The Orchidaceae of the Island of Celebes

Rudolf Schlechter

Book 2 of 2

A translation into English of

Die Orchidaceen der Insel Celebes

as published in

Fedde's *Repertorium specierum novarum regni vegetabilis*
Vol XXI (1925), pp 113-212

with genera index, locality listing and map.

H J Katz & J T Simmons

Rudolf Schlechter
(1872-1925)

Celebes [Sulawesi, Indonesia]

The Australian Orchid Foundation

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Manuscript completed: 1986

First published: 1993 (hardcopy)

Digital version: 2021

Publisher: The Australian Orchid Foundation

www.australianorchidfoundation.org.au

Acknowledgement: The Australian Orchid Foundation acknowledges the assistance of Dr. Stephen Kirby, California, USA and the Herbarium, Royal Botanic Gardens, Kew in preparing the digital version.

SCHLECHTER : THE ORCHIDACEAE OF THE ISLAND OF CELEBES (1925)

GENERA IN ALPHA-SEQUENCE


Australian Orchid Foundation

R. SCHLECHTER : THE ORCHIDACEAE OF THE ISLAND OF CELEBES

I. GENERAL

The following is a compilation of everything known to date of the Orchidaceae of the island of Celebes. From the remarks, it will be seen how much still awaits discovery, since from many large areas of the island we lack collections completely.

In this compilation, I consider that I have managed to attain a fairly complete coverage as far as is at all possible at present. At least I think it will be a useful basis for the future determination of the Orchidaceae of the island of Celebes, all the more, since the previous relevent literature is very scattered.

Up to about 30 years ago, very few orchids were known from the island of Celebes, as listed by Miquel in his 'Flora Indiae Batavae', viz. Dendrobium furcatum Reinw., Eria hirta Bl., Goodyera celebica Bl. and Eulophia celebica Bl. The honour of having brought together such a large collection of species of this family goes to Messrs. P. & F. Sarasin, but, unfortunately this still awaits publication. On the other hand, the species collected by S.H. Koorders in the Minahassa district a year later in 1897 are listed, at least by genus. Today the situation is quite different. We have to thank the relentless efforts of J.J. Smith, that all scientific travellers and other interested parties were repeatedly briefed to attach more importance to these plants, which previously had been overlooked, because of their difficult preservation. It was in this way that our knowledge of the orchid flora of the Malay Archipelago has been promoted in an unforseen manner during the past 20 years. A large contribution came from most of the expeditions of the Dutch Government, which were accompanied by especially trained plant collectors, who at the request of the executive of the Buitenzorg Herbarium, not only pressed herbarium specimens of orchids in bloom during the journeys, but also sent to Buitenzorg, specimens of species not in flower, so that these could be determined there at a later date, when they flowered.

After ending my second expedition to New Guinea in 1909, I decided to stay several months in Celebes to explore the local orchid flora. I considered it very important to try and establish by which path a number of Papuasian types had advanced to the north-east as far as the Philippines and, how far the influence of the orchid flora of Papuasia was still being observed. I surmised that there was a bridgehead by which Papuasian types could penetrate into the Philippines.

Coming from New Guinea, I reached Macassar on October 31, 1909. I learned that the Norddeutscher Lloyd ship 'Schantung' was in port with freight destined for Menado, so I immediately went on board and arranged with the captain to make

.e trip to Minahassa with him. The journey commenced on November 4. We reached Donggala on the 6th, Toli-Toli and Lerk on the 7th, Pelele on the 8th, Bolaang Itang and Sankoep on the 9th, Amoerang on the 10th and finally Menado on November 11th.

With the kind help of our consul, Mr. H.F. Steffens, I could soon complete my arrangements for the journey into the interior, and with the necessary recommendations we left on November 15th for Tomohon, which remained my base until the beginning of December. The location of the place at an altitude of 800m enabled me, without much difficulty, to climb the surrounding volcanoes of Lokon, Mahawo and Masarang, and to explore the whole area intensively for orchid flora. In collecting, I restricted myself almost exclusively to Orchidaceae and Asclepidaceae, since the drying of the plants involved much difficulty in the high humidity and frequent precipitation, which could be overcome only by hiring a few natives who undertook this work on a frame, holding the presses over a fire that was kept alight from morning until evening.

On December 7 I moved to Ayermadidi, at the foot of the Klabat volcano, which now formed my area of activity and whose summit I climbed. However, it was mainly the slopes of the mighty volcano, between 800 and 1200m, which brought a good yield of orchids, whilst the summit proved to have less. On December 19 I left Ayermadidi and travelled via Tonado to Kakas to climb Mt. Kaweng and investigate the orchid flora of the lower hills, but this brought little new. From here, I also made a trip to Kombi, but the main purpose here was to make a report on a small German rubber plantation. As a result of the very dry conditions there, little new was found floral-wise.

On December 24 I travelled via Langowan to Ratahan, hoping to climb Mt. Sopoetan from there. However, since it was difficult to obtain any assistance there and the area did not appear to be of interest in other respects, I returned to Langowan on December 26 and then travelled via Kawangkoan to Lansot. From here on December 27 I climbed Mt. Sopoetan, but was not very satisfied with the botanical yield. There was very little primary forest on this side, the whole area being under intensive cultivation. Even the upper, tree-less open slopes of Mt. Sopoetan, showed little unusual in their flora. I therefore used the next few days to investigate the surroundings of Lansot and on December 31, 1909 I commenced the return to Tomohon via Kawangkoan and Sonder, where I spent two days to pack up my collections and send them in advance to Menado. On January 3, 1910 I then started my descent to Menado. The weather there was very unsatisfactory and, due to the persistent rain, I could not make any excursions, so I was glad when the opportunity arose to leave on January 10 on the 'Sandakan'. We travelled first to Amoerang and the next day via Paleleh to Bwol. On January 12 we reached my new goal of Toli-Toli. After landing my baggage, I received

permission from the Dutch civil servant Mr. Loogeman to occupy the rest-house where I settled in comfortably, and made many excursions to the hills and forests in the vicinity. It was particularly pleasent to accompany Mr. Loogeman, on his invitation, into the interior to the upper Lampasioe [River].

On the evening of January 17 we sailed in a Buginese prau to Kwala-besar and the next day in canoes up the Kwala-besar [River]. At several villages the locals were called together by drum, and whilst Mr. Loogeman attended to his business affairs, I had the opportunity to botanize.

With the strong current we made only slow progress, on January 20 we reached the mouth of the Lampasioe [River] which we then followed upstream. The journey became more difficult with the number of floating logs. On January 21 the limit of navigability was reached and therefore our goal, the old deserted gold sluices, which Mr. Loogeman wanted to reconnoitre. The area at the foot of the mountain was most interesting botanically, so I much regretted having to start the return on January 23.

With the strong current, the journey downstream went very quickly and without stopping, we already by night time reached the mouth of the Kwala-besar [River], where the boat was already waiting for us. Despite a heavy storm, which forced us to seek shelter on the island of Kapoetan, we reached Toli-Toli again at mid-day January 24, in good condition.

Unfortunately, I was seriously troubled with malaria during the next few days, so that I could not collect much. Since we awaited daily the steamer to take us to Macassar, it was not advisable to go too far away. Finally, on February 6 the 'Teo Pao' arrived on its return from Menado. We were at Dongala on February 7 and reached Macassar on February 9. Not until February 21 was I able to continue from there to Batavia. Unfortunately, I had to give up visiting the summit of Mt. Bonthain, as originally planned, since there was no opportunity of getting there and the journey would have been very costly.

Thus the short description of my journey, which I wanted to document at this stage. I must just mention that after my departure from northern Celebes, our consul, Mr. F.C. Steffens had arranged for several orchids to be collected and pressed for me, some had been described earlier, others will appear here.

The expedition of van Vuuren has also added to our recent knowledge of the orchid flora of the Celebes and the native born plant collector Rachmat of the Buitenzorg Garden has gathered together a quite important collection. Of the latter, only very few families, in particular the orchids, have been processed to date, since those were of particular interest.

From all this data it would appear that we know more about the Orchidaceae of the Celebes flora than of the other plant families present and hence it is perhaps particularly suitable to consider them in discussing the plant geography.

From the table following I should like to give a picture of the distribution of the genera and species on the island of Celebes :

SURVEY OF THE ORCHIDACEAE GENERA OF CELEBES

No.	Genus	No. of species	Endemic	North Celebes	Central Celebes	East Celebes	South-east Celebes	South Celebes	Unknown origin
1.	Paphiopedilum	1	–	1	–	–	–	–	–
2.	Pecteilis	1	–	–	1	–	–	1	–
3.	Habenaria	6	4	3	1	–	1	1	–
4.	Stigmatodactylus	1	1	1	–	–	–	–	–
5.	Corysanthes	2	2	1	1	–	–	–	–
6.	Epipogon	1	–	1	–	–	–	–	–
7.	Nervilia	1	1	1	–	–	–	–	–
8.	Gastrodia	1	1	1	–	–	–	–	–
9.	Galeola	1	1	1	–	–	–	–	–
10.	Vanilla	2	1	2	–	–	–	–	–
11.	Aphyllorchis	1	1	1	–	–	–	–	–
12.	Goodyera	3	1	3	–	–	–	–	–
13.	Cystorchis	1	1	1	–	–	–	–	–
14.	Macodes	1	1	1	–	–	–	–	–
15.	Cheirostylis	1	1	1	–	–	–	–	–
16.	Zuexine	3	3	3	–	–	–	–	–
17.	Odontochilus	2	2	2	–	–	–	–	–
18.	Anoectochilus	1	1	1	–	–	–	–	–
19.	Vrydagzenia	2	2	2	–	–	–	–	–
20.	Corymbis	1	1	1	–	–	–	–	–
21.	Diglyphosa	1	1	1	–	–	–	–	–
22.	Nephelaphyllum	1	1	1	–	–	–	–	–
23.	Coelogyne	9	8	7	1	–	–	1	–
24.	Basigne	1	1	–	–	–	–	1	–
25.	Dendrochilum	6	6	4	–	–	–	2	–
26.	Pholidota	3	2	3	–	–	–	–	–
27.	Oberonia	10	10	9	–	–	–	1	–
28.	Hippeophyllum	1	1	1	–	–	–	–	–
		65	54	53	4	–	1	7	–

No.	Genus	No. of species	Endemic	North Celebes	Central Celebes	East Celebes	South-east Celebes	South Celebes	Unknown origin
	Brought forward	65	54	53	4	–	1	7	–
29.	Liparis	11	7	9	–	–	–	1	1
30.	Microstylis	11	10	9	–	–	–	2	–
31.	Arundina	1	–	–	1	–	–	–	–
32.	Dilochia	1	1	1	–	–	–	–	–
33.	Dendrobium	56	40	42	6	–	2	2	6
34.	Eria	26	20	19	–	–	2	3	2
35.	Epiblastus	1	1	1	–	–	–	–	–
36.	Ceratostylis	4	4	2	–	–	–	2	–
37.	Sarcostoma	3	3	1	–	–	–	2	–
38.	Agrostophyllum	2	2	2	–	–	–	–	–
39.	Glossorhyncha	2	2	1	–	–	–	1	–
40.	Podochilus	6	6	3	–	–	–	3	–
41.	Appendicula	7	4	6	–	–	–	–	1
42.	Bromheadia	1	1	1	–	–	–	–	–
43.	Acanthephippium	1	1	1	–	–	–	–	–
44.	Phaius	5	3	4	2	–	–	–	–
45.	Calanthe	4	3	3	1	–	–	–	–
46.	Spathoglottis	4	3	2	1	–	–	2	–
47.	Bulbophyllum	32	28	25	1	–	1	4	1
48.	Cirrhopetalum	3	3	3	–	–	–	–	–
49.	Codonosiphon	1	1	1	–	–	–	–	–
50.	Octarrhena	2	2	1	–	–	–	1	–
51.	Oxanthera	1	–	1	–	–	–	–	–
52.	Thelasis	1	1	1	–	–	–	–	–
53.	Phreatia	7	7	6	–	–	–	1	–
54.	Geodorum	1	–	–	–	–	–	1	–
55.	Eulophia	4	–	3	1	–	–	–	–
56.	Dipodium	1	1	1	–	–	–	–	–
57.	Grammatophyllum	1	–	1	–	–	–	–	–
58.	Grammangis	1	–	1	–	–	–	–	–
		266	216	203	17	–	6	32	11

No.	Genus	No. of species	Endemic	North Celebes	Central Celebes	East Celebes	South-east Celebes	South Celebes	Unknown origin
	Brought forward	266	216	203	17	–	6	32	11
59.	Cymbidium	2	1	2	–	–	1	1	–
60.	Acriopsis	1	–	1	–	–	–	–	–
61.	Thrixspermum	5	5	5	–	–	–	–	–
62.	Sarcochilus	6	5	5	–	–	–	1	–
63.	Doritis	1	1	1	–	–	–	–	–
64.	Phalaenopsis	3	1	2	–	–	1	1	–
65.	Aerides	3	2	1	–	–	–	1	–
66.	Adenoncos	3	3	2	1	–	–	–	–
67.	Luisia	1	1	1	–	–	–	–	–
68.	Vanda	2	2	2	–	–	–	–	–
69.	Vandopsis	2	1	1	–	–	–	–	1
70.	Renanthera	1	–	1	–	–	–	–	–
71.	Ascoglossum	1	1	1	–	–	–	–	–
72.	Staurochilus	1	1	–	1	–	–	–	–
73.	Trichoglottis	3	2	3	–	–	–	–	–
74.	Schoenorchis	1	1	1	–	–	–	–	–
75.	Saccolabium	2	2	2	–	–	–	–	–
76.	Malleola	1	1	1	–	–	–	–	–
77.	Robiquetia	3	3	2	–	–	–	1	–
78.	Pomatocalpa	1	–	1	–	–	–	–	–
79.	Sarcanthus	2	1	1	–	–	–	–	1
80.	Camarotis	1	1	1	–	–	–	–	–
81.	Microtatorchis	1	1	1	–	–	–	–	–
82.	Taeniophyllum	8	8	1	–	–	8	–	–
	Total	321	253	251	19	–	16	36	13

From this we can establish that of the 321 species from 82 genera known to date for the island, no less than 253 or 78.8% are endemic. The large number of species for North Celebes compared with the remaining areas is conspicuous. This does not, however, mean that this part of the island really has a much richer orchid flora, but that the easily accessible Minahassa area has been explored by the main collectors more exactly than the other areas. What we otherwise know

of the island is restricted to the specimens collected by other expeditions whose interests were totally different. There is no reason to assume the important mountain ranges, particularly in Central and South Celebes, should prove to be less rich in orchid flora than the mountains of the Minahassa [district]. I am therefore convinced, for example, that it should not be difficult to collect one hundred different orchids from the Bonthain or Bantaeng Mountains, from which, as yet, nothing has been recorded. My short seven day journey into the interior near the Toli-Toli Bay, has shown what can be found at a relatively low altitude, where I collected no less than over 30 different orchids. Under the precipitation conditions generally prevailing in the ranges of the Celebes, one can expect an appreciably richer orchid flora than in the plains.

From the eastern part of the island we know practically nothing; on the eastern peninsula nothing at all has been collected, whilst from the south-east peninsula we know only those very few species collected by Beccari, the Sarasins and Dr. Elbert.

Thus from these remarks, we can gather that we know only a small fraction of the islands orchid flora.

The little available at present appears to indicate that the whole island, including the northern, southern and eastern regions belong to identical floral areas.

In considering the composition of this orchid flora more closely, we can establish that it consists of a mixture of Papuasian and Malayan elements, in which the former predominate.

Of the genera established in Celebes, the following are missing in Papuasia : Pecteilis, Diglyphosa, Basigyne, Sarcostoma, Doritis, Aerides, Ascoglossum, Staurochilus and Camarotis, a total of eight [nine] genera. This contrasts with only the four genera following, which have not yet been established in Malesia, to the east of Celebes, i.e. on the Sunda Islands and on the Malayan Peninsula : Basigyne, Epiblastus, Glossorhyncha and Condonosiphon. If the relationship of the genera is considered closer, it becomes apparent that these are related closer to the Papuasian species, than to those of the Sunda Islands. It is conspicuous that, so far, only a solitary endemic genus has been found on Celebes, viz. Basigyne.

In the north, definite accords with the flora of the Philippines are noticeable. These are noticed in certain species of the genera Dendrochilum, Liparis, Microstylis, Dendrobium, Eria, Bulbophyllum, Doritis, Phalaenopsis and Microtatorchis, but are not so pronounced as might be expected from the proximity of this floral region.

II. LIST OF SPECIES

1. Paphiopedilum Pfitz.

1. Paphiopedilum Lowii (Lindl.) Pfitz., in Engl. Jahrb. XIX (1894) p. 42.

Cypripedium Lowii Lindl., in Gardn. Chron. (1847), p. 765.

Cypripedium cruciforme Zoll. et Mor. ex De Vr., Ill. Orch. (1854), t. 4.

North Celebes, Minahassa : On trees on Mount Klabat, alt. c. 800m - R. Schlechter, without flowers in Dec. 1906.

At the time,I brought living plants to the Botanical Garden at Buitenzorg, where they were cultivated and, according to corrospondence from J.J. Smith, have proved to belong to this species.

Distribution : Sumatra, Java, Borneo.

2. Pecteilis Rafin.

1. Pecteilis Susannae (L.) Rafin., Flor. Tellur. II (1836), p. 38.

Orchis Susannae L., Spec. Pl. (1753), p. 939.

Orchis gigantea Sm., Exot. Bot. II (1805), p. 79.

Habenaria gigantea D.Don,[G.Don], Prodr. Fl. Nep. (1825), p. 24.

Platanthera gigantea Lindl., in Wall. Cat. (1832), no. 7052.

Platanthera Susannae Lindl., Gen. et Spec. Orch. (1835), p. 295.

Pecteilis gigantea Rafin., Flor. Tellur. III (1836), p. 38.

Orchis altissima Ham. ex Hook.f., Fl. Br. Ind. VI (1890), p. 137.

Hemihabenaria Susannae Finet, in Rev. Gen. Bot. XIII (1891), p. 532.

Central Celebes : In alang (also in the grass plains north of Lake Posso), alt. c. 500m - P & F Sarasin no. 868, flowering on 21 Jan. 1895.

South Celebes : Between herbs near Maros - M. Piscicelli no. 42, flowering on 10 March 1914.

A widely distributed, attractive plant which appears to occur mainly on the alang plains, but never growing in large numbers in colonies, being found only as individuals.

Apart from the four species (Footnote : Schlechter, Orchideol. Sino-Jap. Prodr. (1919), pp. 120-121.) which I placed here earlier, Pecteilis undulata (J.J.Sm.) Schltr. (Platanthera undulata J.J.Sm.) from Java also is included.

Distribution of species : East India, hinterlands of India, China across to the Sunda Islands and Ambon up to Timor [I.].

3. Habenaria Willd.

1. Habenaria celebica Krzl., Gen. et Spec. Orch. (1901), p. 902.

North Celebes, Minahassa : Growing terrestrially on Mount Masarang - P.& F. Sarasin no. 429, flowering on 21 June 1894.

This species was completely misunderstood by Kränzlin; in no way does it belong to the affinity of H. marginata Coleb., but rather to the 'Salaccenes'. In habit it is reminiscent mainly of H. Delessertiana Krzl. from the Philippines.

The flowers are described as white and purple.

Distribution : Endemic.

2. Haberaria Rumphii Lindl., Gen. et Spec. Orch. (1835), p. 320.

Platanthera Rumphii Brongn., Voy. Coq. (1829), p. 104, t. 38a.

Habenaria stauroglossa Krzl., in K. Sch. Fl. Kaiser-Wilhelm-Land (1889), p. 35.

Habenaria Dahliana Krzl., in K. Sch. Fl. Neu-Pomm. (1898), p. 106.

Central Celebes : In grassy areas north of Lake Posso - P. & F. Sarasin no. 883, flowering on 21 Feb. 1895.

Likewise, a fairly widely distributed species which occurs as a solitary specimen on the alang plains; its flowers are white.

In the O. Warburg collection at the Dahlem Herbarium are plants from East Java designated as 'H. javanica Krzl.'; these I prefer to consider as a compact (mountain) form of this species.

The species is also mentioned by J.J.Smith in 'Orch. of Ambon' as occurring in Celebes.

Distribution : Borneo and the Philippines, across Celebes and Ambon up to north-east New Guinea.

3. Habenaria Beccarii Schltr., in Fedde Repert. IX (1911), p. 327.

South-east Celebes : At Toli-Toli, not far from Samparan, in the Kandari District - O. Beccari, without number, flowering in May 1874.

This species is easily distinguished from all the others in the region by the finely lacerated front segments of petals and the side lobes of the labellum. It is related to H. Medusae Krzl., but has smaller flowers.

Distribution : Endemic.

4. Habenaria Medusa Krzl., in Engl. Jahrb. XVI (1892), p. 203.

South Celebes : On the mountains at Tjambo, alt. c. 600m - M. Picicelli no. 45. flowering on 15 Mar. 1914.

The species is most closely related to H. Beccarii Schltr. from S.E. Celebes, but has larger flowers. It was described initially from Java and previously was known only there. I have not seen specimens from Celebes, but mention it here after the published determination by Chiovenda of the plant collected by Piscicelli. The flowers are described as white.

Distribution : Java.

5. Habenaria biloba (Rolfe) Schltr., comb. nov.

Peristylus bilobus Rolfe, in Kew Bull. (1899), p. 132.

North Celebes , Minahassa : On Mount Sopoetan - S.H. Koorders no. 29489.

I have not known this species previously; amongst the Celebes species of the genus it must be most closely related to H. staminodiata Schltr., but is easily distinguished already by the clavate spur which is bilobed at the apex.

Distribution : Endemic.

6.Habenaria staminodiata Schltr., in Fedde Repert. X (1911), p. 3.

North Celebes : In humus of the primary forests on the upper Lampasioe [River], near the old gold diggings on [Mount] Djangdjang, in the Toli-Toli District, alt. c. 180m - R. Schlechter no. 20674, flowering in Jan. 1910.

As I mentioned earlier, the species belongs to the section Peristylus, where it is most closely related to H. bambusetorum Krzl. (Peristylus gracilis Bl.) and H. papuana Krzl. Its flowers are green.

Distribution : Endemic.

4. Stigmatodactylus Maxim.

1. Stigmatodactylus celebicus Schltr., in Fedde Repert. X (1911), p. 4.

North Celebes , Minahassa : At quite dark, strongly humid places in the forests of Mount Klabat, alt. c. 800m - R. Schlechter no. 20530, flowering in Dec. 1907 [1909].

This plant, which is both morphologically and plant-geographically very interesting, was the fourth species of the genus, of which the other three were known. viz. S. sikokianus Maxim.from South Japan, S. paradoxus (Prain) Schltr. from the Himalayas and S. javanicus Schltr. et J.J.Sm. from Java. All the species are minute, apparently semi-saprophytic plants, which tend to occur in the humus of forests in dark places and which have a very local distribution. I found S. celebicus Schltr. growing in company with Sciaphila, Salomonia, Cotylanthera and Gymnosiphon.

Distribution : Endemic.

5. Corysanthes R.Br.

1. Corysanthes muscicola Schltr., in Fedde Repert. X (1911), p. 3.

North Celebes , Minahassa : Between moss on tree-trunks on Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20508, flowering in Dec. 1909; between moss on tree-trunks on Mount Sopoetan, alt. c. 1400m - R. Schlechter no. 20620, flowering in Dec. 1909.

A small species most closely related to the Javanese C. fornicata Bl. The flowers are red on the outside, white towards the base. The labellum is white with dark red markings.

Distribution : Endemic.

2. Corysanthes spec. nov.

Central Celebes : On ridges of the Matinang Range. 'Flowers blue from memory' - P. & F. Sarasin no. 581, on 28 Aug. 1894.

Unfortunately, there are no longer any flowers on this specimen. According to the statement of the 'flowers being blue', and judging by the shape of the leaves, we are probably dealing with a new species.

6. Epipogon Sw.

1. Epipogon nutans (Bl.) Rchb.f. var. celebicus Schltr., in Fedde Repert. X (1911) p. 5.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 700m - R. Schlechter no. 20545, flowering in Dec. 1909.

It is possible that this species will later on be considered as specific, but this can only be decided after a thorough study of the widely distributed E. nutans (Bl.) Rchb.f.

The flowers are pure white.

Distribution of variety : Endemic.

7. Nervilia Comm.

1. Nervilia sciaphila Schltr., in Fedde Repert. X (1911), p. 5.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, in dense shade under shrubs and ferns, alt. c. 700m - R. Schlechter no. 20543, flowering in Dec. 1909.

A relative of N. punctata (Bl.) Schltr. from the Greater Sunda Islands.

Distribution : Endemic.

8. Gastrodia Bl.

1. Gastrodia celebica Schltr., in Fedde Repert. X (1911), p. 6.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 800m - R. Schlechter no. 20529, flowering and fruiting in Dec. 1909.

One of the interesting humus orchids; whole pedicels become greatly extended after pollination of the flower, thereby raising the capsule up high to facilitate a wide distribution of the seed. In this species the thus extended pedicels of the fruit reach up to 17cm in length. In other respects the species is most closely related to G. verrucosa Bl. from Java.

Distribution : Endemic.

9. Galeola Lour.

1. Galeola Minahassae Schltr., in Fedde Repert. X (1911), p. 6.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 700m - R. Schlechter no. 20546, flowering in Dec. 1906 [1909].

This plant is an interesting discovery, being a close relative of the rare G. javanica (Bl.) Bth. The sepals and petals are white, the papillae on the lip are golden-yellow, whilst the latter is suffused with pale pink on the inside.

Distribution : Endemic.

10. Vanilla Sw.

1. Vanilla platyphylla Schltr., in Fedde Repert. X (1911), p.7.

North Celebes, Minahassa : In the forests on Mount Klabat, alt. c. 400m - R. Schlechter no. 20556, flowering in Dec. 1909.

This species is most closely related to several Papuasian species, in particular V. wariensis Schltr. and V. Kempteriana Schltr. It has yellowish sepals and petals and a white labellum with subulate excrescences on the front of the front lobe.

Distribution : Endemic.

2. Vanilla planifolia Andr., Bot. Rep. VIII. (1808), t. 538.

North Celebes, Minahassa : Running wild in old plantations and between shrubs near Ayermadidi, alt. c. 150m - R. Schlechter no. 20523, flowering in Dec. 1909.

Originally introduced to the Old World from Central America for cultivation. This true vanilla of trade can now be met with occasionally run wild, as here at Ayermadidi, where I found it growing in great profusion and even with several young fruit.

Distribution : Central America, wild especially in Mexico. Introduced for cultivation and in places run wild in tropical America and especially in tropical Asia, the Mascarene and Comoro Islands and in tropical West Africa.

11. Aphyllorchis Bl.

1. Aphyllorchis gracilis Schltr., in Fedde Repert. X (1911), p. 8.

North Celebes : In humus of the forests on the upper Lampasioe [River], near the old goldmines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20654, flowering in Jan. 1910.

In habit the species has great similarity with A. pallida Bl. from the Sunda Islands, but differs from it in the shape of the floral segments.

Distribution : Endemic.

12. Goodyera R.Br.

1. Goodyera rubicunda Lindl. var. celebica (Bl.) Schltr., in Fedde Repert. X (1911), p. 9.

Goodyera celebica Bl., Orch. Jav. (1858), p. 36.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 800m - R. Schlechter no. 20534, flowering in Dec. 1909.

The variety differs from the Type in the thicker, less slender column, but otherwise agrees more-or-less with it.

Distribution of variety : Endemic.

2. Goodyera viridiflora Bl., Orch. Fl. Jav. (1858), p. 34 t. 9 f. 2.

Neottia viridiflora Bl., Bijdr. (1825), p. 408.

Physurus viridiflorus Lindl., Journ. Linn. Soc. I. (1857), p. 180.

Orchiodes viridiflorum O. Ktze., Rev. Gen. II (1891), p. 675.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 1400m - R. Schlechter no. 20570, flowering in Dec. 1909.

The flowers of my specimens are not yet fully developed, but there is no doubt that this species is present.

Distribution : Sumatra, Java.

3. Goodyera amoena Schltr., in Fedde Repert. X (1911), p. 9.

North Celebes, Minahassa : In humus of the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20490, flowering in Nov. 1909.

The upper side of these dark velvet green leaves, interspersed with a net of pale pink veins, is reminiscent of G. reticulata Bl., with which the species is related.

Distribution : Endemic.

13. Cystorchis Bl.

1. Cystorchis celebica Schltr., in Fedde Repert. X (1911), p. 10.

North Celebes, Minahassa : In humus of the forests on the upper Lampasioe [River], at the old goldmines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20658, flowering in Jan. 1910.

A very characteristic species, which amongst those so far known is most closely related to C. Beccarii Schltr. from Borneo. The leaves are dark green-red on the upper side, reddish underneath, the flowers whitish, the sepals being brownish at the centre, and with an orange-yellow claw.

Distribution : Endemic.

14. Macodes Bl.

1. Macodes celebica Rolfe, in Kew Bull.(1899), p. 132.

North Celebes : Near Kajoewatoe (Minahassa), S.H. Koorders no. 9492; on rocks between moss in the mountain forests near Toli-Toli, alt. c. 500m - R. Schlechter no. 20703, flowering in Jan. 1910.

This species indicates connections to Papuasia. It is most closely related to M. Sanderiana Rolfe. Its leaves are a luminous green, with silver veining.

Distribution : Endemic.

15. Cheirostylis Bl.

1. Cheirostylis quadrilobata Schltr., in Fedde Repert. X (1911), p. 11.

North Celebes, Minahassa : In humus of the forests on Mount Lokon, between moss, alt. c. 1400m - R. Schlechter no. 20431, flowering in Nov. 1909.

This species is a further proof of the close relationships between Celebes and Papuasia. It is closely related to C. Chalmersii Schltr. from the Fly River in British Papua. Its flowers are white.

Distribution : Endemic.

16. Zeuxine Lindl.

1. Zeuxine stenochila Schltr., sp. nov.

Terrestris, erecta, c. 10 cm alta. Caulis simplex, teres, glaber, bene foliatus, c. 1,25 mm diametro. Folia c. 4 erecta, lanceolato-ligulata, subacuta, c. 2 cm longa, caulem plus minusve obtegentia, glabra, superiora decrescentia. Racemus dense pluriflorus, in specimine nostro c. 10-florus, erectus, 1,8 cm longus; bracteis ovato-lanceolatis, acuminatis, glabris, inferioribus florem aequantibus, superioribus sensim minoribus. Flores illis *Z. strateumaticae* (L.) Schltr. similes, labello excepto glabri, albidi. Sepala oblongo-ovata, obtusa, uninervia, vix 3 mm longitudine excedentia, intermedium concavum, lateralia obliqua. Petala oblique ligulata, medio margine anteriore paulo dilatata, sepalis subaequilonga, sepalo intermedio margine interiore agglutinata. Labellum quam sepala paulo brevius, in affinitate angustum, e basi ovato-cucullata marginibus incurvis in unguem ligulato-oblongum dense et minutissime papillosum carnosulum angustatum antice in laminam suborbicularem apice retusam, minutissime et dense papillosam sursum dilatatum, intus supra basin appendicibus 2 minutis subulatis ornatum. Columna brevissima, subglobosa, rostello erecto satis magno bipartito. Ovarium sessile, cylindraceo-fusiforme, glabrum, c. 4 mm longum.

North Celebes, Minahassa : In the surroundings of Menado (Consul H.F. Steffens' collector), in the year 1911.

This species has a great similarity to Z. strateumatica (L.) Schltr. and to Z. wariana Schltr., but differs from both in the narrower lip, densely papillose on the claw and lamina, as well as in the longer arms of the rostellum, which embrace the viscid mass.

Distribution : [None given].

2. Zeuxine viridiflora J.J.Sm., in Icon. Bogor. II (1903), p. 21. t. 105 B.

Hapochilus viridiflorus J.J.Sm., in Icon. Bogor. II (1903), p. 21. t. 105 B.

North Celebes, Minahassa : Bone near Gorontalo (J.J.Sm.)

This is the only species of the section Monochilus that I know from the Island. It is related to the Moluccan-Papuasian species of this group.

Distribution : Endemic.

3. Zeuxine Minahassae Schltr., in Fedde Repert. X (1911), p. 11.

North Celebes, Minahassa : In humus of the forests on Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20510, flowering in Dec. 1909.

