirken [Rudolf Schlechter's Life and Work] in: Notizbl. Bot. Gart. Berlin-Dahlem, 9, 931-932, 934-938 (1926).

First Expedition to German New Guinea

Dec. 13	1900 Left Naples
Jan. 18	1901 Arrived Singapore, then travels in the Malay Peninsula, Java and Borneo
Oct. 8	1901 Arrived Berlinhafen, thence Potsdamhafen, Friedrich Wilhelmshafen, Stephansort, Finschhafen
Oct. 21	Arrived Herbertshöhe (Neu Pommern)
Oct. 23-Nov. 17	Herbertshöhe—Matupi—Mioko—Herbertshöhe and surroundings—North Daughter Volcano—Massawa and surroundings
Nov. 18-Dec. 13	(Neu Mecklenburg) Kabanut—Punam—Kalil—Kabanut—return to Herbertshöhe,—Matupi—Raluana—to and fro at Herbertshöhe, engaged carriers for the Expedition to the Ramu
Dec. 14-25	Left Herbertshöhe—Finschhafen (Kaiser-Wilhelms-Land)—Stephansort—Friedrich-Wilhelms-Hafen—Jamba—Stephansort—Erima, trained a detachment of 90 natives, inclusive of 10 soldiers
Dec. 26-31	Departure to the Ramu—Erima—Nuru R.—Schumann R.—Warapussa R. amidst hostile Tamuls
Jan. 1-18	1902 Far side of the Warapussa R.—through swampland rivercourses to the upper Ramu R.—along rivercourses and Tamul tracks ascending the Bismarck Ra., over a ridge at 2800 m alt. within sight of the snow-covered Otto(?) Mt.,—attack by hostile Tamul forces and withdrawal
Jan. 19-Feb. 7	Return march (often up to the hips in water)—Warapussa R.—Schumann R.—Nuru R.—Erima—Stephansort (protracted and serious boils on the thigh and buttocks)
Feb. 8-26	In Stephansort (boils persisting). Preparations for the Expedition into the Finisterre Ra.
Feb. 27-Mar. 4	To the Kabenau R.—up the Golumbu R.—up the Weyburum R. (Finisterre Ra.) to 420 m alt.—back to the Yekjau and to the coast—Bogadjim—Stephansort
Mar. 5—Apr. 14	Visited plantations near the coast—Stephansort (serious attack of fever)—to and fro at Jomba—Friedrich-Wilhelms-Hafen—Bogadjim—Erimahafen—Potsdamhafen—Seleo (Berlinhafen)—preparation for the Expedition to the Torricelli Ra.
Apr. 15-May 3	Vrinagel—Paub—up the Garub Valley—crossed several ridges of the Torricelli Ra., climbed a peak of 1100 m alt. and returned—Apur—Garub—Paub—Vrinagel—Seleo
May 4-20	In Vrinagel, Seleo and Tamara (repeatedly sick with fever)—then Seleo—Potsdamhafen—Friedrich-Wilhelm-Hafen—Finschhafen—(Neu Pommern) Herbertshöhe
May 21-30	To and fro at Herbertshöhe—Matupi—north-west tip of Neu Mecklenburg, Nusa and Kaewieng
May 31-June 18	Kaewieng (dismissed the last personnel) Kapsu—Lauanfort—Lakurumau
June 19-July 9	Lakurumau—Fissoa—Lossu—Panerodo—Bo—Bom—Eretubu—Kalil

- July 10-19 Kalil (to and fro in canoe due to unfavourable weather, then finally over to Neu-Lauenburg—Makada—Ellu—Mioko (recuperated and awaited favourable weather conditions)
- July 20-Aug. 13 Mioko—(Neu Pommern), Herbertshöhe—side trip to Paparatawa in the Varzin Mts.—Matupi
- Aug. 14 Left Herbertshöhe for Sydney (Australia), then New Caledonia, return to Sydney and finally
- Mar. 24 **1903** Left Colombo for home

