Australian Orchid Research

Volume 3, 1998

Contributions to Tasmanian Orchidology

David L Jones

The Australian Orchid Foundation

Australian Orchid Research

Volume 3, 1998

Contributions to Tasmanian Orchidology

by

David L. Jones

Editor: David P. Banks

First published: August, 1998 (hardcopy)

Digital version, December 2022

Publisher: The Australian Orchid Foundation - www.australianorchidfoundation.org.au

National Library of Australia
Cataloguing-in-Publication data:
Jones, David. L. (David Lloyd), 1944-
Contributions to Tasmanian Orchidology 1-9

Bibliography.
Includes index.
ISBN 0 9595384 7 X.
1. Orchidaceae – Tasmania – New Taxa – Taxonomic Reviews –
Identification – Ecology.
I. Australian Orchid Foundation.
II. Title. (Series: Australian Orchid Research; v. 3).

Colour Imaging by Terry Webster Graphic Design, The Entrance, 2261, NSW, Australia.
Printed by Gosford Printing Pty. Ltd., Avoca Beach, 2251, NSW, Australia.
Layout and format by David P. Banks.

FRONT COVER PHOTO: **A colony of *Dendrobium striolatum [Dockrillia striolata]* subsp*. chrysantha*** at Bicheno, Tasmania
(© cover photographed in situ by D. P. Banks, October 1995)

David L. Jones

David Lloyd Jones was born at Mont Albert in Victoria in 1944. Early days at Balwyn were spent in nearby Beckett Park and exploring the wonderful collection of native plants in the iconic Maranoa Gardens. School holidays were enjoyed with an elderly garden-loving aunt at The Basin in the Dandenong Ranges where first involvements with native orchids and bushfires were experienced. Knowledge gained at Burnley Horticultural College, where David met Barbara, the sunny lady who was to share his passion for plants and life, was expanded and diversified by a degree in agricultural science at the University of Melbourne which was supported by a cadetship gained from the Department of Agriculture.

After graduating from university in 1968, his research work at the Scoresby Horticultural Research Station in Victoria involved the introduction of fruit cultivars from overseas, introduction and establishment of miscellaneous fruit crops, including blueberries, Chinese gooseberries and feijoas, grafting and nutrition of ornamental plants and the identification and testing of alternative materials for nursery potting mixes with the late David Nicholls. In 1978 the family moved to Queensland opening Eugenia Park Nursery in the Currumbin Valley, growing hardy coastal plants and bringing many rainforest species into cultivation. This was followed by a stint as a horticultural research officer at the Australian National Botanic Gardens in Canberra and then as research scientist in the Orchid Research Group at the Centre for Plant Biodiversity Research established within CSIRO.

A challenge in his teens by a nurseryman that “native orchids are impossible to grow” stimulated him to pioneer cultivation techniques for native terrestrial orchids that are the basis of those in use today. A plentiful supply of displaced plants from Melbourne’s encroaching urban sprawl fuelled the early growing experiments and stimulated his natural botanical curiosity. Corresponding with like-minded enthusiasts in other areas revealed different morphological interpretations between species in different parts of the country. This led to a very successful research program involving a network of licensed collaborators forwarding fresh specimens and for the first time allowing direct comparison between taxa from different areas and habitats. A rewarding simple process that revealed large gaps in our knowledge of native orchids and also resulted in the recognition of numerous new species. Following his first new species, *Pterostylis aestiva* in 1972, David has described more than 370 species of native orchids that have come to his attention from his network of contacts or travels in the bush. He also prepares detailed botanical drawings of native orchids and writes prolifically, sharing his knowledge of plants through books and other publications.

In 1991, David was awarded the Victorian College of Agriculture & Horticulture medal in recognition of his outstanding contribution to the Australian ornamental horticultural industry. In 2001 he was presented with the Australian Orchid Foundation’s prestigious ‘Award of Honour’ in recognition of his enormous contribution to the study of orchids in Australia and internationally. David served as a member of The Australian Orchid Foundation, Research Committee from its inception in 1977 to 2009; and as its Chairman from 1981 to 2002. In 2004 his contribution to orchid taxonomic research, while at the Centre for Plant Biodiversity Research was recognised when he was a finalist in the Australian Museum’s esteemed Eureka Prize for Biodiversity Research.

David's contribution to orchid research and education through his many publications has been considerable. In 1988, he published *Native Orchids of Australia*: a comprehensive coverage of Australia's then known orchid flora. In 2006, he followed with the expanded *A Complete Guide to Native Orchids of Australia including the Territories* with colour photos of each species. And in 2021, David produced a third and comprehensive edition: *A Complete Guide to Native Orchids of Australia.*


Australian Orchid Foundation

COLOUR PHOTOGRAPHS (refer pages 209-224)

1. ***Arthrochilus huntianus*** subsp. ***huntianus***
2. ***Arthrochilus huntianus*** subsp. ***nothofagicola***
3. ***Caladenia alata***
4. ***Caladenia anthracina***
5. ***Caladenia atrata***
6. ***Caladenia campbellii***
7. ***Caladenia carnea***
8. ***Caladenia caudata***
9. ***Caladenia cracens***
10. ***Caladenia dienema***
11. ***Caladenia dilatata***
12.,13. ***Caladenia echidnachila***
14. ***Caladenia fuscata***
15. ***Caladenia helvina***
16. ***Caladenia patersonii***
17. ***Caladenia saggicola***
18. ***Caladenia sylvicola***
19. ***Caladenia transitoria***
20. ***Chiloglottis grammata***
21. ***Chiloglottis gunnii***
22. ***Chiloglottis triceratops***
23. ***Corybas diemenicus***
24. ***Diuris chryseopsis***
25. ***Diuris monticola***
26. ***Diuris orientis***
27. ***Dockrillia striolata*** subsp. ***striolata***
28. & Front Cover ***Dockrillia striolata*** subsp. ***chrysantha***
29., 30. ***Genoplesium archeri***
31. ***Genoplesium brachystachyum***
32. ***Genoplesium tasmanicum***
33. ***Prasophyllum amoenum***
34. ***Prasophyllum concinnum***
35. ***Prasophyllum incurvum***
36. ***Prasophyllum milfordense***
37. ***Prasophyllum montanum***
38. ***Prasophyllum olidum***
39. ***Prasophyllum pulchellum***
40. ***Prasophyllum robustum***
41. ***Prasophyllum rostratum***
42. ***Prasophyllum stellatum***
43. ***Prasophyllum truncatum***
44. ***Prasophyllum tunbridgense***
45. ***Pterostylis alata***
46. ***Pterostylis aphylla***
47. ***Pterostylis atriola***
48. ***Pterostylis commutata***
49. ***Pterostylis furcata***
50. ***Pterostylis melagramma***
51. ***Pterostylis plumosa***
52. ***Pterostylis scabrida***
53. ***Pterostylis stenochila***
54. ***Pterostylis tasmanica***
55. ***Pterostylis tunstallii***
56. ***Pterostylis uliginosa***
57. ***Pterostylis wapstreorum***
58. ***Pterostylis williamsonii***
59. ***Pterostylis ziegeleri***
60. ***Thelymitra ixioides***
61. ***Thelymitra malvina***
62. ***Thelymitra nuda***
63. ***Thelymitra polychroma***
64. ***Thelymitra pulchella***

AUSTRALIAN ORCHID RESEARCH

VOLUME 3

Contributions to Tasmanian Orchidology 1-9 by David L. Jones

* **Paper by David L. Jones & Mark A. Clements**
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601

LINE DRAWINGS AND FIGURE NUMBERS

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 1:

Introduction and the genera *Acianthus*, *Arthrochilus*, x*Calassodia*, *Calochilus*, *Corybas*, *Cyrtostylis*, *Dipodium*, *Dockrillia*, *Gastrodia*, *Leptoceras*, *Microtis*, *Pyrorchis* and *Townsonia*.

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

COMBINED ABSTRACT TO PAPERS 1-9

The nine papers in this series clarify the status of 180 taxa of Orchidaceae which occur in Tasmania and include the description of 44 new species and two subspecies. *Caladenia* R. Br., *Chiloglottis* R. Br., *Diuris* Sm., *Genoplesium* R. Br., *Prasophyllum* R. Br., *Pterostylis* R. Br. and *Thelymitra* J.R. & G. Forst. are reviewed for Tasmania and a checklist of Tasmanian Orchidaceae is presented. The Tasmanian flora contains 191 taxa (186 species, 2 subspecies, 3 named hybrids) of Orchidaceae in 29 genera.