This species is related to the Papuasian forms. It belongs to the section Hetaeriopsis and is most closely related to Z. torricellensis Schltr. and Z. Novae Hiberniae Schltr.

Distribution : Endemic.

17. Odontochilus Bl.

1. Odontochilus klabatensis Schltr., Fedde Repert. X (1911), p. 12.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 1200m - R. Schlechter no. 20557, flowering in Dec. 1909.

A very characteristic species, which differs from all others in the structure and shape of the labellum. The flowers are snow-white, the leaves green.

Distribution : Endemic.

2. Odontochilus platysepalus Schltr., sp. nov.

Terrestris, erectus, pusillus, c. 5—6,5 cm altus. Rhizoma cauliforme, decumbens, radicans; radicibus flexuosis, villosulis. Caulis teres, 4—6-foliatus, glaber, 1,5—2 mm diametro. Folia petiolata, glabra, lamina oblique ovata vel ovato-lanceolata, acuta, basi subrotundata, usque ad 2 cm longa, infra medium usque ad 1 cm lata (saepe bene minora), erecto-patente, petiolo basi dilatata vaginante, usque ad 7 mm longo. Racemus perbreviter pedunculatus 1—3-florus. erectus; bracteis lanceolatis, acuminatis, erectis, ovarium aequantibus vel paulo superantibus. Flores nivei, illis *O. klabatensis* Schltr. similes sed paululo majores. Sepala oblonga, obtusa, dimidio inferiore sparsim retrorso-papillosa vel subglabra, 8 mm longa, intermedium concavum, lateralia obliqua, apice quam intermedium paulo latiora, basi paulo decurrentia. Petala oblique ligulata, obtusa, glabra, basin versus antice paululo dilatata, sepalo intermedio aequilongo marginibus agglutinata. Labellum e basi ovato-cucullata, intus 2-callosa in unguem ligulatum margine dentibus 7—8 breviter subulatis pectinatum angustatum antice in laminam late reniformem apice excisam cum apiculo interjecto explanatum, totum 1,2 cm longum, supra basin 3 mm, in medio laminae 7 mm latum. Columna brevis, glabra, rostello elato, margine exteriore utrinque obtuse auriculato. Ovarium cylindraceo-fusiforme, pilis sparsis brevibus retrorsis glanduloso-pilosulum, c. 5 mm longum.

North Celebes : On mossy rocks in the mountain forests near Toli-Toli, alt. c. 800m - R. Schlechter no. 20712a, flowering in Jan. 1910.

Previously, I considered this plant to be O. klabatensis Schltr., with which

it is closely related. It differs specifically in larger flowers and in the shape of the lip, with longer pectinate excrescences.

Distribution : [None given].

18. Anoectochilus Bl.

1. Anoectochilus insignis Schltr., in Fedde Repert. X (1911), p. 13.

North Celebes, Minahassa : In the primary forest on Mount Klabat, alt. c. 700m - R. Schlechter no. 20548, flowering in Dec. 1909.

This apparently very rare species has beautiful, velvety, dark red-green leaves which are traversed by a delicate rose-red, gold glistening net of veins.

Distribution : Endemic.

19. Vrydagzenia Bl.

1. Vrydagzenia celebica Schltr., in Fedde Repert. X (1911), p. 13.

North Celebes : In humus of the primary forests on the upper Lampasioe [River], near the old goldmines on [Mount] Djangdjang, alt. c. 180m - R. Schlechter no. 20659, flowering in Jan. 1910.

Amongst those so far known, this species is most closely related to V. albostriata Schltr. from New Guinea.

Distribution : Endemic.

2. Vrydagzenia obliqua Schltr., in Fedde Repert. X (1911), p. 14.

North Celebes : In humus of the mountain forests near Toli-Toli, alt. c. 500m - R. Schlechter no. 20907, flowering in Jan. 1910. [no. possibly 20707].

This species belongs to a widely dispersed group, of which I consider V. albida Bl. from the Sunda Islands to be the basic Type.

Distribution : Endemic.

20. Corymbis Bl.

1. Corymbis exaltata Schltr., in Fedde Repert. X (1911), p. 15.

North Celebes, Minahassa: In humus of the forests on Mount Klabat, alt. c. 700m - R. Schlechter no. 20544, flowering in Dec. 1909.

I am sure that a more precise study of the Malayan species of this genus will show that more species are present here than initially accepted. This is definitely the most stately one that I at present know. It develops 2.0-2.5m tall shrubs with 70cm long leaves in whose axils it carries the short, compressed panicles of snow-white flowers, which here are about 3.0cm long.

Distribution : Endemic.

21. Diglyphosa Bl.

1. Diglyphosa celebica Schltr., D. Orch. (1914), p. 131.

Diglyphosa latifolia Bl. var. celebica Schltr., in Fedde Repert. X (1911), p. 15.

North Celebes : Near Tomohon (Minahassa) - P. & F. Sarasin no. 580, in bud on 9th Oct. 1894; on Mount Masarang, Minahassa - P. & F. Sarasin no. 643, flowering on 30th Sept. 1894; in humus in the mountain forests near Toli-Toli, alt. c. 800m - R. Schlechter no. 20720, flowering in Jan. 1910.

Initially, I considered this plant to be a variety of D. latifolia Bl., but I am now convinced to regard it as a separate species, because of its more slender growth, the lax inflorescences and the pandurate lip. The statements by the Sarasins for the colour of the flowers are given as'dark purple-brown'for no. 580 (in bud) and for no. 643 'red-brown, with the inside of the lip red-brown'. The flowers of the plant I collected had about the same colour.

Distribution : Endemic.

22. Nephelaphyllum Bl.

1. Nephelaphyllum sp. nov. ?

North Celebes : In humus of the forests on the upper Lampasioe [River], near the old goldmines on [Mount] Djangdjang, Toli-Toli district - R. Schlechter no. 20665, fruiting in Jan. 1910.

Apparently this is a new species from the affinity of N. mindorense Ames from the Philippines. Unfortunately, I could not find any flowers of this interesting plant.

23. Coelogyne Lindl.

1. Coelogyne rhizomatosa J.J.Sm., in Rev. Trav. Bot. Néerl. II (1905), p. 141.

North Celebes, Minahassa : Mount Mahawo near Tomohon - Forster; near Tomohon - P. & F. Sarasin no. 217, flowering and fruiting on 30th Apr. 1894; P. & F. Sarasin no. 508, flowering on 24th Oct. 1894; epiphytic on Mount Masarang - P. & F. Sarasin no. 417, flowering on 5th June 1894; on trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20430, flowering in Nov. 1909.

This species is often found in the forests, as well as on solitary trees, in the mountains of the Minahassa [district], at altitudes of 1000-1100m. I have noted the colouration as follows; sepals and petals whitish green, labellum with brown markings, column yellow towards above.

Distribution : Endemic.

2. Coelogyne Sarasinorum Krzl., in Engl. Pflanzr. IV 50, II B, 7 (1907), p. 29, fig. 7.

North Celebes, Minahassa : Epiphytic near Tomohon - P. & F. Sarasin no. 700,

flowering in Oct. 1894; on trees near Kakaskassen, not far from Tomohon, alt. c. 800m - R. Schlechter no. 20406, flowering in Oct. [Nov.] 1909.

The area of distribution of this delightful plant appears to be very restricted. I have encountered it only on the mountains in the vicinity of Tomohon. I noted the colouring of the flowers as : sepals and petals whitish green. Labellum with brown markings. Column yellow towards above.

Distribution : Endemic.

3. Coelogyne platyphylla Schltr., sp. nov.

Epiphytica, valida, usque ad 70 cm alta. Rhizoma abbreviatum. Pseudobulbi fusiformi-cylinuracei, unifoliati, c. 11 cm alti, infra medium ad 2 cm diametro. Folium suberectum, ellipticum, breviter acuminatum, basin versus sensim subpetiolato-angustatum, parte petioliformi c. 5 cm longa inclusa 49 cm longum, medio fere 13,5 cm latum. Inflorescentia synantha, erecta, sensim evoluta usque ad 15-flora, folium demum subexcedens, pedunculo nudo, stricto, teretiusculo, 33 cm longo, bracteis caducis, lanceolato-ellipticis, c. 5 cm longis. Flores in genere inter maximos, illis *C. caloglossae* Schltr. similes, glabri, succedanei, flavescenti-virescentia, labello brunneo-picti. Sepala oblonga, obtusiuscula, c. 5 cm longa, concava, lateralia obliqua, extus carinata. Petala oblique linearia obtusiuscula, sepalis fere aequilonga. Labellum circuitu ovale, supra medium 3-lobum, basi concavum, 4,7 cm longum, explanatum medio 3,3 cm latum, carininis 2 paroallelis crenulatis, antice paululo dilatatis e basi usque supra basin lobi intermedii decurrentibus ornatum, carina tenuiore leviter crenulata e basi usque in medium interjecta, lobis lateralibus semiorbicularibus, rotundatis, c. 1,3 cm latis, intermedio e isthmo brevissimo suborbiculari, antice inciso cum lobis sese leviter tegentibus, 1,8 cm longo, medio fere 1,6 cm lato, margine obscure crenulato. Columna leviter curvata, 4 cm longa, apicem versus conspicue dilatata, clinandrio leviter 8-angulato, apice truncatissimo, amplo. Ovarium pedicellatum, clavatum, 6-costatum, glabrum, c. 1,3 cm longum.

Central Celebes : Dongala (?) - Native collector.

I obtained this beautiful species from Mr. Becker, the consul at Macassar, who had cultivated it in his garden and told me that it had been brought from Dongala by dealers. It is characterised by its very broad leaves. In the lip it is reminiscent of C. caloglossa Schltr.

Distribution : Endemic.

4. Coelogyne caloglossa Schltr., in Fedde Repert. X (1911), p. 16.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 1000m - R. Schlechter no. 20571, flowering in Dec. 1909.

Probably one of the most beautiful species of the section Speciosae. It is most closely related to C. Beccarii Rchb.f. from New Guinea, but readily distinguished as a species by its labellum.

Distribution : Endemic.

5. Coelogyne celebensis J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1917), p. 3.

South-east Celebes : Kolaka - J. Elbert, in the year 1909; [S.E. Celebes] Kampong Tapalang near Macassar - van Vuuren, Noerkas, in the year 1912; Mount Paka-Paka - van Vuuren, Rachmat no. 678, in Sept. 1913; Bili-Bili - Rachmat.

J.J.Smith places this species, which is unknown to me, into the affinity of C. speciosa (Bl.) Lindl. It differs in the broader leaves, the more robust inflorescence and in the shape of the lip. The flowers are pallid greenish, the labellum with dark brown markings and having dark brown keels.

Distribution : Endemic.

6. Coelogyne chlorophaea Schltr., in Fedde Repert. X (1911), p. 17.

North Celebes, Minahassa : On trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20420, flowering in Oct.[Nov.] 1909.

This is the first representative species in the island of Celebes of the Lentiginosae group [section]. It is apparently most closely related to Coelogyne chloroptera Rchb.f. from the Philippines. The markedly undulate keels of the ovary are characteristic. The flowers are green, the lip with brown markings, its crests white in front.

Distribution : Endemic.

7. Coelogyne Steffensii Schltr., sp. nov.

Epiphytica, erecta, c. 50—60 cm alta. Rhizoma breve; radicibus filiformibus, flexuosis, glabris. Pseudobulbi cylindracei, bifoliati, obscure 7-angulati, c. 18 cm longi, 1,7—1,9 cm diametro. Folia erecto-patentia, petiolata, elliptica, obtusiuscule acuminata, basi cuneata, coriacea, lamina 28—32 cm longa, medio fere 9—10 cm lata, petiolo c. 8 cm longo. Racemi heteranthi, penduli, usque supra basin laxe multiflori, c. 40 cm longi, pedunculo brevi, vaginis c. 4—5 amplectentibus omnino obtecto, c. 4 cm longo; bracteis longius persistentibus, demum deciduis, ellipticis, obtusis, ovario pedicellato paulo brevioribus. Flores illis *C. Rochussenii* De Vries similes, glabri. Sepala subpatentia anguste oblonga, extus carinata, subacuta, 7-nervia, 2 cm longa, lateralia obliqua. Petala oblique linearia, obtusiuscula, basin versus sensim paululo angustata, 5-nervia, sepalis subaequilonga. Labellum explanatum circuitu ovale, supra medium trilobum, 2 cm longum, medio fere 1,3 cm latum, carininis 2 perdense et breviter fimbriatis basi et apice paululo elatioribus, parallelis e basi labelli usque in medium lobi intermedii decurrentibus ornatum, carina intermedia tenuiore e basi labelli usque ad basin lobi intermedii interjecta, carinis 2 brevibus similibus lateralibus in dimidio inferiore lobi intermedii additis, lobis lateralibus brevibus oblique ovatis, obtusis, denticulatis, lobo intermedio e isthmo brevi margine denticulato in laminam ovatam longius acuminatam margine denticulatam expanso, 9,5 mm longo, 6 mm infra medium lato. Columna gracilis, apicem versus dilatata, 1,6 cm longa, clinandrio apice retuso-truncatissimo, rhombeo, margine minute crenulato. Ovarium pedicellatum acute 6-costatum, gracile, c. 2 cm longum.

North Celebes, Minahassa : Surroundings of Menado - Steffens' collector, in the year 1911.

This species is closely related to C. Rochussenii De Vries, but in my opinion, to be separated specifically on account of the broader shape of the lip and the completely different column.

8. Coelogyne Rochussenii De Vries, Ill. Orch. Or. Néerl. (1854), t. 2.

Coelogyne plantaginea Lindl., in Gardn. Chron. (1855), p. 20.

North Celebes : On trees in the forests on Mount Klabat, (Minahassa), alt. c. 800m - R. Schlechter, without flowers in Dec. 1909. [no collection no.]

I brought the flowerless specimens live from Mount Klabat to Buitenzorg, where they were cultivated. As J.J. Smith wrote, they proved to be Coelogyne Rochussenii De Vries. However, I consider it possible that we are not dealing with C. Rochussenii De Vries, but the closely related C. Steffensii Schltr., described above.

Distribution : Sumatra, Java, Borneo, Banka and Soela.

9. Coelogyne multiflora Schltr., in Fedde Repert. X (1911), p. 18.

North Celebes, Minahassa : On old primary forest trees at the summit of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20513, flowering in Dec. 1909.

In the description of this plant, I have already stated that it stands quite isolated and so I have felt myself obliged to raise it to the status of the Type of its own section Cyathogyne. The plant is a conspicuously strong grower and is reminiscent in its vegetative of robust specimens of C. asperata Lindl., but from which it differs completely in the flowers and inflorescence. The flowers are white, the lip with brown markings.

Distribution : Endemic.

24. Basigyne J.J.Sm.

1. Basigyne muriculata J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1911), p. 5.

South Celebes : Mount Tolongan - van Vuuren, Rachmat no. 1001, flowering in Jan. 1914.

This interesting Type of a new genus, which approaches Dendrochilum in habit, but in the shape of the lip is more reminiscent of Panisea and which shows a pouched dorsal sepal, similar to that of Cryptostylis, is reported to have red flowers, standing as a narrow-stemmed, lax, nine-flowered raceme, and whose sepals are covered on the outside with black, short, minute calli, the petals and lip with short hairs. Without doubt this is a very noticeable Type.

Distribution : Endemic.

25. Dendrochilum Bl.

1. Dendrochilum latibrachiatum J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1917), p. 14.

South Celebes : Mount Pangararan - van Vuuren, Rachmat no. 922a, flowering in Nov. 1913.

This very characteristic species, which in common with D. simplicissimum

J.J.Sm. has an undivided labellum, is distinguished from it by the short, broad column-arms.

Distribution : Endemic.

2. Dendrochilum simplicissimum J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1917), p. 15.

South Celebes : Mount Pangararan - van Vuuren, Rachmat no. 922, flowering in Nov. 1912.

As the very appropriate species name indicates, it is distinguished by the very simple segments of the flower. Not only is the labellum completely undivided and keel-less, but the column also lacks the very characteristic little arms of the section Platyclinis.

Distribution : Endemic.

3. Dendrochilum tenuissimum Krzl., in Engl. Pflanzr. IV 50, II B. 7 (1907), p. 98.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 211, flowering on 2nd May 1894.

I have observed this plant, unfortunately without flowers, in large quantities in the trees on the side of the volcano Mahawo facing Tomohon, at altitudes of 900 - 1100m. It is easily distinguished from the other species by the narrower leaves and the long, narrow racemes, reminiscent of D. filiforme Rchb.f. The colour of the flowers is given as brown.

Distribution : Endemic.

4. Dendrochilum heptaphyllum Krzl., in Engl. Pflanzr. IV 50, II B. 7 (1907) p. 99.

North Celebes, Minahassa : On the summit of [Mount] Sudara, epiphytic - P. & F. Sarasin no. 192, flowering on 17th Oct. 1893.

This species which has pale brown-red flowers, is reminiscent in habit somewhat of D. arachnites Rchb.f. from the Philippines. However, the sepals and petals are not extended so far and are shorter, whilst the labellum, as well as the column, are different. Apparently this species is very rare, since I have never encountered it. The specimen to hand also is somewhat sparse.

Distribution : Endemic.

5. Dendrochilum macropterum Krzl., in Engl. Pflanzr. IV 50, II B. 7 (1907) p. 99.

North Celebes, Minahassa : On trees on Mount Masarang - P. & F. Sarasin no. 219, flowering on 23rd Apr. 1894; ebenda, alt. c. 1200m - R. Schlechter no. 20415, flowering in Oct. 1909.

The smallest species of the genus, so far known from the island. It is very abundant in the Minahassa [district] and frequently found in old disused coffee trees on which fairly small specimens appear to come into flower. The flowers

are white, the labellum reddish towards the base, the anther orange-red.

Distribution : Endemic.

6. Dendrochilum macrobulbon Krzl., in Engl. Pflanzr. IV 50, II B. 7 (1907) p. 108.

North Celebes, Minahassa : On the [Mount] Sopoetan massif, alt. c. 1000m - P. & F. Sarasin no. 1091, flowering on 19th Apr. 1895; in the forests of Mount Mahawo, alt, c 1200m - R. Schlechter no. 20434, flowering in Nov. 1909.

It is correct to compare this species with D. longifolium Lindl., with which it has a certain similarity. However, the pseudobulbs are thicker, the leaves relatively broader and the more robust peduncles carry somewhat larger flowers of a brownish green colour, with a brown-flushed lip. The species is the most robust of those so far known in Celebes.

Distribution : Endemic.

26. Pholidota Lindl.

1. Pholidota celebica Schltr., in Fedde Repert. X (1911), p. 19.

North Celebes, Minahassa : On trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20472, fruiting in Nov. 1909.

The first species of the section Crinonia to become known in Celebes. Unfortunately, the specimens were already in fruit, but nevertheless without difficulty it could be established from all segments of the undamaged flowers, that it was most closely related to P. torricellensis Schltr. from New Guinea, but is well separated specifically.

Distribution : Endemic.

2. Pholidota imbricata Lindl. var. platyphylla Schltr., in Fedde Repert. X (1911), p. 19.

North Celebes, Minahassa : On trees at the foot of Mount Lokon and Mount Empung, alt. c. 1000m - R. Schlechter no. 20442, flowering in Nov. 1909; epiphytic at Tomohon - P. & F. Sarasin no. 553, flowering on 15th Oct. 1894.

This species is distinguished from all the other varieties of this species widely distributed from India through China, the Philippines, the whole of Malaysia and Papuasia to Australia and New Caledonia, by its particularly robust growth, conspicuously broad bracts and snow-white colour of the flowers. It is questionable whether P. imbricata Lindl. comprises several species, but this can only be solved by a comprehensive investigation.

Distribution of variety : Endemic.

3. Pholidota Minahassae Schltr., in Fedde Repert. X (1911), p. 20.

Pholidota articulata Lindl. var. Minahassae J.J.Sm., in Bull. Jard. Bot.

Buitenz., ser. 3, v. I, fasc. II (1919), p. 95.

North Celebes, Minahassa : On trees at Tomohon, alt. c. 900m - R. Schlechter no. 20453, flowering in Nov. 1909; on trees on the hills at Lansot, alt. c. 700m - R. Schlechter no. 20627, flowering in Dec. 1909; on [Mount] Sopoetan massif, alt. c. 1000m - P. & F. Sarasin no. 1092, flowering on 19th Apr. 1895.

I am firmly convinced of having handled it correctly, when I described this plant as being separate from the Indian species P. articulata Lindl. J.J.Smith considers it only as a variety. I went closer into the differences between P. Minahassae Schltr. and P. articulata Lindl. in the description of the former. A comparison of the two typical forms in the living state, will definitely prove that I was correct.

Distribution : Endemic.

27. Oberonia Lindl.

1. Oberonia hastata Schltr., in Fedde Repert. X (1911), p. 21.

North Celebes, Minahassa : On trees at Tomohon, alt. c. 800m - R. Schlechter no. 20516, flowering in Dec. 1909.

This species presents the first specimen of the section Platystreptus from Celebes. It is most closely related to O. monstruosa Lindl. from Java and several species from New Guinea; where the section appears to have its centre of evolution. The flowers are a pallid yellow.

Distribution : Endemic.

2. Oberonia imbricatiflora J.J.Sm., in Bull. Jard. Bot. Buitenz., ser.2, XIII (1914), p. 5.

South [Central] Celebes : Enrekang - van Vuuren.

The species is reported to be reminiscent in habit of O. imbricata Lindl., but to be so different in the flowers, particularly in the shape of the lip, so that J.J.Smith considers it must belong either to Hymenobratea or Platystreptus. I consider the latter more likely.

Distribution : Endemic.

3. Oberonia exaltata Schltr., in Fedde Repert. X (1911), p. 21.

North Celebes, Minahassa : At Tomohon, epiphyte - P. & F. Sarasin no. 208, flowering on 12th Apr. 1894; ebenda, alt. c. 900m - R. Schlechter no. 20494, flowering in Nov. 1909.

The tallest of the species so far known to me. I have collected specimens which were 60cm tall. The species belongs to the section Platyacron which appears to be mainly Papuasian and is characterised by the labellum, which is obcordate and much broadened in front. The flowers of our species are orange-

yellow.

Distribution : Endemic.

4. Oberonia masarangica Schltr., in Fedde Repert. X (1911), p. 22.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20419, flowering in Nov. 1901 [1909].

This and the following species belong to the section Adenorhachis, which is distributed from East Africa to the Tongan and Viti [Fiji] Islands. Thus, amongst the species of the island, it stands closest to O. pleistophylla Schltr., but is much shorter in growth, and in habit is reminiscent more of O. glandulosa Lindl. from Polynesia and several species from New Guinea. The flowers are greenish yellow.

Distribution : Endemic.

5. Oberonia pleistophylla Schltr., in Fedde Repert. X (1911), p. 22.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20421, flowering in Oct.[Nov.] 1909.

This species is readily distinguished amongst the others of the section Adenorhachis, by the long, thin rhizomes, which carry 10 - 18 leaves and by the ridges of the ovary, which have papillose hairs.

Distribution : Endemic.

6. Oberonia celebica Schltr., in Fedde Repert. X (1911), p. 23.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c, 1200m - R. Schlechter no. 20474, flowering in Nov. 1909.

A species of the section Otoglossum, to which most of the species of the genus belong. It is more closely related to certain Papuasian species.

The colour of the flowers is yellow-brown.

Distribution : Endemic.

7. Oberonia rhizophoreti Schltr., in Fedde Repert. X (1911), p. 23.

North Celebes : On trees in the mangrove swamps at the beach of Toli-Toli - R. Schlechter no. 20645, flowering in Jan. 1910.

An unique species, in the shape of the labellum, which probably will be raised in status to the Type of a section. It is not related in any way to the species so far known to me. Its flowers are orange-red.

Distribution : Endemic.

8. Oberonia vulcanica Schltr., in Fedde Repert. X (1911), p. 24.

North Celebes, Minahassa : On trees in the forests on Mount Mahawo, alt. c.

1200m - R. Schlechter no. 20509, flowering in Dec. 1909.

All the species listed above belong to the sub-genus Menophyllum, where the leaves are not discarded on withering, rather they gradually rot on the stem. The present and both the following ones, however, do discard the leaves on withering and therefore are placed in the sub-genus Apotemnophyllum. Of the following two, O. vulcanica Schltr. is recognised outwardly by the shorter leaves and fox-brown flowers.

9. Oberonia tomohonensis Schltr., in Fedde Repert. X (1911), p. 24.

North Celebes, Minahassa : On trees at Tomohon, alt. c. 900m - R. Schlechter no. 20636, flowering in Dec. 1909.

This one is distinguished specifically from the related O. mahawoensis Schltr. by the shape of the lip, especially that of the middle lobe. The middle lobe of the labellum is broadened from the narrowed base into an almost reniform lamina, which is tri-lobed in front. The flowers are yellowish.

Distribution : Endemic.

10. Oberonia mahawoensis Schltr., in Fedde Repert. X (1911), p. 25.

North Celebes, Minahassa : On trees in the forests on Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20487, flowering in Nov. 1909.

This one differs both from O. tomohonensis Schltr. and O. vulcanica Schltr. in the shortened lateral lobes of the labellum, which are not acuminate. Furthermore, it is more robust than both the above. The flowers are yellowish, as for O. tomohonensis Schltr.

Distribution : Endemic.

28. Hippeophyllum Schltr.

1. Hippeophyllum celebicum Schltr., in Fedde Repert. X (1911), p. 26.

North Celebes, Minahassa : On trees at Tomohon, alt. c. 1000m - R. Schlechter no. 20492, flowering in Nov. 1909; on trees at Lansot, alt. c. 700m - R. Schlechter no. 20628, flowering in Dec. 1909.

The small genus Hippeophyllum, which I set up in 1895 with two species from New Guinea, now includes eight species which are distributed over a region that stretches from the hinterlands of India (Perak) [Malayan Peninsula], via the Greater Sunda Islands, the Philippines and North Celebes to eastern New Guinea. H. celebicum Schltr. is related to H. Scortechinii (Hook.f.) Schltr. from Perak. The flowers are yellowish with whitish sepals and petals.

Distribution : Endemic.

29. Liparis L.C.Rich.

1. Liparis ficicola Schltr., in Fedde Repert. X (1911), p. 26.

North Celebes, Minahassa : Epiphytic on fruiting branches of a Ficus species on the summit of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20476, flowering and fruiting in Nov. 1909.

Biologically, a very interesting species which I found twice under the same conditions, viz. growing on the fruiting branches of a Ficus species near the summit of Mount Masarang. The species belongs to the section Phyllocardium and is probably most closely related to L. cordifolia Hook.f. from British India. The flowers are green.

Distribution : Endemic.

2. Liparis punctifera Schltr., in Fedde Repert. X (1911), p. 26.

North Celebes : In humus of the mountain forests at Toli-Toli, alt. c. 700m - R. Schlechter no. 20718, flowering in Jan. 1910.

The species belongs to a small group of species of the sub-genus Sturmia, which is distinguished by the labellum being lacerated in front. It is related to L. pectinifera Ridl. from the Malayan Peninsula and to L. maboroensis Schltr. from New Guinea. The flowers are greenish.

Distribution : Endemic.

3. Liparis firma J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2. XIII (1914), n. 7.

South Celebes : Kampong Masawa, Polewali - van Vuuren.

The species is described as a robust plant with 6.0-18.5cm tall bifoliate pseudobulbs and 28.5-40.0cm long leaves. It is reputed to be related to L. bicolor J.J.Sm., but differing in thicker pseudobulbs, larger leaves and the labellum hardly broadened towards the top. The colouring of the flowers is yellow-brown.

Distribution : Endemic.

4. Liparis Minahassae J.J.Sm., in Ic. Bogor. II (1903), p. 43, t. 109A.

Liparis latifolia Koorders, Syst. Verz. III (1914), p. 22 (non Lindl.).

North Celebes : On trees in the forests of Mount Klabat (Minahassa) - S.H. Koorders no. 29533, flowering on 19th Jan. 1895; ebenda, alt. c. 900m - R. Schlechter no. 20579, flowering in Dec. 1909; on trees in the mountain forests at Toli-Toli, alt. c. 900m - R. Schlechter no. 20719, flowering in Jan. 1910.

Although related to L. latifolia Lindl., the labellum separates it well as a species. The flowers are reddish brown with a cinnabar-red labellum.

Distribution : Endemic.

5. Liparis confusa J.J.Sm., Orch. Flor. Jav. (1905), p. 275.

North Celebes, Minahassa : On trees at Tomohon - P. & F. Sarasin no. 419, flowering on 8th June 1894; no. 431, flowering on 6th June 1894; ebenda, alt. c. 800m - R. Schlechter no. 20155 [20515], flowering in Dec. 1909; on trees in the forests of Mount Klabat, alt. c. 600m - R. Schlechter no. 20586, flowering in Dec. 1909; near Ranoketa - S.H. Koorders no. 29491, flowering on 19th Mar. 1895.

As already repeatedly mentioned, I am not completely happy with the delimitation of the species. We may have to split off several species, once the forms are more closely defined. The species is one of the most widely distributed ones of the genus. The flowers are yellowish white, with an orange-red lip.

Distribution : From the hinterlands of India, through Indo-China, the whole of Malaysia, the Philippines and Moluccas to eastern New Guinea.

6. Liparis parviflora (Bl.) Lindl., Gen. et Spec. Orch. (1830), p. 31.

Malaxis parviflora Bl., Bijdr.(1825), p. 292.

Liparis flaccida Rchb.f.in Linnaea XII (1877), p. 44.

Leptorchis parviflora O. Ktze., Rev. Gen. II (1891), p. 671.

Leptorchis flaceida O. Ktze., Rev. Gen. II (1891), p. 670.

North Celebes, Minahassa : Near Kajoewatoe - S.H. Koorders no. 2934, flowering on 2nd Mar. 1894.

The species is very similar to L. confusa J.J.Sm., but has larger pseudobulbs and more-pallid flowers.

Distribution : Sumatra, Java, Borneo.

7. Liparis viridiflora (Bl.) Lindl., Gen. et Spec. Orch. (1830), p. 31.

Malaxis viridiflora Bl., Bijdr. (1825), p. 392.

Leptorchis viridiflora O. Ktze., Rev. Gen. II (1891), p. 671.

'Celebes'

The species is in cultivation at the Botanical Garden in Buitenzorg, with 'Celebes' given as its origin. It belongs to the small-flowered species of the genus and in habit has some similarity with the previous one, but has an indistinct trilobed labellum which is slightly pointed in front, a two-edged peduncle and whitish green flowers with a green lip.

Distribution : Reported from Ceylon, India, Assam, Java and Celebes, but there is probably some doubt as to the identity of all these plants.

8. Liparis minima (Bl.) Lindl., Gen. et Spec. Orch. (1830), p. 32.

Malaxis minima Bl., Bijdr. (1825), p. 391.

Malaxis angustifolia Bl., Bijdr. (1825), p. 393.

Liparis angustifolia Lindl., Gen. et Spec. Orch. (1830), p. 31.

Leptorchis minima O. Ktze., Rev. Gen. II (1891), p. 671.

North Celebes : On trees in the mountain forests near Toli-Toli, alt. c. 700m - R. Schlechter no. 20723, flowering in Jan. 1910.

The delimitation of this plant is no way definitely established yet, it certainly differs from L. minima Lindl., which was united by J.J.Smith with L. caespitosa Lindl. from Lemuria [Madagascar]. Likewise, L. Prainii Hook.f. and L. Duthiei Hook.f. as, in general,the Indian Types of this group do not belong here. I therefore have reduced it to a synonym of the Sundanese form.

The species is the smallest one so far known in the region. Its flowers are green.

Distribution : Hinterlands of India?, Sunda Islands?, (New Guinea?).