Second Expedition to German New Guinea

- Oct. 23 **1906** Departed Genoa for Singapore, arriving there Nov. 22, then Borneo, Sarawak, Sumatra and engaged personnel at Padang
- Feb. 24 **1907** Departed Singapore via Hong Kong and Manila to Friedr.-Wilhelms-Hafen (Mar. 13)—French I.
- Mar. 21 Arrived Herbertshöhe (Neu Pommern)
- Mar. 22-31 Herbertshöhe—Simpsonhafen—French I.—Friedr.-Wilhelms-Hafen (Kaiser-Wilhelms-Land)—Stephansort—Constantinhafen—Bulu (Headquarters until Feb. 28, 1908)
- Footnote: From here onwards, for a better orientation, the three maps in Schlechter's book: *Die Guttapercha- und Kautschuk-Expedition des Kol. Wirtsch. Komit. usw. nach Kaiser-Wilhelms-Land 1907-1909* should be consulted. [Ed.- These 1:75,000 maps are difficult to reproduce, localities and rivers are marked in very small print, confused by contours, whilst co-ordinates are lacking.]
- Apr. 1-May 12 Bulu and surroundings—Konstantinberg, Kalika, Damum; Bogadjim, Minjem R. as far as the Gorge
- May 13-June 17 Excursion to Wengi and Albu and return
- June 18-July 7 Bulu—Male—along Minjem R. to near Kelel and return to Bulu
- July 8-24 Depart Bulu for the Minjem R. as far as the first base (Kaulo Base)—return to Bulu—excursion to Bongu and Melamu (Constantinhafen)
- July 25-Aug. 14 Bulu—Kaulo Base and return to Bulu and Melamu (Constantinhafen)
- Aug. 15-25 With the Governor to Kaulo Base, return to Bulu
- Aug. 26-Sept. 22 Bulu—Kaulo Base—Minjem Gorge (Djamu Gorge) and to the south-west on the heights between the Djamu R. and Mudjene R.—return to Base and to coast via Stephansort to Bulu, sick with fever at Bulu
- Sept. 22-Oct. 20 Bulu—Minjem Gorge—Base 1 (Kaulo Base)—Camp 3—upwards along the Mudjene R. to Camp 4—return to the Base—further upwards along the Djamu R.—by various tracks to the summit—return usual way to Bulu and remain in Bulu and Stephansort
- Oct. 21-Dec. 1 Leave Bulu—Base 1—Kani Mt.—return to Base 1 (work at the Station)—Djamu Camp—Base 1—Gati Camp—Summit of Mt. Gati—Base 1—again via the Djamu Camp to Base 2 (Kani Base)—return to Kaulo Base (Base 1)
- Dec. 2-15 Leave Kaulo Base—along bed of the Mudjene R. upwards—Storage dam (Rabo-Wobbe)—Panebo—Mt. Kani Camp—Kani Base—return as usual to Bulu and remain at Bulu (work at the Station)
- Dec. 16-31 Leave Bulu—Kaulo Base—Kani Base (Christmas)—upper Mudjene R.—Boroai Valley—Ibo Ra. (panorama of Ramu Plain)—return to Boroai—along the Akaipi R.—along the upper Mudjene R. to Kani Base
- Jan. 1.-Feb. 9 **1908** Kani Base—Kerissi region—Kaulo Base—Bulu and remain there
- Feb. 10-29 Leave Bulu—Kaulo Base—Kani Base—Kerissi and upper Djamu R.
- Mar. 1-18 Leave Bulu together with the Governor—Finschhafen—Hercules R. (Waria R.)—Unn village—upwards along the Waria R.—Siu—Gomadia Mt.—Pema