ABSTRACT TO PAPER 1

The first paper deals with the genera *Acianthus* R. Br., *Arthrochilus* F. Muell., x*Calassodia* M.A. Clem., *Calochilus* R. Br., *Corybas* Salisb., *Cyrtostylis* R. Br., *Dipodium* R. Br., *Dockrillia* Brieg., *Gastrodia* R. Br., *Leptoceras* (R. Br.) Lindl., *Microtis* R. Br., *Pyrorchis* D.L. Jones & M.A. Clem. and *Townsonia* Cheeseman. Two new taxa are described: *Arthrochilus huntianus* subsp. *nothofagicola* D.L. Jones and *Dockrillia striolata* subsp. *chrysantha* D.L. Jones. *Gastrodia procera* G.W. Carr is characterised and fully described. *Cyrtostylis robusta* D.L. Jones & M.A. Clem. is newly recorded for Tasmania. *Dipodium roseum* D.L. Jones & M.A. Clem., *Pyrorchis nigricans* (R. Br.) D.L. Jones & M.A. Clem. and *Townsonia viridis* (Hook. f.) Schltr. are characterised.

INTRODUCTION

The botanical explorations of Tasmania in the late 18th and 19th centuries made a highly significant contribution to Australian Orchidaceae, with no fewer than 59 taxa being described from collections gathered in that state during this period. Notable authorities included Robert Brown (16 species, seven described from his own collections and the rest from the collections of Colonel William Paterson), John Lindley (28 species, all from specimens provided by Ronald Gunn), Joseph Hooker (four species), Jacques Labillardière (four species), Heinrich Reichenbach (four taxa) and George Bentham (one species). Ronald Gunn is the outstanding collector of the period with at least 30 of his collections being used as types, mainly by John Lindley. Buchanan (1990) has detailed Gunn's collecting localities and points out that other collectors, including Joseph Milligan, Charles Stuart and Charlotte Smith, contributed specimens which were passed on by Gunn. Because of the important historical contribution by these early botanists and collectors to Australian botany, any comprehensive study of southern Australian terrestrial Orchidaceae must have a significant part of its foundation in Tasmania.

A study of Australian orchid types held in Australian and overseas herbaria (Clements 1989), resulted in the recognition of some previously overlooked Tasmanian taxa (for example *Caladenia lindleyana* (Rchb. f.) M.A. Clem. & D.L. Jones), and also revealed others that have been commonly misinterpreted (for example *Caladenia pallida* Lindl.). The original descriptions of such species are invariably so brief as to be of limited value. Consequently these species remain poorly known today and may even

be included within the delimitations of other taxa. Following my examination of the pertinent types, many of these confused species are here characterised and described fully for the first time.

Over the last nine years I have been examining the orchid flora of Tasmania, with special emphasis on the relationships of that suite of species to those of mainland Australia and New Zealand. These studies have resulted in the description of three Tasmanian endemics (Jones 1991, 1994, 1996A) and the elucidation of complexes surrounding *Caladenia lyallii* Hook. f. (Jones 1996A) and *Prasophyllum alpinum* R.Br. (Jones 1996B).

In 1991/92 David Ziegeler conducted a project with the Tasmanian Parks and Wildlife Service to prepare an Atlas of Tasmanian Orchids. This project resulted in numerous collections of fresh material being sent to me for identification by David Ziegeler and a number of field operatives throughout the state. Following the completion of the Atlas, which resulted in a data base of close to 10,000 records of Tasmanian Orchidaceae, the flow of fresh material continued, due largely to the activities of Hans and Annie Wapstra and Jeff Campbell. This abundance of specimens, together with the extensive pioneering collections made by John Whinray from various Bass Strait Islands, provided a solid basis for my studies and facilitated the completion of this series of papers. These papers contain the descriptions of new taxa and also confront a number of other taxonomic issues including confused species, species newly recorded for Tasmania, recent significant collections and doubtful or erroneous records. The following genera are also reviewed for the state: *Caladenia* R. Br., *Chiloglottis* R. Br., *Diuris* Smith, *Genoplesium* R. Br., *Prasophyllum* R. Br., *Pterostylis* R. Br. and *Thelymitra* J.R. & G. Forst.

These accounts will facilitate the preparation of *Flora of Australia* Volume 47, the *Catalogue of New Zealand Orchidaceae* and the *Orchids of Tasmania.* Keys to all genera and species of Tasmanian Orchidaceae will be included in the latter publication.

Curtis (1979) collated the knowledge of Tasmanian orchids in her *Student's Flora of Tasmania* where she recognised 24 genera and 145 species. This present treatment includes changes in nomenclature and provides the basic details, including typification, diagnostic characters and specimen citation, of all Tasmanian taxa described since that publication. Buchanan (1995) published a census of Tasmanian vascular plants, listing 147 species of Orchidaceae in 28 genera. Many of the taxa detailed in these papers were included in that listing. The final paper in this series is a current checklist of Tasmanian Orchidaceae.

The studies reported in this first paper concentrate on 13 genera: *Acianthus*, *Arthrochilus,* x*Calassodia, Calochilus, Corybas, Cyrtostylis, Dipodium, Dockrillia, Gastrodia, Leptoceras*, *Microtis*, *Pyrorchis and Townsonia*.

MATERIALS AND METHODS

This study is based on the morphological examination of fresh flowers collected from localities in mainland south-eastern Australia and Tasmania, a comparison of living plants of many taxa cultivated in the collection of the Australian National Botanic Gardens, examination of dissected flowers mounted on cards, also dried and spirit-preserved herbarium specimens and photographs of living flowers. In addition herbarium collections (spirit and dried) were examined from the following herbaria: AD, AK, BM, CANB, CHR, K, HO, MEL, NSW, QVM and the herbarium of the Tasmanian Parks and Wildlife Service. Type specimens or photographs (*fide* M.Clements) of the types of all species have been examined. Measurements given in descriptions are from living plants or dissected flowers on cards. Notes on distribution, habitat (particularly soil and plant association) and conservation status were derived from my own field studies or from those of Hans Wapstra and David Ziegeler, and from herbarium labels. Distribution is detailed from north to south and east to west.

Acianthus

Buchanan (1995) lists two species, *viz. A. caudatus* R. Br. and *A. pusillus* D.L. Jones. The latter species was reduced to synonymy in a recent treatment (Kores 1995) but that is not accepted here.

1. *Acianthus pusillus* D.L. Jones, *Austral. Orch. Res*. 2: 7-8 (1991).
TYPE: New South Wales, Merewether Hill, Newcastle, 16 May 1966, *B.Whitehead* (holo CANB!; iso CANB!, NSW!).

Illustration: Page 39, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in open forest, coastal scrubs and heathland in sands, sandy loam and shallow clay loams. Altitude: 0-1000 m. Flowering period: March to August.

Very widely distributed and common in Tasmania, often growing in extensive clonal colonies.

Notes: Kores (1995) reduced this species to a synonym of *A. exsertus* R.Br. without seeing the type material. The two species are sister taxa, but are readily distinguishable in the field and on herbarium sheets. *Acianthus pusillus* is less robust and differs morphologically from *A. exsertus* by having smaller (5-10 mm long cf. 12-16 mm), paler green to pinkish brown flowers which are more crowded in the raceme. *Acianthus exsertus* does not occur in Tasmania, although it occurs in coastal districts of Gippsland and may possibly be found on Bass Strait Islands.

Selected specimens: (25 seen):
TASMANIA: The Two Sisters, Rocky Cape Natl Park, 29 June 1986, *Collier 1504* (HO); 3 km E. of Weymouth, 26 Aug. 1989, *Collier 4059* (HO); East Risdon, 22 May 1951, *Cruickshank* (HO); Circular Head, May 1838, *Gunn* (HO); Bellerive, on Rosny Hill, 3 Mar. 1931, *Long* (HO); Alum Cliffs, 28 April 1983, *Moscal 2219* (HO); Blackmans Bay, June 1929, *Rodway* (HO); Rosetta, Hobart, 20 July 1958, *Thompson* (HO).

Arthrochilus

Curtis (1979) and Buchanan (1995) list one species. A new subspecies is described below.