9. Liparis piestopus Schltr. sp. nov.

Epiphytica, erecta, 30—42 cm alta. Rhizoma ut videtur brevis; radicibus filiformibus, flexuosis, breviter et dense pilosulis. Pseudobulbi approximati, ovato-oblongoidei vel anguste oblongi, apicem versus sensim paulo angustati, ut videtur bene compressi, bifoliati, 5—6 cm alti, infra medium 1—1,5 cm lati. Folia suberecta, ligulata, acuta, basin versus sensim paulo angustata, exsiccatione tenuiora, 22—30 cm longa, supra medium 2—2,3 cm lata. Inflorescentia erecta, gracilis, folia paulo superans, pedunculo ancipiti, 10—15 cm longo, 2—2,5 mm lato, racemo dense multifloro; bracteis patentibus, hyalinis, lanceolatis, acuminatis, ovario pedicellato duplo fere brevioribus. Flores in genere inter minimos, glabri, illis *L. longipes* Ldl. similes, ut videtur flavido-albidi, inversi, recurvi. Sepala reflexa anguste oblonga, obtusa, uninervia, 3 mm longa, lateralia obliqua. Petala reflexa anguste et oblique linearia, obtusa, uninervia, sepalis subaequilonga. Labellum genuflexum, carnosum, oblongum, subacutum, basi subcordato-rotundatum, longitudinaliter latifoveatum, ecallosum, glabrum, vi explanatum petalis fere aequilongum. Columna leviter curvata, basin versus paululo dilatata, vix 2 mm longa, juxta stigma margine utrinque leviter rotundato-dilatata. Ovarium graciliter pedicellatum, glabrum, c. 5 mm longum. Capsula pedicellata, pendula, ellipsoidea, pedicello excluso c. 6 mm longa, obtuse 3-costata.

North Celebes, Minahassa : Surroundings of Menado - H.F. Steffens' collector, in the year 1911.

In habit this species is reminiscent of L. parviflora Lindl. in the flowers, especially the labellum, but more so of L. longipes Lindl. and L. myriantha Schltr.

Distribution : Endemic.

10. Liparis celebica Schltr., in Fedde Repert. X (1911), p. 28.

North Celebes, Minahassa : Bujong - O. Warburg no. 15750; near Tomohon - P. & F. Sarasin no. 215; on trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20668, flowering in Nov. 1909.[cf. 29/10, probably 20468].

This is a close relative of L. mucronata Lindl., but from which it differs in the yellow-brown flowers, the broad leaves and the labellum.

Distribution : Endemic.

10. [11.] Liparis quadribullata Schltr., in Fedde Repert. X (1911), p. 29.

North Celebes : On trees in the forests on the upper Lampasioe [River], Toli-Toli district, alt. c. 150m - R. Schlechter no. 20668, flowering in Jan. 1910.

This, together with L. celebica Schltr., are representatives of the section Distichon of the genus. Further investigation in Celebes will show that this group is very numerous, since both in the Philippines and in Papuasia it is distinguished by the multitude of forms. L. quadribullata Schltr. is most closely related to L. gibbosa Finet and to several Papuasian species. The flowers are of a red ochre colour.

Distribution : Endemic.

30. Microstylis Nutt.

1. Microstylis trigonopetala J.J.Sm., in Natuurk. Tijdschr. Nederl. Indie LVIII (1898), p. 358.

North Celebes, Minahassa : Without locality details - S.H. Koorders, in the year 1895; in humus of the forests on Mount Klabat, alt. c. 600m - R. Schlechter no. 20540, flowering in Dec. 1909.

A very peculiar species, which I have made the Type of a separate section Trigonopetalum, on account of its unusual petal shape and lip structure. The sepals and petals are greenish yellow with a red ochre coloured lip and a dark olive-green column.

Distribution : Endemic.

2. Microstylis cupuliflora J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1917), p. 23.

South Celebes : Mount Keppe - van Vuuren, Rachmat no. 548, flowering in Aug. 1913; Mount Taloang - van Vuuren, Rachmat.

The second species of the section Trigonopetalum. Readily distinguished from M. trigonopetala J.J.Sm. by the cupped, trilobed labellum which is deeply split in two at the front. The flowers are orange-yellow, the lip a deeper colour, and with a green column.

Distribution : Endemic.

3. Microstylis latifolia (Sm.) J.J.Sm., Orch. Flor. Jav. (1905), p. 248.

Malaxis latifolia Sm., in Rees Cyclop. (1814) XXII, no. 3.

Malaxis plicata Roxb., Hort. Beng. (1826), p. 63.

Spiranthes plantaginea Sprgl., Syst.III (1827), p. 703.

Dienia congesta Lindl., Bot. Reg. (1827), sub t. 825.

Dienia fusca Lindl., Gen. et Spec. Orch. (1830), p. 22.

Microstylis congesta Rchb.f., in Walp. Ann. VI (1861), p. 206.

Microstylis fusca Rchb.f., in Walp. Ann. VI (1861), p. 207.

Microstylis trilobulata Kurz., Veg. Andam. Rep. App. B. (1870), p. 19.

Microstylis Bernaysii F.v.M., Fragm. XI (1878), p. 21.

Liparis Bernaysii F.v.M., Fragm. XI (1878), p. 21.

South Celebes : Near Macassar - P. & F. Sarasin no. 824, flowering on 4th Jan. 1895; ebenda, in bushes on the route to Goar, alt. c. 30m - R. Schlechter no. 20788, flowering in Feb. 1910.

In its present delimitation, this species belongs to the most widely distributed of orchids in the monsoon regions. It is characterised by robust growth, the very small, pallid green or violet-suffused flowers in a densely clustered raceme and in the concave, deeply trilobed labellum, with the margins of the lobes entire. It is possible that the species may later on be split.

Distribution : Western and eastern borders of India, China, Sunda Islands, New Guinea and northern Australia?

4. Microstylis celebica Schltr., in Fedde Repert. X (1911), p. 30.

North Celebes, Minahassa : In humus of the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20467, flowering in Nov. 1909.

Within the section Pleidon, to which it belongs, this species is distinguished by the side lobes, each having only a single little tooth on the inside margin and with very blunt auricles at the base of the lip.

Distribution : Endemic.

5. Microstylis lokonensis Schltr., in Fedde Repert. X (1911), p. 30.

North Celebes, Minahassa : In humus of the forests on Mount Lokon, alt. c. 1000m - R. Schlechter no. 20445, flowering in Nov. 1909. [cf. 30/8, same citation].

This species of the section Pleiodon, is easily recognised by the conspicuous, short basal auricles of the labellum and the rhizomes with 4 - 5 leaves at their apex. Its flowers are yellow.

Distribution : Endemic.

6. Microstylis truncicola Schltr., in Fedde Repert. X (1911), p. 31.

North Celebes, Minahassa : On tree-trunks 1.5-2.0 ft. above the ground, on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20478, flowering in Nov. 1909.

I am not otherwise aware of species of Pleiodon growing epiphytically. It needs to be further observed whether the species always chooses this unusual habit on tree trunks. In habit the species is somewhat reminiscent of M. latifolia (Sm.) J.J.Sm., but has typical Pleiodon flowers of a greenish colour.

Distribution : Endemic.

7. Microstylis umbraticola Schltr., in Fedde Repert. X (1911), p. 31.

North Celebes : In humus of the forests on the upper Lampasioe [River], in the Toli-Toli district, alt. c. 180m - R. Schlechter no. 20661, flowering in Jan. 1909 [1910].

This species is distinguished by its lax inflorescences with delicate pedicels and is to be placed in the affinity of M. fasciata Schltr. from New Guinea. Its fairly small flowers are golden-yellow.

Distribution : Endemic.

8. Microstylis trichopoda Schltr., in Fedde Repert. X (1911), p. 32.

North Celebes, Minahassa : Near Tomohon, terrestrial - P. & F. Sarasin no. 1085, flowering on 3rd. April 1895; ebenda, alt. c. 900m - R. Schlechter no. 20445, flowering in Nov. 1909. [cf. 30/5, same citation].

Without doubt, we are considering here a close relative of the Papuasian M. pedicellata Rchb.f., but from which it is well distinguished by the labellum. Both species are characterised by the almost horizontally protruding, conspicuously long pedicels. For M. trichopoda Schltr. the leaves are dark green above and violet-red underneath, the flowers yellow-green and speckled with red.

Distribution : Endemic.

9. Microstylis klabatensis Schltr., in Fedde Repert. X (1911), p. 33.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 400m - R. Schlechter no. 20568, flowering in Dec. 1909.

Amongst those species known to date, this is the largest and most robust in the section Pleiodon from Celebes. It appears to stand closest to M. grandifolia Schltr. from New Guinea, but is not as tall as the latter. The flowers are yellowish, with the labellum violet at the base and a violet ovary.

Distribution : Endemic.

10. Microstylis nigrescens J.J.Sm., in Naturk. Tijdschr. Ned. Ind. LVIII (1898), p. 359, t. IV.

North Celebes, Minahassa : Without locality details - S.H. Koorders, in the year 1895; in humus of the forests on Mount Klabat, alt. c. 600m - R. Schlechter no. 20541, flowering in Dec. 1909.

This species is best placed in the section Commelinodes, on account of the more-or-less creeping rhizomes, but it is readily distinguished amongst the species of this section by the labellum. Furthermore, the colouring of the flowers is very characteristic, being dark violet-red, with yellow tips to the petals and lip.

Distribution : Endemic.

11. Microstylis repens Rolfe, in Kew Bull. (1899), p. 127.

Microstylis cordifolia Rolfe, in Kew Bull. (1899), p. 127.

North Celebes, Minahassa : On Mount Lokon - S.H. Koorders no. 29539, flowering on 7th Jan. 1895; in humus of the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20418, flowering in Nov. 1909; on Mount Klabat - S.H. Koorders no. 29537, flowering on 19th Jan. 1895; ebenda, alt. c. 1200m - R. Schlechter no. 20572, flowering in Dec. 1909.

I have not managed to find characteristics by which M. cordifolia Rolfe could be kept separate from M. repens Rolfe. The very small differences in dimensions are transitional, according to observations on my extensive material. Furthermore, it would appear that Koorders considered the two specimens collected by him, and which are the Types of Rolfe's two species, to be one and the same species.

The species is related to M. commelinifolia Zoll. from Java and like this one, belongs to the section Commelinodes. It is found frequently in the mountain forests of the Minahassa [district]. The flowers are of a very pale colour, the sepals and petals being pale yellow, the labellum almost white.

Distribution : Endemic.

31. Arundina Bl.

1. Arundina speciosa Bl. var. Sarasinorum Schltr. var. nov.

Differt a forma typica caule greciliore; foliis magnis approximatis angustioribus, in ramis floriferis 6.0-8.0mm tantum latis, labello petala paulo excedente.

Central Celebes : Sosso, in alang - P. & F. Sarasin no. 1231, flowering on 11th Aug. 1895.

The collectors describe the plant as follows : 'the main stem with yellow peduncle, imitates the grass peduncle exactly. Stems c. 2.0m (inclusive of several lateral shoots). The flower with a superb velvety carmine-red lip.

The variety is distinguished by very closely placed, conspicuously narrow leaves. The lip is also longer than usual, since it overtops the petals clearly in length.

Distribution of variety : Endemic.

32. Dilochia Wall.

1. Dilochia celebica Schltr. comb. nov.

Arundina celebica Schltr., in Fedde Repert. X (1911), p. 38.

North Celebes, Minahassa : On trees in the mountains near Tomohon, alt. c. 800m - R. Schlechter no. 20452, flowering in Nov. 1909.

It is probably better to keep the genera Dilochia and Arundina separate.

Such a separation appears justified on account of the epiphytic growth pattern, the broader, thicker leaves, the panicle nature of the inflorescence, with flowers of a thicker consistency and having narrowed petals, as well as the lip not embracing the column so closely, and by the round capsule.

Consequently, the genus Dilochia comprises three species : D. Wallichii Lindl., D. Cantleyi (Hook.f.) Ridl. and D. celebica Schltr. D. celebica Schltr. is closest to D. Wallichii Lindl., but has much smaller flowers.

33. Dendrobium Sw.

§ Desmotrichum

1. Dendrobium parietiforme J.J.Sm., in Ic. Bogor. II (1903), p. 92, t. 117.

Desmotrichum parietiforme Krzl., in Engl. Pflanzr. IV 5, II 13, 21 (1910), p. 349.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 800m - R. Schlechter no. 20449, flowering in Nov. 1909; near Palele - Behagel.

This represents one of the simplest forms of the section Desmotrichum. With its reduced pseudobulbs and fairly small longish-ovate, rigid leaves, as well as small yellowish flowers with a white labellum, this plant is very characteristic.

Distribution : Endemic.

2. Dendrobium rhodobalion Schltr., in Fedde Repert. VIII (1910), p. 501.

North Celebes, Minahassa : On solitary trees near Lansot, alt. c. 600m - R. Schlechter no. 20631, flowering in Dec. 1909.

One of the difficult to distinguish species of the affinity of D. flabellum Rchb.f., but having shorter pseudobulbs. The cream coloured flowers are covered with small matt-red spots.

Distribution : Endemic.

3. Dendrobium flabellum Rchb.f., Xen. Orch. II (1865), p. 75, t. 118.

Desmotrichum fimbriatum Bl., Bijdr. (1825), p. 329.

Dendrobium fimbriatum Lindl., Gen. et Spec. Orch. (1830), p. 76.

Dendrobium Binnendijkii Rchb.f., Xen. Orch. II (1865), p. 74.

Dendrobium Kunstleri Hook.f., Flor. Br. Ind. V (1890), p. 714.

Callista flabella O. Ktze., Rev. Gen. II (1891), p. 654.

Callista Binnendijkii O. Ktze., Rev. Gen. II (1891), p. 654.

Callista kunstleri O. Ktze., Rev. Gen. II (1891), p. 655.

Desmotrichum Binnendijkii Krzl., in Engl. Pflanzenr. IV 50, II B. 21 (1910), p. 353.

Central Celebes : Forest in the Koro district - P. & F. Sarasin no. 2138, flowering on 9th Sept. 1902.

I have not been able to check the specimen against the determination, since

only a single flower remains. However, the species is given in the Buitenzorg catalogue of orchids as being in cultivation there at the Garden.

The species appears to me to be too broadly set at present. Unfortunately, there are no details on the colour of the flowers of this plant from Celebes.

Distribution : Malacca Peninsula, Sunda Islands, Siam, Celebes.

4. Dendrobium rhipidolobum Schltr., in K. Schum. et Lauterb. Nachtr. (1905),p. 151.

'Celebes' : Without locality details.

J.J.Smith lists this plant in the Buitenzorg catalogue as from Celebes and in cultivation at the Garden. I cannot judge whether this plant really is identical with the one from New Guinea. J.J.Smith lists it also for Ceram. It is very close to D. flabellum Rchb.f., but is easily distinguished specifically, by the pallid flowers and the shape of the lip.

Distribution : New Guinea, Ceram, Celebes.

5. Dendrobium mentosum Schltr., in Fedde Repert. X (1911), p. 77.

North Celebes : On trees on the upper Lampasioe [River], near the old gold-mines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20662, flowering in Jan. 1910.

Likewise, a species of the D. flabellum Rchb.f. affinity, but with smaller flowers, which is characterised by a sharply protruding mentum, having an inclined apex. The flowers are yellow with the sepals and petals spotted and dotted in red on the outside.

Didtribution : Endemic.

6. Dendrobium heterobulbum Schltr., in Fedde Repert. VIII (1910), p. 501.

North Celebes, Minahassa : On trees in the coffee plantations on Mount Masarang, alt. c. 1000m - R. Schlechter no. 20471,[cf. 33/24, this possibly 20410], flowering in Nov. 1909; near Tomohon - P. & F. Sarasin no. 1080, flowering Nov. 1895.

A species well characterised by the shape of the front lobe of the labellum. Kränzlin mentions a plant under Desmotrichum scopa (Lindl.) Krzl. in the Sarasin collection (no. 812), but I cannot find it. I believe the above-mentioned number is correct, but he gave it a new (Mss) name, which however, does not occur in his monograph. His statement of 'November' for the time of flowering also does not agree with this specimen.

The flowers are pallid yellow, with violet-red spots on the outside.

Distribution : Endemic.

7. Dendrobium celebense J.J.Sm., in Bull. Dep. Agric. Ind. Néerl. XLV (1911),p. 15.

North Celebes, Minahassa : In the surroundings of Gorontalo - Hees, in 1900.

According to J.J.Smith, this species which is unknown to me, is closest to D. angulatum Lindl., but differs in larger dimensions, thick, rigid, dark green leaves, appreciably larger flowers and almost straight fringes on the lip. The sepals and petals are yellowish, with brown spots towards the apex, the lip yellowish, red-dotted, speckled,and beset with yellowish keels.

Distribution : Endemic.

§ Diplocaulobium

8. Dendrobium nitidicolle J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, no. III (1912), p. f.

South Celebes : Without locality details - J. Elbert, in the year 1910.

A small-flowered species of the section whose main centre of evolution appears to lie in the Moluccas and in New Guinea. It is characterised by the almost completely undivided labellum. The flowers are yellowish, with golden-yellow apices to the sepals and petals and golden yellow keels to the lip.

Distribution : Endemic.

9. Dendrobium stenophyton Schltr., in Fedde Repert. VIII (1910), p. 500.

Diplocaulobium arachne Krzl., in Engl. Pflanzr. IV 50, II B. 21 (1910), p. 334.

North Celebes, Minahassa : on trees near Tomohon - P. & F. Sarasin no. 569, flowering on 8th Oct. 1894; no. 783, flowering on 21st Nov. 1894; ebenda, alt. c. 900m - R. Schlechter no. 20501, flowering in Dec. 1909.

This species is easy to distinguish specifically from the others in the group [section] from Celebes by the long, thin rhizomes, long, narrow, stiffly erect leaves and the obovate front lobe of the labellum. The flowers are yellowish, later reddish-suffused, the labellum white with red spots.

Distribution : Endemic.

10. Dendrobium filiforme J.J.Sm., in Icon. Bogor. II (1903), t. 113, p. 43.

Diplocaulobium filiforme Krzl., in Engl. Pflanzr. IV 50, II B. 21 (1910), p. 341.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20481, flowering in Nov. 1909; on trees in the forests on Mount Klabat, alt. c. 1600m - R. Schlechter no. 20565, flowering in Dec. 1909.

A fairly short species of the section, with narrow leaves. It is characterised by the flower with the lanceolate, finely-tapered middle lobe of the labellum and the relatively short (2.8cm long) sepals. Its flowers are pallid yellow, whitish towards the base, the labellum sulphur yellow.

The origin of the plant was unknown for a long time until I was able to

identify it in the Minahassa [district].

Distribution : Endemic.

§ Latourea [Latouria]

11. Dendrobium macrophyllum A.Rich., Sert. Astrol. (1834), p. 22, t. 9.

Dendrobium Veitchianum Lindl., Bot. Reg. (1847), sub. t. 25.

Dendrobium ferox Hassk., in Retzia I, p. 1.

Callista Veitchiana O. Ktze., Rev. Gen. II (1891), p. 655.

Dendrobium tomohonense Krzl., in Engl. Pflanzr. IV 50, II B. 21 (1910), p. 244.

North Celebes, Minahassa : On trees near Tomohon - P. & F. Sarasin no. 655, flowering on 2nd Aug. 1894; no. 799, flowering on 1st Nov. 1894; ebenda, 1000m - R. Schlechter no. 20491, flowering in Nov. 1909; on trees in the forests of Mount Sopoetan, alt. c. 1200m - R. Schlechter no. 20619, flowering in Nov. 1909.

The only species, so far known in Celebes, of the large, mainly Papuasian section. The leaves are greenish white or yellow-greenish, with red markings, particularly in the lip.

Distribution : From Java across Ambon, the Moluccas, Timor, to New Guinea.

§ Eugenanthe

12. Dendrobium heterocarpum Wall., ex Lindl. Gen. et Spec. Orch. (1830), p. 78.

Dendrobium aureum Lindl., Gen. et Spec. Orch. (1830), p. 77.

Dendrobium rhombeum Lindl., Bot. Reg. (1843), t. 17.

Callista heterocarpa O. Ktze., Rev. Gen. II (1891), p. 654.

Dendrobium Hildebrandi Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 34 p. pt.

Dendrobium Minahassae Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910),p.107.

North Celebes, Minahassa : Without locality details - O. Warburg s. n. ; near Tomohon - P. & F. Sarasin no. 800 ; no. 810, flowering respectively on 1st and 15th Nov. 1894; ebenda, alt. c. 900m - R. Schlechter no. 20496, flowering in Nov. 1909; on trees in the forest clearings on Mount Sopoetan, alt. c. 1000m - R. Schlechter no. 20622, flowering in Dec. 1909; ebenda, alt. c. 1000m - S. H. Koorders no. 29527, flowering on 5th May 1895.

A widely distributed species with white or pale yellowish, beautiful flowers and beautiful brown-veined lip, golden-brown on the inside.

Distribution : From British India, across the Sunda Islands and Philippines and as far as Celebes.

13. Dendrobium superbum Rchb.f., in Walp. Ann. VI (1861), p. 282.

Dendrobium macrophyllum Lindl., Bot. Reg. (1834), Misc. p. 46 (non A.Rich.).

Dendrobium anosmum Lindl., Bot. Reg. (1844), Misc. p. 41.

Dendrobium macranthum Miq., Flor. Ind. Bat. III, p. 642.

Dendrobium Scortechinii Hook.f., Flor. Br. Ind. V (1890), p. 741.

Callista anosma O. Ktze., Rev. Gen. II (1891), p. 653.

Callista Scortechii O. Ktze., Rev. Gen. II (1891), p. 655.

North Celebes, Minahassa : On trees at the resthouse at Ratahan, alt. c. 400m - R. Schlechter no. 20608, flowering in Dec. 1909.

This splendid species with dark rose-red, strongly fragrant flowers and the labellum dark purple on the inside, likewise has a very wide area of distribution. The specimens from Celebes agree quite well with those from Borneo.

Distribution : From the hinterlands of India, across Borneo and the Philippines, Ambon and Ceram to New Guinea.

14. Dendrobium foetens Krzl., in Engl. Pflanzr. IV, 50, IIB. 21 (1910), p. 77.

North Celebes, Minahassa : Epiphyte at Tomohon - P. & F. Sarasin no. 587 [not no. 588 - remark by Schlechter], flowering on 4th Oct. 1894.

A very characteristic species in the section with appreciably smaller flowers than the two previous ones. The stems are almost clavate, much reduced below, but only up to 15cm long. In their shape the flowers are reminiscent of those of D. lamellatum Lindl. The flowers are white, the lip honey-yellow on the indide, fetid.

Distribution : Endemic.

15. Dendrobium tetrodon Rchb.f. var. van Vuurenii J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 3, I (1919), p. 113.

'Celebes' : Without locality details.

J.J.Smith gives the specimen in cultivation at the Buitenzorg Garden as coming from Celebes; it is unknown to me. The Type comes from Malacca and Java.

Distribution of variety : Endemic.

§ Calcarifera

16. Dendrobium oliganthum Schltr. sp. nov.

Epiphyticum, suberectum, c. 20—25 cm altum. Rhizoma valde abbreviatum; radicibus flexuosis, glabris. Caules pro subgenere gracillimi, simplices vel subsimplices, bene foliati, carnosuli, demum longitudinaliter sulcati, vix 3 mm diametro. Folia patentia, linearia, subacuta, 3—3,5 cm longa, medio fere ad 2 cm lata, textura tenuiora. Racemi in caulibus defoliatis apicem versus nati, erecti vel erecto-patentes, laxe pauci- (c. 2)-flori, pedunculo brevi, basi paucivaginulato cum rhachi usque ad 1,7 cm longo; bracteis parvulis. Flores illis *D. lancifolii* A. Rich. similes, rosei, glabri. Sepala oblonga, obtusiuscula, c. 1 cm longa, lateralia valde obliqua, basi margine anteriore valde dilatata cum pede columnae mentum oblongoideo-conicum, obtusiusculum, 1,3 cm longum formantia. Petala oblique elliptico-spathulata, obtusiuscula, quam sepala paululo breviora. Labellum circuitu rhombeo-obovatum basin versus sensim unguiculiformi-angustatum, supra basin ligula retrorsa, carnosula, ovato-trian-

gula, obtusa donatum, 3-ta parte anteriore obscure trilobatum, 2,2 cm longum, supra medium 1,3 cm latum, lobis lateralibus abbreviatis, obtusatis vix prominentibus, intermedio semiorbiculari, margine leviter crenulato-undulato. Columna brevis, vix 3 mm alta, clinandrii lobis lateralibus oblique et anguste triangulis, dorsalem paulo superantibus, pede leviter curvato, 1,3 cm longo. Ovarium graciliter pedicellatum, glabrum, 1,5 cm longum.

South Celebes ? : In the garden of 'Hotel Meyers' in Macassar.

The small specimen which, according to the proprietoress of the hotel, is reputed to come from the 'interior' was already in a very deplorable condition and had produced a few flowers in fright. The dimensions of the flowers therefore need correcting at a later date.

The species is clearly related to D. lancifolium A. Rich., but differs as a species in the linear leaves, the short 1 to 2-flowered racemes and in the shape of the lip.

Distribution : Endemic.

17. Dendrobium lancifolium A. Rich., Sert. Astrol. (1834), p. 20, t. 8.

Dendrobium lilacinum Teysm. et Binnend., in Nat. Tijdschr. Ned. Ind. XXVII (1864), p. 18.

Callista lancifolia O. Ktze., Rev. Gen. II (1891), p. 655.

Dendrobium vulcanicum Schltr., in Bull. Herb. Boiss. ser. 2, IV (1906), p. 459.

'Celebes' : Without locality details.

According to J.J.Smith, specimens of this species, coming from Celebes, are in cultivation at the Buitenzorg Garden. The species has very handsome rose-red flowers, with the labellum purple in front and having a violet margin.

Distribution : Boeroe, Ambon, Banda Archipelago.

18. Dendrobium Rachmatii J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1917), p. 56.

South Celebes : Mount Pasangmalambe - van Vuuren, Rachmat no. 963, flowering in Dec. 1913; Mount Tolmongah - van Vuuren, Rachmat no. 968, flowering in Dec. 1913.

The species is reputed to be closely related to D. lancifolium A. Rich., but differs in the recurved leaves, larger flowers with longer mentum, and in the much narrower labellum, with a protruding front lobe. The colouring of the flowers is given as 'red' and 'pale red'.

Distribution : Endemic.

§ Pedilonum

19. Dendrobium Alderwereltianum J.J.Sm., Bull. Jard. Bot. Buitenz. XXV (1917), p. 58.

South Celebes : Mount Sinadji - van Vuuren, Rachmat no. 898, flowering in

Nov. 1913; Mount Katong Moan - van Vuuren, Rachmat no. 1008, flowering in Jan. 1914.

A fairly short-stemmed species of the section Pedilonum, with few-flowered (two-flowered), short inflorescences in the axils of the upper leaves. The fairly large, c. 4.0cm long flowers are reputed to be coloured red.

Distribution : Endemic.

20. Dendrobium klabatense Schltr., in Fedde Repert. VIII (1910), p. 505.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 500m - R. Schlechter no. 20550, flowering in Dec. 1909.

An aberrant species in the section with fairly large, pale violet-pink flowers, having a yellowish spur and yellow anther. The species appears, as far as known, to stand quite isolated.

Distribution : Endemic.

21. Dendrobium purpureum Roxb. var. Steffensianum Schltr., in Fedde Repert. X (1911), p. 81.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 197, flowering in Mar. up to May 1894; on trees in the forests on Mount Klabat, alt. c. 800m - R. Schlechter no. 20549, flowering in Dec. 1909.

The variety differs from the Type in somewhat broader leaves, shorter inflorescences and the flowers having a denser covering of papillae. The flowers of the specimens I collected were rose-red, slightly paler at the base; the Sarasin ones were rose-red with green tips.

Distribution of variety : Endemic.

22. Dendrobium secundum Lindl., in Wall. Cat. (1832), no. 1996.

Pedilonum secundum Bl., Bijdr. (1825), p. 730.

Callista secunda O. Ktze., Rev. Gen. II (1891), p. 653.

'Celebes' : Without locality details.

Amongst the species of the section in Celebes, this one is, without doubt, the most robust. It is most closely related to the previous one, but easily recognised by the longer, protruding, dense and monostichous, many-flowered racemes of rose-red flowers. In the Buitenzorg Garden, one specimen of the species is in cultivation; it comes from Celebes.

Distribution : Malay Peninsula, Cochin [Indo] China, Sunda Islands.

§ Calyptrochilus

23. Dendrobium amblyogenium Schltr., in Fedde Repert. X (1911), p. 82.

Dendrobium erosum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 97 p. pt. (non Lindl.).

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 1083, flowering and fruiting on 30th March 1890; on trees in the forests on Mount Klabat, alt. c. 1000m - R. Schlechter no. 20574, flowering in Dec. 1909.

This probably is the most westerly species of the predominantly Papuasian group [section]. It agrees fairly closely with several species from New Guinea and is a further indication of the influence on the flora of Celebes by Papuasian types. The flowers are pink with whitish tips.

Distribution : Endemic.

§ Oxyglossum

24. Dendrobium parvulum Rolfe, in Kew Bull. (1899), p. 127.

North Celebes, Minahassa : On Mount Klabat - S.H. Koorders no. 29565, flowering on 19th Jan. 1895; on trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20471, flowering in Nov. 1909. [cf. 33/6, same citation].

From a plant-geographic point of view, the discovery of two quite typical [section] Oxyglossum species in Celebes is very interesting. Both belong to the small-flowered types and agree closely with the Papuasian forms. This one is well separated from the one following by the more creeping habit and much broader leaves, as well as the colouring of the flowers, which is violet-pink, with a cinnabar-red apex.

Distribution : Endemic.

25. Dendrobium masarangense Schltr., in Fedde Repert. X (1911), p. 78.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20473, flowering in Nov. 1909.

This species is easily distinguished from the one above by the compact growth, small-linear leaves, and white flowers with a yellow apex to the lip.

Distribution : Endemic.

§ Ceratobium [Spatulata]

26. Dendrobium Rumphianum Teysm. et Binnend., in Nat. Tijdschr. Ned. Ind. XXIV (1862), p. 317.

Dendrobium bicaudatum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 149 (an Lindl.?).

North Celebes : Near Tomohon (Minahassa) - P. & F. Sarasin no. 422, flowering on 22nd June 1894; no. 555, flowering on 8th Oct. 1894; ebenda, alt. c. 900m - R. Schlechter no. 20454, flowering in Nov. 1909; on trees near Lansot (Minahassa), alt. c. 700m - R. Schlechter no. 20635, flowering in Dec. 1909; on trees on Kapoetan Island, in Toli-Toli Bay, alt. c. 20m - R. Schlechter no. 20689, flowering in Jan. 1910.

In North Celebes, this, the only so-far known species of the group [section] within the region, is quite abundant and widely distributed. It is found from the coast up to the lower boundary of the mist forests, i.e. up to c. 1000m. The colouring of the flowers is whitish, at times with greenish tips to the petals and red veins on the lip.

Distribution : Celebes, Ambon, Moluccas.

§ Rhopalanthe

27. Dendrobium plebejum J.J.Sm., in Bull. Dep. Agric. Ind. Néerl. V (1907), p. 6.

North Celebes : Kota Menado (Minahassa) - S.H. Koorders no. 29574, flowering on 27th Dec. 1894; Bone near Gorontalo - J.J.Smith; on trees in the mangrove swamps near Toli-Toli - R. Schlechter no. 20716, flowering in Jan. 1910.

Of all the presently known species of the group [section], not only in the region, but generally, this is the most insignificant one. The almost circular, 5.0-7.0cm long leaves are fairly widely spaced. The small, white-green flowers measure about 1.0cm from the apex of the upper sepals to the apex of the fairly long mentum.

Distribution : Endemic.

28. Dendrobium cuneilabrum J.J.Sm., in Ic. Bogor. III (1906), p. 11, t. 205.

Dendrobium utriculariopsis Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 239.

North Celebes, Minahassa : Epiphytic near Tomohon - P. & F. Sarasin no. 204, flowering on 28th Apr. 1894; ebenda - S. H. Koorders no. 29569, flowering on 19th March 1895; no. 29570, flowering on 5th May 1895; on trees in the coffee plantations on Mount Masarang, alt. c. 1000m - R. Schlechter no. 20409, flowering in Nov. 1904 [1909]; on trees in the forests on Mount Sopoetan, alt. c. 1200m - R. Schlechter no. 20624, flowering in Nov. 1909.

A very abundant, particularly delicate orchid in the mountains of the Minahassa [district]. In old coffee plantations, which generally are very lucrative localities for orchid collectors, the trees are often covered comptetely with gracious, pendulous plants in all stages of development. As with all the species of the section, all individual flowers open on one and the same day. Since they last for only a day, nothing more of them can be seen on the following day. The flowers are white, finely pink-lined inside.