- village—Waube Creek and further upstream—ridge of Mt. Dscheregi—Mt. Mimi—return to Waube Creek—Pema—Goromia—Yatuna—Unn—mouth of the Waria R.—Friedrich-Wilhelms-Hafen—Bulu—Kaulo Base
- Mar. 19-Apr. 5 Kaulo Base—Kani Base (The Governor returns home)—Kaulo Base—Bulu and remain there (foot-sores)
- Apr. 6-May 12 Bulu—Kaulo Base—ford over the Djamu R.—Mt. Kani—Kani Base—return to Camp at the foot of the Kani Ra.
- May 13-June 15 Relocated Camp at the foot of the Kani to Kani Base (track construction continues)—to the Akaipi R.—Boroai—Ibo Ra.—return to Boroai—along the Akaipi R. to confluence with the Mudjene R. then upstream through several gorges of the latter and return to Kani Base—Kaulo Base—Minjem Gorge—Bulu and remain there (severe fever)
- June 16-July 5 Bulu—Minjem Gorge—Kaulo Base—Kani Base—return to Bulu
July 6-31 Journey to the Finisterre Ra.—leave Bulu—Melamu—across the Kabenau R.—across the Bobi R. and Wabe R.—Marakum—up the Maijen R.—Meireka—climb to about 1000 m alt., return to Bulu
- Aug. 1-11 Bulu—Kani Base and return to Bulu, preparation for the expedition to the Ramu R. together with the Governor
- Aug. 12-26 Leave Bulu—Kaulo Base—Kani Base—Boroai—Ibo Camp—Giao—Romba—Keire—downstream along the Suru R.—Giagoro—Kubai—Kenejia R. (= Ramu R.)—return journey—Kubai—upstream along the Giagoro—Ibo Ra.—Akaipi R.—Mudjene R.—Kani Base—Kaulo Base—Minjem Gorge—Bulu and preparations there for a second journey to the Finisterre Ra.
- Aug. 27-Sept. 17 Bulu—Melamu—Kabenau R.—Bogi R.—Maijen R.—Marakum—upstream along the Maijen R.—Fomambe R.—Kambaran R.—Jare Creek—Wangeldambe—Keanger—Wakeak Creek—Niango Creek—Elagabatta—up the Nionge Valley to the ridge of the Finisterre Ra. at about 1200 m alt.—return journey—descent to the Njonge—Ambo Camp—Wakeak Creek Camp—Kambaran R.—Fomambe—downstream along the Maijen R.—Bogi—Bulu and remain there
- Sept. 18-Nov. 1 Bulu—Kaulo Base—Kani Base—Ibo Camp—Saki R.—Kinemare—Giagoro—Camp on the Kenejia R. (Ramu R.)—across the Ramu R.—site for Base, arranged building of canoes—Saugueti Base (track construction to the Bismarck Ra.,—penetrated into Bismarck Ra. above Hokrocho to about 1600 m alt.
- Nov. 2-Dec. 4 Return journey to Saugueti Base—cleared path to east along the Malia R., also to the west—advanced again into the Bismarck Ra. to about 2200 m alt., repulsed hostile Tamuls near Hokrocho village—return to Saugueti Base and remain there
- Dec. 5-31 Return to Kenejia Base—cross Kenejia R. by canoes—Kubai—downstream along the Giagoro R. to Kinemare—across the Saki R. to the Schibruba Camp—Ibo Ra.—Kani Base—Kaulo Base—Bulu
- Jan 1-21, **1909** Bulu—Melamu—across the Kabenau R. to the Maijen R.—upstream along this and the Fomambe R.—across the Kambaran R. towards the ridge, across various creeks to the Wakeak and Njonge near Ambo—upwards along the creek to the upper camping site at 950 m (in the Finisterre Ra.) and to the ridge at 1200-1300 m alt.
- Jan. 22-Feb. 8 Return journey to the Wakeak, Jare and Kambaran (difficult traverse this time)—Fomambe—downstream along the Maijen—Marakum—Bulu and remain there
- Feb. 9-Apr. 3 Bulu—Madang—Bili-bili—Hilo—Friedrich-Wilhelms-Hafen and surroundings—Alexishafen and surroundings—Friedrich-Wilhelms-Hafen (Hansemannberg)—Biliao—Hilo (via Jomba and Bili-bili)—return to Friedrich-Wilhelms-Hafen