2. *Arthrochilus huntianus* (F. Muell.) Blaxell subsp. ***huntianus***, *Contr. New South Wales Natl. Herb*. 4 : 277 (1972).
Drakaea huntiana F.Muell., *Victorian Naturalist* 5: 174 (1889);
Spiculaea huntiana (F.Muell.) Schltr., *Feddes Repert.* 17: 81 (1921).
TYPE: Tingerinji Mountain, 2 Mar. 1889, *W.Baeuerlen* 175 (holo MEL!; iso NSW).

Illustration: Page 41, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in open forest and woodland, especially in montane situations. Often occurs in accumulations of litter in open areas near large eucalypts. Altitude: 100-1500 m. Flowering period: December to March.

Notes: This taxon occurs on Flinders Island (Curtis 1979, J.S. Whinray pers. comm.). There are no specimens to substantiate the record but I have seen photographs taken on the day of the collection (*fide* J. Whinray).

3. subsp. ***nothofagicola*** D.L. Jones, subsp. nov.,
callo labelli multo deminuto trichomatibus paucioribus, brevioribus, et cardine labello partim fungente, differt.

TYPUS: Tasmania, Behind Needles Picnic Area, Gordon River Rd., 24 Feb. 1994, *A. Garner & D. Ziegeler (Jones 12812A)* (holo CANB). **Fig. 1.1.**

Distribution and ecology: Endemic to western Tasmania. Grows in dense rainforest with the dominant trees being *Nothofagus cunninghamii* (Hook.) Oerst., *Eucalyptus delegatensis* R.T. Baker and *Atherosperma moschatum* Labill. This is a very unusual habitat for *Arthrochilus*.

Notes: This subspecies differs from the typical by its much reduced labellum callus with fewer, shorter trichomes and a partially functional labellum hinge.
The reduced labellum trichomes and partially functional labellum hinge are suggestive of autogamy.

Specimens examined:
TASMANIA: Behind Needles Picnic Area, Gordon River Rd, 3 Feb. 1994, *Garner* (HO 409854);*ibid*, 3 Feb. 1995, *Rubenach (Jones 13839)* (CANB).

x*Calassodia*

A genus erected to accommodate a natural intergeneric hybrid between *Caladenia* and *Glossodia* (Clements 1989). Firth (1966) and Curtis (1979) included this hybrid in *Caladenia* and Buchanan (1995) treated it in x*Calassodia*.

4. x***Calassodia tutelata*** (R.S. Rogers) M.A. Clem., *Austral.Orch. Res.* 1: 33 (1989);
Caladenia tutelata R.S.Rogers, *Trans. & Proc. Roy. Soc. South Australia* 32:211 (1907).
TYPE: Blackwood, South Australia, 24 Aug. 1907,*E. Ashby* (holo AD!).

Illustration: Page 116, Backhouse & Jeanes (1996).

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in open forest, woodland, heathland and heathy forest in sandy loams and clay loams. Altitude: 0-200 m. Flowering period: September and October.

Notes: An intergeneric hybrid between *Caladenia deformis* and *Glossodia major*, with intermediate features between the parents. Curtis (1979) records it from the north and the north-east but I cannot locate any herbarium specimens.

Calochilus

Both Curtis (1979) and Buchanan (1995) record five species from Tasmania. One species, *C. imberbis*, is discounted as an abnormal development and *C. campestris* is apparently extremely rare or extinct on mainland Tasmania.

5. ***Calochilus campestris*** R. Br., *Prodr.* 320 (1810).
TYPE: Port Jackson, Sydney, Sept.-Oct. 1804, *R. Brown* (lecto specimen a BM, *fide* Clements 1989, photo!; isolecto BM,E,L, K).

Illustration: Page 123, Backhouse & Jeanes (1996).

Distribution and ecology: Queensland, New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, wet sclerophyll forest, woodland and heathland. Altitude: 0-500 m. Flowering period: August to November.

Notes: Known from Clarke Island in Bass Strait but I cannot locate any herbarium specimens of this species from mainland Tasmania. The only evidence to support its presence on the main island is a lithograph (number 3187) in *Curtis's Botanical Magazine* Volume 6 (1832). This drawing, although credited to Dr. James Scott, was almost certainly done by William Buelow Gould (St George 1989). It is tempting to speculate that the specimen illustrated did not originate from Tasmania, however accompanying notes by Sir William Hooker dispel any doubts as to its origin: "Our drawing was made from the living plant in Van Diemens's Land".

Calochilus campestris is characterised by robust habit; large ribbed leaf; floral segments spreading widely; recurved labellum; prominent blue plates on the base of the labellum callus; and, a dense bushy beard. In Tasmania it is usually confused with *C. herbaceus* which is widespread and often locally common.

Specimen examined: TASMANIA: near Sandy Lagoon, Clarke Island, 12 Nov. 1979, Whinray 2494 (CANB).

6. *Calochilus herbaceus* Lindl., *Gen. sp. orchid. pl.* 459 (1840).
TYPE: Tasmania, Rocky Cape, Dec. 1837, *R. Gunn 920* (lecto specimen 3b, K-L, *fide* Clements 1989, photo!; isolecto K, W).

Illustration: Fig. 7, Curtis (1979).

Distribution and ecology: Southern Victoria and Tasmania. Grows around swamps and in moist depressions in heathland, heathy forest and buttongrass moorland in grey to black sand and peaty sand. Often colonises embankments and track verges. Altitude: 0-450 m. Flowering period: October to February.

Notes: This species is characterised by slender habit; reduced slender leaf; floral segments not spreading widely; recurved labellum; blue plates on the base of the labellum callus often discontinuous; and, a sparse, often uneven beard. See also the entry for *C. campestris*.

Selected specimens: (33 seen):
TASMANIA: Birchs Riverplains, 16 Nov. 1983, *Buchanan 1393* (HO); South Bruny Island, 8 Nov. 1986, *Collier 1820* (HO); Rocky Cape, 29 Dec. 1837, *Gunn* (QVM); Sea Elephant Rd, King Island, 5 Nov. 1991, *Jones 8478* (CANB); N. edge Picketts Plain, 15 Nov. 1983, *Moscal 4061* (HO); Smithton, 26 Nov. 1939, *Perrin* (HO); Blackmans Bay, Dec. 1928, *Rodway* (HO); Lady Bay Rd, 6 Dec. 1958, *Somerville* (HO);

Corybas

Buchanan (1995) lists six species of which *C. fordhamii* does not reach mainland Tasmania. *Corybas dienemus* was described recently from Macquarie Island (Jones 1993), and *C. incurvus* has had a confused history which was clarified following a study of the types (Jones & Clements 1988). Taxonomic problems still exist on the mainland with *C. diemenicus*.

7. *Corybas diemenicus* (Lindl.) Rchb. f., *Beitr. Syst. Pflanzenk.* 42 (1871).
Corysanthes diemenica Lindl., *Gen. sp. orch. pl.* 393 (1840).
Corysanthes fimbriata var. *diemenica* (Lindl.) Benth., *Fl. Austral*. 6: 351 (1873).
TYPE: Tasmania, Circular Head, June 1837, *R. Gunn 614* (holo K-L, photo!; iso K, L, P, W).

Illustration: Page 142, Backhouse & Jeanes (1995) - as *C. dilatatus.*

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in wet sclerophyll forest, open forest, heathy forest, coastal scrubs and heathland, in sands, sandy loams and clay loams. Altitude: 0-1000 m. Flowering period: June to September.

Notes: A complex of several variants, especially on the Australian mainland. The relationship between *C. diemenicus* and *C. dilatatus* (Rupp & Nicholls) Rupp still needs to be resolved.

Variation occurs in southern Tasmania with some populations having wholly purple

flowers whereas adjacent colonies can have a prominent white boss.

8. *Corybas dienemus* D.L. Jones, *Fl. Australia* 50: 572 (1993).
TYPE: Macquarie Island, N. of Bauer Bay, 27 Nov.1989, *J. Croft 10445* (holo CANB!; iso HO, MEL, NSW, WELT).
Corybas macranthus auct. non (Hook.f.) Rchb. f.: M.J. Brown et al., *New Zealand J. Bot.* 16: 405-7 (1978).

Illustration: Fig. 90, F & G, page 473, *Flora of Australia* 50 (1993).