Distribution : Endemic.

29. Dendrobium juncifolium Schltr., in Fedde Repert. X (1911), p. 76.

North Celebes : On trees on the Lampasioe and Kuala Besar [Rivers], alt. c. 30-50m, in the Toli-Toli district - R. Schlechter no. 20680, flowering in Jan.

1910; on trees near Toli-Toli, alt. c. 30cm - R. Schlechter no. 20701, flowering in Jan. 1910.

A not very conspicuous species with thin, circular leaves like the two previous ones, but with a distinctive trilobed labellum. It is probably most closely related to D. gracile Lindl. from Java. Its flowers are very delicate, white with a yellow spot on the lip.

Distribution : Endemic.

30. Dendrobium faciferum J.J.Sm., in Bull. Dep. Agr. Ind. Néerl. XV (1908), p. 10.

'Celebes' : Without locality details.

A very slender, up to one metre long species with lanceolate leaves and relatively small, very numerously appearing, brilliant yellow flowers, truly a most unusual colour within this group [section]. According to the catalogue of the orchids at the Buitenzorg Garden, the species, which comes from Celebes, is in cultivation there. It was origionally described from Ambon.

Distribution : Ambon.

31. Dendrobium crumenatum Sw., in Act. Holm. (1800), p. 246.

Onychium crumenatum Bl., Bijdr. (1825), p. 326.

Callista crumenata O. Ktze., Rev. Gen. II (1891), p. 653.

'Celebes' : Without locality details.

This well-known and widely distributed orchid is, according to J,J, Smith, being cultivated at the Botanical Garden in Buitenzorg in specimens coming from Celebes. I have not yet seen specimens of the species from the Celebes. The specimens collected by the Sarasins under no. 191 at Kema (Minahassa) may perhaps belong here.

Distribution : From India across the Sunda Islands and Cochin [Indo]-China, and as far as Ambon.

32. Dendrobium sauveolens Schltr., in Fedde Repert. XIII [VIII] (1910), p. 504.

North Celebes : On trees near Toli-Toli - R. Schlechter no. 20691, flowering in Jan. 1910.

The species is related to D. crumenatum Sw. and to the two following, but specifically well separated in the labellum. The very agreeably fragrant flowers are white, the labellum with red veins and yellow keels.

Distribution : Endemic.

33. Dendrobium odoratum Schltr., in Fedde Repert. VIII (1910), p. 503.

Dendrobium podograria Krzl., in Engl. Pflanzr. VI, 50, II B. 21 (1910), p. 230 p. pt. (non Hook.f.).

Dendrobium gemmiferum Krzl., in Engl. Pflanzr. VI. 50, II B. 21 (1910), p. 237.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 86, flowering on 24th Mar. 1894; no. 198, flowering on 15th Mar. 1894; ebenda, alt. c. 900m - R. Schlechter no. 20457, flowering in Nov. 1909; Tondano - O. Warburg.

Easily distinguished from the related D. suaveolens Schltr. and D. papilioniferum J.J.Sm. by the labellum. The odour of the flowers is reminiscent of hyacinths. Their colour is snow-white, the red-veined labellum having a golden-yellow, swollen longitudinal stripe. I am now not in doubt that D. gemmiferum Krzl. belongs here.

Distribution : Endemic.

34. Dendrobium papilioniferum J.J.Sm., Orch. Amb. (1905), p. 43.

South-east Celebes : Lepo-Lepo near Kandari - O. Beccari s. n., May 1874.

(?) North Celebes, Minahassa : In primary forest near the Pinamorongán bivouac, near Kajoewatoe - S.H. Koorders no. 29573, flowering on 1st. Mar. 1895.

The flowers of this species are of a similar colour to that of the previous one; however, the front lobe of the labellum is violet-red, with a white margin. I have not seen the specimens placed here by Koorders. I consider it somewhat doubtful whether the species extends so far to the north.

Distribution : South-east Celebes, Ambon, Moluccas, Kei Islands.

§ Aporum

35. Dendrobium confusum Schltr., in Fedde Repert. X (1911), p. 72.

Dendrobium salicornioides J.J.Sm., Orch. Amb. (1905), p. 52 (non Teysm. et Binn.).

Dendrobium parciflorum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 222 (non R.f.).

North Celebes, Minahassa : On trees beside the way between Menado and Tomohon, alt. c. 20-800m, very abundant - R. Schlechter no. 20403, flowering in Nov. 1909; near Tomohon - P. & F. Sarasin no. 582, flowering on 13th Oct. 1844 [1894]; no. 798, flowering on 30th Oct. 1894; Kota Menado - S.H. Koorders no. 29572, flowering on 30th Dec. 1894.

I have written extensively, at an earlier date, about this species (Fedde Repert. X pp. 72-73). It was established on the specimens I collected in the Minahassa [district]. It is a true gem of the Minahassa flora, with its beautiful white flowers which, unfortunately, last always for only a very short time. I doubt whether the plant from Penang belongs here.

Distribution : Celebes, Ambon.

36. Dendrobium ramificans J.J.Sm., in Rec. Trav. Bot. Néerl., n.2 (1905), p. 2.

Dendrobium micranthum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 212 p. pt. (non Lindl.).

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20495, flowering in Nov. 1909; near Tondano - Forster.

D. rosellum Ridl. can probably be considered as one of the closest relatives of this species, our plant differing from it in the stronger branching, smaller flowers and shape of the lip. The flowers are white with pink-striped sepals and petals.

Distribution : Endemic.

37. Dendrobium thysanophorum Schltr., in Fedde Repert. X (1911), p. 73.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 1000m - R. Schlechter no. 20493, flowering in Nov. 1909.

In habit and on superficial observation, this plant is so similar to D. dischichum (Presl) Rchb.f. from the Philippines, that without examination of the flowers it is barely possible to keep them apart. However, the flowers although remarkably similar on the outside, have a completely different labellum.

Distribution : Endemic.

38. Dendrobium concavum J.J.Sm., var. Minahassae J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 3, I (1919), p. 107.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20456, flowering in Nov. 1909.

The plant from the Minahassa [district] has recently been separated from the Ambon plant as a separate variety. It has great similarity in habit with D. Smithianum Schltr. and the peculiar D. mirandum Schltr. The flowers are white.

Distribution of variety : Endemic.

39. Dendrobium Smithianum Schltr., in Fedde Repert. X (1911), p. 75.

? Dendrobium concavum J.J.Sm. var. celebense J.J.Sm., in Bull. Dep. Agric. Néerl. V (1907), p. 8.

North Celebes : On trees near Ayermadidi (Minahassa), alt. c. 150m - R. Schlechter no. 20522, flowering in Dec. 1909; in trees in the forests on the Lampasioe [River], Toli-Toli district, alt. c. 80m - R. Schlechter no. 20681, flowering in Jan. 1910.

The species is closely related to D. concavum J.J.Sm., but differs specifically in the labellum. The flowers are yellowish with a white lip having red markings.

var. nebularum Schltr., in Fedde Repert. X (1911), p. 75.

North Celebes, Minahassa : On trees in the mountain forests near Tomohon, alt. c. 800m - R. Schlechter no. 20433, flowering in Nov. 1909.

A variety with the labellum having shorter side lobes and a narrower front lobe.

Distribution : Endemic.

40. Dendrobium mirandum Schltr., in Fedde Repert. VIII (1910), p. 509.

North Celebes, Minahassa : On trees near Tampusso, not far from Tomohon, alt. c. 850m - R. Schlechter no. 20505, flowering in Dec. 1909; on trees in the forests of Mount Kaweng, alt. c. 800m - R. Schlechter no. 20601, flowering in Dec. 1909.

This species cannot be distinguished in habit from the two previous ones. It is however, excellently distinguished by the middle lobe lacerated in front, an occurrence I am unaware of otherwise in the whole section. The delicate flowers are white, the labellum having pale rose-red lateral lobes which have a darker veining.

Distribution : Endemic.

41. Dendrobium chrysotaenium Schltr., Fedde Repert. VIII (1910), p. 508.

North Celebes, Minahassa : On trees besides the main track near Kakaskassen, alt. c. 800-900m - R. Schlechter no. 20407, flowering in Nov. 1909.

One could well be in doubt with this species whether to place it in [sections] Aporum or Rhopalanthe, since one segment of the lower rhizome shows a slight swelling. In its flowers it is very reminiscent of D. confusum Schltr., but it has a completely different habit. The fragrant, snow-white flowers are embellished on the lip with a yellow central band, which is golden-yellow in the front.

Distribution : Endemic.

42. Dendrobium macraporum J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, VIII (1912), p. 38.

Central Celebes : Enrekang in Masenrempoeloe (District).

A very handsome species which, with a long peduncle and, for this section, very large flowers with a conspicuously long mentum, is reminiscent of D. MacFarlanei F.v.M. from New Guinea. The yellow-green flowers later become suffused with a pale golden-yellow.

Distribution : Endemic.

43. Dendrobium diaphanum Schltr., in Fedde Repert. VIII (1910), p. 508.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 600m - R. Schlechter no. 20525, flowering in Dec. 1909.

A very characteristic species, easily recognised by the up to 50cm long,

pendulous stems, carrying narrow leaves right up to the apex, and by the large flowers. The yellowish flowers have red veins and a yellowish labellum, with yellow ridges at the front.

Distribution : Endemic.

§ Oxystophyllum

44. Dendrobium hypodon Schltr., in Fedde Repert. VIII (1910), p. 502.

Dendrobium capitellatum Krzl., in Engl. Pfanzr. IV, 50, II B. 21 (1910), p. 215.

North Celebes, Minahassa : On trees near Tomohon - P. & F. Sarasin no. 556, flowering on 8th Oct. 1894; ebenda, alt. c. 900m - R. Schlechter no. 20502, flowering in Dec. 1909; on trees near Langowan, alt. c. 800m - R. Schlechter no. 20612, flowering in Dec. 1909.

This species was originally described by me in some detail and followed up a year later in Fedde Repert. X [1911], p. 71. It is most closely related to D. oligadenium Schltr. Its flowers are almost a black-purple colour.

Distribution : Endemic.

45. Dendrobium lepoense Schltr., in Fedde Repert. IX (1911), p. 285.

South-east Celebes : Near Lepo-Lepo, not far from Kandari - O. Beccari s. n. flowering in July 1884.

This species is readily distinguished from the related D. hypodon Schltr., by the narrow leaves and very blunt labellum. To date there are, unfortunately, no details of the colouring.

Distribution : Endemic.

46. Dendrobium oligadenium Schltr., in Fedde Repert. VIII (1910), p. 502.

North Celebes : On trees near Toli-Toli [no alt. given] - R. Schlechter no. 20693, flowering in Jan. 1910. [cf. 66/1, same citation].

In habit, the plant is reminiscent of D. atropurpureum Miq. from New Guinea. Its rhizomes are appreciably richer in leaves and longer than in the case of the two previous species; the leaves also are shorter. It is well characterised by the labellum, which is short bilobed in front and finely serrated at the margin.

Distribution : Endemic.

47. Dendrobium lockhartioides Schltr., in Fedde Repert. VIII (1910), p. 507.

Dendrobium atropurpureum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 217 p. pt. (non Miq.).

North Celebes : On trees at the foot of Mount Lokon, above Kakaskassen, alt. c. 1000m - R. Schlechter no. 20447, flowering in Nov. 1909; near Tomohon - P. & F.

Sarasin no. 559, flowering on 12th Oct. 1894.

One of the species of the group [section] with appreciably extended, branched stems. It is closely related to D. speculigerum Schltr. and D. cultratum Schltr., but is readily distinguished by the shape of the labellum, which is somewhat constricted in its upper third, and by the yellowish, reddish-suffused flowers, with pink petals and wine-red lip, darker on the inside.

Distribution : Endemic.

48. Dendrobium cultratum Schltr., in Fedde Repert. X (1911), p. 72.

North Celebes : On trees in the mountain forests near Toli-Toli, alt. c. 400m - R. Schlechter no. 20703, flowering in Jan. 1910.

Although having dark purple flowers, in common with D. atropurpureum Miq., this species is easily distinguished by the pendent, branched, c. 30cm long rhizomes. It differs from D. lockhartioides Schltr. in the longish labellum which is broadened at the middle.

Distribution : Endemic.

49. Dendrobium speculigerum Schltr., in Fedde Repert. VIII (1910), p. 507.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 900m - R. Schlechter no. 20567, flowering in Dec. 1909.

Amongst the species of the group [section] in Celebes, this one is characterised by the moderately branched, up to 70cm long, lax, pendulous stems; furthermore by the longish labellum which is densely papillose above, right up to the longish, glossy lamina. The flowers are brownish, with dark red petals and labellum.

Distribution : Endemic.

§ Grastidium

50. Dendrobium imitans Schltr., in Fedde Repert. X (1911), p. 80.

North Celebes, Minahassa : On trees near Lansot, alt. c. 700m - R. Schlechter no. 20625, flowering in Dec. 1909.

The species is closely related to D. salaccense (Bl.) Lindl. from Java, but differs in the shape of the labellum and the relatively long mentum of the flowers, as well as in the more robust growth with up to 1.0m long stems. The flowers are white-yellow.

Distribution : Endemic.

51. Dendrobium truncicola Schltr., in Fedde Repert. X (1911), p. 81.

North Celebes, Minahassa : On tree-trunks on the hills near Lansot, alt. c. 700m - R. Schlechter no. 20630, flowering in Dec. 1909.

This species is reminiscent of D. acuminatissimum (Bl.) Lindl. from the Sunda Islands. Like the latter it has long-acuminate leaves and long-acuminate sepals and petals. It can be separated specifically from D. acuminatissimum (Bl.) Lindl. by the labellum. The flowers are whitish, at times lightly rose-red suffused.

Distribution : Endemic.

52. Dendrobium sororium Schltr., in Fedde Repert. VIII (1910), p. 504.

Dendrobium pruinosum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 197 p. pt. (non Teysm. et Binnend.).

North Celebes, Minahassa : On solitary trees near Kakas, alt. c. 650m - R. Schlechter no. 20603, flowering in Dec. 1909; near Tomohon, P. & F. Sarasin no. 210, flowering on 18th Apr. 1894; no. 428, flowering on 15th June 1894.

D. imbricatum J.J.Sm. from New Guinea, can be considered as the closest relative, but D. pruinosum Teysm. et Binnend. also stands close. Our plant, however, is well separated from both of these species by its flowers. The leaves and rhizomes of the whole plant are blue-green to brown-purple-green, the flowers are a pallid yellow.

Distribution : Endemic.

§ Pleianthe

53. Dendrobium phragmitoides Schltr. sp. nov.

Epiphyticum, elatum, verosimiliter ultra metrale. Caules simplices, bene foliati, vaginis foliorum arcte amplectentibus omnino obtecti, 8 mm diametro. Folia erecto-patentia, lanceolato-linearia, subacuta, basi rotundato-contracta, coriacea, 19—23 cm longa, infra medium 1,6—1,8 cm lata. Flores more sectionis lateralibus ex pulvine lineari (rhachi lateraliter adnata) nati, 6—10, patentes; bracteis minutis, deltodeis. Sepala ovato-oblonga, obtusa, 8 mm longa, glabra, lateralia obliqua cum pedo columnae mentum breve c. 3 mm longum formantia. Petala oblique ligulata, 3-nervia, obtusiuscula, quam sepala subaequilonga, glabra. Labellum circuitu ellipticum, e basi cuneata supra medium trilobum, 7 mm longum, medio fere 4,25 mm latum, lobis lateralibus oblique semiobovatis, valde obtusis, intermedio antico suborbiculari, breviter acuminato, lineis 3 parallelis carinato-incrassatis e basi labelli usque in medium lobi antici decurrentibus appendicibusque pluribus subulatis in medio lobi antici ornatum. Columna brevis, glabra, 2 mm alta, clinandrii lobis lateralibus inaequaliter 2-dentatis, dorsali subulato paululo brevioribus, pedo decurvulo, mediocri, c. 3 mm longo. Ovarium pedicellatum, glabrum c. 1,2 cm longum.

North Celebes, Minahassa : Environs of Menado - Consul H.F. Steffens' collector.

A very interesting discovery, being the first representative of the section outside New Guinea. The species is closely related to D. pleianthum Schltr., but is well characterised by the labellum. In habit it is reminiscent of our 'bulrush', although not as tall.

Distribution : Endemic.

§ Dolichocentrum

54. Dendrobium furcatum Reinw., ex Lindl., in Journ. Linn. Soc. III (1854), p. 13.
Dendrobium amabile Schltr., in Fedde Repert. VIII (1910), p. 505.
Dendrobium Sarasinorum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 55.
Dendrobium dolichocentrum Koorders, Syst. Verz. III (1914), p. 23, 21 (1910), p. 55.

North Celebes, Minahassa : Without collection details - Reinwardt; Kota Menado - S.H. Koorders no. 29527, flowering on 9th Apr. 1895; near Tomohon - P. & F. Sarasin no. 193, flowering on 26th Apr. 1894; on Mount Lokon-Empung - P. & F. Sarasin no. 194, flowering on 17th May 1894; on Mount Masarang, alt. c. 900m - R. Schlechter no. 20463, flowering in Nov. 1909; summit of [Mount] Sudara - P. & F. Sarasin no. 193, flowering on 17th Oct. 1893; on trees in the forests of Mount Klabat, alt. c. 1700m - R. Schlechter no. 20577, flowering in Dec. 1909; on trees in the forests on Mount Sopoetan, alt. c. 1300m - R. Schlechter no. 20623, flowering in Dec. 1909.

A gem of the mountain forests of the Minahassa [district]. The delightful plant is frequently found on older trees in coffee plantations. It stands completely isolated, so that I felt myself compelled to make it the Type of its own section Dolichocentrum. That is probably also the reason why Koorders in his list, quotes a name 'Dendrobium dolichocentrum Schltr.', which I never gave. The fairly large flowers are pure white.

Distribution : Endemic.

§ Conostalix

55. Dendrobium lacustre Schltr. sp. nov.

Suffrutex pergracilis, erectus, usque supra 75 cm altus. Rhizoma decumbens, radicans. Caules simplices vel subsimplices, bene foliati, teretiusculi, vaginis foliorum pallide brunnescenti-maculatis, sparsim furfuraceo-puberulis omnino obtecti, c. 2—3 mm diametientes. Folia erecta vel suberecta, linearia vel lineari-ligulata, inaequaliter et obtuse bilobulata, 4,5—6 cm longa, medio vel infra medium 3,5—4,5 mm lata, glabra. Flores 1—2-ni. subpatuli, illis *D. conostalix* R. f. paulo majores, glabri; pedunculo nullo; bractea ovali, apiculata, ovario pedicellato multo breviore. Sepala oblonga, breviter acuminata vel acuta, dimidio superiore recurvata, 7 mm longa, lateralia obliqua, basi margine anteriore valde decurrentia cum pede columnae et basin labelli mentum recurvum, calcariforme c. 7,5 mm longum obtusiusculum formantia. Petala oblique ligulata, supra medium leviter dilatata, breviter acuminata, glabra, margine subdenticulata, quam sepala subaequilonga. Labellum e basi unguiculato-angustata lineari, sensim paulo dilatatum, supra medium trilobatum, totum c. 1,6 cm longum, explanatum inter apices loborum lateralium 5,5 mm latum, lobis lateralibus parvulis, oblique triangulis, acutis, intermedio multo majore, subquadrato-obovato, antico breviter exciso, margine dimidio inferiore subcrenulato, c. 4,5 mm longo, infra apicem 4,5 mm lato, carnoso, carinis 2 obscuris parallelis in medio labelli in lobo intermedio mox evanescentibus. Columna brevis, crassiuscula, pede elongato, c. 7,5 mm longo, clinandrii lobis lateralibus oblique semiquadratis, truncatis, dorsali dentiformi haud longiore. Anthera rhomboideo-cucullata, glabra. Ovarium pedicellatum subclavatum, c. 8 mm longum.

Dendrobium conostalix Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 162 p. pt. (non Rchb.f.).

Central Celebes : On the south bank of Lake Posso - P. & F. Sarasin no. 850. flowering on 19th Feb. 1895.

The species is most closely related to D. paludicola Schltr., but differs from this, as well as from D. conostalix Rchb.f., in the hirsute and spotted sheaths of the leaves. In degree of hairiness it is about intermediate between D. villosulum Wall. and D. conostalix Rchb.f. The flower colouring for D. lacustre Schltr. is given as white. Kränzlin shuffled the species of this affinity wildly about, whereas, in general, many Dendrobium species were so much clearer defined than before his publication of this so-called 'monograph.' In this area he has managed to create a jumble without equal.

Distribution : Endemic.

§ Monanthos

56. Dendrobium Koordersii J.J.Sm., Orch. Amb. (1905), p. 67.

North Celebes, Minahassa : In primary forest, [Mount] Lolomboelan - S.H. Koorders no. 29561, flowering on 23rd Apr. 1895; on trees near Tomohon, alt. c. 900m - R. Schlechter no. 20482, flowering in Nov. 1909.

The only species of the group [section], so far known in Celebes. It is closely related to the Papuasian forms and clearly is the most westerly representative of the section. The flowers are greenish white, the labellum spotted in dark red.

Distribution : Celebes, Ambon.

34. Eria Lindl.

§ Goniorhabdos

1. Eria javanica Bl., Rumphia (1836), p. 23.

Dendrobium javanicum Sw., in Act. Holm (1800), p. 247.

Eria stellata Lindl., Bot. Reg. (1825), t. 904.

Dendrolirium rugosum Bl., Bijdr. (1825), p. 345.

Eria rugosa Lindl., Gen. et Spec. Orch. (1830), p. 66.

Eria vaginata Benth. ex Jacks. Ind. Kew. I (1893), p. 864.

Tainia stellata Pfitz., in Engl. et Prantl., Nat. Pflanzfam. II, 6 (1889), p. 153.

North Celebes, Minahassa : On trees, not far from Lansot, alt. c. 700m - R. Schlechter no. 20626, flowering in Dec. 1909.

A widely distributed plant, whose final specific delimitation is probably still somewhat uncertain. In Celebes it appears to be the sole representative of the group [section]. Its flowers are yellowish on the outside, white on the inside.

Distribution : From the hinterlands of India, across the Sunda Islands, Philippines, Celebes, Ambon to Timor.

§ Aeridostachya

2. Eria vulcanica Schltr., in Fedde Repert. VIII (1910), p. 560.

North Celebes, Minahassa : On trees besides the crater rim of Mount Mahawo, alt. c. 1300m - R. Schlechter no. 20511, flowering in Dec. 1909.

The sole species of the small group [section], so far known in Celebes. It is distinguished from the others by the shape of the labellum. Its flowers are pale yellow, outside brownish stellate-tomentose, the stigma with a red margin, the anther dark purple-red.

Distribution : Endemic.

§ Polyura

3. Eria quinquangularis J.J.Sm., Orch. Amb. (1905), p. 76.

Celebes : Without locality details.

This species evidently is related to E. vagans Schltr., and which was described initially from Ambon, is, according to statements from J.J.Smith, being cultivated with specimens originating from Celebes. It differs from E. vagans Schltr. in the colouring of the flowers and in the shape of the lip.

Distribution : Ambon, Celebes.

4. Eria vagans Schltr., in Fedde Repert. X (1911), p. 90.

North Celebes : On trees on Kapoetan Island, in Toli-Toli Bay, alt. c. 10m - R. Schlechter no. 20678, flowering in Jan. 1910. [cf. 61/1, same citation].

With the branching rhizome spreading widely in all directions, this species is easily distinguished from E. glabra Schltr., the third species in the group mentioned below. In habit it is reminiscent of several Papuasian species of the section. The flowers are reddish white.

Distribution : Endemic.

[4a.] Eria glabra Schltr., in Fedde Repert. X (1911), p. 90.

North Celebes : On trees in the forests on the upper Lampasioe [River], near the old goldmines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20673, flowering in Jan. 1910.

As already mentioned above, this species is easily distinguished from Eria vagans Schltr. by its habit, since here the rhizome is much reduced and the slender pseudobulbs therefore, are more compact. Its flowers are pale yellowish, with the lip a pale purple in its lower half.

Distribution : Endemic.

§ Hymeneria

5. Eria anomala Schltr., sp. nov.

Epiphytica, erecta, c. 13 cm alta. Rhizoma valde abbreviatum; radicibus filiformibus, flexuosis, glabris. Pseudobulbi cylindracei, bifoliati, c. 5 cm alti, 1 cm diametro. Folia erecto-patentia, oblongo-ligulata, obtusiuscula, coriacea, basi sensim in petiolum brevem angustata, lamina 7—8 cm longa, medio fere 2 cm lata, petiolo canaliculato 1,5 cm longo. Racemus juxta apicem pseudobulbi natus, erectus, subdense pluri-(c. 4—5-)florus, pedunculo petiolo aequilongo incluso c. 3,5 cm longus, pilis brevibus niveis stellatis obsessus; bracteis oblongis, patentibus, ovarium fere aequantibus. Flores in sectione parvi, extus breviter stellato-puberuli, roseo-albidi. Sepalum intermedium oblongum, obtusum, 5-nervium, vix 4 mm longum, lateralia perlate et oblique triangula, basi margine anteriore dilatata cum pede columnae mentum oblongoideum, obtusum, 4 mm longum formantia, obtuse apiculata. Petala oblique vel subfalcato-oblonga, obtusa, 3-nervia, glabra, sepalo intermedio subaequilonga. Labellum e basi suborbiculari-conconcava cuneatum, antice 3-lobum, 5 mm longum, antice inter apices loborum lateralium vix 3 mm latum, glabrum, in tertia parte basilari medio gibbo parvulo obtuso donatum, caeterum nudum, lobis anticis triangulis, subacutis, subaequimagnis. Columna brevis, glabra, pede longo, 4,5 mm longo, apice incurvulo. Ovarium breviter pedicellatum subclavato-cylindraceum, breviter stellato-puberulum.

North Celebes, Minahassa : Amoerang?

The plant was in cultivation in a garden at Menado and from the owner I obtained a small piece (a pseudobulb with leaves and inflorescence); it is reputed to have been brought in from the vicinity of Amoerang.

I have placed the species under [the section] Hymeneria to avoid having to create a new section on such sparse material. It differs from all species in the section, but in floral structure is somewhat reminiscent of Aeridostachya. It is distinguished from [section] Aeridostachya by its Hymeneria habit.

Distribution : Endemic.

6. Eria kawengica Schltr., in Fedde Repert. X (1911), p. 86.

North Celebes, Minahassa : On trees in the forests of Mount Kaweng, alt. c. 1000m - R. Schlechter no. 20595, flowering in Dec. 1909.

Likewise an aberrant species of the section Hymeneria. It is distinguished by the monofoliate pseudobulbs, the medium-large, white-pink flowers, with the labellum yellow in front, and by the very characteristic shape of the lip. To allow for a clearer delimitation later on, it would almost appear necessary to separate a further few species of [the section] Hymeneria and place them into sections which would have to be newly created.

Distribution : Endemic.

7. Eria bractescens Lindl., in Bot. Reg. (1941) [?1841], Misc. 18.

Pinalia bractescens O. Ktze., Rev. Gen. II (1891), p. 679.

Celebes : Without locality details.

In the catalogue of orchids in cultivation at the Buitenzorg Garden, this

species is listed, likewise, as coming from Celebes. I must admit to the possibility of this plant being considered specifically different. I can hardly imagine that the true E. bractescens Lindl. would really have spread to Celebes.

Distribution : British India, West Malaysia, (Ambon?, Philippines?).

[7a.] Eria oreogena Schltr., in Fedde Repert. X (1911), p. 87.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 600m - R. Schlechter no. 20584, flowering in Dec. 1909.

A typical species of the group [section], belonging to the affinity of E. oligotricha Schltr. from New Guinea. The flowers are whitish yellow, with a reddish labellum and golden-yellow front lobe.

Distribution : Endemic.

§ Cuneilabium

8. Eria rhizophoreti Schltr., in Fedde Repert. X (1911), p. 87.

North Celebes : On trees in the mangrove swamps near Toli-Toli, alt. c. 10m - R. Schlechter no. 20694, flowering in Jan. 1910.

This is the sole representative outside Papuasia of a small group [section] which also includes E. dischorensis Schltr., E. montana Schltr. and E. singulifolia Schltr. The species are all well distinguished by habit and shape of the lip.

The flowers of our species are yellowish, with the side lobes of the labellum being red-margined.

Distribution : Endemic.

§ Urostachya

9. Eria pulla Schltr., in Fedde Repert. X (1911), p. 88.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 800m - R. Schlechter no. 20551, flowering in Dec. 1909.

This species is easily recognised from all others in the region, by the shape of the labellum. It has a uniform trilobed lamina in front, and above the concave,base on each side, has a short dentate lobule. The flowers are pale rose-red, with a dark violet-red column.

Distribution : Endemic.

10. Eria celebica Rolfe, in Kew Bull. (1899), p. 128.

Eria straminea Krzl., in Engl. Jahrb. XLIV, Beibl. 101 (1910), p. 24.

Eria multiflora Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 120 p. pt. by Lindl.

North Celebes, Minahassa : On Mount Masarang - P. & F. Sarasin no. 226, flowering on 10th May 1894; ebenda, on trees, alt. c. 1200m - R. Schlechter no.

20469, flowering in Nov. 1909; on Mount Lokon - S.H. Koorders no. 29558, flowering in Jan. 1895; on Mount Klabat - S.H. Koorders no. 29563, flowering on 19th Jan. 1895; on Mount Sopoetan, alt. c. 1000m - P. & F. Sarasin no. 1093, flowering on 19th Apr. 1895.

The species is closely related to E. opeatoloba Schltr., but specifically different in the shape of the labellum. Above the base, the labellum has, supported at the apex, two short lobules which surround the thicker base of the lip, like very thin margins. The whole front portion of the lip resembles that of E. opeatoloba Schltr. The flowers are yellowish, reddish at the base, the front lobe of the labellum being yellow.

Distribution : Endemic.

11. Eria opeatoloba Schltr., in Fedde Repert. VIII (1910), p. 511.

North Celebes, Minahassa : On trees near Mount Tampusso, alt. c. 900m - R. Schlechter no. 20504, flowering in Dec. 1909.

A close relative of E. celebica Rolfe, which initially I considered could perhaps be only a variety of E. celebica Rolfe. However, the structure of the broader labellum, which lacks the peculiar side lobules at the base, is really too different. The colouring of the flowers is about the same as for E. celebica Rolfe.

Distribution : Endemic.

12. Eria Minahassae Schltr., in Fedde Repert. X (1911), p. 88.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20634, flowering in Jan. 1910; ebenda - P. & F. Sarasin no. 424, flowering from 20th up to 26th June 1894; no. 811, flowering on 15th Nov. 1894; near Sonder - O. Warburg no. 15752.

This species is a relative of E. erecta Lindl., but is more reminiscent of E. multiflora Lindl. Amongst the species of the section in the Minahassa [district], it is easily recognised by the robust growth and the relatively thick pseudobulbs.

The flowers are pale or dark rose-red, with a darker lip and a dark purple column.

Distribution : Endemic.

13. Eria sopoetanica Schltr., in Fedde Repert. X (1911), p. 88.

North Celebes, Minahassa : On trees in the forests on Mount Sopoetan, alt. c. 1300m - R. Schlechter no. 20618, flowering in Dec. 1909.

A close relative of the previous one and almost as robust in growth, but distinguished by the shape of the labellum and the paler colouring of the flowers.

The flowers are one-coloured, whitish rose-red.

Distribution : Endemic.

14. Eria amplectens J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, no. III (1912), p. 12.

South-east Celebes : Kolak - J. Elbert, in the year 1909.

This species is distinguished from all the other currently known species in the group [section], by the absence of the lobules at the base of the labellum. In habit, according to J.J. Smith, it is reputed to differ very little from the other Urostachya species. The rhizomes of the pseudobulb are leaved only at the apex and carry dense racemes of small, white, purple-tinged flowers.

Distribution : Endemic.

§ Mycaranthes

15. Eria tricuspidata Rolfe, in Kew Bull. (1899). p. 128.

Eria Sarasinorum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 129, p. pt.