- Apr. 4-June 6 Friedrich-Wilhelms-Hafen—Stephansort—Finschhafen—Bukaua—Adolf-Hafen—Morowai Coast—mouth of the Waria R.—Siu—Kamudu—Yaduna—upstream along the Waria R.—climbed Gomadjidji Mt.—Pema—Waupe Creek—Mimi Mt.—Maboro Ra.—Gobi—Dschischungari—summit of the Dischore (over 1300 m alt.)
- June 7-July 6 Return to mouth of the Waria R.
- July 7-27 Left Adolfhafen—Margot R.—Braunschweig Bay—Bayern Bay—mouth of the Markham R.—Bukaua—Finschhafen (Bussim, climbed Mt. Sattelberg)—Friedrich-Wilhelms-Hafen (Blackwater fever)
- July 28-Aug. 6 Left Friedrich-Wilhelms-Hafen—Potsdamhafen—mouth of the Ramu R.—Kaiserin-Augusta R. [Sepik R.] and upstream—Sigrin—Mangut—Olem—Pagen and further about 185 nm [Ed.—nautical miles] upstream—return journey—Mangut—Sigrin—mouth of the Kaiserin-Augusta R.—Dallmannhafen
- Aug. 7-Sept. 1 Muschu—Eitape—Peso—across the Raju R.—Tadji—Pro—return to Tadji—Eitape (excursion to Fumleo)—Paub
- Sept. 2-10 Journey to the Torricelli Ra.: Paub—Rinjemuc R. upstream, then towards the south-west—Afu—Garup Camp—upstream along the Garup R.—climb up to Camp 630—Sak-Sak Camp from 1902—fever attack—southwards across the watershed to near the vicinity of Aku Village—Apur Village
- Sept. 10-26 Return journey to the Rintejaio R. via the watershed and the same way back to the Garup, then downstream to Paub
- Sept. 27-Oct. 21 Pro—Eitape and surroundings—Muschu—Potsdamhafen—Friedrich-Wilhelms-Hafen and remain there (Expedition disbanded, report-writing)—excursion to Bulu (now deserted and his first companion Dammkohler murdered in the meantime)—final farewell and departure from New Guinea at Friedrich-Wilhelms-Hafen. Stay at Celebes, then Java, Singapore, Sumatra and on
- Apr. 11 **1910** departed Belawan for Colombo, Aden and Naples, thence home

Other references:

- Schlechter, R. Reisebericht der Guttapercha-und Kautschuk-Expedition nach den Südsee Kolonien, in: *Tropenpflanzer*, 6, 213-234 (1902); 6, 394-396 (1902) and 7, 308-320 (1903)
- Schlechter, R. (1911) *Die Guttapercha-und Kautschuk-Expedition . . . nach Kaiser Wilhelmsland 1907-1909*. Berlin
- Cyclopedia of Collectors—Schlechter, in: *Flora Malesiana*, ser. I, vol. 1, 470-472 (1950)

Appendix 5—Serial Publications with Abbreviations used by Schlechter.

Annales botanicae systematicae. Ed. Walpers. Leiden.	Walpers Annales
Annales: museum botanicum lugduns-batavum. Amsterdam.	Mus. Lugd.-Bat.
Annals of Botany. London.	Ann. Bot.
Botanical Magazine. London.	Bot. Mag.
Botanical Register. London.	Bot. Reg.
Botanisches Centralblatt. Kassel.	Bot. Centralbl.
Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie. Leipzig. Also Beiblatt	Engl. Bot. Jahrb. (Beibl.)
Bulletin du département de l'agriculture aux Indes Néerlandaises. Buitenzorg.	Bull. Dep. Agr. Ind. Néerl.
Bulletin du jardin botanique de Buitenzorg. Buitenzorg.	Bull. Jar. Buitenz.
Feddes Repertorium speciarum novarum regnis vegetabilis Berlin.	Fedde, Repertor.
Gardener's Chronicle. London.	Gardn. Chron.
Gartenflora. Erlangen.	Gartenfl.
Icones Bogoriensis. Leiden.	Icon. Bogor.
Journal of Botany, british and foreign. London.	Lond. Journ. Bot.
Journal of the Linnean Society, Botany. London.	Journ. Linn. Soc. Lond.
Journal of the Straits Branch of the Royal Asiatic Society, Singapore.	Journ. Straits Branch Royal Asiatic Soc.
Lindenia, iconographie des orchidées. Ghent and Brussels.	Lindenia
Memoires de l'herbier Boissier. Geneva.	Mem. Herb. Boiss.
Melbourne chemist and druggist. Melbourne.	Melb. Chemist
Natuurkundig tijdschrift voor Nederlandsch-Indië. Batavia.	Natuur. Tijdschr. Nederl. Ind.
Notizblatt des Königlichen botanischen Gartens und Museums zu Berlin. Leipzig.	Notizbl. Kgl. Bot. Gart.
Oesterreichische Botanische Zeitschrift. Vienna.	Österr. Bot. Zeitschr.
Pflanzenfamilien. Ed. Engler. Leipzig.	Engl. Pflanzenfam.
Pflanzenreich. Ed. Engler. Leipzig.	Engl. Pflanzenr.
Phillipine journal of Science. Manila.	Phillip. Jour. Sci.
Proceedings of the Biological Society of Washington. Washington, D.C.	Proc. Biol. Soc. Wash.
Queensland agricultural journal. Brisbane.	Queensl. Agric. Jour.
Queensland botanical bulletin. Brisbane.	Queensl. Bot. Bull. Dep. Agr.
Revue général du botanique. Paris.	Rev. Gen.
Transactions and Proceedings of the Royal Society of Victoria. Melbourne.	Trans. et Proc. Roy. Soc. Vict.
Southern Science Record. Melbourne.	Wing's South. Sci. Record