Distribution and ecology: Endemic to Macquarie Island. Grows in very wet bog communities mainly on bleak windswept raised beach terraces. Altitude: c. 0-30 m. Flowering period: November to January.

Notes: Macquarie Island, although geographically part of New Zealand, is politically Australian. This species, which has characters not found in any *Corybas* occurring in mainland Australia and Tasmania, can be recognised by its thick-textured cupped leaves and long unequal lateral sepals and petals which extend high above the dorsal sepal.

Surprisingly, specimens of *Corybas* from Auckland Island and Campbell Island, which are also subantarctic islands not far from Macquarie Island, do not match *C. dienemus*.

Selected specimens: (20 seen) :
MACQUARIE ISLAND: Half Moon Bay, 12 Nov. 1980, *Copson* (HO); Sawyer Ck Valley, c. 400 m S. of Sawyer Ck waterfall, 23 Jan. 1981, *Seppelt 11935* (HO); Green Gorge Basin, 5 Nov. 1981, *Seppelt 12098* (HO); between Douglas Point and Boiler Rocks, 11 Dec. 1981, *Seppelt 12161* (HO); upper raised beach terrace, Boiler Rocks, 2 Feb. 1982, *Seppelt 12814* (HO).

9. *Corybas incurvus* D.L. Jones & M.A. Clem.,*Kew Bull.* 43(1): 135-137 (1988).
TYPE: Victoria, 5 km ENE. of Tyabb, on Yaringa Rd, at edge of Western Port Bay, 9 Aug. 1985, *H.M.E. Richards 82* (holo CANB!; iso K!, MEL!).
Corysanthes hamiltonii Fitzg. ex Rupp & Nicholls, *Proc. Linn. Soc. New South Wales* 53: 81 (1928), *nom. nud.*
Corybas diemenicus auct. non Lindl.; W.M. Curtis, *The Student's Flora of Tasmania* 4A: 121 (1979).

Illustration: Page 147, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, coastal scrubs and heathland. Altitude: 0-800 m. Flowering period: July to November.

Notes: This species is readily recognised by the dark purple flowers; incurved denticulate labellum margins; and, a conspicuous white labellum boss which is grooved or notched.

Selected specimens: (35 seen) :
TASMANIA: South Bruny Island, 6 Nov. 1984, *Buchanan 3993* (HO 102290); 5 km WSW. of Beechford, 28 June 1987, *Collier 631* (HO 117810); Cape Frederick Hendrick, 23 Aug. 1987, *Collier 2584* (HO 120249); Pittwater Bluff, 8 Sept. 1985, *Moscal 8416* (HO 95254); Austins Ferry, 9 Sept. 1969, *Palmer* (HO 56729); Low Head, 14 Aug. 1928, *Perrin* (HO 56780); Lindisfarne, 10 Aug. 1946, *Richardson* (HO 56716); Georges Bay, Aug. 1892, *Rodway* (HO 42102).

Cyrtostylis

Buchanan (1995) lists two species, *viz C. reniformis* and *C. robusta*. The latter has been very recently recorded from Tasmania. Kores (1995) reduced *Cyrtostylis* to a section of *Acianthus* but did not provide any evidence for this conclusion which was at odds to its placement by Jones & Clements (1987). Further studies using morphology and embryology unequivocally place *Cyrtostylis* and *Acianthus* in different major groups within the Diuridae (Clements 1995), supporting the view that they are distinct genera. Coincidentally this placement is also supported by the mycorrhizal associations noted in Jones & Clements (1987).

10. *Cyrtostylis robusta* D.L. Jones & M.A.Clem., *Lindleyana* 2(3): 157-160 (1987). TYPE: Western Australia, c. 5 km S. of Jerramungup, 28 Aug. 1986, *D.L.Jones 2410* (holo CANB!; iso AD!, CANB!, K!).

Illustration: Page 156, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania, South Australia and Western Australia. Grows in open forest, coastal scrubs and heathland, usually in sandy soils. Altitude: c. 0-50 m. Flowering period: June to September.

Notes: This species, which has been shown to be much more widespread than was known at the time of its description, has recently been recognised from Tasmania. It has been overlooked due to confusion with *C. reniformis* and the records are mostly from coastal districts in the north of the state. This species is probably also widespread on the islands of Bass Strait. Very recently specimens have been received from the south of the state (South Arm) collected by Les Rubenach and Hans and Annie Wapstra.

Kores *et al* (1993) went to extraordinary lengths to prove that herbarium specimens of *C. robusta* are indistinguishable quantitatively from *C. reniformis*.

Nonetheless, the two species are readily distinguished by qualitative characters. The leaves of each species are so distinctive that it is possible to identify them from the fresh leaves alone. Those of *C. robusta* are bright green whereas the leaves of *C. reniformis* are grey green. *Cyrtostylis robusta* also has a broader more reddish labellum than that of *C. reniformis* and generally begins flowering about two weeks earlier where they are sympatric. This habit is maintained in cultivated plants. Once alerted to these differences field operatives have no difficulty in distinguishing these taxa.

Hybrids between them are unknown, even though they grow sympatrically in some areas.

Specimens examined: (c. 20 seen):
TASMANIA: King Island, 1967, *Bartlett* (HO); Petal Point, 19 July 1994, *Campbell (Jones 13117)* (CANB); Circular Head, 1 Oct. 1837, *Gunn* (HO); Flinders Island, 2 Sept. 1847, *Milligan 936* (HO); without locality, no date, *Rodway* (HO); Goats Bluff, South Arm, 15 June 1997, *Rubenach* (CANB); Summer Hill Estate, Port Sorell, 11 Sept. 1992, *Tonelli (Jones 10039)* (CANB); Badger Island, 29 July 1973, *Whinray 221* (CANB); Vansittart Island, 22 Aug. 1973, *Whinray 538* (CANB); N. of Mt Emma, Babel Island, 23 July 1968, *Whinray 966* (CANB); Port Sorell, 13 Aug. 1996, *Ziegeler* (HO); Hardwickes Hill, 20 Aug. 1996, *Ziegeler* (HO); West Head, 21 Aug. 1996, *Ziegeler* (HO).

Dipodium

The recently described *Dipodium roseum*, listed in Buchanan (1995), is characterised here.

11. *Dipodium roseum* D.L. Jones & M.A. Clem., *Austral. Orchid Res.* 2: 51 (1991).
TYPE: Victoria, Old Coach Rd, Montrose, Dandenong Ranges, 24 Feb. 1990, *H.M.E. Richards & D.R. Richards* (holo CANB!; iso MEL!).
D. punctatum auct. non R. Br.: W.M. Curtis, *The Student's Flora of Tasmania* 4A: 131 (1979).

Illustration: Page 166, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in wet sclerophyll forest, dry open forest, woodland and coastal scrubs. Altitude: 0-1000 m. Flowering period: mainly December to March.

Notes: This species was previously confused with *D. punctatum* R. Br. which does not occur in Tasmania. *Dipodium roseum* can be recognised by its pale pink finely spotted flowers, recurved tips on the perianth segments and striped labellum.

Selected specimens:
TASMANIA: Blythe River, Kimberley, N. Tas., Dec. 1931, *Barnard 855* (CANB); Little Bluestone Bay, 31 Dec. 1983, *Buchanan 3557* (HO); 3 miles [c. 4.8 km] N. of Copping, 20 Jan. 1949, *Burbidge 3209* (CANB); George Town, 19 Dec. 1842, *Gunn* (NSW 102679); Harford, Jan. 1932, *Hamilton* (HO); SW. end of Freycinet Pen., 26 Jan. 1967, *Olsen* (NSW); Cape Barren Island, 1 Jan. 1970, *Whinray 372* (MEL).

Dockrillia

Dockrillia is a natural group of orchids which have been segregated from the large genus *Dendrobium* (Brieger 1981, Rauschert 1983, Clements & Jones 1996). They lack pseudobulbs, have single fleshy leaves which are mostly terete in cross-section, each leaf terminates a stem, and their protocorms are isobilateral. One species consisting of two subspecies occurs in Tasmania.

12. *Dockrillia striolata* (Rchb. f.) Rauschert subsp. ***striolata***, *Feddes Repert.* 94 (7-8): 447 (1983).
Dendrobium striolatum Rchb. f., *Hamburger Garten-Blumenzeitung* 13: 313 (1857). *Callista striolata* (Rchb. f.) Kuntze, *Revis. gen. pl.* 2: 655 (1891).
TYPE: cult. *Schiller* (holo W).
Dendrobium milliganii F. Muell., *Fragm.* 1: 88, t. 6 (1859).
TYPE: Flinders Peak, granite rocks, 10 Oct. 1845, *J. Milligan 923* (lecto MEL!, *fide* Clements 1989; isolecto BM).