Eria tomohonensis Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 128.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no.224, flowering on 2nd May 1894; no. 433a, flowering on 20th June 1894; no. 803, flowering on 21st Nov. 1894; on trees in the coffee plantations on Mount Masarang, alt. c. 1000m - R. Schlechter no. 20408, flowering in Nov. 1909; on Mount Lokon, mid-region - P. & F. Sarasin no. 433, flowering on 6th June 1894; on Mount Sopoetan- S.H. Koorders no. 29564, flowering on 5th May 1895.

A frequent orchid of the Minahassa [district], where it occurs on large forest trees, as well as in coffee plantations. The shape of the labellum is very characteristic.

The flowers on the outside are whitish tomentose; on the inside greenish yellow, with red spots and the lip callus dusted as with white flour [farinose].

Distribution : Endemic.

16. Eria Vanvuurenii J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 61.

South Celebes : Mount Ambabah, near Padah village - van Vuuren, Rachmat no. 560, flowering in Aug. 1913.

According to J.J.Smith, the species is reputed to be reminiscent of Eria tricuspidata Rolfe in the shape of the lip, but to attain the size of E. latifolia Rchb.f. At present, details on the colouring of the flowers are lacking.

Distribution : Endemic.

§ Aporodes

17. Eria decipiens Schltr., in Fedde Repert. X (1911), p. 85.

North Celebes : On trees in the mangrove swamps near Toli-Toli - R. Schlechter no. 20692, flowering in Jan. 1910.

In habit and outwards appearance, the plant has much similarity with Eria aporoides Lindl. from the Philippines, but differs in the labellum. All the species of this section are very similar, so are E. soronensis Schltr. and E. incrassata (Brongn.) Schltr. (Aporum incrassatum Brongn.).

The flowers are white.

Distribution : Endemic.

18. Eria aporoides Lindl., in Journ. Linn. Soc. III (1859), p. 60.

North Celebes, Minahassa : S.H. Koorders no. 29529, on 30th Dec. 1894.

In his systematic compilation, Koorders lists this species under his Minahassa Plants (III, 1, p. 24.), but I am fairly certain that it represents E. decipiens Schltr. I have included the plant here, since it is in Koorder's list, but I have not seen specimens of it.

Distribution : Philippines.

§ Cylindrolobus

19. Eria virginalis Schltr., in Fedde Repert. VIII (1911) [1910], p. 511.

Trichotosia virginalis Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 161.

Trichotosia pleistophylla Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 160.

North Celebes, Minahassa : Tomohon - P. & F. Sarasin no. 660, flowering on 1st Aug. 1894; on trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20461, flowering in Nov. 1909.

This species is very well distinguished by the narrow shape of its flowers, and, above all, by its very characteristic labellum. I know of no species with which it is related.

The flowers are snow-white.

Distribution : Endemic.

20. Eria quadricolor J.J.Sm., in Icon. Bogor. III (1906), p. 31, t. 213.

Trichotosia quadricolor Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 159.

North Celebes, Minahassa : Without locality details - S.H. Koorders, in the year 1895; in the environs of Menado - Consul F.C. Steffens' collector, in the year 1910.

In habit, the plant is reminiscent of E. rigida Bl., but is well character-

ised by the lacerated middle lobe of the labellum.

The flowers are white, the sepals yellow and red-flushed at the base, the lateral ones being brown-striped at the base, and the lip having red side lobes. In the Garden at Buitenzorg, J.J.Smith has noticed a variety with almost white flowers.

Distribution : Endemic.

21. Eria kandariana (Krzl.) Schltr., in Fedde Repert. IX (1911), p. 285.

Dendrobium kandarianum Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1910), p. 190.

South-east Celebes : Near Lepo-Lepo, not far from Kandari - O. Beccari s. n. flowering in May 1874.

The species is closely related to E. quadricolor J.J.Sm., but is easily recognised by the barely-lacerated middle lobe.

Precise details on the flower colouring are still lacking.

Distribution : Endemic.

§ Trichotosia

22. Eria klabatensis Schltr., in Fedde Repert. VIII (1910), p. 310.

Trichotosia klabatensis Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 161.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 800m - R. Schlechter no. 20539, flowering in Dec. 1909.

One of the largest species in the section. It appears to stand close to E. phaeotricha Schltr. from New Guinea and more so to E. Teysmanii J.J.Sm. from Borneo, but is smaller than the latter.

The flowers are whitish green, with yellow hairs on the outside, the labellum reddish in front.

Distribution : Endemic.

23. Eria hirta Bl., Mus. Bot. Lugd. Bat.II (1881), p. 184.

Pinalia hirta O.Ktze., Rev. Gen. II (1891), p. 678.

Trichotosia canaliculata Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 155 p. pte.

Epiphytica, patula, usque ad 60 cm longa. Rhizoma valde abbreviatum. Caules simplices, teretes, bene foliati, vaginis foliorum arcte amplectentibus, dense pilis pallide fuscis obsessis omnino obtecti, 4 - 5 mm diametientes. Folia erecto-patentia oblongo-lanceolata, obtusiuscula vel obtuse acuminata, obliqua, coriacea, superne glabrata, subtus et et margine pilis tenuibus brevibus, pallidifuscis obtecta, 6—8 cm longa, 2—2,8 cm lata. Racemi breves, 2,5—3 cm longi, densius pauci-vel pluriflori; bracteis ovatis, dense rufo-pilosis, ovarium excedentibus. Flores in sectione inter mediocres. Sepala c. 1,2 cm longa, extus dense fulvo-pilosa, obtusiuscula, intermedium anguste oblongum, lateralia anguste ovata, basi margine anteriore valde ampliata cum pede columnae mentum

oblongoideium, obtusum, c. 5 mm longum formantia. Petala oblique ligulata, obtusiuscula, sparsim et breviter pilosula, sepalis subaequilonga. Labellum e basi contracta subunguiculata cuneatum, 1,3 cm longum, tertia parte anteriore 3-lobatum, explanatum inter apices loborum lateralium 5,5 mm longum, medio carinis 2 obtusis, basin versus evanescentibus usque infra basin lobi intermedii decurrentibus ornatum, carina simili minute papillosa e medio usque in apicem labelli decurrente interjecta auctum, lobis lateralibus brevibus, oblique triangulis obtusis, antice truncatis, intermedio antico reniformi-rhombeo, antice breviter exciso, marginibus irregulari, 4 mm longo, supra basin 5,5 mm lato. Columna semiteres, puberula, 4 mm alta, clinandrii lobis lateralibus semiquadratis, truncatis. Ovarium cylindraceum perdense fulvo-pilosum, 6 mm longum.

North Celebes, Minahassa : In the environs of Menado - Consul H.F. Steffens' collector, in the year 1911; on trees near Tondano - Forster; on trees near Tomohon - P. & F. Sarasin no. 651, flowering on 2nd Aug. 1894.

The species belongs to the affinity of E. ferox Bl., but from which it differs in the paler, non-protruding shorter hairs, the weaker growth, smaller leaves, flowers in a more compact raceme, and in the shape of the labellum.

I have described the species here again, since up to the present it is very little known.

The flowers are yellowish white.

Distribution : Endemic.

24. Eria gowana Schltr., sp. nov.

Epiphytica, dependens, usque ad 50 cm longa. Rhizoma valde abbreviatum; radicibus filiformibus, tenuibus, glabris. Caules simplices, densius foliati, teretes, vaginis foliorum arcte amplectentibus, fusco-hirtis omnino obtecti, usque ad 7 mm diametro. Folia erecto-patentia oblique oblonga vel oblongo-lanceolata, obtusiuscula vel obtusiuscule acuminata, superne subglabra, subtus et margine rufo-pilosa 4,5—6,5 cm onga, 1,3—2,5 cm lata. Racemi patuli, laxe pluriflori, folia haud superantes, pedunculo et rhachi dense rufo-hirti; bracteis ovatis, obtusiusculis, ovarium bene superantibus. Flores in sectione mediocres, albidi. Sepala extus dense rufo-pilosa, obtusiuscula, c. 1,2 cm longa, intermedium ligulato-oblongum, lateralia valde obliqua oblonga, basi margine anteriore dilatata cum pede columnae mentum oblongoideum, obtusum, 7 mm longum formantia. Petala oblique oblongo-ligulata, obtusa, basin versus paulo angustata, glabra, sepalis subaequilonga. Labellum e basi unguiculato-angustata circuitu obovatum, 4-ta parte anteriore 3-lobatum explanatum 1,4 cm longum, inter apices loborum lateralium 5 mm latum, usque in basin lobi intermedii carinulis 3 papillosis basin versus evanescentibus, medio latere utrinque carina breviore glabra auctis ornatum, lobis lateralibus brevibus, semi-oblongis, obtusis, intermedio antico, ex isthmo brevissimo lato reniformi, margine undulato-crenato, 6 mm lato. Columna mediocris, semiteres, clinandrii lobis lateralibus truncatis subcrenulatis. Ovarium breviter cylindraceum, dense rufo-pilosum, c. 5 mm longum.

South Celebes : Gowa district.

The species was in cultivation in a garden at Macassar. I was told that it came from the Gowa district. It is related to E. Steffensii Schltr., but is readily distinguished as a species by the labellum.

The flowers are of a whitish colour.

Distribution : Endemic.

Undetermined species.

25. Eria sp. nov.?

Trichotosia canaliculata Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 155, p. pte.

South Celebes : On the summit of Pic [Mount] Maros, alt. c. 1330m - P. & F. Sarasin no. 1121, on 4th July 1895.

This plant was identified by Kränzlin as Eria canaliculata Bl., but with which it has nothing in common. Unfortunately, the specimen is without flowers. According to the habit, I would conclude that it belongs to the affinity of E. vulpina Lindl. from the Philippines.

26. Eria sp. nov.?

Trichotosia elongata Krzl., in Engl. Pflanzr. IV, 50, II B. 21 (1911), p. 150, p. pte.

North Celebes : Salabanca - P. & F. Sarasin no. 870, on 23rd Dec. 1894.

Unfortunately, the specimen can no longer be precisely determined, since the labellum of the solitary flower is missing. It is quite different from Kränzlin's determination as Eria elongata Bl. It is possible that it could belong to E. quadricolor J.J.Sm., but seems to differ slightly from it.

Unfortunately, details about the flower colouring are missing.

35. Epiblastus Schltr.

1. Epiblastus masarangicus (Krzl.) Schltr., in Fedde Repert. IX (1911), p. 287.

Eria masarangica Krzl., in Engl. Jahrb., Beibl. 101 (1910), p. 30.

North Celebes, Minahassa : On Mount Masarang, epiphytic - P. & F. Sarasin no. 658, flowering on 2nd Aug. 1894; on trees in the forests on Mount Kaweng, alt. c. 1000m - R. Schlechter no. 20598, in bud in Dec. 1909.

This plant is particularly interesting plant-geographically, being the furthest north-west representative of the Papuasian genus, which in a like manner has penetrated towards the east as far as Samoa. The following note by Sarasin gives an indication of the colouring of the flowers : 'Flowers pale red, stigma (anther?), black inside like the head of a maggot on a white, roundish upper lip.'

Distribution : Endemic.

36. Ceratostylis Bl.

1. Ceratostylis vagans Schltr., in Fedde Repert. X (1911), p. 67.

North Celebes : On trees near Tomohon (Minahassa) - P. & F. Sarasin nos 423, 425, flowering on 20th and 22nd June 1894; ebenda, alt. c. 900m - R. Schlechter no. 20483, flowering in Nov. 1909; on trees in the forests on Mount Klablat(Minahassa), alt. c. 1000m - R. Schlechter no. 20576, flowering in Dec. 1909; on trees in the mountain forests above Toli-Toli, alt. c. 800m - R. Schlechter no. 20908, flowering in Jan. 1910. [no. possibly 20708].

The plant,which Hooker fil. cites as Ceratostylis pendula Hook.f. from 'Celebes -- leg. Riedel',probably belongs here. The species is actually related to C. pendula Hook.f., but differs both in the lip, as well as in the column.

The flowers are white, with the labellum being sulphur-yellow in front.

Distribution : Endemic.

2. Ceratostylis cebolleta J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 28.

South Celebes : Mount Babalombang - van Vuuren, Rachmat no. 470, flowering in Aug. 1913.

According to J.J.Smith, this species differs from C. vagans Schltr. in much narrower, almost terete, carnose leaves and in floral characters.

Distribution : Endemic.

3. Ceratostylis parvifolia J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 29.

South Celebes : Mount Babalombang - van Vuuren, Rachmat no. 478, flowering in Aug. 1913.

A very characteristic species with two-edged stems as for C. anceps Bl., but with very small, only 2.3cm long, almost terete leaves, smaller flowers and much broader petals.

Distribution : Endemic.

4. Ceratostylis sima J.J.Sm., in Bull. Dep. Agric. Ind. Néerl., XV (1908), p. 9.

North Celebes, Minahassa : Without locality details - S.H. Koorders, in the year 1895; in the forests on Mount Masarang (Minahassa), alt. c. 1200m - R. Schlechter no. 20465, flowering in Nov. 1909; on trees on the [Mount] Sopoetan massif (Minahassa) - P. & F. Sarasin no. 1094, flowering on 19th Apr. 1895; on trees in the mountain forests near Toli-Toli, alt. c. 900m - R. Schlechter no. 20725, flowering in Jan. 1910.

In habit this species is reminiscent of C. subulata Bl., but is well distinguished by the long, spur-like mentum, somewhat inflated at the apex, and in the long, clawed labellum. The sepals and petals are pallid, slightly suffused with purple, the lip is white with a swollen yellow apex.

Distribution : Endemic.

37. Sarcostoma Bl.

1. Sarcostoma celebicum Schltr., in Fedde Repert. X (1911), p. 66.

North Celebes, Minahassa : On trees in the forests on Mount Lokon, alt. c. 1400m - R. Schlechter no. 20432, flowering in Nov. 1909.

Apart from the two species listed here, there is only one other, Sarcostoma javanicum Bl., the Type of the genus, known from the Sunda Islands, but which is much smaller and shorter than the two from Celebes. S. celebicum Schltr. differs from the recently established S. brevipes J.J.Sm. in the broader leaves, decidedly flatter on the upper surface, and in the larger flowers, which are grouped in few-flowered clusters. The colouring of the flowers is snow-white.

Distribution : Endemic.

2. Sarcostoma subulatum Schltr., sp. nov.

Epiphyticum, verosimiliter patulum, c. 10 cm longum. Rhizoma haud valde elongatum, adscendens, vaginis brunneis obtectum, basi tantum radicans; radicibus filiformibus, flexuosis, glabris. Caules breves, teretiusculi, usque ad 7 mm longi, vix 1 mm crassitudine excedentes, vaginis brunneis obtecti, monophylli. Folium subulatum, acutum, superne tenuissime canaliculatum, 3,5—5,5 cm longum, 1,25—1,5 mm diametiens, vulgo falcato-recurvatum. Inflorescentiae in apice caulis acervatae, more generis uniflorae, pedunculo brevi, piloso, vaginis 2 obtecto, vix 1,5 mm longitudine excedente; bractea elliptica, acuminata, ovarium paululo superante. Flos in genere parvulus, albus, tenuis. Sepala oblonga, obtusiuscula, glabra, 2 mm longa, lateralia obliqua, basi margine anteriore dilatata et connata mentum breve semioblongoideum, vix 1,5 mm longum formantia. Petala oblique ovato-oblonga, obtusiuscula, quam sepala paululo breviora. Labellum petalis textura crassius, ex ungue breviter lineari, in laminam circuitu oblongam, dimidio anteriore paululo angustiorem obtuse apiculatum, perbrevi. Anthera reniformi-cucullata, glabra. Pollinia 4 oblique obovoideo-clavata. Ovarium cylindraceum pilosulum.

South Celebes : On [Mount] Bowonglang - P. & F. Sarasin no. 2144, flowering on 24th Apr. 1902.

I have compared this plant with the flowers of S. brevipes J.J.Sm. and come to the conclusion that they should be separated specifically. This plant is less robust than S. brevipes J.J.Sm., has shorter leaves, smaller flowers, blunter sepals, much broader petals and a different lip-shape.

3. Sarcostoma brevipes J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XIII (1914), p. 9.

South Celebes : Kampong Masawa, Polewali [village] - van Vuuren, Rachmat no. 420, flowering in Aug. 1913.

The species is easily distinguished from S. celebicum Schltr. in the very short pseudobulbs (stems), the almost subulate leaves and much smaller flowers, which are fairly numerous and bunched in a capitate manner.

Distribution : Endemic.

38. Agrostophyllum Bl.

1. Agrostophyllum celebicum Schltr., in Fedde Repert. X (1911), p. 40.

North Celebes : On Mount Mahawo (Minahassa) - P. & F. Sarasin no. 888, flowering on 25th Sept. 1894; on trees in the forests on the upper Lampasioe [River], near the old goldmines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20655, flowering in Jan. 1910.

One of the small- and short-leaved species of the affinity of A. stipulatum (Griff.) Schltr., but readily distinguished by the labellum. The flowers are white, the labellum with a golden-yellow centre, the column with a red apex.

Distribution : Endemic.

2. Agrostophyllum simile Schltr., in Fedde Repert. X (1916) [1911], p. 39.

North Celebes, Minahassa : On trees near Tomohon - P. & F. Sarasin no. 781, flowering on 21st Nov. 1894; ebenda, alt. c. 800m - R. Schlechter no. 20519, flowering in Nov. 1909.

This species in habit is closest to A. parviflorum J.J.Sm. from New Guinea, but in floral structure is more reminiscent of A. atrovirens J.J.Sm. from Ambon and A. longifolium Rchb.f. from the Sunda Islands. In the size of its flowers, however, it does not surpass A. parviflorum J.J.Sm. The flowers are yellowish, with a white labellum.

Distribution : Endemic.

39. Glossorhyncha Ridl.

1. Glossorhyncha celebica Schltr., in Fedde Repert. X (1911), p. 39.

Glomera celebica J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 27.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20416, flowering in Nov. 1909.

This species deserves special interest as the furthest north-west representative of the preponderantly Papuasian genus. It is most closely related to G. amboinensis Ridl., the Type of the genus, and to several Papuasian species. The flowers are snow-white.

Distribution : Endemic.

2. Glossorhyncha sororia (J.J.Sm.) Schltr., comb. nov.

Glomera sororia J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 25.

South Celebes : Mount Sinadji - van Vuuren, Rachmat no. 907, flowering in Nov. 1913.

This species is reputed to differ from G. celebica Schltr. in broader

leaves, unequally bilobed at the apex and with long ciliated sheaths, also in linear petals and the broad-rhombic labellum.

Distribution : Endemic.

40. Podochilus Bl.

1. Podochilus curviunguis Schltr., in Fedde Repert. X (1911), p. 34.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 700m - R. Schlechter no. 20542, flowering in Dec. 1909.

The lip of this species is bent over in a peculiar manner at the base, respectively the claw, and thus is somewhat similar to P. rhombeus J.J.Sm., but in our species the lip-lamina has a quite different shape, being longish and somewhat contracted below the middle. The flowers are greenish white, later on yellow, with a red spot on the petals and with a red-margined column.

Distribution : Endemic.

2. Podochilus rhombeus J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 87.

South Celebes : Mount Boesoe - van Vuuren, Rachmat no. 596, flowering in Aug. 1913.

This species is described as a relative of P. curviunguis Schltr. It is said to differ in that the dorsal sepal is narrower at the apex, with the pointed lateral sepals forming a slightly introrse mentum and with the lip-lamina not contracted at the middle. The colouring of the flowers is given as white.

Distribution : Endemic.

3. Podochilus Minahassae Schltr., in Fedde Repert. X (1911), p. 34.

North Celebes, Minahassa : On trees in the forests on Mount Kaweng, alt. c. 1000m - R. Schlechter no. 20593, flowering in Dec. 1909.

The species is reminiscent of P. longipes J.J.Sm. and other species from New Guinea. It is distinguished by the narrow labellum. The flowers are white, with a red spot on the petals and with a red lip-lamina.

Distribution : Endemic.

4. Podochilus intermedius J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1817) [1917], p. 86.

South Celebes : Mount Nanakan - van Vuuren, Rachmat no. 552, flowering in Aug. 1913.

In habit this species is said to be similar to P. sciuroides Rchb.f., but to be reminiscent of P. lucescens Bl. and P. imitans Schltr. in the shape of the

lip. Accordingly, it must be a very characteristic species. Details of the flower colouring, so far, are lacking.

Distribution : Endemic.

5. Podochilus rhombipetalus J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 85.

South Celebes : Mount Paka Paka - van Vuuren, Rachmat no. 680, flowering in Sept. 1913.

This first species from the island of the affinity of P. lucescens Bl. and P. imitans Schltr., hence belonging to a Papuasian affinity. It is said to differ from both of these in the size and shape of the floral segments. There are no details yet of the flower colouring.

Distribution : Endemic.

6. Podochilus schistanthera Schltr., in Fedde Repert. X (1911), p. 35.

North Celebes : On trees in the forests on Mount Klabat (Minahassa), alt. c. 600m - R. Schlechter no. 20555, flowering in Dec. 1909; on trees in the mountain forests, above Toli-Toli, alt. c. 700m - R. Schlechter no. 20706, flowering in Jan. 1910.

Outwardly, the species is strongly reminiscent of P. gracilis Lindl., but differs in the labellum, as well as in the two separated viscid masses and the thereby resulting different structure of the rostellum. The sepals and petals are white with rose-red tips, the labellum white, with a violet-red apex.

Distribution : Endemic.

41. Appendicula Bl.

1. Appendicula cyclopetala Schltr., Orch. Dtsch. Neu-Guinea (1912), p. 336.

Podochilus cyclopetalus Schltr., in Fedde Repert. X (1911), p. 36.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 500m - R. Schlechter no. 20527, flowering in Dec. 1909.

This belongs to the section Euappendicula, where it is most closely related to A. cornuta Bl. and A. callifera J.J.Sm. The almost circular petals are very characteristic of the species. The flowers are white, with two red spots and with red tubercles on the labellum.

Distribution : Endemic.

2. Appendicula anceps Bl., var. celebica Schltr., var. nov.

Differt a forma typica petalis latioribus, labello magis pandurato, appendice latiore textura tenuiore.

North Celebes : On trees on the upper Lampasioe [River], near the old gold mines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20656, flowering in Jan. 1910.

I consider it advisable to consider this plant as a separate variety of the widely dispersed A. anceps Bl., since a comparison with specimens from more westerly localities has shown that it differs in the broader petals, the lip more pandurate at the middle and the broader, but not so carnose lip callus.

Distribution of variety : Endemic.

3. Appendicula reflexa Bl. var. cycloglossa Schltr., in Fedde Repert. X (1911), p. 37.

North Celebes : On trees near Tampusso (Minahassa), alt. c. 1000m - R. Schlechter no. 20506, flowering in Dec. 1909; on trees in the forests on Mount Sopoetan (Minahassa), alt. c. 1300m - R. Schlechter no. 20615, flowering in Dec. 1909; on trees in the forests on the upper Lampasioe [River], Toli-Toli district, alt. c. 180m - R. Schlechter no. 20677, flowering in Jan. 1910.

The variety is characterised by the almost circular lip-lamina. The Type is dispersed over an enormous area, from British India to New Guinea, at least in the currently accepted delimitation.

Distribution of variety : Endemic.

4. Appendicula celebica Schltr., Orch. Dtsch. Neu-Guinea (1912), p. 341.

Podochilus celebicus Schltr., in Fedde Repert. X (1911), p. 36.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20466, flowering and fruiting in Nov. 1909.

The species is most closely related to A. xythriphora Rchb.f. from the Philippines, but is distinguishable by the taller growth and the shape of the floral segments. The flowers are greenish yellow, with a whitish mentum and a white lip. There is a red spot on the petals, two violet ones on the lip.

Distribution : Endemic.

5. Appendicula triloba Schltr., Orch. Dtsch. Neu-Guinea (1912), p. 341.

Podochilus trilobus Schltr., in Fedde Repert. X (1911), p. 35.

North Celebes : On trees in the forests of the mountains around Toli-Toli, alt. c. 500m - R. Schlechter no. 20704, flowering in Jan. 1910.

This species is easily distinguished from all the others in the section Chaunodesme, by the shape of the labellum. In habit it shows much similarity with the Sundanese A. pendula Bl. The colouring of the flowers is greenish.

Distribution : Endemic.

6. Appendicula cristata Bl., Bijdr. (1825), p. 24, f. 40.

Conchochilus oppositifolius Hassk., in Tijdschr. Nat. Gesch. IX (1842), p. 147.

Appendicula longepedunculata Rolfe, in Kew Bull. (1899), p. 132.

Podochilus cristatus Schltr., in Bull. Herb. Boiss. (1900), no. XXI, p. 43.

'Celebes' : Without locality details.

According to statements from J.J.Smith, this species is said to occur on Celebes, but unfortunately no detailed localities have yet been disclosed. The species belongs to the section Pododesme, which is characterised by the long-stemmed, very slender inflorescences.

Distribution : Sumatra, Java, Borneo, Celebes.

7. Appendicula striata Schltr., sp. nov.

Podochilus buxifolius (Bl.) Schltr. var. striatus Schltr., in Fedde Repert. X (1911), p. 38.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 600m - R. Schlechter no. 20536, flowering in Dec. 1909.

After an exact comparison of the plant with the typical A. buxifolia Bl., I have become convinced that it is best regarded as a separate species that differs not only in the brown-striped flowers on a yellow base, but also in the shape of the lip.

Distribution : Endemic.

42. Bromheadia Lindl.

1. Bromheadia sp. nov.?

North Celebes : On trees in the hill forests near Toli-Toli, alt. c. 300m - R. Schlechter, sterile in Jan. 1910.

I found a species from the affinity of B. aporoides Rchb.f. and B. falcifolia Schltr. at the above-mentioned locality. Since, unfortunately, there were no flowers, the species could not be determined precisely. I mention this mainly because the locality is important regarding the dispersion of the genus. It is clearly a new species.

Distribution : Endemic.

43. Acanthephippium Bl.

1. Acanthephippium splendidum J.J.Sm., in Nat. Tijdschr. Ned. Ind. LVIII (1898), p. 360.

North Celebes, Minahassa : Without locality details - S.H. Koorders, in the year 1895; near Tomohon - P. & F. Sarasin no. 432, flowering on 6th June 1894; in the secondary forest at the foot of Mount Klabat, alt. c. 500m - R. Schlechter

no. 20553, flowering in Dec. 1909.

A handsome plant, which is not uncommon in the Minahassa [district], particularly in the secondary forests. The large flowers are yellowish on the outside, suffused with red towards the apex, more-or-less red-striped on the outside and with a golden-yellow lip. [The author gives conflicting statements here on the colour of the outside of the flowers].

Distribution : Endemic.

44. Phaius Lour.

1. Phaius Tankervilliae (R.Br.) Bl., Mus. Bot. Zuyd. Bat. II (1858), p. 177. [Phaius tancarvilliae (Banks) Bl.]

Bletia Tankervilliae R.Br., Bot. Mag. (1817), t. 1924.

Limodorum Tankervilliae Roxb., Flor. Ind. III (1832), p. 466.

Limodorum Incarvillei Bl., Bijdr. (1825), p. 394.

Phaius grandifolius Lindl., in Wall. Cat. (1830), p. 3747.

Phaius Blumei Lindl., Gen. et Spec. Orch. (1831), p. 127.

Phaius bicolor Lindl., Gen. et Spec. Orch. (1831), p. 128.

Phaius grandiflorus Rchb.f., in Walp. Ann. VI (1861), p. 459.

Phaius Incarvillei O.Ktze., Rev. Gen. II (1891), p. 675.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 581, flowering on 9th Oct. 1894; on grassy slopes of Mount Mahawo, alt. c. 1000m - R. Schlechter no. 20514, flowering in Dec. 1909.

I have no doubt that this species is conceived far too broadly and later will have to be split into several species which would appear to be well circumscribed from plant-geographic considerations. The specimens from Celebes clearly belong to the same form as do the Japanese ones.

Distribution : From India across the Sunda Islands up to Celebes.

2. Phaius trichoneurus Schltr., sp. nov.

Terestris, erectus, c. 1,30 m altus. Folia erecta vel suberecta, petiolata, lanceolata, acuminata, plicata, basin versus sensim angustata, lamina usque ad 80 cm longa, usque ad 7 cm lata, petiolo usque ad 30 cm longo. Scapus strictus, usque ad 1,30 m cum racemo altus, teres, glaber, racemo laxo 8—10-floro; bracteis caducis, mihi nondum notis. Flores erecto-patentes, speciosi, illis *Tankervilleae* Bl. similes. Sepala patentia lanceolato-oblonga, acuta, glabra, 4 cm longa, lateralia obliqua. Petala sepalis similia obliqua et fere acquimagna. Labellum circuitu late obovatum, 4-ta parte anteriore 3-lobum, columnam amplectens, explanatum 4 cm longum, supra medium 3 cm latum, nervis 3 parallelis carinato-incrassatis minute pubescentibus ornatum, nervisque pluribus minute pubescentibus haud incrassatis signatum, lobis lateralibus semioblongis, brevibus rotundatis, intermedio antico semiquadrato, obtusissimo, 8 mm longo, basi 1,2 cm lato, calcare curvato, tenui, obtuso, c. 6 mm longo. Columna semiteres, antice puberula, 1,8 cm longa, apice paulo dilatata. Ovarium pedicellatum, glabrum, c. 3 cm longum.

Central Celebes : In cultivation in a garden in Donggala.

This beautiful species which is said to originate from the vicinity of Donggala is close to P. callosus Bl. in the shape of the lip, but in this case, its upper surface is of quite a different nature. The thin, longer spur is an excellent characteristic of this species.

Distribution : Endemic.

3. Phaius celebicus Schltr., in Fedde Repert. X (1911), p. 68.

North Celebes, Minahassa : In humus of the forest on Mount Mahawa, alt. c. 1200m - R. Schlechter no. 20507, flowering in Dec. 1909.

P. flavus Lindl. can be considered as the closest relative of this species. P. celebicus Schltr. is well distinguishable from it specifically by the slender habit, as well as by the shape of the labellum. The flower colouring is yellowish.

Distribution : Endemic.

4. Phaius amboinensis Bl., Mus. Bot. Lugd. Bat. II (1858), p. 180.

Phaius Zollingeri Rchb.f., Xen. Orch. II, p. 201, t. 76.

North Celebes, Minahassa : In humus of the forest on Mount Klabat, alt. c. 600m - R. Schlechter no. 20564, flowering in Dec. 1909.

This beautiful plant is easily recognised by the white, large flowers, having a yellow lip. My material, consisting of a single leaf and an inflorescence, was brought to me by a native.

Distribution : Java, Ambon, Celebes, New Guinea.

5. Phaius stenocentron Schltr., in Fedde Repert. X (1911), p. 68.

North Celebes, Minahassa : In humus of the forests on Mount Klabat, alt. c. 800m - R. Schlechter no. 20547, flowering in Dec. 1909.

(?) Central Celebes : Takalekadjo - P. & F. Sarasin, in bud on 8 Feb. 1895.

The affinity of the specimen from Central Celebes is not yet quite definite, since only a simple, not completely developed but is present. In habit it agrees well with my species. The species is closely related to P. pauciflorus Bl. and P. corymbioides Schltr., but has a much longer spur.

Distribution : Endemic.

45. Calanthe R.Br.

1. Calanthe triplicata (Willem.) Ames var. Minahassae Schltr., var. nov.

Differt a forma typica foliis magnis, lamina elliptico-lanceolata, scapo robusto, floribus minoribus, calcare subrecto quam sepala fere aequilongo, forsan species distincta.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 501, flowering

on 11th July 1894; no. 806, flowering on 1st Nov. 1899; ebenda, alt. c. 1000m - R. Schlechter no. 20437, flowering in Nov. 1909; in humus of the forests on Mount Klabat, alt. c. 500m - R. Schlechter no. 20528, flowering in Dec. 1909.

The former C. veratrifolia R.Br., or C. triplicata (Willem.) Ames, as it is now called, belongs to those species whose further division will be necessary. The variety described here could just as well be considered as a species. We must still decide whether certain deviations from the Type of C. veratrifolia R.Br. are consistent enough to warrant the separation into species. The flowers of the new variety are snow-white with a yellow callus.

[Distribution not listed].