Appendix 6—Non-Serial Publications with Abbreviations used by Schlechter.

Ames, O. (1905-1922) <i>Orchidaceae</i> . Boston, Mass.	Orchidaceae
Bentham, G. (1863-1878) <i>Flora Australiensis</i> . London.	Fl. Austral.
Blume, C.L. <i>Bijdragen tot de flora van Java</i> .	Bijdr.
Don, D. (1825) <i>Prodromus florae Nepalensis</i> . London.	Prod. Fl. Nep.
Dumont d'Urville, J.S.C. (1832) <i>Sertum Astrolabianum: Voyage de decouvertes de L'Astrolabe</i> . . . Paris.	Sert. Astrol.
Gaudichaud-Beaupré, C. (1826) <i>Voyage autour du monde exécuté sur les corvettes de S.M. l'Uranie et la Physicienne pendant les années 1817, 1818, 1819 et 1820 par M. Freycinet</i> . Paris.	Freyc. voy.
Hooker, J.D. (1875-1897) <i>The Flora of British India</i> . London.	Fl. Brit. India
Hooker, W.J. (1823) <i>Exotic Flora</i> . Edinburgh.	Hook. Exot. Fl.
Lindley, J. (1831) <i>Genera and Species of Orchidaceous Plants</i> . London.	Gen. et Spec. Orch.
Miquel, F.A.W. (1855-59) <i>Flora Indiae Batavae</i> . Amsterdam.	Flor. Ind. Bat.
Mueller, F. von (1875-1890) <i>Descriptive notes on Papuan plants</i> . Melbourne.	Papuan Plants or Descr. notes Pap. pl.
Reichenbach, H.G. fils (1858-1870, 1900) <i>Zenia Orchidacea</i> . Leipzig.	Xen. Orch.
Schumann, K and Lauterbach, K. (1901) <i>Die Flora der deutschen Schutzgebiete in der Südsee</i> . Leipzig.	Fl. Dtsch. Schutzg. Süds.
Idem. (1905) <i>Nachträge zur Flora der deutschen Schutzgebiete in der Südsee</i> . Leipzig.	K. Schum et Laut., Nachtr.
Seeman, B. (1865-1873) <i>Flora Vitiensis</i> . London.	Seem. Flor. Vit.
Schumann, K. and Hollrung, M. (1889) <i>Die Flora von Kaiser-Wilhelms-Land. Beiheft zu den Nachrichten über Kaiser-Wilhelmsland und dem Bismarck-Archipel</i> .	Fl. Kaiser-Wilhelms- Land
Warburg, O. (1893) <i>Plantae Hellwigianae. Beiträge zur Flora von Kaiser-Wilhelmsland</i> (in: Engl. Jahrb.)	Warbg., Pl. Hellwig.

Appendix 7—Schlechter's Collection Numbers for *Orchidaceae* of German New Guinea.

Although the Holotypes of Schlechter's collections in New Guinea were among the orchid material destroyed in the bombing of the Berlin Herbarium in 1943, the existence of large numbers of Isotypes held at other herbaria prompted the editors to make a close study of the collection numbers and data citations in the original German text. This was complicated by the lack of access to a Register, if Schlechter kept one, some errors in his recordings, coupled with an apparently poor standard of typesetting and proof reading.