Illustration: Page 160, Backhouse & Jeanes (1995) - as *Dendrobium striolatum*.

Distribution and ecology: New South Wales, Victoria and the Furneaux group of islands, Tasmania. Forms clumps on sheltered boulders and cliffs. Altitude: 20-800 m. Flowering period: September to November.

Notes: This species is characterised by short stems; short often curved terete leaves; short one-two-flowered racemes; yellowish tepals; and, a white labellum with crispate margins. The typical subspecies has prominent dark stripes on the tepals, these being conspicuous on the exterior surface.

Specimens examined:
TASMANIA: Mt Munro, Cape Barren Island, 7 Oct. 1988, *Collier 3574* (HO); North Patriarch, 30 km N. of Lady Barron, Flinders Island, 26 Oct. 1990, *Collier 4872* (HO); Flinders Island, 4 Oct. 1847, *Milligan* (HO); South Patriarch, Flinders Island, 30 Oct. 1977, *Whinray 2352* & Gregory (CANB); Killiecrankie Bay, Flinders Island, 6 Nov. 1977, *Whinray 2358* (CANB).

13. subsp. ***chrysantha*** D.L. Jones, subsp. nov.,
ab subsp. *striolata* floribus parum majoribus, vivide flavis; tepalis vittis paucis vel nullis; et labello valdius crenulato, differt.

TYPUS: Tasmania, Bicheno, 18 Oct. 1994, *D.L. Jones 13582 & B.E. Jones* (holo CANB).

Illustration: Plate 27, Curtis (1979).

Distribution and ecology: Endemic to eastern parts of mainland Tasmania growing on granite boulders and monoliths. Altitude: 0-250 m. Flowering period: October and November.

Notes: This subspecies has bright butter yellow tepals which lack stripes or are only faintly striped. The labellum margins are also more strongly crenulate.

Specimens examined:
TASMANIA: Coles Bay, Oct. 1957, *Guilline* (HO); Bicheno, 10 Nov. 1990, *Jones & Broers* (CANB); Bedggood Hill near Bicheno, 20 Mar. 1980, *Moscal 234* (HO).

Gastrodia

Gastrodia procera was named by Carr (1991) without a full description. This species, listed along with *G. sesamoides* R. Br. in Buchanan (1995), is fully described and characterised here for the first time.

14. ***Gastrodia procera*** G.W. Carr, *Indigenous Flora and Fauna Association Miscellaneous Paper* No. 1: 22 (1991).
TYPE: Victoria, Dandenong Ranges, near junction of Olinda and Stonyford Creeks, 4 Dec. 1958, *T.B. Muir 572* (holo MEL 2233604!).

Illustration: Page 188, Backhouse & Jeanes (1995).

Glabrous, terrestrial saprophytic *herb*. *Rhizome* irregularly terete, 8-20 cm long, 2-4 cm wide, swollen, fleshy, brown, covered with numerous closely sheathing, scarious scales. *Inflorescence* 40-120 cm tall, thick, erect at all stages, fleshy, brittle, dark brown to blackish. *Sterile bracts* six to eight, oblong-ovate, 6-15 mm long, 8-12 mm wide, closely sheathing; lower ones encircling the base of the scape. *Floral bracts* linear-ovate to ovate, 4-8 mm long, 2-4 mm wide, subacute, closely sheathing to spreading. *Pedicels* 7-11 mm long, slender, recurved. *Flowers* five-c. 75, tubular 20-25 mm long 10-12 mm wide, semi-pendent, externally dark brown with white tips, internally crystalline white, opening widely, with a strong spicy fragrance. *Ovary* linear-ovoid, 5-7 mm long, c. 4 mm wide, irregularly verrucose. *Dorsal sepal* 20-25 mm long, c. 8 mm wide, united with the lateral sepals for all but the distal 5 mm; distal margins incurved, irregularly crenulate; exterior irregularly verrucose. *Lateral sepals* 20-25 mm long, c. 10 mm wide, distal 5 mm free and widely divergent; exterior irregularly verrucose. *Petals* oblong-orbicular to transversely obovate, c. 4.5 mm long, c. 4 mm wide, attached laterally near the apex of the dorsal sepal, crystalline white; margins irregularly crisped to crenate. *Labellum* broadly ovate, 15-17 mm long, 6.5-8 mm wide, with thickened orange margins in the proximal 4 mm where attached to the sinus of the lateral sepals, then contracted before expanding into the main lamina which is prominently three-lobed; lateral lobes c. 8 mm long, c. 3 mm wide, white; lateral margins incurved and irregularly crenate; distal margins with two or three lacerations; mid-lobe more or less oblong, c. 6 mm long, c. 4 mm wide, orange; lateral margins incurved or thickened, irregularly crisped to sinuate; distal margin thickened, irregularly lobed. Lamina callus consisting of two yellow to orange ridges which extend from the base of the lamina to the base of the mid-lobe where they thicken and become dark orange before coalescing and becoming a series of irregularly thickened ridges which extend along the central part of the mid-lobe nearly to the apex; pseudopollen coarse, dark yellow, profuse all over the callus on mid-lobe. *Column* linear, 13-15 mm long, 4-4.5 mm wide, slightly recurved from the end of the ovary, white or pale brown; anterior and dorsal surfaces in proximal half transversely wrinkled, smooth in distal half; column wings c. 2 mm long, linear-deltate, not exceeding the anther cap. *Anther cap* c. 3 mm long, smooth, with a prominent rostrum. *Pollinia* c. 2 mm long, dark orange, granular. *Stigma* ovate, c. 2.5 mm long, c. 2.5 mm wide, sunken. *Capsules* ovoid to ellipsoid, 25-30 mm long, 9-11 mm wide,

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in wet sclerophyll forest, wetter areas of tall open forest and montane forests. Soils are shallow clay loams, stony loams and deep, well-structured loams and krasnozems. Altitude: 100-800 m. Flowering period: November to January.

Notes: This species is characterised by robust habit (plants to 120 cm tall); inflorescence erect at all stages; flowers crowded, to 75 per raceme; flowers to 25 mm long; and, labellum broadly ovate. By contrast *G. sesamoides* is much less robust with uncrowded flowers to 20 mm long and the inflorescence apex is strongly hooked in bud.
Flowering is enhanced by summer fires.

Specimens examined:
TASMANIA: near Scamander, 7 Dec. 1977, *Phillips 1156* (CANB); Devonport, 17 Dec. 1992, *Ziegeler & Tonelli* (CANB).

Leptoceras

Although described in 1840, this genus has been included in *Caladenia* in most modern floras. It is characterised by glabrous habit, clavate glandular petals and unusual floral configuration with the lateral sepals porrect beneath the labellum and the petals erect.

15. *Leptoceras menziesii* (R. Br.) Lindl., *Gen. sp. orchid. pl.* 416 (1840);
Caladenia menziesii R. Br.,*Prodr.*325 (1810).
TYPE: New Holland, King Georges Sound, *A. Menzies* (holo BM, photo!).
C. macrophylla R. Br., *Prodr.* 325 (1810);
Leptoceras macrophylla (R. Br.) Lindl., *Gen. sp. orchid. pl.* 416 (1840).
TYPE: New Holland, King Georges Sound, *A. Menzies* (holo BM, photo!).
Leptoceras oblonga Lindl., *Edward's Bot. Reg.: Swan Riv. App.* lii (1840).
TYPE: Swan River, *J. Mangles* (holo K-L; iso BM).

Illustration: Page 210, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania, South Australia and Western Australia. Grows in clonal colonies in open forest, woodland, coastal scrubs and heathlands in sands, sandy loams and shallow clay loams. Flowering is dramatically stimulated by fires. Altitude: 0-300 m. Flowering period: August to November.

Notes: Sterile plants have a small, ligule-like growth in the cordate base of the leaf.