2. Calanthe celebica Rolfe, in Kew Bull. (1899), p. 129.

North Celebes, Minahassa : On Mount Masarang - P. & F. Sarasin no. 209, flowering on 25th Apr. 1894; ebenda - S.H. Koorders no. 29520, flowering on 10th Jan. 1895; ebenda, at the top fringe of the coffee plantations, in forest humus, alt. c. 1000m - R. Schlechter no. 20413, flowering in Nov. 1907 [1909]; in humus of the forest on Mount Kaweng, alt. c. 900m - R. Schlechter no. 20602, flowering in Dec. 1909; on Mount Lokon - S.H. Koorders no. 29523, flowering on 7th Jan. 1895.

This species is closely related to C. emarginata Lindl. It is much more slender than the above species and has violet flowers with a thicker, almost geniculate spur.

Distribution : Celebes, Ambon.

3. Calanthe hyacinthina Schltr., sp. nov.

Terestris, erecta, c. 1 m alta. Radices flexuosi, breviter et dense pilosi. Caulis brevis sed distinctus, 6—7 cm altus, dense pluri-(c. 7-) foliatus. Folia suberecta, lanceolato-ligulata, acuminatissima, basi sensim in petiolum longum angustata, glabra, lamina usque ad 70 cm longa, medio 3,5—4 cm lata, nervis 3—5 subtus prominulis, petiolo usque ad 35 cm longo, canaliculato. Inflorescentia erecta, foliis bene brevior, pedunculo tereti, glabro, vaginis paucis dissitis, acuminatis obsesso, c. 35 cm longo, 5 mm diametiente, racemo denso multifloro, cylindraceo, usque ad 12 cm longo, c. 6 cm diametro; bracteis ligulatis acuminatis, quam flores primum fere aequilongis, ante anthesin caducis. Flores erecto-patentes, nivei, glabri. Sepala oblonga, subacuta, 9 mm longa, lateralia obliqua. Petala oblique oblongo-elliptica, obtusiuscula, sepalis subaequilonga. Labellum basi (ungue) marginibus columnae omnino adnatum, oblongo-quadratum antice truncatum, lamina alte triloba ab apice unguis incisura brevi acuta margine utrinque ima basi separata, 5 mm longa, inter apices loborum lateralium 3 mm lata, nuda, basi truncata, lobis lateralibus oblique ovato-triangulis, subacutia, antrorsum spectantibus, brevibus, intermedio e basi breviter lineari-ligulata obovato-spathulato, retuso-obtusissimo, laterales subtriplo excedente, 3,25 mm longo, infra apicem 1,5 mm lato, calcare dependente, anguste cylindraceo subrecto, apice leviter dilatata obtusa levissime recurvulo, 1,3—1.4 cm longo. Columna crassiuscula subrecta, glabra, apicem versus sensim paululo ampliata, antice oblique truncata, sublobulata, 6 mm longa, glabra, rostello subulato, porreto, longius prosiliente. Ovarium graciliter et longius pedicellatum, glabrum, pedicello incluso 1,5 cm longum.

Central Celebes : Between bushes in the shade, near Donggala, alt. c. 30m - R. Schlechter no. 20715, flowering on 7th Feb. 1909 [1910].

A very characteristic species of the section Styloglossum, which is well characterised by the labellum.

Distribution : Endemic.

4. Calanthe melinosema Schltr., sp. nov.

Epiphytica, erecta, c. 60 cm alta. Rhizoma breve; radicibus flexuosis, breviter pilosulis. Pseudobulbi ovoidei vel ovoideo-conici, c. 8—9 cm alti, infra medium c. 6 cm diametientes, apice plurifoliati. Folia erecto-patentia vel suberecta, lanceolata vel interiora lineari-lanceolata, acuminata, plicata, basi subpetiolato-angustata, glabra usque supra 40 cm longa, medio fere usque ad 6 cm lata. Scapus ad basin pseudobulborum natus, erectus usque ad 60 cm altus, laxe 10—15-florus, tenuiter pilosus, vaginis paucis arcte amplectentibus, dissitis obsessus, c. 5—6 mm diametro, racemo usque ad 23 cm longo; bracteis elliptico-lanceolatis, acuminatis, tenuibus, inferioribus ovarium pedicellatum excedentibus, superioribus sensim brevioribus. Flores illis *C. vestitae* Ldl. similes, sed minores, nivei, ad basin labelli macula aurantiaca notati. Sepala oblonga, acuminata, longius et tenuiter pilosa, 1,8—1,9 cm longa, lateralia obliqua. Petala oblique elliptica, apiculata, glabra, sepalis fere aequilonga sed latiora, 9 mm lata. Labellum e basi cuneata alte 3-lobum, basi marginibus columnae adnatum, 2,2 cm longum, explanatum medio 2 cm latum, carina mediana e basi vel ostio calcaris usque ad basin lobi intermedii ornatum, glabrum, lobis lateralibus oblique semioblongo-quadratis, valde obtusis, intermedio cuneato antice usque ad tertiam partem apicalem obcordato-bilobulato, lobis inclusis 1 cm longo, supra medium 1,2 cm lato, calcare filiformi, obtuso, antrorsum curvato, breviter et tenuiter piloso, 1,3 cm longo. Columna crassa, 8 mm longa, antice oblique truncata, marginibus labello basi omnino adnata. Ovarium pedicellatum, villosum, pedicello incluso 1,5 cm longo.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 850m - R. Schlechter no. 20405, flowering in Nov. 1909.

My material, unfortunately, is not very good, so that I initially did not want to describe the plant, but since the analysis has been well maintained, I have named the plant. The species is well distinguished from C. vestita Lindl. in smaller flowers and in the shape of the lip.

46. Spathoglottis Bl.

1. Spathoglottis velutina Schltr., sp. nov.

Terrestris, erecta, elata, usque ad 100 cm alta; tubera oblique ovalia vel subglobosa, depressa, subterranea, usque ad 3 cm diametro, pluri- (c. 4-) foliata. Folia erecta, angusto lanceolata, acuminata, basin versus sensim in petiolum usque ad 20 cm longum attenuata, valde plicata, glabra, lamina usque ad 50 cm longa, ad 3 cm lata. Scapus strictus vel substrictus, laxe 10—15- florus, vaginis paucis, dissitis, brevibus obsessus, teres, apicem versus et rhachi breviter et dense velutinus, supra basin usque ad 5 mm diametiens; bracteis patentibus vel patulis, ovalibus, obtusis, concavis, breviter velutinis, ovario pedicellato 3-plo brevioribus. Flores in genere mediocres, erecto-patentes, violaceoa-rosei. Sepala oblonga, obtusa, extus breviter et dense velutina, 2 cm longa, lateralia obliqua intermedio paulo latiora. Petala oblique elliptica, obtusa, glabra, quam sepala subaequilonga sed medio latiora. Labellum sepalis paulo brevius, explanatum 1,9 cm longum, inter apices loborum lateralium 2 cm latum,

lobo intermedio 1,65 cm longo, inf apicem 1 cm lato, lobis lateralibus (explanatis) divaricatis, rectis, oblique ligulatis, apicem versus sensim dilatatis, apice oblique rotundatis, intermedio e basi angusta apicem versus sensim dilatato antice in lobum cuneato-obreniformem breviter excisum dilatato, supra basin margine utrinque lobulo falcato-triangulo acuto superne basin versus dense puberulo, 3 mm longo aucto, basi callis 2 oblique rhombeo-triangulis, carnosis, glabris ornato. Columna gracilis, apicem versus dilatata, glabra, 1,4 cm longa. Ovarium pedicellatum, velutinum, c. 3 cm longum.

North Celebes : On open slopes above Toli-Toli, alt. c. 350m - R. Schlechter no. 20647, flowering in Jan. 1910.

Central Celebes : In a dry alang field on coral limestone near Donggala - P. & F. Sarasin no. 830, flowering on 5th Dec. 1894.

This species belongs to the affinity of S. portus Finschii Krzl. and S. Kenejiae Schltr., but differs from both in the labellum. It appears to be widely distributed in northern and central Celebes, in the hills along the coast, since the specimen collected by the Sarrasins [Sarasins] near Donggala agrees completely with mine, but is slightly less robust.

2. Spathoglottis plicata Bl. var. Minahassae Schltr., var. nov.

Differt a forma typica labelli lobis magis divaricatis, angustioribus, apice valde obliquis, lobi intermedii ungue medio haud gibboso, lamina basi cuneata. Verosimiliter species diversa.

North Celebes, Minahassa : Terrestrial near Tomohon, common - P. & F. Sarasin no. 223, flowering on 3rd Apr. 1894; ebenda, on rocky slopes, alt. c. 900m - R. Schlechter no. 20460, flowering in Nov. 1909; near Kajoevatoe, Ratahan, Pakoe-veroe, Sonder, Rindengan, on the road to Boeh and near Kota Menado - S.H. Koorders no. 29548 up to 29554, in the year 1895; near Menado - Consul H.F. Steffens'collector, in the year 1911.

I consider it possible that this plant, which is common in the Minahassa [district], may later prove to be a separate species, after the true S. plicata Bl. has been more critically defined.

Distribution of variety : Endemic.

3. Spathoglottis Vanvuurenii J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XIII (1914), p. 3.

South Celebes : Kampong Baverang, Madjene - L. van Vuuren, Rachmat.

This species is described as a close relative of S. plicata Bl., from which it differs in smaller dimensions, blue-green leaves, more lax inflorescences, longer side lobes and with with the front lobe of the lip, having four weak longitudinal ribs. The flowers are rose-red, purple-red or white.

Distribution : Endemic.

4. Spathoglottis tricallosa J.J.Sm., in Bull. Jard. Bot. Buitenz. XXV (1917), p. 16.

South Celebes : Mount Lambelo - van Vuuren, Rachmat no. 670, flowering in Sept. 1913.

This species is said to be reminiscent of S. aurea Lindl., but the flowers are described as whitish, red-dotted on the outside; with yellowish red-dotted side lobes and with yellow, brown-dotted front lobes, having a white tip.

Distribution : Endemic.

47. Bulbophyllum Thou.

§ Sestochilus

1. Bulbophyllum subuliferum Schltr., in Fedde Repert. X (1911), p. 91.

North Celebes : On trees in the mangrove swamps near Toli-Toli - R. Schlechter no. 20646, flowering in Jan. 1910.

The only species in the group [section] Sestochilus, so far known from Celebes. It is distinguished by the labellum, which is extended towards the apex in a subulate manner, and in the lacking of column-arms. The flowers are reddish with darker spots.

Distribution : Endemic.

§ Hyalosema

2. Bulbophyllum Minahassae Schltr., in Fedde Repert. X (1911), p. 92.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 850m - R. Schlechter no. 20518, flowering in Dec. 1909.

One of the interesting species of the small, mainly Papuasian group, characterised by the handsome flowers appearing singly on the peduncle, with the sepals having peculiar translucent glossy spots. Our species appears to stand closest to B. Leysianum Burb. from Java.

Distribution : Endemic.

3. Bulbophyllum Elbertii J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XIII (1914), p. 30.

South-east Celebes : Kolaka - J. Elbert, in the year 1909.

The species is closely related to B. Minahassae Schltr., but differs from it in shorter and thicker pseudobulbs, longer inflorescences, the somewhat smaller flowers with the dorsal sepal definitely longer than the lateral ones, the lip hirsute above, and in the relatively longer column.

Distribution : Endemic.

§ Lepidorhiza

4. Bulbophyllum amplebracteum Teysm. et Binnend., in Nat. Tijdschr. Need. Ind., XXIV (1863), p. 307.

North Celebes, Minahassa : On trees near Tomohon - P. & F. Sarasin nos 790, 795, flowering resp. 24th and 28th Oct. 1884 [probably 1894]; ebenda, alt. c. 1000m - R. Schlechter no. 20498, flowering in Nov. 1909; on Mount Sopoetan - S.H. Koorders no. 29567, flowering on 5th May 1895.

This species is readily distinguished from the one following, by the labellum lacking the short, soft bristles on the upper side of the labellum. Furthermore, the plant is more slender and taller than B. klabatense Schltr. The flowers are a muddy green-yellow with more-or-less clearly predominant reddish or brownish markings.

Distribution : Celebes, Ambon.

5. Bulbophyllum klabatense Schltr., in Fedde Repert. X (1911), p. 93.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c. 900m - R. Schlechter no. 20526, flowering in Dec. 1909.

I have already above, pointed to the differences between this species and B. amplebracteum Teysm. et Binnend. The species is especially characterised by the labellum, which has short, soft bristles on its upper side. The colouring of the flowers is similar to that of B. amplebracteum Teysm. et Binnend.

Distribution : Endemic.

6. Bulbophyllum Vanvuurenii J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 65.

South Celebes : Mount Lambolo - L. van Vuuren, Rachmat no. 190, in the year 1913.

J.J.Smith places this species in the section Dialeipanthe. It is, however, said to be related to B. klabatense Schltr., and without doubt belongs here. It is said to differ from B. klabatense Schltr. in the far more acuminate sepals and petals and in the lateral sepals being bent downwards in a falcate manner. The colouring of the flowers is said to be the same.

Distribution : Endemic.

§ Nematorhizis

7. Bulbophyllum pachyneuron Schltr., in Fedde Repert. X (1911), p. 95.

North Celebes, Minahassa : On trees in the forests on Mount Kaweng, alt. c. 1000m - R. Schlechter no. 20596, flowering in Dec. 1909.

The affinity of this and the three following species to the group [section], is still not quite certain, because I have been unable to determine clear boundaries. The species is closely related to B. gracile Lindl. from Java, in floral

structure, but has quite a different habit. The flowers are dark red.

Distribution : Endemic.

8. Bulbophyllum lokonense Schltr., in Fedde Repert. X (1911), p. 96.

North Celebes, Minahassa : On trees in the forests of Mount Lokon, alt. c. 1300m - R. Schlechter no. 20438, flowering in Nov. 1909.

A species, so far standing quite isolated in the whole area. It is characterised by fairly large flowers and the column having two short, little arms bent downwards. Accordingly, it is possible that later on it may be better to transfer it to the section Manobulbon. The flowers are yellowish, with brown veining.

Distribution : Endemic.

9. Bulbophyllum longerepens Schltr., in Fedde Repert. X (1911), p. 95.

North Celebes, Minahassa : On trees in the forests on Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20423, flowering in Nov. 1909.

A fairly small-flowered species, which appears to be related to B. ciliatum Lindl., but having smaller flowers and a glabrous labellum. It is readily distinguished from the three others in the section, by the pallid yellow flowers.

Distribution : Endemic.

10. Bulbophyllum amblyoglossum Schltr., in Fedde Repert. X (1911), p. 95.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20422, flowering in Nov. 1909.

It would appear that this species is closely related to B. tenellum Lindl. from Java, but differing in the broader labellum, with two swollen longitudinal lines, and in the longer column-arms. The flowers are golden-yellow, orange towards the base, the labellum brown-red.

Distribution : Endemic.

§ Polyblepharon

11. Bulbophyllum aberrans Schltr., in Fedde Repert. X (1911), p. 177.

North Celebes : On trees on the upper Lampasioe [River], near the old gold mines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20666, flowering in Jan. 1910.

The sole species from Celebes of the section Polyblepharon, which in New Guinea is very form-rich, but from which one species, B. tortuosum Lindl. has penetrated westwards, as far as Java and Sumatra. B. aberrans Schltr., however, both in habit and floral characters is more similar to the Papuasian forms. The colouring of the flowers is muddy violet-red, as often in the section.

Distribution : Endemic.

§ Hybochilus

12. Bulbophyllum masarangicum Schltr., in Fedde Repert. X (1911), p. 96.

North Celebes, Minahassa : On trees in the forests on Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20024, flowering in Nov. 1909.

The species belongs to that small group which is fairly closely attached to [the section] Polyblepharon and which is related to certain Papuasian forms, but which is distinguished by a very characteristic lip shape. B. acutum J.J.Sm. from Java, also belongs to this affinity. The flowers are red, white towards the base.

var. nanodes Schltr., in Fedde Repert. X (1911), p. 96.

North Celebes, Minahassa : On trees on the summit of Mount Lokon, alt. c. 1600m - R. Schlechter no. 20500, flowering in Nov. 1909.

This variety of the Type probably is occasioned by the high altitude, but it gives quite a different impression with its appreciably closer, broader pseudobulbs and broader leaves, as well as the very low, respectively short habit.

Distribution : Endemic.

§ Oxysepalum

13. Bulbophyllum myrianthum Schltr., in Fedde Repert. X (1911), p. 178.

North Celebes, Minahassa : On trees near Kakas, alt. c. 800m - R. Schlechter no. 20605, flowering in Dec. 1909.

Like most of the species of the group [section], this one is characterised by its abundance of flowers, in which it even surpasses the others. In habit it is reminiscent of B. sessile (Koen.) J.J.Sm., but is more compact in growth and shorter, and has appreciably broader leaves. The yellowish white flowers, at times, almost completely cover the branched stem formed by the rhizome.

Distribution : Endemic.

§ Ceratostylopis

14. Bulbophyllum ceratostyloides Schltr., sp. nov.

Bulbophyllum mutabile Lindl. var. ceratostyloides Schltr., in Fedde Repert. X (1911), p. 179.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20414, flowering in Nov. 1909; on Mount Lokon-Empung - P. & F. Sarasin no. 430, flowering on 17th May 1894.

It surely is better to separate this one specifically from B. mutabile Lindl., since it differs in narrower leaves, slightly longer pseudobulbs, narrower petals and in the narrower and more pointed labellum. On live specimens from Sumatra, which I consider to be B. mutabile Lindl., I have been able to establish clearly the presence, on the front half of the lip margin, of scattered small papillae or

little hairs which, however, are missing in the Celebes plant, i.e. Bulbophyllum ceratostyloides Schltr. The colouring of the flowers is a pallid yellow, as for the latter.

Distribution : Endemic.

§ Minahassaea

15. Bulbophyllum agapethoides Schltr., in Fedde Repert. X (1911), p. 179.

North Celebes, Minahassa : On trees near Tampuso, alt. c. 1000m - R. Schlechter no. 20503, flowering in Dec. 1909.

This species, already in habit, differs so greatly from the others in the region, that it is thereby easily recognised. In vegetative structure it can be compared with B. dichotomum J.J.Sm., but the flowers are not arranged here as for this one in shortened, single-flowered inflorescences, but in pendulous 3 to 6-flowered racemes at the base of the pseudobulbs. The stiff stems and the growth are reminiscent of certain epiphytic Ericacea, e.g. Agapethes. The flowers are small and white.

Distribution : Endemic.

§ Stathmocaulos

16. Bulbophyllum perpendiculare Schltr., in Fedde Repert. X (1911), p. 179.

North Celebes, Minahassa : On trees in the forests on Mount Masarang, alt. c. 1200m - R. Schlechter no. 20470, flowering in Nov. 1909.

A very conspicuous species hanging vertically and lax up to 80cm long from the limbs of trees and showing a completely geotropic tip growth. The flowers occur in 3 to 4-flowered pendulous racemes and are reminiscent of certain species of the section Aphanobulbon. Their colouring is yellowish white.

Distribution : Endemic.

§ Aphanobulbon

17. Bulbophyllum odoratum Lindl. var. grandiflorum J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 3, I (1919), p. 176.

'Celebes' : Without locality details.

This name is to be found in J.J.Smith's list of orchids in cultivation at the Buitenzorg Garden. I have not yet come across a description of this variety, whose origin is given as 'Celebes.' From the species name it is probably sure that it has larger flowers than the Type.

Distribution of variety : Endemic ?

18. Bulbophyllum tylophorum Schltr., in Fedde Repert. X (1911), p. 180.

North Celebes : On trees in the forest on the upper Lampasioe [River], near

the old goldmines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20670, flowering in Jan. 1910.

Outwardly, this species has an undeniable similarity to B. odoratum Lindl., but the labellum is completely different, having a longish cushion covered at the middle by minute, pedicelled, swollen particles. The flowers are yellowish, with an orange-yellow lip.

Distribution : Endemic.

19. Bulbophyllum Steffensii Schltr., sp. nov.

Epiphyticum, usque ad 45 cm altum. Rhizoma crassum, polyrhizum; radicibus filiformibus, flexuosis, glabris. Pseudobulbi 1—1,5 cm inter se distantes, brevissimi, depressi, vix 3 mm altitudine excedentes, 6—8 mm diametro, unifoliati. Folia erecta, petiolata, crasse coriacea, lamina oblonga, obtusa, basi cuneata, 17—22 cm longa, medio fere 4,5—5,7 cm lata, petiolo crasso, sulcato, 6—8 cm longo. Inflorescentiae singulae, juxta basin pseudobulborum natae, erectae, racemo incluso usque ad 45 cm longae, pedunculo vaginis paucis amplectentibus obsesso, usque ad 7 cm longo, valido, ut rhachis 3,5—4 mm diametro, racemo usque ad 38 cm longo, dense permultifloro; bracteis patulis, lanceolatis, acuminatis, tenuibus, ovarium pedicellatum aequantibus vel paulo superantibus. Flores illis *B. tylophori* Schltr. similes, glabri. Sepala ovato-lanceolata, apice incrassatulo obtusiuscula, vix 4 mm longa, lateralia obliqua, basi margine anteriore paulo dilatata cum pede columnae mentum breve obtusum, c. 1,5 mm longum formantia. Petala quam sepala fere triplo breviora, oblique ovato-elliptica, obtusa, glabra, uninervia. Labellum paulo tantum majus, carnosum, antice obscure trilobatum, circuitu ellipticum basi cuneatum, toro oblongo, verruculoso-papilloso e basi usque in apicem decurrente, lobum anticum omnino obtegente ornatum, lobis lateralibus obtusatis, abbreviatis, intermedio antico semirhombeo-quadrato, obtuso, brevi. Columna perbrevis, dimidium labelli paululo superans, stelidiis subulatis, pede brevi, leviter incurvulo. Ovarium pedicellatum glabrum, c. 3—4 mm longum.

North Celebes, Minahassa : Environs of Menado - Consul H.F. Steffens' collector, in the year 1911.

The species differs from the related B. tylophorum Schltr. in the more robust growth, the long racemes and in the shape of the floral segments.

Distribution : Endemic.

20. Bulbophyllum sopoetanense Schltr., in Fedde Repert. X (1911), p. 181.

North Celebes, Minahassa : On trees in the forests on Mount Sopoetan, alt. c. 1300m - R. Schlechter no. 20614, flowering in Dec. 1909.

Apart from B. Korthalsii Schltr. from Sumatra, this species has the largest flowers of all species in the section. In the shape of the flowers, however, it is more closely related to B. unguiculatum Rchb.f. The colouring of the flowers is yellowish.

Distribution : Endemic.

21. Bulbophyllum elaphoglossum Schltr., in Fedde Repert. X (1911), p. 181.

North Celebes, Minahassa : On trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20462, flowering in Nov. 1909.

This species, reminiscent in habit of a robust B. flavescens Lindl., is well characterised already, by the labellum, which is papillose on the upper side. Conspicuous, furthermore, is the colouring of the flowers, which is white with red-striped sepals and petals and a golden-yellow lip.

Distribution : Endemic.

22. Bulbophyllum oligoblepharon Schltr., in Fedde Repert. X (1911), p. 182.

North Celebes, Minahassa : On trees in the forests of Mount Sopoetan, alt. c. 1000m - R. Schlechter no. 20613, flowering in Dec. 1909.

The species is related closely to B. unguiculatum Rchb.f. The broad labellum, short-ciliated in front, distinguishes it. The flowers are yellowish white.

Distribution : Endemic.

23. Bulbophyllum balapiuense J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, XXV (1917), p. 69.

South Celebes : Mount Balapioe - L. van Vuuren, Rachmat, in the year 1913.

The species is described as a close relative of B. oligoblepharon Schltr., but is said to differ in its broader leaves, shorter racemes, glabrous lip and the cushioned column-foot. The fragrant flowers are a pallid yellow.

Distribution : Endemic.

24. Bulbophyllum obliquum Schltr., in Fedde Repert. X (1911), p. 182.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20435, flowering in Nov. 1909.

One of the larger-flowered species of the group. It is characterised by the conspicuously oblique leaves and the long extended sepals. The flowers are about 1.1cm long and of a yellowish colour.

Distribution : Endemic.

25. Bulbophyllum anguipes Schltr., in Fedde Repert. X (1911), p. 183.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 600m - R. Schlechter no. 20580, flowering in Dec. 1909.

The species has much similarity with B. gibbosum Lindl., but has much thicker rhizomes, the inflorescences appearing adjacent to the bulbs, and with differently constituted floral segments. The colouring of the flowers is yellowish white.

Distribution : Endemic.

§ Osyricera

26. Bulbophyllum pubiflorum Schltr., in Fedde Repert. X (1911), p. 184.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 570, flowering on 8th Oct. 1909; on trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20426, flowering in Nov. 1909.

Easily distinguished externally already from the closest-related B. hastiferum Schltr., by the creeping rhizomes and the less carnose rachis of the more slender racemes. The rachis is red-brown hatched, the flowers whitish with pink veins.

Distribution : Endemic.

27. Bulbophyllum hastiferum Schltr., in Fedde Repert. X (1911), p. 184.

North Celebes, Minahassa : On trees near Tomohon - P. & F. Sarasin no. 434a, flowering in June 1894; ebenda, alt. c. 900m - R. Schlechter no. 20459, flowering in Nov. 1909; on Mount Masarang - P. & F. Sarasin no. 434, flowering on 5th June 1894.

The species is readily distinguished from the preceding one already, by the almost erect, shrub-like habit and the fairly thickly carnose rachis. It is also closely related to B. saurocephalum Lindl. from the Philippines. The flowers are whitish, with dark red spots and veins; the lateral sepals on the inside, the lip and column are yellow.

Distribution : Endemic.

28. Bulbophyllum crassissimum J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, XXV (1917), p. 72.

South Celebes : Mount Babalombang - L. van Vuuren, Rachmat no. 480, flowering in Aug. 1913.

The species approaches B. mirabile Hallier f. from Borneo, in its very thick, pendulous racemes. It is especially characterised by two auricle-like tubercles at the base of the column. The flower colouring is not yet known.

Distribution : Endemic.

29. Bulbophyllum trigonobulbum Schltr. et J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, XIII (1914), p. 28.

North Celebes : Without locality details, probably Toli-Toli - R. Schlechter in the year 1909/1910.

This plant was described by J.J.Smith from living specimens which I had brought to Buitenzorg for cultivation. It is said to differ in the closer-together, three-edged pseudobulbs, shorter and more lax inflorescences, and with flowers ciliated at the margins and having different margins.

Distribution : Endemic.

§ Desmosanthus

30. Bulbophyllum laxiflorum Lindl. var. celebicum Schltr., in Fedde Repert. X (1911), p. 178.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20480, flowering in Nov. 1909; ebenda - P. & F. Sarasin no. 235, flowering in May 1894.

This very characteristic plant is strongly reminiscent in its whole habit, of certain Cirrhopetalum species. I consider it possible that the variety may later prove to be a separate species. The yellowish white flowers have a pleasant, delicate odour.

Distribution of variety : Endemic.

§ Manobulbon

31. Bulbophyllum Sarasinorum Schltr., sp. nov.

Epiphyticum, longe repens, pusillum. Rhizoma elongatum, filiforme, flexuosum; radicibus filiformibus flexuosis, glabris. Pseudobulbi 1,3—2,5 cm inter se distantes, ovoidei vel ellipsoidei nunc subglobosi, unifoliati, 3—4,5 mm alti, medio vel infra medium c. 2,75—3,25 mm diametro. Folium erecto-patens, oblongum vel ovato-oblongum, acutum, basi contractum, 1,5—1,9 cm longum, medio vel infra medium c. 5—6 mm latum. Inflorescentiae ad basin pseudobulborum vel in axillis vaginarum rhizomatis natae, erectae, uniflorae, breves, pseudobulbos altitudine paulo excedentes, pedunculo bivaginulato, c. 2—3 mm longo; bractea ovata, acuminata, ovarium pedicellatum paululo superante. Flos in sectione inter minores, glaber, tenuis. Sepala lanceolato-oblonga, acuta, 3-nervia, vix 5 mm longa, lateralia obliqua, basin versus antice paululo dilatata cum pede columnae mentum breve obtusum formantia. Petala oblique et anguste oblonga, obtusa, uninervia, c. 3 mm longa. Labellum curvatum, oblongum, obtusum, basi retusum, medio leviter constrictum, carnosum, ecallosum, vi explanatum petalis fere aequilongum. Columna perbrevis, labello plus duplo brevior, stelidiis more sectionis falcato-uncinatis, obtusis, margine superiore dente vel angulo minuto obtuso donatis, pede satis evoluto, incurvulo. Ovarium pedicellatum, glabrum, c. 2 mm longum.

South Celebes : On [Mount] Bowonglangi - P. & F. Sarasin no. 2144a, flowering on 24th Apr. 1902.

This species is interesting as the first representative of the section in Celebes. It is most closely related to B. microcharis Schltr. from New Guinea. I found the specimens intermixed with Sarcostoma subulatum Schltr.

Distribution : Endemic.

Doubtful species.

32. Bulbophyllum sp. nov.

Central Celebes : Epiphytic on the Takalekade Range, alt. c. 1000m - P. & F. Sarasin no. 900, on 9th Feb. 1895.

Definitely a new species, clearly belonging to the section Globiceps and

characterised within it by large, narrow leaves. Unfortunately, there are no longer any flowers on the specimen and therefore, the plant cannot be described.

48. Cirrhopetalum Lindl.

1. Cirrhopetalum Koordersii Rolfe, in Kew Bull. (1899), p. 128.

Bulbophyllum Koordersii J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, VIII (1912), p. 25.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 800m - R. Schlechter no. 20533, flowering in Dec. 1909; near Totok - S.H. Koorders no. 29566, flowering on 26th Jan. 1895.

The species is distinguished, in particular, by the anther being lacerated in front. It belongs to those species where the margins of the petals are finely serrated and have long cilia. The flowers are pale rose-red, red-spotted, the petals dark purple-spotted at the apex.

Distribution : Endemic.

2. Cirrhopetalum dolichoblepharon Schltr., in Fedde Repert. X (1911), p. 185.

Bulbophyllum dolichoblepharon J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, VIII (1912), p. 23.

North Celebes : On trees in the mangrove swamps near Toli-Toli - R. Schlechter no. 20644, flowering in Jan. 1910.

This and the next species belong to the affinity of C. lepidum (Bl.) Schltr. from Java, but both differ in the papillose petals and the pointed, small column-arms. The flowers of this species are dark red, with the tips of the lateral sepals being paler.

Distribution : Endemic.

3. Cirrhopetalum brevibrachiatum Schltr., in Fedde Repert. X (1911), p. 186.

Bulbophyllum brevibrachiatum J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, VIII (1912), p. 23.

North Celebes : On trees in the mangrove swamps near Toli-Toli - R. Schlechter no. 20702, flowering in Jan. 1910.

The species is distinguished from C. dolichoblepharon Schltr. by more robust growth, broader leaves, the colouring of the flowers, shape of the lip and by the petals, which are papillose only towards the tip. The flowers are yellowish, with red spots on the dorsal sepal and on the petals.

Distribution : Endemic.

49. Codonosiphon Schltr.

1. Codonosiphon codonanthum Schltr., Orch. Dtsch. Neu-Guinea (1913), p. 893.

Bulbophyllum codonanthum Schltr., in Fedde Repert. X (1911), p. 177.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20425, flowering in Nov. 1909.

J.J. Smith wants to re-unite the genus Codonosiphon with Bulbophyllum, but in my opinion it is thoroughly different. I even anticipate that at a later stage, we shall have to remove further types from Bulbophyllum.

The species is closely related to C. papuanum Schltr. Its flowers are dark red.

50. Octarrhena Thw.

1. Octarrhena celebica Schltr., in Fedde Repert. X (1911), p. 189.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20486, flowering in Nov. 1909.

This small, only 6.0-7.0cm tall plant is closely related to O. Amesiana Schltr. from the Philippines, but is readily distinguished by the shape of the labellum and by the column. The flowers are greenish yellow.

Distribution : Endemic.

2. Octarrhena Vanvuurenii J.J.Sm., in Bull. Jard. Bot. Buitenz. ser. 2, XXV (1917), p. 83.

South Celebes : Mount Pangararan - L. van Vuuren, Rachmat no. 921, flowering in Nov. 1913.

This species is almost still smaller than the one above and differs from it in the leaves bent inwards towards the stem, also in triangular sepals and oval petals.

Distribution : Endemic.

51. Oxanthera Brongn.

1. Oxanthera carinata (Bl.) Schltr., in Mem. Herb. Boiss. XXI (1900), p. 76.

Thelasis carinata Bl., Bijdr. (1825), p. 386.