The result is, to a degree, a compromise where we have attempted to highlight possible or probable errors while maintaining the original text. It has been assumed that Schlechter numbered his specimens in chronological sequence and the base selected for comparison was to determine a logical low and high number for each month and comment on deviations from this.

Accountability for all numbers has not been attempted since Schlechter used specimen numbers for plants not in flower or fruit which he does not cite. The text also includes occasional numbers in the 15,700 series which were numbers allocated to some of his New Caledonian collections.

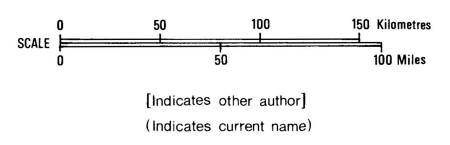
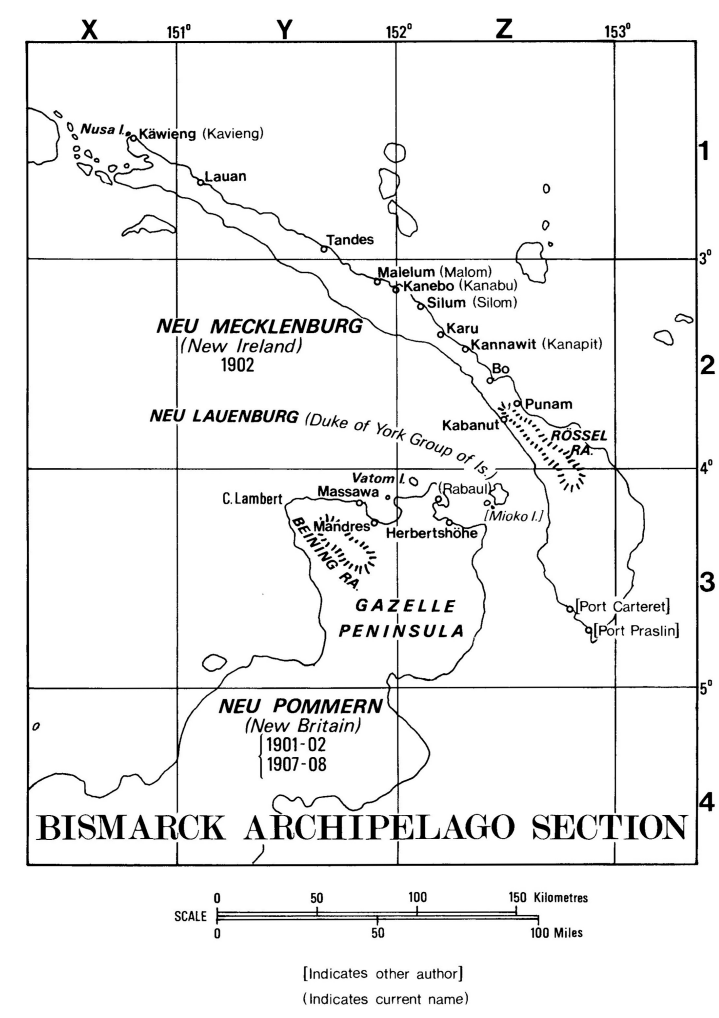
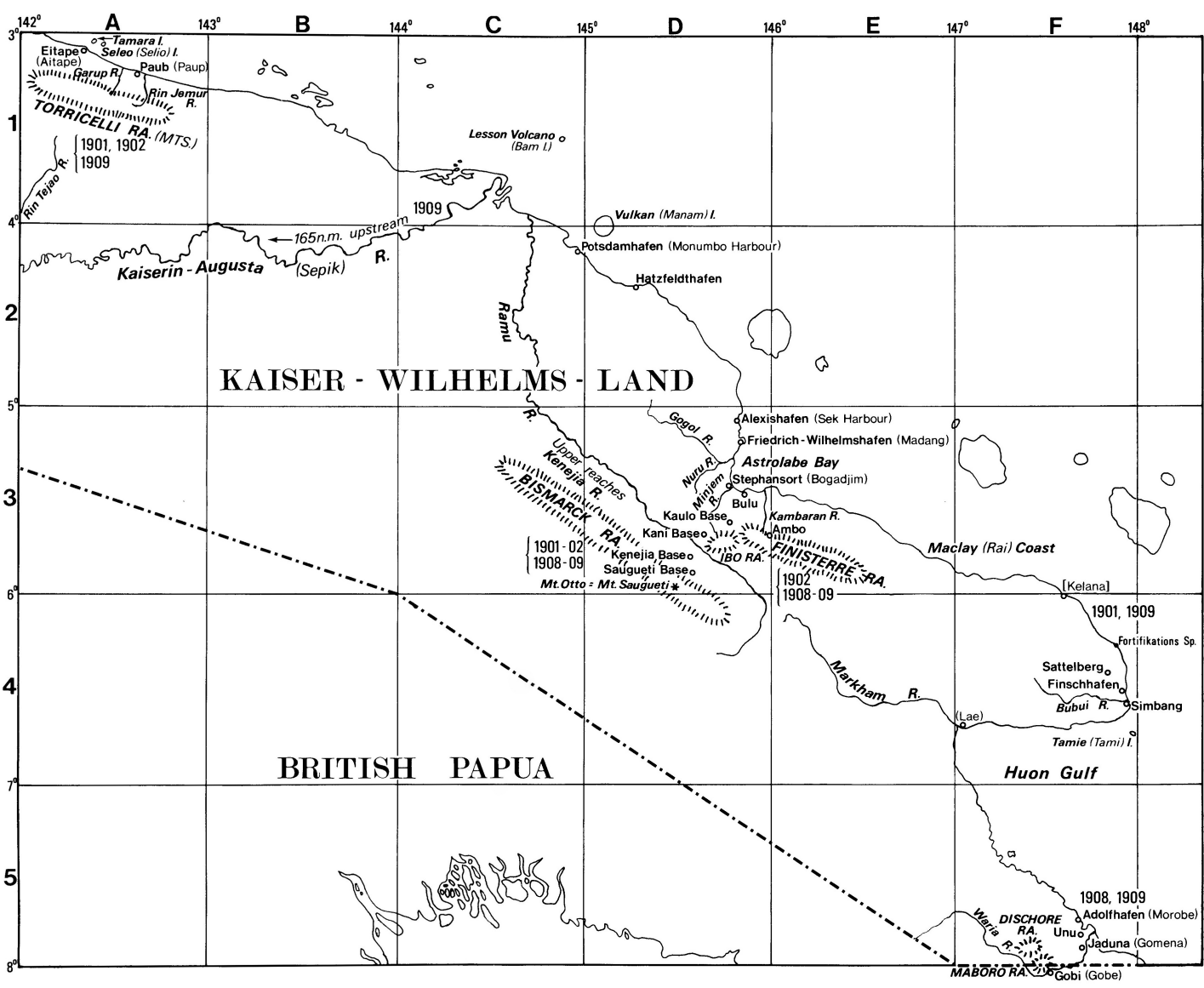
Loesener cites numbers 13669-14712 for Schlechter's 1901-02 collections in German New Guinea and the Bismarck Archipelago and numbers 16036-20399 for his 1907-09 collections.