Specimens examined:
TASMANIA: Circular Head, Nov. 1837, *Gunn* (HO, QVM); Emu Bay, 7 Nov. 1841, *Milligan* (HO); near Launceston, Nov. 1892, *Rodway* (HO); Bruny Island, Nov. 1892, *Rodway* (HO); Sandfly, Oct. 1893, *Rodway* (HO); Lauriston, 7 Nov. 1947, *Somerville* (HO);

Microtis

This genus causes significant identification problems to field workers, principally because of the small flowers and variability. Problems, which largely remain unresolved, have been encountered with Tasmanian specimens and it is apparent that undescribed taxa occur in the state. Curtis details six species and Buchanan (1995) also lists six but with one name change. That change is detailed here and the identity of another species is discussed.

16. *Microtis arenaria* Lindl., *Gen. sp. orchid. pl.* 306 (1840).
TYPE: Tasmania, Sandy hills, Circular Head, Jan. 1837, *R. Gunn 916* (holo K-L, photo!; iso AD, K, P, W).
Microtis pulchella R. Br. var. *vivax* Lindl., *Gen. sp. orchid. pl.* 395 (1840).
TYPE: Circular Head, Tasmania, Nov. 1836, *R. Gunn 915* (lecto specimen 4a, K-L, *fide* Clements 1989; isolecto E, FI, K, P).
Microtis biloba Nicholls, *Victorian Naturalist* 66: 93, f. J-L (1949).
TYPE: Moe, Victoria, 1946, *N. Holmes* (holo MEL!).

Illustration: Page 216, Backhouse & Jeanes (1995).

Distribution and ecology: South-eastern New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, woodland, heathy forest, coastal scrubs and heathland. Altitude: 0-200 m. Flowering period: October to December.

Notes: This species is characterised by crowded pale green to yellowish green flowers; labellum usually hanging away from the ovary; and, deeply bilobed labellum apex. Flowering is strongly stimulated by summer fires.

Specimens examined:
TASMANIA: Lulworth, 25 Oct. 1995, *Campbell 95019* (CANB); Petal Point, 2 Dec. 1992, *Harris* (CANB); Henry Somerset Orchid Reserve, 2 Dec. 1992, *Tonelli* (CANB); Brodes Bay, 3 Nov. 1992, *Wapstra* (CANB); Orford, 8 Dec. 1992, *Wapstra* (CANB); Milford, 16 Dec. 1992, *Wapstra* (CANB); Babel Island, 21 Jan. 1967, *Whinray 888* (CANB); Deal Island, 27 Nov. 1970, *Whinray 1240* (CANB); Robin Hill, Clarkes Island, 7 Nov. 1979, *Whinray 2389* (CANB); Eaglehawk Neck, 22 Nov. 1992, *Ziegeler* (CANB); Dover, 8 Dec. 1992, *Ziegeler* (CANB).

17. *Microtis rara* R. Br., Prodr. 321 (1810).
TYPE: Port Jackson, 1804, R.Brown (lecto BM!, fide Bates 1984; isolecto AD!, K).

Notes: The relationship between *M. rara* and *M. oblonga* R.S. Rogers requires further careful study. Field observations suggest that this group may actually be a complex which includes some undescribed taxa. In Tasmania specimens approaching both *M. rara* and *M. oblonga* have been identified and further detailed collections are required to solve the problem.

Specimens examined:
TASMANIA: near Pillingers Peak, Flinders Island, 24 Dec.1974, *Whinray 2222* (CANB); Chain of Lagoons, 25 Nov. 1992, *Ziegeler* (CANB); Aerodrome Rd, 25 Nov. 1992, *Ziegeler* (CANB).

Pyrorchis

This genus was described recently to accommodate two species previously placed in *Lyperanthus* (Jones & Clements 1994). Generic characters include ground-hugging, amphistomatic, broadly ovate to orbicular leaves which are pellucid adaxially and with flat margins. The plants mainly flower after disturbance, particularly from fire but also from mowing, slashing and clearing operations.

18. *Pyrorchis nigricans* (R. Br.) D.L. Jones & M.A. Clem., *Phytologia* 77(6): 449 (1994).
Lyperanthus nigricans R. Br., *Prodr.* 325 (1810).
Caladenia nigricans (R. Br.) Rchb. f., *Beitr. Syst. Pflanzenk.* 67 (1871).
TYPE: Port Jackson, Sydney, Oct. 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989).

Illustration: Page 212, Backhouse & Jeanes (1995) - as *Lyperanthus nigricans*.

Distribution and ecology: New South Wales, Victoria, Tasmania, South Australia and Western Australia. Grows in a wide range of forested habitats, heathland and on rock outcrops. Altitude: 0-500 m. Flowering period: September to November.

Notes: This species is characterised by a solitary, fleshy, ovate, ground-hugging leaf; white flowers with dark reddish stripes and suffusions; large, strongly cucullate dorsal sepal; and, deeply fringed labellum mid-lobe. The plants turn black on drying.

Selected specimens: (16 seen) :
TASMANIA: Safety Cove, S. of Port Arthur, 5 Oct. 1986, *Collier 1703* (HO); near Dazzler Ra., 18 Nov. 1986, *Collier 1890* (HO); Bridport, Aug. 1953, *Curtis* (HO); Eaglehawk Neck, 19 Oct. 1933, *Fletcher* (HO); Rocky Cape, near Cave Bay, 11 Sept. 1988, *Minchin* (HO); Mt William, 17 Oct. 1983, *Moscal 3576* (HO); Mt Cameron, 23 Oct. 1983, *Moscal 3806* (HO).

Townsonia

This genus, treated as a synonym of *Acianthus* by Curtis (1979) and Jones and Clements (1987), is listed correctly in Buchanan (1995). Distinct generic characters include: extant stolonoid roots joining plants; dimorphic leaves, the sterile leaves being erect with a membranous lamina, the fertile leaves being reduced cauline and amplexicaul; sepals lacking terete apical points; petals much reduced; labellum lacking paired basal glands.

19. *Townsonia viridis* (Hook. f.) Schltr., *Feddes Repert.* 9: 250 (1911).
Acianthus viridis Hook. f., *Fl. Tasman.* 2: 372 (1859).
TYPE: Base of Mount Wellington, Nov. 1839-40, *R. Gunn* (holo K, photo!; iso K-L).

Illustration: Page 388, Jones (1988) - as *Acianthus viridis*.

Distribution and ecology: Endemic to Tasmania. Grows in temperate rainforests, particularly those dominated by *Nothofagus cunninghamii* (Hook.) Oerst. Altitude: 300-1100 m. Flowering period: November to February.

Notes: This species is characterised by fleshy inflorescences, often with a separate basal sterile leaf; flowers one to four, porrect to deflexed, green to greenish-yellow with red markings; and, the labellum transversely ovate, more or less folded along mid-line.

Selected specimens: (16 seen) :
TASMANIA: Mt Maurice Rd, N. of Launceston, 17 Dec. 1990, *Campbell (Jones 7297)* (CANB); Mother Cummins Ck, Central Plateau, 17 Jan. 1991, *Campbell (Jones 7316)* (CANB); Mother Cummins, 14 Dec. 1994, *Campbell 94183* (CANB); track to Mt Field from Lake Fenton, 2 Dec. 1969, *Curtis* (HO *304393*); near Lake Fenton, 2 Jan. 1969, *Palmer* (HO); Mt Field, Jan. 1971, *Palmer* (HO); track to Mt Field, 3 Jan. 1972, *Palmer & Rayner* (HO *304392*).