North Celebes : On trees on the upper Lampasioe [River], Toli-Toli district, alt. c. 80m - R. Schlechter no. 20675, flowering in Jan. 1910.

This species has a broad distribution. The plant from Celebes is distinguished by the conspicuously lax inflorescence. It is possible it may have to be separated as an individual species. The flowers are pale brown, with white tips.

Distribution : Sumatra, Java, Bali, Borneo, Celebes, Soela Island.

52. Thelasis Bl.

1. Thelasis celebica Schltr., in Fedde Repert. X (1911), p. 187.

North Celebes, Minahassa : On trees in the forests on Mount Klabat, alt. c.

600m - R. Schlechter no. 20587, flowering in Dec. 1909.

The species is closely related to T. elongata Bl., but differing specifically in the almost trilobed, very blunt labellum, the shorter anther and the very short viscid mass. The flowers are greenish white.

Distribution : Endemic.

53. Phreatia Lindl.

1. Phreatia potamophila Schltr., in Fedde Repert. X (1911), p. 187.

North Celebes, Minahassa : On trees on the upper Lampasioe [River], Toli-Toli district, alt. c. 800m - R. Schlechter no. 20669, flowering in Jan. 1910.

One of the insignificant, small species of the affinity of P. secunda Lindl. It is recognised by an almost circular frontal incision of the concave base and with a lobule-like, blunt, little tip.

Since in 1913, in my book on the Orchids of German New Guinea, p. 937 [p. 997 of English Translation], I used the same species name for a novelty in New Guinea, I shall have to give the Papuasian plant a new name, which I designate here as P. rivularis Schltr.

The flowers of P. potamophila Schltr. are greenish.

Distribution : Endemic.

2. Phreatia Koordersii Rolfe, in Kew Bull. (1899), p. 129.

Phreatia Sarasinorum Krzl., in Pflanzr. 50b (1911), p. 36.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 196, flowering on 17th Mar. 1894; no. 218, flowering on 19th Apr. 1894; no. 808, flowering on 15th Sept. 1894; on trees in the forests of Mount Lokon, alt. c. 1000m - R. Schlechter no. 20448, flowering in Nov. 1909; on trees in the coffee plantations and forests on Mount Masarang, alt. c. 1000m - R. Schlechter no. 20411, flowering in Nov. 1909; on trees in the forests of Mount Klabat, alt. c. 1600m - R. Schlechter no. 20566, flowering in Dec. 1910 [1909]; on the summit of the Lolomboelan Ranges - S.H. Koorders no. 29493, flowering in Apr. 1895.

A very abundant species in the mountain forests and in all coffee plantations in the Minahassa [didtrict]. It stands close to P. laxiflora Lindl., but differs in the denser inflorescences, broader, more rhombic-ovate petals and in the shorter rostellum. As with P. laxiflora Lindl., especially the lower part of the lip-lamina is covered with short, easily-overlooked papillae.

To me it is almost incomprehensible how Kränzlin arrived at describing the Type specimens of P. Sarasinorum Krzl. as having pseudobulbs. This again is a good example for the manner in which this author works and for the value of his descriptions.

Distribution : Endemic.

3. Phreatia Minahassae Schltr., sp. nov.

Epiphytica, erecta, 9—25 cm alta, acaulis vel subacaulis. Radices filiformes, flexuosi, glabri. Folia usque ad 8, erecto-patentia vel suberecta, linearia, apice inaequaliter obtusiuscula, basin versus sensim paululo angustata, vaginis exclusis 8—17 cm longa, medio 4—8 mm lata, spathis striato-nervosis, exauriculatis, usque ad 2 cm longis, nunc brunnescentibus. Inflorescentiae singulae, erectae, graciles, pedunculo incluso usque ad 25 cm longae, folia semper excedentes, pedunculo gracili, vaginis 4—5 dissitis, arcte amplectentibus, acuminatis obsesso, usque ad 12 cm longo, racemo dense multifloro, elongato, apicem versus attenuato usque ad 13 cm longo, vix 6 mm diametro; bracteis lanceolatis, acuminatis, inferioribus florem subexcedentibus, superioribus florem subaequantibus. Flores in genere inter minores, nivei, glabri. Sepala late ovata, obtusa, c. 1 mm longa, lateralia obliqua, basi margine anteriore dilatata cum pede columnae mentum breve, obtusum formantia. Petala quam sepala tertia parte breviora oblique ovata, obtusa, uninervia. Labellum sepalis subaequilongum, e basi concava ovali-unguiculata in laminam semiorbiculari-reniformem obtusissimam retusam, glabram diladatum. Columna perbrevis, crassiuscula, rostello breviter bidentato, quam dorsum clinandrii subbreviore, pede decurvulo columna ipsa sublongiore. Stigma angustum transverse lineare. Anthera late reniformis, dorso umbonata. Pollinia oblique obovoidea, stipite lineari, polliniis sublongiore viscidio parvulo orbiculari affixa. Ovarium pedicellatum, clavatum, glabrum, 2 mm longum.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20489, flowering in Nov. 1909; on trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter s.n., flowering in Nov. 1909; on trees in the forests of Mount Klabat, alt. c. 600m - R. Schlechter no. 20554, flowering in Dec. 1909.

The species is closely related to P. Koordersii Rolfe, but according to my observations on living material, is best regarded as a separate species. In general, the leaves are somewhat narrower relative to length, than for P. Koordersii Rolfe and not so blunt, furthermore, the raceme is not so dense, is narrowed gradually towards the top and tapers out thinly. The petals are oblique-ovate, not rhombic-ovate as for P. Koordersii Rolfe and also not as broad. The lip has a different shape, with the claw more oval and with a completely glabrous, reniform lamina. The rostellum is characterised by sharply truncated, little teeth, but is not as tall as for P. laxiflora Lindl. The flowers are white.

Distribution : Endemic.

4. Phreatia celebica Rolfe, in Kew Bull. (1899), p. 127.

Phreatia listrophora Krzl., in Engl. Pflanzr. IV 50, II 23 (1911), p. 32 p.pt. (non Ridl.).

North Celebes, Minahassa : Tomohon - P. & F. Sarasin no. 212, flowering on 22nd Apr. 1894; on Mount Sopoetan, alt. c. 1100m - S.H. Koorders no. 29494, flowering on 5th May 1895; on trees in the forests of Mount Klabat, alt. c. 1400m - R. Schlechter no. 20569, flowering in Dec. 1909.

An extremely characteristic species which Rolfe, quite rightly, compared with P. prorepens Rchb.f. from the Philippines; it has very little in common with

P. listrophora Ridl. Prof. Kränzlin here also, as for the Dendrobiinae, has managed in his so-called 'monograph' to create more confusion than order in the Thelasinae group. His treatment, furthermore, is a random sequence of species, without any consideration of the conditions of relationships.

The flowers of the species are snow-white.

Distribution : Endemic.

5. Phreatia masarangica Schltr., in Fedde Repert. X (1911), p. 188.

North Celebes, Minahassa : On trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20417, flowering in Nov. 1909.

A close relative of P. celebica Rolfe, but with more compact pseudobulbs and with a much shorter-clawed and broader lip-lamina of a different shape.

The flowers are snow-white.

Distribution : Endemic.

6. Phreatia sinadjiensis J.J.Sm., in Bull. Jard. Bot. Buitenz., XXV (1917), p. 84.

South Celebes : Mount Sinadji - L. van Vuuren, Rachmat no. 877, flowering in Nov. 1913.

The species is compared with P. tjibodasana J.J.Sm. from Java, but is said to differ in the more-distantly spaced pseudobulbs and in the shape of the floral segments. I have not seen any specimens of the species, which differs from the two other species from Celebes of the section Bulbophreatia, already in the denser racemes.

Details are lacking on flower colouration, but it can probably be accepted as white, as for the other species of this affinity.

Distribution : Endemic.

7. Phreatia klabatensis Schltr., in Fedde Repert. X (1911), p. 189.

Phreatia calcarata Krzl., in Engl. Pflanzr., 50 II B 23 (1911), p. 29 p.pt. (non J.J.Sm.).

North Celebes, Minahassa : Epiphytic on Mount Masarang - P. & F. Sarasin no. 416, flowering on 21st June 1894; on trees in the forests of Mount Klabat, alt. c. 1400m - R. Schlechter no. 20558, flowering in Dec. 1909.

So far the only species of the section Saccophreatia from Celebes. It is most closely related to P. saccifera Schltr. from New Guinea, but is separated specifically by the labellum and, in particular, by the shape of the lip-lamina. As for all species of the section, the flowers are white.

Distribution : Endemic.

54. Geodorum Jacks.

1. Geodorum purpureum R.Br. (?), in Ait. Hort. Kew, ed. 2 V (1813), p. 207.

South Celebes : Near Macassar - P. & F. Sarasin no. 820, flowering on 12th Dec. 1894.

Unfortunately, the flowers of this very strongly pressed specimen are more-or-less destroyed, so that a determination is somewhat doubtful, even though it can be accepted that this widely distributed species is present here, all the more since the flower colouration is given as pale violet.

Distribution : East India, Java.

55. Eulophia R.Br.

1. Eulophia macrorhiza Bl. var. Minahassae Schltr., in Fedde Repert. X (1911), p.70.

North Celebes, Minahassa : In humus of the forests of Mount Klabat, alt. c. 500m - R. Schlechter no. 20552, flowering in Dec. 1909.

The variety differs from the widely distributed Type in its larger flowers, longer, more protruding front lobe of the labellum and in longer lip-keels. The flowers are brown, the labellum whitish on the outside, inside a muddy red, with a darker base and white middle.

Distribution of variety : Endemic.

2. Eulophia squalida Lindl. var. celebica (Bl.) Schltr., in Fedde Repert. X (1911), p. 71.

Eulophia celebica Bl., in Orch. Flor. Jav. (1858), p. 54.

North Celebes, Minahassa : Near Menado - Forster; on alang plains near Ayermadidi, alt. c. 150m - R. Schlechter no. 20524, flowering in Dec. 1909; Pinamorongan [Bivouac] - S.H. Koorders no. 29518, flowering on 25th Jan. 1895.

The variety differs from the Type in the shorter spur, the somewhat different lip-lamina with its veins more delicately swollen at the base. The flowers are reddish violet or yellow-green, with the petals whitish or yellowish in front and with a rose-red or white lip.

Distribution of variety : Endemic (?).

3. Eulophia exalata Rchb.f. var. Sarasinorum Schltr., var. nov.

Differt a forma typica foliis angustioribus, usque ad 1.0cm latis, scapo graciliore, floribus paulo minoribus, labelli lobo intermedio quadrato-retuso, calcare paulo antrorsum curvato.

Central Celebes : In Alang near Enrekang - P. & F. Sarasin no. 1229, flowering on 15th Aug. 1895.

The variety differs outwardly already from the Type, which occurs in Java and the Philippines, in the more slender growth and smaller flowers. According to the collector, the plant mimics clumps of grass precisely. The flowers are yellow, as for the Type.

Distribution of variety : Endemic.

4. Eulophia emarginata Bl., Orch. Flor. Jav. (1858), p. 152.

Graphorchis Blumeana O. Ktze., Rev. Gen. II (1891), p. 663.

North Celebes, Minahassa : Without locality details - O. Warburg no. 15748.

The specimen is already much withered, but I am sure that this species, which is widely distributed in the Malayan Archipelago, is present here also. Eulophia macrostachya Lindl. from Ceylon, which J.J.Smith also unites with this species, could probably also be considered as a separate species.

Distribution : From Sumatra across Java, Borneo, Celebes, the Moluccas up to New Guinea.

56. Dipodium R.Br.

1. Dipodium gracile Schltr., in Fedde Repert. X (1911), p. 191.

North Celebes : On the borders of swamps, at the base of tree-stumps, on the lower part of Mount Kaweng, alt. c. 750m - R. Schlechter no. 20599, flowering in Dec. 1909.

This species is probably best placed next to the Australian D. ensifolium F.v.M. Amongst the Malayan species it probably is closest related to D. palustre Rchb.f., but from which it differs appreciably in the labellum.

57. Grammatophyllum Bl.

1. Grammatophyllum scriptum Bl. var. Minahassae Schltr., in Fedde Repert. X (1911), p. 190.

North Celebes : Kota Menado (Minahassa) - S.H. Koorders no. 29513, flowering on 27th Dec. 1895; on trees in the forests of Mount Lokon (Minahassa) - R.Schlechter no. 20446, flowering in Nov. 1909; on trees on Kapoetan Island, in Toli-Toli Bay, alt. c. 30m - R. Schlechter no. 20668 [probably 20688], flowering in Jan. 1910.

The variety differs from the Type in more lax and much longer inflorescences, longer-stemmed flowers, and a labellum with more-pointed side lobes and a broader front lobe. The colouring of the flowers is generally the same, i.e. brown-spotted on a yellow-green base, with a white, red-marked lip.

Distribution of variety : Endemic.

58. Grammangis Rchb.f.

1. Grammangis stapeliiflora (Teysm. et Binnend.) Schltr., in Engl. Jahrb. Beibl. 104 (1911), p. 53.

Cymbidium stapeliaeflorum Teysm. et Binnend., in Nat. Tjidschr. Need. Ind. XXIV, p. 319.

Cymbidium Huttoni Hook.f., in Bot. Mag. (1867), t. 5676.

Grammangis Huttoni Bth., in Gen. Pl. III (1883), p. 538.

Cymbidium Stephensi Ridl., in Journ. Bot. (1900), p. 71.

North Celebes, Minahassa : On trees near Tomohon, alt. c. 900m - R. Schlechter no. 20497, flowering in Nov. 1909.[cf. 71/1, same number].

I now have certain doubts whether the plant is correctly placed with Grammangis, but it belongs definately neither to Cymbidium nor to Grammatophyllum. Likewise, it appears to me doubtful whether the plant from Celebes can finally remain united with the more westerly ones from Java, Sumatra and Perak. Further investigations are necessary here, before these two questions can be decided, so for the present, I have had to leave them open.

Distribution : Malayan Peninsula (Perak), Sumatra, Java, Celebes.

58. [59.] Cymbidium Sw.

1. Cymbidium Finlaysonianum Lindl., in Wall. Cat. (1832), no. 7358.

Cymbidium pendulum Bl., Bijdr. (1825), p. 379.

Cymbidium Wallichii Lindl., Gen. et Spec. Orch. (1831), p. 165.

Cymbidium tricolor Miq., Choix Pl. R. Jard. Buit. (1863), t. 19.

North Celebes : On the coast, at the foot of the Matinang Chain - P. & F. Sarasin no. 648, flowering on 25th Aug. 1895; on trees on Kapoetan Island, in Toli-Toli Bay, alt. c. 10m - R. Schlechter no. 20685, flowering in Jan. 1910.

Central Celebes : At the beach, near Dongala, frequent - R. Schlechter [s.n.], seen in bud, in Nov. 1909.

South Celebes : Near Macassar - P. & F. Sarasin no. 817, flowering on 14th Dec. 1994 [1894].

South-east Celebes : Near Kolaka in forest - P. & F. Sarasin no. 2165, flowering on 13th Feb. 1903.

The species is widely distributed along the coast in Celebes. It is well characterised by the long, broad leaves and long pendulous inflorescences. In colouration, the flowers vary somewhat in that the red marking on the lip, sometimes is more pronounced.

The sepals and petals are yellowish, the lip white with red markings.

Distribution : From the hinterlands of India, through the Sunda Islands as far as the Philippines.

2. Cymbidiun celebicum Schltr., sp. nov.

Epiphyticum, erectum, usque ad 80 cm altum. Rhizoma valde abbreviatum. Radices crassiusculae, flexuosae, glabrae. Pseudobulbi ovoidei vel oblongoideis, paulo compressi, plurifoliati, vaginis foliorum omnino obtecti, c. 7 cm alti, medio fere 2—3 cm lati. Folia erecta vel suberecta, ligulata, apice valde inaequaliter et obtuse bilobulata, coriacea, 40—75 cm longa, medio 1,3—1,7 cm lata. Inflorescentia erecta, laxe 8—13-flora, usque ad 30 cm alta, pedunculo brevi vaginis alte amplectentibus, acutis obtecto ; bracteis parvulis, oblongis vel ovalibus obtusis, ovario pedicellato multo brevioribus. Flores in genere vix inter mediocres, erecto-patentes, illis *C. pubescentis* Ldl. similes. Sepala anguste oblonga, obtusiuscula, 1,7 cm longa, glabra, lateralia obliqua. Petala sepalis similia, sed paulo

breviora, subacuta, 1,5 cm longa. Labellum circuitu ovale, dimidio superiore trilobum, basi concava callis 2 cariniformibus leviter curvatis, obtusiusculis ornatum, callis 2 minoribus infra medium antepositis auctum, callis exceptus superne minutissime papilloso-puberulum, 1,5 cm longum, medio fere 1 cm latum, lobis lateralibus erectis, breviter et oblique ovatis, obtusis, intermedio obovato vel ovali obtuso, 6,5 mm longo, c. 5 mm lato. Columna subrecta, semiteretes, glabra, 1,1 cm longa. Anthera cucullata, antice truncatissima, minute papillosa. Pollinia transverse et oblique ovato-triquetra, stipite brevissimo lata Ovarium pedicellatum glabrum c. 1,4 cm longum.

Cymbidium pubescens Lindl. var. celebicum Schltr., in Fedde Repert. X (1911), p. 190.

North Celebes : On trees near Lansot (Minahassa), alt. c. 700m - R. Schlechter no. 20629, flowering in Dec. 1909; on trees in the mountain forests near Toli-Toli, alt. c. 600m - R. Schlechter s.n., flowering in Jan. 1910.

I have now come around to the opinion of considering the plant as a separate species. The erect inflorescence, long leaves, blunt side lobes and the very different calli on the lip, indicate it is specifically different from C. pubescens Lindl.

Distribution : Endemic.

60. Acriopsis Reinw.

1. Acriopsis javanica Reinw., in Flora Litt. II (1825), p. 4.

Acriopsis picta Lindl., Bot. Reg. (1843), Misc. 105.

Acriopsis crispa Griff., Notul. III (1831), p. 333.

? Spathoglottis trivalvis Wall., Catal. (1830), no. 3742.

Acriopsis Griffithii Rchb.f., in Bonpl. II (1854), p. 92.

North Celebes : Tomohon (Minahassa) - P. & F. Sarasin no. 601, flowering on 24th Sept. 1894; on trees near Langowan (Minahassa), alt. c. 800m - R. Schlechter no. 20611, flowering in Dec. 1910; at Lake Tondano (Minahassa) - S.H. Koorders no. 29497, flowering on 12th Jan. 1895; near the Kakas resthouse (Minahassa) - S.H. Koorders no. 29498, flowering on 13th Mar. 1895; on trees near the mountains near Toli-Toli, alt. c. 600m - R. Schlechter no. 20710, flowering in Jan. 1910.

A very widely distributed plant, whose appearance on the island could be expected. It can be assumed, with a fair degree of certainty, that it occurs also in other parts of the island.

Distribution : From the Malayan Peninsula over the whole of the Malay Archipelago.

61. Thrixspermum Lour.

1. Thrixspermum celebicum Schltr., in Fedde Repert. X (1911), p. 205.

North Celebes : On trees on the upper Lampasioe [River], near the old gold mines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20678, flowering in Jan. 1910. [cf. 34/1, same citation].

Related to T. arachnites (Bl.) Rchb.f. from Java, but differing specifically in the labellum. The flowers are yellow-white, the labellum white, yellowish at the base, with a few golden-yellow spots at the side.

Distribution : Endemic.

2. Thrixspermum tylophorum Schltr., in Fedde Repert. X (1911), p. 206.

North Celebes, Minahassa : On trees in the forests at the foot of Mount Lokon, alt. c. 1000m - R. Schlechter no. 20450, flowering in Nov. 1909; near Tomohon - P. & F. Sarasin no. 1088, flowering on 9th Apr. 1895.

This species is most closely related to T. oreadum Schltr. and T. aberrans Schltr. from New Guinea, particularly with the former, but specifically well separated in lip structure. The flowers are white, with a brown spot in front of the pouch, and with brown dots on the margin of the middle lobe of the labellum.

Distribution : Endemic.

3. Thrixspermum Loogemanianum Schltr., in Fedde Repert. X (1911), p. 206.

North Celebes : On trees near Toli-Toli, alt. c. 100m - R. Schlechter no. 20690, flowering in Jan. 1910.

An extremely characteristic form within the genus, standing somewhat isolated, which perhaps could be related to the above and its relatives. The flowers are white, with a golden-yellow lip and column.

Distribution : New Guinea.

4. Thrixspermum cymboglossum Schltr., in Fedde Repert. X (1911), p. 207.

North Celebes, Minahassa : On trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20464, flowering in Nov. 1909.

Here, likewise, we are considering an aberrant form, so far without any known closer relatives. The shape of the lip, in particular, is very characteristic. The flowers are pale yellow, with a white lip having pale yellow spots towards the base, inside of the margin.

Distribution : Endemic.

5. Thrixspermum filifolium Schltr., in Fedde Repert. X (1911), p. 208.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20485, flowering in Nov. 1909; on trees at the foot of the [Mount] Sopoetan massif - P. & F. Sarasin no. 1100, flowering on 21st Apr. 1895.

I do not know the normal flowers of the species. My specimen showed only gall-affected flowers, whilst the flowers had fallen off the Sarasin ones. These gall-affected flowers are biologically of particular interest. After the ovary has been stung by a gall-fly, the completely young segments change considerably; the flower becomes almost peloric and cleistogamic. Of all the many I have observed

not a single one had opened, even though all had been fertilised. Unfortunately, I could not establish whether seed capable of germinating had been formed.

The species produces up to 50cm long, laxly pendulous stems with almost filament-shaped leaves, hence it is very characteristic.

Distribution : Endemic.

62. Sarcochilus R.Br.

1. Sarcochilus pallidus (Bl.) Rchb.f. var. celebicus Schltr., in Fedde Repert. X (1911), p. 203.

North Celebes, Minahassa : On trees near Ayermadidi, alt. c. 150m - R. Schlechter no. 20251 [probably 20521], flowering in Dec. 1909.

As I stated already earlier, I consider it fairly certain that this variety will prove to be a separate species. Unfortunately, my material is too sparse to decide this question. The flowers of the variety are pale yellow, with 1 to 2 brown spots at the base of the sepals, the labellum is whitish and brown-spotted.

Distribution of variety : Endemic.

2. Sarcochilus phalaenopsis Schltr., in Fedde Repert. X (1911), p. 203.

North Celebes : On trees on the Lampasioe [River], Toli-Toli district, alt. c. 80m - R. Schlechter no. 20652, flowering in Jan. 1910.

This species has the largest flowers within the genus. It belongs to the affinity of S. pallidus Rchb.f., but is recognised in habit by the slender, longer-stemmed inflorescences. The labellum is similar to that of S. pallidus Rchb.f., but different in detail. The colouring of the flowers is yellowish white.

Distribution : Endemic.

3. Sarcochilus incurvicalcar J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XIII (1914), p. 39.

South Celebes [Central Celebes] : Enrekang - L. van Vuuren.

According to J.J.Smith, this is a relative of S. appendiculatus J.J.Sm., from which it differs in the distinctly clawed lip, and in the spur being bent strongly forwards. The flowers are pale brown-yellow with chestnut-brown stripes, the lip is white with brown-red marking.

Distribution : Endemic.

4. Sarcochilus pulviniferus Schltr., in Fedde Repert. X (1911), p. 204.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 600m - R. Schlechter no. 20583, flowering in Dec. 1909.

A species of the section Ascochilus, from the affinity of S. Zollingeri Rchb.f. which is characterised by the cushion on the labellum. The yellow flowers are red-spotted, the lateral lobes of the labellum red-striped, the front lobe is white,

the spur yellow.

Distribution : Endemic.

5. Sarcochilus quinquelobatus Schltr., in Fedde Repert. X (1911), p. 205.

North Celebes : In the forest on the upper Lampasioe [River], near the old gold mines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20672, flowering in Jan. 1910.

Likewise, a species of the section Ascochilus. It is related to Sarcochilus Zollingeri Rchb.f. and S. pulviniferus Schltr., but distinguished by the labellum. The flowers are yellow, the labellum white, red in front.

Distribution : Endemic.

6. Sarcochilus aberrans Schltr., in Fedde Repert. X (1911), p. 203.

North Celebes, Minahassa : On trees in the forests of Mount Sopoetan, alt. c. 1300m - R. Schlechter no. 20616, flowering in Dec. 1909.

I am not quite sure of whether the species belongs to this genus, but would prefer to avoid separating it for the time being. In the shape of the lip it is reminiscent of the other species of the genus, yet the column is completely footless. The flowers are golden-yellow.

Distribution : Endemic.

63. Doritis Wight [Lindl.]

1. Doritis Steffensii Schltr., in Fedde Repert. X (1911), p. 194.

North Celebes, Minahassa : In the environs of Menado - Consul H.F. Steffen's collector, in the year 1910.

The only, so far, known species of the genus in Celebes. It is closest akin to D. philippinensis Ames from the Philippines, but differs in the shape of the lip, particularly in the short-clawed, narrower front lobes. It is dedicated to the German Consul in Menado, H.F. Steffens. The flowers appear to be rose-red.

Distribution : Endemic.

64. Phalaenopsis Bl.

1. Phalaenopsis psilantha Schltr., in Fedde Repert. X (1911), p. 193.

North Celebes : On trees on the upper Lampasioe [River], near the old gold mines on [Mount] Djangdjang, Toli-Toli district, alt. c. 180m - R. Schlechter no. 20667, flowering in Jan. 1910.

The species belongs to the affinity of P. Lueddemannia Rchb.f. and P. speciosa Rchb.f., but is distinguished by the completely glabrous labellum. The flowers are greenish white, the sepals and petals brown-striped, the labellum white with a brown-red centre, the side lobes golden-yellow at the base, the column white.

2. Phalaenopsis amabilis Bl. var. moluccana Schltr., in Fedde Repert. X (1911), p. 193.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 195, flowering on 15th Mar. 1894; no. 785, flowering on 12th Sept. 1894; on trees in the forests of Mount Klabat, alt. c. 400m - R. Schlechter no. 20581, flowering in Dec. 1909; on trees near Lansot, alt. c. 700m - R. Schlechter no. 20632, flowering in Dec. 1909; near Kota Amoerang - S.H. Koorders no. 29512, flowering on 2nd Apr. 1895.

The variety differs from the Type from Java, in the narrower front lobes of the labellum, which are not so strongly saggitate at the base.

Distribution of variety : Celebes, Moluccas.

var. cinerascens J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2, XXV (1917), p. 88.

South-east Celebes : Kolaka - J. Elbert.

According to J.J.Smith, this variety is said to corrospond almost completely in its flowers with P. amabilis Bl. var. moluccana Schltr., but to differ conspicuously in the leaves, with their grey-green colouring.

3. Phalaenopsis Aphrodite Rchb.f., in Hamb. Gartztg. XVIII (1862), p. 35.
Phalaenopsis amabilis Lindl., Bot. Reg. (1838), t. 34 (non Bl.).
Phalaenopsis ambigua Rchb.f., in Hamb. Gartztg. XVIII (1862), p. 35.
Phalaenopsis Sanderiana Rchb.f.

South Celebes : At the border of the forests on trees of the mountains at Tjambo, alt. c. 600m - M. Piscicelli no. 49, flowering on 18th Mar. 1914.

This species, known previously only from the Philippines, is included by Chiovenda in the list of plants collected by Piscicelli in Celebes. I cast some doubt as to whether the determination is correct. I have not seen the specimen. The species is very closely related to P. amabilis Bl.

Distribution : Philippines.

65. Aerides Lour.

1. Aerides odoratum Lour. var. celebicum J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 3 I (1919), p. 122.

South Celebes : On trees in the streets of Macassar - R. Schlechter s.n., in Oct. 1909.

This Celebes plant is given by J.J.Smith as a separate variety of the more westerly Type. It is found frequently on trees, especially on tamarinds in the streets of Macassar.

Distribution of variety : Endemic (?).

2. Aerides reversum J.J.Sm., in Bull. Jard. Bot. Buitenz., ser. 2 VIII (1912),p. 45.

North Celebes : Palele - General de Voogt.

The species differs from A. odoratum Lour., in the long-stemmed erect flowers, shorter sepals and petals, with the side lobes of the lip leaving the column completely free, and with the column-foot parallel to the ovary. The flowers are purple, paler towards the base.

Distribution : Endemic.

3. Aerides inflexum Teysm. et Binnend., in Nat. Tijdskr. Ned. Ind. XXIV (1862), p. 324.

South Celebes : On trees near Goa - Tolson; on trees in the environs of Macassar, alt. c. 30m - R. Schlechter no. 20729, flowering in Feb. 1910.

I do not doubt that here in my specimen is the re-discovered species of Tolson. The lip is free of the column and characterised by the middle lobe standing upright between the fairly large side lobes. The colouring of the flowers is white, with pale rose-red tips and a yellowish lip.

Distribution : Endemic.

65. [66.] Adenoncos Bl.

1. Adenoncos celebicus Schltr., in Fedde Repert. X (1911), p. 192.

North Celebes : On trees in the mangrove swamps, near Toli-Toli - R. Schlechter no. 20693, flowering in Jan. 1910. [cf. 33/46, same citation].

This species, which has certain similarity with A. borneensis Schltr., is very well characterised by the shape of the labellum. The flowers are greenish with the labellum initially green, then turning to chocolate-brown.

Distribution : Endemic.

2. Adenoncos nasonioides Schltr., in Fedde Repert. X (1911), p. 193.

North Celebes : On trees in the mangrove swamps near Toli-Toli, often together with Adenoncos celebicus Schltr. - R. Schlechter no. 20697, flowering in Jan. 1909 [1910].

A no less interesting species than the previous one. In habit it is reminiscent of several South American Nasonia species. In all its segments, the species is somewhat smaller than for those of A. celebicus Schltr. It is well characterised by the shape of the labellum. The flowers are always yellow-green.

Distribution : Endemic.

3. Adenoncos macranthus Schltr., sp. nov.

Epiphyticus, patulus, usque ad 25 cm longus. Caulis simplex, curvatus, teretiusculus, dense foliatus, vaginis foliorum arcte amplectentibus, minute rugulosis omnino obtectus, c. 3 mm diametiens. Folia patentia falcato-curvata, oblongo-ligulata vel lineari-oblonga obtusa, valde carnosa, subtus carinata, 2,5—4 cm longa, medio fere 7—11 mm lata. Inflorescentiae laterales, more generis uniflorae, brevissimae, pedunculo subnullo, bivaginulato; bractea brevi, ovato-triangula, obtusa, ovarium paulo excedente. Flos in genere magnus, cereaceus, lutescenti-viridis, labello obscure rubro-brunneo. Sepala patentia,

8 mm longa, glabra, intermedium oblongo-ovatum, obtusiusculum, lateralia oblique oblonga, obtusiuscula, extus nervo medio carinato-incrassata. Petala erecto-patentia oblique oblongo-ligulata, obtusiuscula, glab., margine microscopice denticulata, 1-nervia, vix 7 mm longa. Labellum carnosum, circuitu anguste ovatum, tertia parte basilari late rhombeum, deinde paulo constrictum et in laminam ovato-triangulam, incrassatam subito sursum incrassatum, apice obtusum, basi callo angusto, dense et brevissime papilloso ornatum, nervis in dimidio inferiore (tenuiore) leviter incrassatum, totum c. 1 cm longum, medio fere et in tertia parte basilari 6,5 mm latum. Columna brevis, crassiuscula, glabra. Anthera quadrato-cucullata, antice truncata. Pollinia suborbicularia, stipite obovato viscidio rotundato parvulo affixa. Ovarium sessile, cylindricum, glabrum, vix 5 mm longum.

Central Celebes : On a fallen tree near Dongala, alt. c. 20m - R. Schlechter no. 20714, flowering on 7th Feb. 1910.

The species is closely related to A. celebicus Schltr., but is easy to distinguish by the broader petals and the shape of the lip.

67. Luisia Gaud.

1. Luisia celebica Schltr., in Fedde Repert. X (1911), p. 191.

North Celebes, Minahassa : On trees on the main track between Menado and Kakaskassen, alt. c. 100 - 600m - R. Schlechter no. 20404, flowering in Nov. 1909; near Kota Amoerang - S.H. Koorders no. 29582, flowering on 27th Apr. 1895.