The low and high numbers noted in the text for 1901-02 are 13670-14709 and for 1907-09 are 16073-20367.

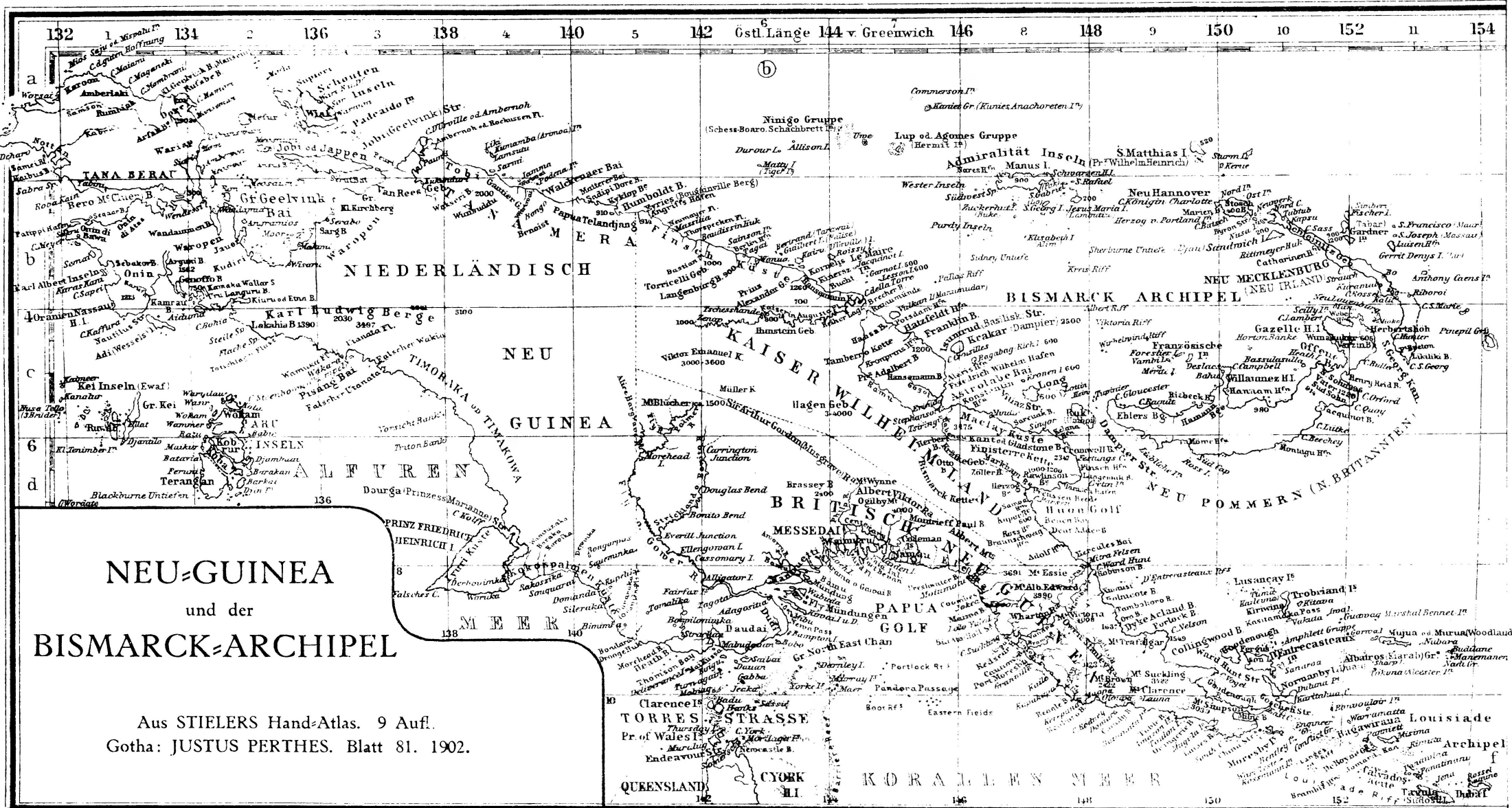
Reference: Loesener, Th. (1926) Rudolf Schlechters Leben und Wirken. *Notizbl. Bot. Gart.*, Berlin 9, 912-958.

1901	October	13670-13707
	November	13708-13796
	December	13798-13834
1902	January	13835-14154
	February	14171-14297
	March	14298-14301
	April	14308-14616
	May	— — —
	June	14617-14623
	July	14624-14709
1907	May	16073-16136
	June	16142-16216
	July	16234-16341
	August	16343-16481
	September	16482-16600
	October	16607-16750
	November	16752-16931
	December	16936-17109
1908	January	17111-17263
	February	17268-17367
	March	17371-17509
	April	17517-17636
	May	17642-17819
	June	17823-17888

1908	July	17889-18082
	August	18083-18132
	September	18136-18320
	October	18321-18565
	November	18568-18900
	December	18904-19038
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1909	January	19039-19193
	February	— — —
	March	19200-19210
	April	19212-19342
	May	19343-19647
	June	19649-19931
	July	19934-19961
	August	19963-20002
	September	20004-20367
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AREAS OF GERMAN NEW GUINEA
VISITED BY SCHLECHTER



NEU-GUINEA
und der
BISMARCK-ARCHIPEL

Aus STIELERS Hand-Atlas. 9. Aufl.
Gotha: JUSTUS PERTHES. Blatt 81. 1902.