ACKNOWLEDGEMENTS

Many people have made a valuable contribution to this study. I gratefully acknowledge the strong support received from Hans and Annie Wapstra, not only with specimens but also information on distribution and habitat, as well as hospitality and critically reading the manuscript. I also give special thanks to David Ziegeler and Jeff Campbell for numerous specimens and locality and habitat details. Lalani Hyatt, Laurie Porteus, Les Rubenach, Peter Tonelli, Mark Wapstra, Ron and Kath Williamson assisted in the field, often following up tenuous leads. Others who have provided specimens or information over the years include Lex Barton, Colin Bower, Peter Branwhite, Alex Buchanan, Mary Cameron, Ralph Crane, Winifred Curtis, John Firth, Stephen Harris, Dennis Morris, Pat Palmer, Ross Smith, Ron Tunstall and John Whinray. Mark Clements is thanked for his help in numerous ways, including information on types and constructive comments on the manuscript. Helen Hewson provided major guidance with editing and the layout of the manuscript. Bob Makinson assisted with a final reading of the manuscript. I thank Alex George for the Latin diagnoses and Barbara Jones for word processing, support and help in the field. Corinna Broers, Maggie Nightingale and Karina FitzGerald provided technical assistance. Special thanks go to Marion Garratt for help in numerous ways, especially with the illustrations and other technical matters. I am also grateful to the directors of the herbaria AD, AK, BM, CANB, CHR, K, HO, MEL, NSW, QVM for providing access to specimens. Finally, I thank David Banks for his editorial contributions.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Bates, R. (1984). The genus *Microtis* R. Br. (Orchidaceae): a taxonomic revision with notes on biology. *J. Adel. Bot. Gard*. 7(1): 45-89.
- Bower, C.C. (1992). The use of pollinators in the taxonomy of sexually deceptive orchids in the subtribe Caladeniinae (Orchidaceae). *The Orchadian* 10: 331-338.
- Bower, C.C. (1996). Demonstration of pollinator-mediated reproductive isolation in sexually deceptive species of *Chiloglottis* (Orchidaceae: Caladeniinae), *Aust. J. Bot.* 44: 15-33.
- Brieger, F.G. (1981). Subtribe Dendrobiinae. R. Schlechter, *Die Orchideen* (Edn 3) 1(11-12): 636-752.
- Buchanan, A.M. (1990). In P.Short ed. *History of Systematic Botany in Australasia* (Australian Systematic Botany Society, Collingwood) 179-192.
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Burbidge, N.T. & Gray, M. (1970). *Flora of the Australian Capital Territory*. (Australian National University Press, Canberra).
- Carr, G.W. (1991). New Taxa in *Caladenia* R. Br., *Chiloglottis* R. Br. and *Gastrodia* R. Br. (Orchidaceae) from south-eastern Australia, *Indigenous Flora & Fauna Association, Miscellaneous Paper* No 1.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Clements, M.A. (1993). The status of recently named orchids from south-eastern Australia, *Muelleria* 8(1): 69-72.
- Clements, M.A. (1995). Reproductive biology in relation to phylogeny of the orchidaceae, especially the subtribe Diuridae. Doctor of Philosophy Thesis. (Australian National University, Canberra).
- Clements, M.A. & Jones, D.L. (1996). A checklist of the genus *Dockrillia*, *The Orchadian* 12(2): 60.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*. (Government Printer, Hobart).
- Firth, M.J. (1965). *Native Orchids of Tasmania.* (C.L.Richmond & Sons, Devonport).
- Firth, M.J. (1966). The Sentinel Caladenia, *Aust. Orch. Rev.* 31(2):97-98.
- George, A.S. (1971). A Checklist of the Orchids of Western Australia. *Nuytsia* 1(2): 166-196.
- Jones, D.L. (1988). *Native Orchids of Australia*. (Reed Books, Frenchs Forest).
- Jones, D.L. (1991). New Taxa of Australian Orchidaceae, *Australian Orchid Research* 2: 1-108.
- Jones, D.L. (1993). *Corybas dienernus* in *Flora of Australia* 50: 572. (Australian Government Publishing Service, Canberra).

- Jones, D.L. (1994). New Species of Orchidaceae from South-eastern Australia, *Muelleria* 8(2): 177-192.
- Jones, D.L. (1996A). Reinstatement of *Caladenia alpina* R.S. Rogers (Orchidaceae) as distinct from *Caladenia lyallii* Hook.f. and the description of *Caladenia cracens*, a related new species from southern Tasmania, *Muelleria* 9: 41-50.
- Jones, D.L. (1996B). Resolution of the *Prasophyllum alpinum* R. Br. (Orchidaceae) complex in mainland south-eastern Australia and New Zealand, *Muelleria* 9:51-62.
- Jones, D.L. & Clements, M.A. (1987). Reinstatement of the genus *Cyrtostylis* R. Br. and its relationship with *Acianthus* R. Br. (Orchidaceae), *Lindleyana* 2(3): 156-160.
- Jones, D.L. & Clements, M.A. (1994). *Pyrorchis*, a new genus of Orchidaceae from Australia, *Phytologia* 77(6): 447-451.
- Kores, P.J. (1995). A Systematic Study of the Genus *Acianthus* (Orchidaceae: Diuridae), *Allertonia* 7(3): 87-220.
- Kores, P.J., Molvray, M. & Darwin, S.P. (1993). Morphometric Variation in three species of *Cyrtostylis* (Orchidaceae), *Syst. Bot.* 18(2): 274-282.
- Nicholls, W.H. (1969). *Orchids of Australia.* (Thomas Nelson, Melbourne).
- Rauschert, S. (1983). Beitrag zur Nomenklatur der Orchidaceae. *Feddes Repert.* 94(7-8): 433-471.
- Rupp, H.M.R. (1943). *The Orchids of New South Wales.* (Australian Medical Publishing Coy, Sydney).
- St George, I. (1989). Who drew *Calochilus campestris*?, *The Orchadian* 9(8): 179-181.
- Willis, J.H. (1970). *A Handbook to Plants in Victoria.* Vol. 1 (2nd edition). (Melbourne University Press, Carlton).

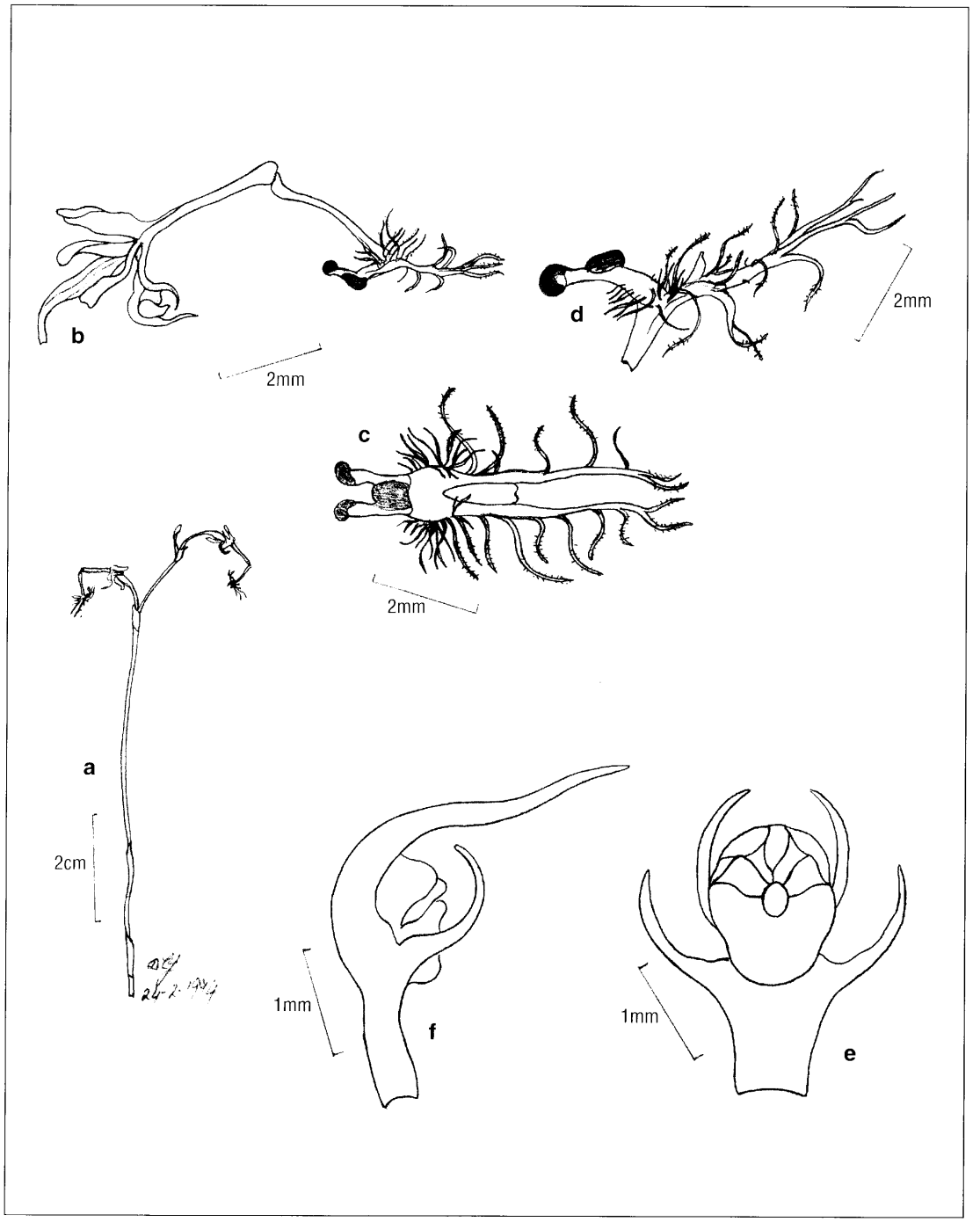


Fig. 1.1

Arthrochilus huntianus subsp. *nothofagicola*

Gordon River Road, Tasmania.