One of the species of the L. teretifolia Gaud. affinity, which, in particular, is closely related to L. confusa Rchb.f. from Ambon. The sepals are brownish, the petals yellowish, the labellum black-violet, with a paler spot in the front, and the column green with a yellow anther.

Distribution : Endemic.

68. Vanda R.Br.

1. Vanda arcuata J.J.Sm., in Bull. Dep. Agric. Ind. Néerl. V (1907), p. 35.

North Celebes, Minahassa : Without locality details - Jellesma; on trees near Tomohon, alt. c. 900m - R. Schlechter no. 20458, flowering in Nov. 1909; [Mount] Lokon forest - P. & F. Sarasin no. 1089, flowering on 3rd Apr. 1894.

This, the sole species of the section Euvanda, known at present in Celebes, is easily recognised by the fairly pallid, brownish flowers; with sepals and petals lightly tinted-reddish and with a brownish labellum. It is most closely related to Vanda helvola Bl. from Java.

Distribution : Endemic.

2. Vanda celebica Rolfe, in Kew Bull. (1899), p. 131.

North Celebes, Minahassa : Pinget - S.H. Koorders no.29502, flowering on 31st Jan. 1895; in the environs of Menado - Consul H.F. Steffens' collector, in the year 1910; on trees in the forests of Mount Klabat, alt. c. 300m - R. Schlechter no.

20538, flowering in Dec. 1909.

This species belongs to the Vanda hastifera Rchb.f. affinity, which together with a few other species forms a characteristic group, based on the structure and shape of the labellum, which I name Deltalobos [section], from the delta-shaped front lobe of the lip. The flowers of our species are yellow-white, with brown-marked sepals and petals, the lip red-striped and red in front.

Distribution : Endemic.

69. Vandopsis Pfitz.

1. Vandopsis lissochiloides (Gaud.) Pfitz., in Engl. et Prantl. Nat. Pflanzenfamilien II 6 (1889), p. 210.

Fieldia lissochiloides Gaud., Voy. Frey. (1833), p. 424, t. 36.

Vanda lissochiloides Lindl., Gen. et Spec. Orch. (1830-1840), p. 216.

Vanda Batemani Lindl., Bot. Reg. (1846), t. 59.

Stauropsis lissochiloides Pfitz., Vergl. Morph. Orch. (1882), p. 14.

'Celebes' : Without locality details.

In the catalogue of cultivated orchids at the Buitenzorg Garden, J.J.Smith states that there is a specimen in cultivation, coming from Celebes. The species is easily recognised by the tall growth and erect, long raceme of large flowers, the latter being yellow on the outside and red on the inside.

Distribution : Ambon, Celebes, Philippines.

2. Vandopsis celebica Schltr., in Fedde Repert. X (1911), p. 195.

Arachnis celebica J.J.Sm., in Nat. Tijdschr. Ned. Ind. LXXII (1912), p. 4.

Celebes, Minahassa : On trees near Lansot, alt. c. 700m - R. Schlechter no. 20633, flowering in Dec. 1910 [1909].

A relative of V. breviscapa (J.J.Sm.) Schltr. from Borneo, with up to 70cm long pendulous stems and short 2 to 4-flowered racemes of fairly carnose, yellowish, red-brown-spotted flowers.

Distribution : Endemic.

70. Renanthera Lour.

1. Renanthera sp.

North Celebes, Minahassa : Near Amoerang - S.H. Koorders no. 29503, on 26th March 1895.

As informed by S.H. Koorders, this is said to be a Renanthera. The occurrence of a species of this genus in Celebes is not suprising, as such. Unfortunately, the species has not yet been specifically determined.

71. Ascoglossum Schltr.

1. Ascoglossum aurantiacum Schltr., Orch. Dtsch. Neu-Guinea (1913), p. 975.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 659, flowering on 2nd Aug. 1894; ebenda, on trees, alt. c. 1000m - R. Schlechter no. 20497, flowering in Jan. 1910. [cf. 58/1, same collection number].

72. Staurochilus Ridl.

1. Staurochilus paniculatum (J.J.Sm.) Schltr., comb. nov.

Trichoglottis paniculata J.J.Sm., in Bull. Dep. Agric. Ind. Néerl. V (1905), p. 29.

South Celebes : [Mount] Bonthain, Lanjienga - Teysman.

Ridley's genus Staurochilus should, in my opinion, be retained in company with Trichoglottis Bl. Compared with the true Trichoglottis, the inflorescence is so peculiar, that a separation of the two genera appears thoroughly appropriate. The species has the branched inflorescence in common with S. ionosum (Lindl.) Schltr. and S. Dawsonianum (Rchb.f.) Schltr. It would appear to be most closely related to the latter.

Distribution : Endemic.

73. Trichoglottis Bl.

1. Trichoglottis geminata (Teysm. et Binnend.) J.J.Sm., Orch. Ambon (1905), p. 106.

Sarcanthus geminatus Teysm. et Binnend., in Nat. Tijdschr. Ned. Ind. (1867), p. 243.

Trichoglottis oblongifolia Rolfe, in Kew Bull. (1899), p. 130.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 300m - R. Schlechter no. 20537, flowering in Dec. 1909; near Kajoewatoe - S.H. Koorders no. 29506, flowering on 25th Feb. 1895.

This species is easy to recognise by the shape of the labellum, which has small, erect side lobes and a front lobe narrowed and extended in a lingulate manner, from an oval base.

Distribution : Ambon, Celebes.

2. Trichoglottis Koordersii Rolfe, in Kew Bull. (1899), p. 130.

North Celebes, Minahassa : On trees in the forests of Mount Lokon, alt. c. 1000m - R. Schlechter no. 20440, flowering in Nov. 1909; near Totok and Ratatotok - S.H. Koorders no. 29507, flowering on 20th Mar. 1895; on the Lolomboelan [Range] - S.H. Koorders no. 29504, flowering on 9th Apr. 1895.

The species indicates close relationships with T. philippinensis Rolfe from the Philippines and T. litoralis Schltr. from Papuasia. The flowers are white, the labellum with a violet-red front lobe and the column apex, red at the sides.

Distribution : Celebes, Moluccas.

3. Trichoglottis celebica Rolfe, in Kew Bull. (1899), p. 130.

North Celebes, Minahassa : Near Ranoketan - S.H. Koorders no. 29505, flowering on 14th Mar. 1895.

The closest relative of the species is T. sororia Schltr. from New Guinea. In a similar manner it is characterised by the trilobed front lobe of the labellum, whose lateral lobules are obliquely rhombic and appreciably broader than the lingulate middle lobule.

Distribution : Celebes, West New Guinea.

74. Schoenorchis Bl.

1. Schoenorchis subulata (Schltr.) J.J.Sm., in Nat. Tijdschr. Ned. Ind. LXXII (1912), p. 31.

Saccolabium subulatum Schltr., in Fedde Repert. X (1911), p. 198.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 600m - R. Schlechter no. 20585, flowering in Dec. 1909.

The species belongs to the affinity of S. paniculata Bl. and S. micrantha Bl. It is readily distinguished from both by the conspicuously deep positioning of the stigma. The flowers are white.

Distribution : Endemic.

75. Saccolabium Bl.

1. Saccolabium celebicum Schltr., in Fedde Repert. X (1911), p. 198.

North Celebes, Minahassa : Near Tomohon - P. & F. Sarasin no. 560, flowering on 10th Oct. 1894; on trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20475, flowering in Nov. 1909; on trees in the forests of Mount Sopoetan, alt. c. 1300-1500m - R. Schlechter no. 20617, flowering in Dec. 1909.

The species is most closely related to S. rhopalorhachis (Rchb.f.) J.J.Sm. from Ambon and S. sarcochiloides Schltr. from the Philippines. The flowers are snow-white, with a golden-yellow labellum apex.

Distribution : Endemic.

2. Saccolabium aberrans Schltr., in Fedde Repert. X (1911), p. 202.

North Celebes, Minahassa : On trees in the forests of Mount Klabat, alt. c. 600m - R. Schlechter no. 20582, flowering in Dec. 1909.

An aberrant species, not related closely to any other. Perhaps it is best to leave it for the time being in Saccolabium, even though I do not doubt that it will eventually have to be removed. However, I wanted to avoid forming another monotypic genus.

The flowers are yellow, the lip white with a red margin, the column pale yellow.

Distribution : Endemic.

76. Malleola J.J.Sm. et Schltr.

1. Malleola Steffensii J.J.Sm. et Schltr., in Orch. Dtsch. Neu-Guinea (1913), p. 981.

Saccolabium Steffensii Schltr., in Fedde Repert. X (1911), p. 199.

North Celebes, Minahassa : In the environs of Menado - Consul H.F. Steffens' collector, in the year 1910.

The species belongs to the affinity of M. Witteana (Rchb.f.) J.J.Sm. et Schltr. and M. palustris J.J.Sm. et Schltr. It is closely related, in particular, to the latter, which comes from New Guinea. It is easily recognised by the shape of the gently backwards-bent spur.

I have dedicated the plant to our German Consul in Menado, H.F. Steffens, whom I have to thank for his assistance and kindness for many a success in Celebes.

Distribution : Endemic.

var. tomohonensis Schltr., in Fedde Repert. X (1911), p. 200.

North Celebes, Minahassa : On solitary trees near Tomohon, alt. c. 800m - R. Schlechter no. 20436, flowering in Nov. 1909.

The variety differs from the Type in more-bunched racemes, more-protruding flowers with shorter spurs, and in the compact growth.

Distribution of variety : Endemic.

77. Robiquetia Gaud.

1. Robiquetia Minahassae (Schltr.) J.J.Sm., in Nat. Tijdschr. Ned. Ind. LXXII (1912), p. 44.

Saccolabium Minahassae Schltr., in Fedde Repert. X (1911), p. 200.

North Celebes, Minahassa : In the environs of Menado - Consul H.F. Steffens' collector; near Tomohon - P. & F. Sarasin no. 203, flowering on 22nd Apr. 1894; on trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20427, flowering in Nov. 1909; on the summit of Mount Lokon - P. & F. Sarasin no. 203a, flowering on 1st July 1894.

An abundant, widely distributed orchid in the mountains of the Minahassa [district]. In common with most of the species of this genus recently, quite rightly, resurrected by J.J.Smith, the flowers are brown-spotted on the inside.

Distribution : Endemic.

2. Robiquetia longipedunculata Schltr., sp. nov.

Epiphytica, patula, usque supra 70 cm longa. Caulis validus, crassus, leviter compressus, vaginis foliorum omnino obtectus, 1.3—1,5 cm latus. Folia oblonga, inaequaliter et obtuse bilobata, coriacea, 16—20 cm longa, medio fere 4.2—4,4 cm lata. Inflorescentia longipedunculata, pauciramosa, pedunculo gracili, c. 20 cm longo incluso usque ad 50 cm longa, dense multiflora; bracteis deflexis, ellipticis, acutis, inferioribus ovarium aequantibus vel paulo superantibus, superioribus sensim paulo minoribus. Flores illis *R. Minahassae* (Schltr.) J. J. Sm. similes, glabri, carnosi, flavi,

intus purpureo-picti. Sepala oblonga, obtusa, 6 mm longa, extus sparsim furfuracea, lateralia obliqua, obtuse apiculata. Petala oblique oblonga, valde obtusa, sepalis paulo breviora. Labellum trilobum, 5,5 mm longum, obliquo infundibulare, lobis lateralibus semiorbicularibus, erectis, intermedio ovato-oblongo, concavo, adscendente, obtusiusculo, laterales bene superante, calcare cylindraceo apice hamato incurvo, leviter incrassato obtuso, 6 mm longo. Columna brevis, crassa, lateraliter paulo compressa rostello brevi, bifido. Ovarium cylindricum, furfuraceum, 8 mm longum.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20427a, flowering in Nov. 1909.

I found this specimen under my duplicates of R. Minahassae (Schltr.) J.J.Sm. Perhaps the odd piece may have been distributed in error under this name. The species is recognised at first sight by the shorter, much broader leaves, the long-stemmed panicles and shorter lip-spur. Furthermore, here the side lobes of the labellum are rounder and the front lobe longer.

Distribution : Endemic.

3. Robiquetia angustifolia Schltr., sp. nov.

Epiphytica, patula, 30—40 cm longa. Radices flexuosi, elongati, glabri. Caulis bene foliatus, vaginis foliorum striato-nervosis, arctissime amplectentibus omnino obtectus, 5 mm diametiens. Folia anguste ligulata, obtuse et inaequaliter bilobulata, coriacea, 15—22 cm longa, medio fere 1,5—1,7 cm lata. Inflorescentia pendula, pedunculo gracili, paucivaginato, c. 9 cm longo, racemo dense multifloro, 7 cm longo, c. 1,7 cm diametro; bracteis oblongis subacutis recurvis, ovarium paulo superantibus. Flores in genere vix inter mediocres, extus sparsim et brevissime furfuracei, rubescentes basi flavidi. Sepala late ovalia vel late oblonga, valde obtusa, extus sparsim et breviter furfuracea, 4,5 mm longa, lateralia obliqua, intermedio concavo paulo latiora. Petala oblique obovata, obtusissima, glabra, vix 4 mm longa. Labellum trilobum, obliquo infundibulari-cucullatum, petalis fere aequilongum, lobis lateralibus erectis quadrato-semiorbicularibus, intermedio suberecto, naviculari-concavo, ovato, obtuso, carnoso, laterales vix excedente, calcare cylindraceo apice leviter incrassato obtuso, apice hamato-incurvo, vix 5 mm longo. Columna perbrevis, crassa, vix 2 mm alta, rostello porrecto, bifido, clinandrio adscendente. Ovarium cylindraceum, sparsim furfuraceum, 5 mm longum.

South Celebes : Mount Bonthain, Cult. Hort. Macassar, flowering in Feb. 1910.

The plant was found in cultivation at the garden of Hotel Meyers at Macassar and is said to come from the summit of Mount Bonthain. The proprietoress was so kind as to give it to me.

In the leaves, the species is reminiscent of R. Minahassae (Schltr.) J.J.Sm., but in proportion they are appreciably smaller. The flowers are smaller, reminiscent of the denser racemes of R. Mooreana (Rchb.f.) J.J.Sm., and are smaller, and with a shorter spur.

Distribution : Endemic.

78. Pomatocalpa Brech [Breda]

1. Pomatocalpa Koordersii (Rolfe) J.J.Sm., in Nat. Tijdschr. Ned. Ind. LXXII

(1912), p. 34.

Cleiostoma Koordersii Rolfe, in Kew Bull. (1899), p. 31.

Saccolabium Koordersii Schltr., in Fedde Repert. X (1911), p. 201.

North Celebes : Near Ratatotok (Minahassa) - S.H. Koorders no. 29500, flowering on 24th Mar. 1895; near Amoerang (Minahassa) - S.H. Koorders no. 29501, flowering on 1st Apr. 1895; on trees in the mountain forests near Toli-Toli, alt. c. 200m - R. Schlechter no. 20717, flowering in Jan. 1910.

The species is closely related to P. marsupiale (Krzl.) J.J.Sm. from New Guinea. Its flowers are greenish yellow, often with a white lip-lamina.

Distribution : Celebes, Ambon.

79. Sarcanthus Lindl.

1. Sarcanthus subulatus (Bl.) Rchb.f., in Bonpl. V (1857), p. 41.

Cleisostoma subulatum Bl., Bijdr. (1825), p. 363.

Micropera pallida Lindl., in Wall. Cat. (1832), no. 7321.

Sarcanthus secundus Griff., Notul. III (1851), p. 362.

Saccolabium secundum Ridl., Mat. Flor. Mal. Penins. I (1909), p. 168.

'Celebes' : Without locality details.

This species is always easy to distinguish from the others by the narrow leaves with a subulate, fairly long tip. I have not seen any specimens from Celebes, but J.J.Smith in his catalogue of orchids in cultivation at the Buitenzorg Garden, lists several specimens in cultivation there, as coming from Celebes.

Distribution : From British India across the Malayan Archipelago, widespread.

2. Sarcanthus bilamellatus J.J.Sm., in Bull. Dep. Agric. Ind. Néerl. V (1907),p. 28.

Saccolabium bilamellatum Schltr., in Fedde Repert. X (1911), p. 201.

North Celebes, Minahassa : Without locality details - Forsters; on trees near Langowan, alt. c. 800m - R. Schlechter no. 20609, flowering in Dec. 1909.

A species growing very robustly with broad, thick leaves and large, long-stemmed, branched inflorescences. The flowers are whitish, the sepals and petals with a central red-spot.

Distribution : Endemic.

80. Camarotis Lindl.

1. Camarotis sterrophylla (Schltr.) J.J.Sm., in Nat. Tijdschr. Ned. Ind. LXXII (1912), p. 28.

Saccolabium sterrophyllum Schltr., in Fedde Repert. X (1911), p. 201.

North Celebes, Minahassa : On trees in the forests of Mount Lokon, alt. c. 1000m - R. Schlechter no. 20443, flowering in Nov. 1909.

A close relative of C. callosa (Rchb.f.) J.J.Sm., from which it is readily

distinguished by the stiffer growth, resulting in conspicuously rigid leaves, and in smaller flowers, with differently shaped segments. The flowers are yellow.

Distribution : Endemic.

81. Microtatorchis Schltr.

1. Microtatorchis celebica Schltr., in Fedde Repert. X (1911), p. 208.

North Celebes, Minahassa : On trees in the forests of Mount Mahawo, alt. c. 1200m - R. Schlechter no. 20429, flowering in Nov. 1909.

The first species from Celebes of the predominantly Papuasian genus. I am convinced that the island harbours further species of this minute, usually overlooked genus. The flowers are greenish.

The species is related to M. compacta (Ames) Schltr. from the Philippines.

Distribution : Endemic.

82. Taeniophyllum Bl.

§ Sepalocodon

1. Taeniophyllum usneoides Schltr., in Fedde Repert. X (1911), p. 209.

North Celebes, Minahassa : On slender trees in the forests of Mount Masarang, alt. c. 1200m - R. Schlechter no. 20428, flowering in Nov. 1909.

The species is easily recognised in the section, by the very numerous aerial roots and the peduncles, thin as hairs. The aerial roots, first grow upwards, but after a certain time, bend downwards. The flowers are yellow-green.

Distribution : Endemic.

2. Taeniophyllum sciaphila Schltr., in Fedde Repert. X (1911), p. 209.

North Celebes, Minahassa : On tree-trunks in the densest primary forest on Mount Kaweng, alt. c. 1000m - R. Schlechter no. 20592, flowering in Dec. 1909.

A fairly small species with short, very papillose peduncles and about 8.0cm long, flat aerial roots. The colouring of the flowers, also with this species is yellow-green.

Distribution : Endemic.

3. Taeniophyllum inconspicuum Schltr., in Fedde Repert. X (1911), p. 210.

North Celebes, Minahassa : On fruit trees near Tomohon, alt. c. 800m - R. Schlechter no. 20517, flowering in Dec. 1909.

The smallest of the so far known species of the genus in Celebes. It is lively reminiscent of T. Alwisii Lindl. from Ceylon, but from which it differs in the shape of the floral segments. The flowers are red-brown.

Distribution : Endemic.

§ Brachyanthera

4. Taeniophyllum celebicum Rolfe, in Kew Bull. (1897), p. 131.

North Celebes, Minahassa : Near Kajoewatoe - S.H. Koorders no. 29499, flowering on 28th Feb. 1895.

This species is distinguished from all others in the section, and altogether in the genus, so far known in Celebes, by the labellum not having a clearly truncated, but rather simply concave spur.

Distribution : Endemic.

§ Trachyrhachis

5. Taeniophyllum potamophila Schltr., in Fedde Repert. X (1911), p. 210.

North Celebes : On trees near Kuala Besar, Toli-Toli district, alt. c. 30m - R. Schlechter no. 20651, flowering in Jan. 1910.

A species from the affinity of T. obtusum Bl., but differing from it in the lip and narrower petals. The flowers are yellow, with a white labellum and two red spots on the anther. Footnote : Sphalm. potamophylla [cf. 1911 publication].

6. Taeniophyllum aggreatum Schltr., in Fedde Repert. X (1911), p. 211.

North Celebes : On trees on the Lampasioe [River], Toli-Toli district, alt. c. 40m - R. Schlechter no. 20653, flowering in Jan. 1910.

Likewise a relative of T. obtusum Bl., but differing in the rough bracts and the shape of the labellum. The sepals and petals are yellowish, the labellum white.

Distribution : Endemic.

7. Taeniophyllum paludicola Schltr., in Fedde Repert. X (1911), p. 211.

North Celebes : On trees in the mangrove swamps near Kuala Besar, Toli-Toli district, alt. c. 10m - R. Schlechter no. 20649, flowering in Jan. 1910.

The species is closely related to the two previously listed, but well characterised as a species by the more lax inflorescence, the shape of the lip and by the length of the spur. The flowers, likewise, are yellowish with a white labellum.

Distribution : Endemic.

§ Loboglossum

8. Taeniophyllum ficicola Schltr., in Fedde Repert. X (1911), p. 212.

North Celebes : On large Ficus trees on the Lampasioe [River], Toli-Toli district, alt. c. 30m - R. Schlechter no. 20679, flowering in Jan. 1910.

As the representative of the section Loboglossum, this species differs from all others in the region in the distinctly-lobed labellum. It is most closely related

to T. pulvinatum Schltr. from New Guinea. The flowers are pale yellow.

Distribution : Endemic.


Australian Orchid Foundation

APPENDIX I.

LOCALITIES IN CELEBES.

SCHLECHTER R. (1911 & 1925) 'THE ORCHIDACEAE OF CELEBES'

KEY TO AREA LOCATIONS

C = Central Celebes
N = North Celebes
N-M = North Celebes, Minahassa district.
S = South Celebes
S.E. = South-East Celebes

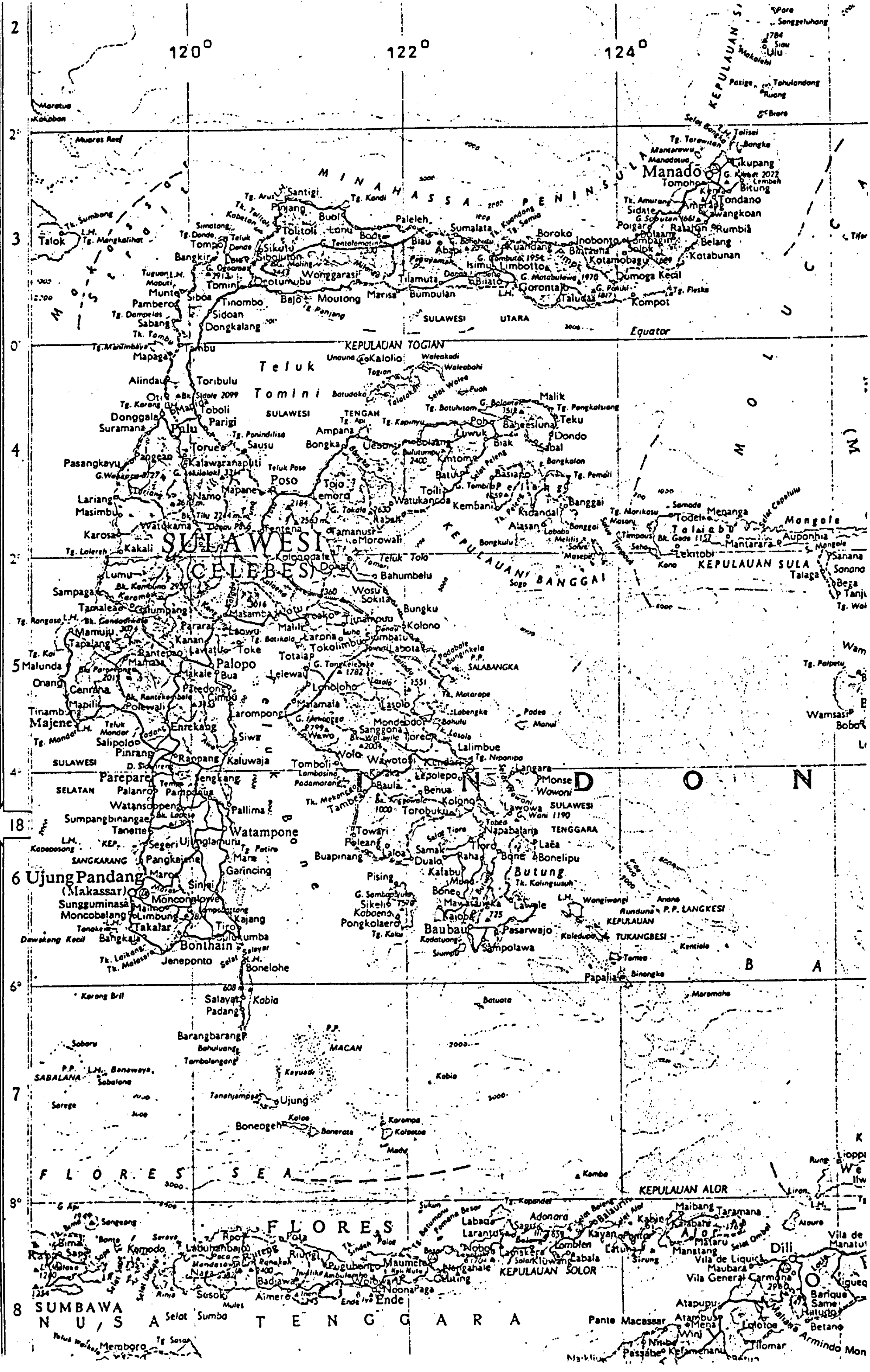
KEY TO TEXT NAMES

G = Gunong, Guenong = Mount or Volcano
Kota = Township
Kuala = River mouth
Kampong = Village

		°	°E
Ambabah,(Mount)	S		
Amoerang, (Township)	N-M	1.11 N	124.35
Ayermadidi, (Village) Later Airmadidi	N-M	1.25 N	124.59
Babelombang, (Mount)	S		
Balapioe,(Mount)	S		
Bantaeng (Pic), see Bonthain (Mount)			
Baverang, (Village)	S		
Bili-Bili,(Village) Later Bilibili	S		
Boeh, (Village)	N-M		
Boesoe (Mount)	S		
Bolaang Itang Later Bolaangitan	N	0.54 N	123.19
Bone, (Village)	N	0.33 N	123.08
Bonthain (Pic), (Mount) Later Lompobatang	S	5.20 S	119.55
Bowonglang (i) (Pic), (Mount) Later Boang	S		
Bujong, (Village)	N		
Bwol, (Village) Later Buol	N	1.10 N	121.26
Djangdjang, (Mount)	N-M	Toli-Toli District	
Donggala, Dongala, (Village)	C	0.40 S	119.44
Empung, (Mount)	N-M		
Enrekang, (Village)	C	3.34 S	119.47
Goa (r), (Village) Gowa District	S	5.10 S	119.40
Gorontolo, (Township)	N	0.33 N	123.03
Kajoewatoe, (Village) Later Kajuwatu	N-M	1.08 N	124.58
Kakas, Kakaskassen, (Village)	N-M	1.11 N	124.53
Kandari, (Township & District) Later Kendari	S.E.	3.57 S	122.35

Kapoetan (Island)	N	1.03 N	120.38
Katong Moan, Later Ketung?	S	3.32 S	116.11
Kawangkoan, (Village) Later Kavangkoan	N-M	1.12 N	124.47
Kaweng, (Mount)	N-M	1.09 N	124.54
Kema, (Village)	N-M	1.23 N	125.44
Keppe, (Mount & Village)	S	3.33 S	120.22
Klabat, (Mount)	N-M	1.28 N	125.02
Kolaka, Kolak	S.E.	4.03 S	121.36
Kombi, (Village)	N-M	1.14 N	125.01
Kovo, (District)	C		
Kuala Besar, Kwala-Besar, (Village)	N	Toli-Toli District	
Kwala Besar, Kuala-Besaar, (River)	N	"	"
Lambelo, Lambolo, (Mount)	S		
Lampasioe,(River)	N	Toli-Toli District	
Langowan, (Village)	N-M	1.09 N	124.50
Lanjienga, (Village)	S		
Lansot, (Village) Later Lansat	N-M	1.13 N	124.44
Lepo-Lepo, (Village) Later Lepolepo	S.E.	4.04 S	122.51
Lerk, (Village)	N		
Lokon, (Mount)	N-M	1.22 N	124.47
Lokon-Empung, (Mountains) See individual Mts.	N-M		
Lolomboelan, (Range or Mount)	N-M		
Macassar, Makassar, (Township) Later Ujung Pandang	S	5.07 S	119.24
Madjene, (Village)	S	3.30 S	119.08
Mahawo, Mahawa, (Mount)	N-M		
Maros (Pic), (Mount & Village)	S	5.00 S	119.34
Masawa, (Village)	S	3.16 S	119.20
Masenrempoeloe,	C		
Masarang, (Mount)	N-M		
Matinang, (Range)	C		
Menado, (Township)	N	1.29 N	124.51
Minahassa, (District & Peninsula)	N-M	1.00 N	124.25
Nanakan, (Mount)	S		
Padah, (Village)	S		
Paka-Paka, (Mount)	S		
Pakoe-veroe, (Village)	N-M		
Paleleh, Palele, (Village)	N	1.04 N	121.57

Paloppo, (Village) Later Palopo	C	3.00 S	120.12
Pangararan, (Mount)	S		
Pasangmalambe, (Mount)	S		
Pinamorongan, (Bivouac)	N-M		
Polewali (Village)	S	3.25 S	119.20
Posso, (Lake) Later Poso	C	1.52 S	120.35
Ranoketa (n), Later Ranoketang	N-M	1.04 N	124.39
Ratahan, (Village)	N-M	1.04 N	124.48
Ratatotok, (Village)	N-M	0.51 N	124.42
Rindengan,	N-M		
Salabanca, (Village) Later Salabangka	N		
Samparan, (Village)	S.E.		
Sankoep, (Village) Later Sangkup	N	0.54 N	123.38
Sinadji, (Mount)	S	3.15 S	119.58
Sonder, (Village)	N-M	1.16 N	124.46
Sopoetan, (Mount) Later Sopotan	N-M	1.07 N	124.45
Sosso, (Village)	C		
Sudara, (Mount) Later Duasudara	N-M	1.29 N	125.09
Takalekal, Takalekadjo,(Range)	C		
Taloang, (Mount)	S		
Tampuso, Tampusso, (Mount) Near Tomohon	N		
Tapalang, (Village)	S	2.51 S	118.49
Tjambo, (Village) Later Tjamba	S	4.54 S	119.50
Toli-Toli, (Township & Bay)	N	1.03 N	120.49
Tolmongah, (Mount)	S		
Tolongan, (Mount)	S		
Tomohon,(Village)	N-M	1.19 N	124.49
Tondano,(Village & Lake)	N-M	1.19 N	125.54
Totok, (Village)	N-M	0.52 N	124.47


120°
122°
124°
MINAHASSA PENINSULA
Manado
Tondano
Bitung
Kotabunan
Gorontalo
Limboto
Kotamobagu
Paleleh
Toli Toli
Buol
Sumalata
Kuandang
Tinombo
Moutong
Marisa
SULAWESI UTARA
Equator
KEPULAUAN TOGIAN
Teluk Tomini
SULAWESI TENGAH
Palu
Donggala
Parigi
Poso
Ampana
Luwuk
Banggai
KEPULAUAN BANGGAI
KEPULAUAN SULA
Mangole
Taliabu
Kolonodale
Bungku
SULAWESI (CELEBES)
Mamuju
Majene
Polewali
Palopo
Malili
Pinrang
Parepare
Rantepao
Makale
Enrekang
Sengkang
Watampone
Kendari
Kolaka
Raha
Bau Bau
Butung
SULAWESI TENGGARA
SULAWESI SELATAN
Ujung Pandang (Makassar)
Maros
Pangkajene
Sungguminasa
Takalar
Jeneponto
Bonthain
Bulukumba
Sinjai
Salayar
Kepulauan Tukangbesi
FLORES SEA
MACAN
FLORES
Ende
Maumere
Larantuka
Ruteng
Labuhanbajo
Komodo
Bima
SUMBAWA
NUSA TENGGARA
KEPULAUAN SOLOR
KEPULAUAN ALOR
Kalabahi
Dili
Atapupu
Atambua
INDONESIA
Feet
Metres
9843
3000
18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