A. Garner & D. Ziegeler (D.L. Jones 12812A), from the type collection.

a. plant; b. flower from side; c. labellum from above;
d. labellum from side; e. column from front; f. column from side.

Drawing 24/2/1994 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 2:

A Taxonomic Review Of *Caladenia* R.Br. In Tasmania

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

This paper clarifies the status of *Caladenia* R.Br. in Tasmania. Nine new species are described: *Caladenia anthracina* D.L. Jones, *C. atrochila* D.L. Jones, *C. campbellii* D.L. Jones, *C. dienema* D.L. Jones, *C. mentiens* D.L. Jones, *C. saggicola* D.L. Jones, *C. sylvicola* D.L. Jones, *C. tonellii* D.L. Jones and *C. transitoria* D.L. Jones. *Caladenia echidnachila* Nicholls is reinstated from synonymy and characterised in a broad sense; *C. oenochila* G.W. Carr is found to be distinct from *C. lindleyana* (Rchb. f.) M.A. Clem. & D.L. Jones and is reinstated (for Victoria) and *C. minor* J.D. Hook. is found to be endemic to New Zealand. *Caladenia longii* R.S. Rogers is reduced to a synonym of *C. angustata* Lindl. and *C. patersonii* R. Br. var *rosea* Rupp to a synonym of *C. pallida* Lindl. The following poorly known or confused species are characterised and fully described: *C. angustata* Lindl., *C. gracilis* R. Br., *C. lindleyana* (Rchb. f.) M.A. Clem. & D.L. Jones, *C. pallida* Lindl. and *C. patersonii* R. Br. *Caladenia aurantiaca* (R.S. Rogers) Rupp, *C. brachyscapa* G.W. Carr and *C. cardiochila* Tate are recorded from Tasmania for the first time. The record of *C. australis* G.W. Carr is substantiated. New distribution records are provided for *Caladenia helvina* D.L. Jones. A key to the species of *Caladenia* in Tasmania is provided.

INTRODUCTION

Caladenia R. Br., which is mainly Australian, is a large complex genus badly in need of revisionary treatment. Clements (1989) lists 110 taxa for Australia and about another 46 taxa have been described since (Carr 1991, Jones 1991, 1994, 1996). In addition Hopper and Brown in Hoffman and Brown (1992) propose about 85 new taxa which are yet to be formalised. This means that the Australian component of the genus consists of about 240 taxa.

Buchanan (1995) lists 24 species of *Caladenia* for Tasmania. These were all described but not correctly interpreted by Curtis (1979). This study leads to the recognition of 35 species in Tasmania and gives the full description and characterisation of some confused taxa.

MATERIALS AND METHODS

As for paper 1 in this series.

TAXONOMIC TREATMENT

Caladenia

Caladenia R. Br., *Prodr.* 323 (1810).
Type species: *Caladenia carnea* R, Br. (*fide* Clements 1989).

Terrestrial tuberous *herbs*. *Roots* filamentous, much reduced, inconspicuous. *Tubers* globose to ovoid, sheathed partially in a multi-layered tunic which extends to the soil surface; replacement tubers produced at the end of short droppers; daughter tubers produced in few taxa, on the end of short droppers or on stolonoid roots. *Leaf* 1 per shoot, basal, convolute, hairy. *Inflorescence* racemose, 1-several-flowered, terminal; scape hairy. *Flowers* resupinate. *Dorsal sepal* free, similar to or slightly smaller than the lateral sepals. *Lateral sepals* free or rarely wholly or partially connate. *Petals* free, as long as or smaller than the sepals. *Labellum* free, attached to the column base by a short claw, hinged or mobile; lamina 3-lobed or nearly entire; lateral lobes nearly indistinguishable to well-developed, margins entire, toothed or with marginal calli; mid-lobe mostly deltate, porrect to recurved, often coloured differently from the rest of the lamina. *Calli* sessile or stalked, in rows, often coloured differently from the lamina. *Column* lacking free filament and style; column wings fused to the column, often cucullate. *Column foot* absent. *Anther* incumbent. *Pollinia* four, soft, mealy. *Stigma* entire. *Rostellum* ventral. *Capsule* glandular-hairy.

A genus of *c*. 250 taxa distributed in Australia, New Zealand, New Caledonia, Timor and Java. Thirty-four species of *Caladenia* occur in Tasmania.

Key to *Caladenia* in Tasmania.

1. Tepals < 20 mm long; apices acute or obtuse **2**
Tepals > 20 mm long; apices long-acuminate, filiform or with terminal osmophores **23**

2. Labellum calli arising from a plate-like structure, arranged basally in a semi-circle **25. *C. latifolia***
Labellum calli in rows along the lamina, not arising from a plate-like structure **3**

3. Tepals < 9 mm long **4**
Tepals > 10 mm long **5**

4. Plants 4-10 cm tall; scape sturdy; flowers 8-10 mm across; sepals obtuse .... **30. *C. pusilla***
Plants 6-20 cm tall; scape slender; flowers 12-15 mm across; sepals acute **27. *C. mentiens***

5. Labellum heavily stained and suffused with dark red ..... **6. *C. atrochila***
Labellum wholly white or variously barred or spotted and blotched, never heavily stained and suffused with dark red **6**

6. Dorsal sepal obliquely erect, erect or recurved, never strongly incurved and cucullate over the column **7**
Dorsal sepal incurved and strongly cucullate over the column **17**

7. Flowers blue (rarely pink or white); labellum calli linear, densely clustered at the labellum apex ..... **17. *C. deformis***
Flowers pink or white; labellum calli clavate, never densely clustered at the labellum apex .. **8**

8. Flower usually white; labellum lamina and/or column lacking pink, red or purplish bars **9**
Flower usually pink, sometimes white; labellum lamina and /or column with pink, red or purplish bars **10**

9. Tepals in a stiff, stellate arrangement, not drooping at the tips; petals acuminate; column green ..... **7. *C. aurantiaca***
Tepals not in a stiff, stellate arrangement, drooping at the tips; petals subacute; column white ..... **32. *C. sylvicola***

10. Labellum lateral lobes incurved close to the column **11**
Labellum lateral lobes erect or outcurved **13**

11. Plants 15-35 cm tall; leaf nearly as long as the scape; flowers 10-12 mm across (flowering Nov.-Jan.) ..... **35. *C. vulgaris***
Plants 8-18 cm tall; leaf much shorter than the scape; flowers 14-18 mm across (flowering Sept.-Nov.) **12**

12. Tepals in a stiff, stellate arrangement; petals acuminate; labellum mid-lobe flanked by two basal flat, orange, marginal calli ..... **1. *C. alata***
Tepals not in a stellate arrangement; petals subacute to obtuse; labellum mid-lobe with several pairs of cream to pale yellow marginal calli ..... **22. *C. fuscata***

13. Plants lacking the ability to produce more than one flower ..... **22. *C. fuscata***
Flowers one to three **14**

14. Perianth segments usually < 11 mm long; labellum mid-lobe with two prominent orange basal calli **15**
Perianth segments usually > 15 mm long; labellum mid-lobe lacking prominent orange basal calli **16**

15. Leaf 2-3 mm wide; scape c. 1.5 mm diameter; tepals to 11 mm long; petals subacute; labellum lateral lobes broadly rounded ..... **10. *C. campbellii***
Leaf 1-1.5 mm wide; scape c. 0.5 mm diameter; tepals to 8 mm long; petals acuminate; labellum lateral lobe angular ..... **1. *C. alata***

16: Plants to 25 cm tall; flowers 20-25 mm across; labellum lateral lobes angular ..... **12. *C. carnea***
Plants to 35 cm tall; flowers 25-38 mm across; labellum lateral lobes broadly rounded ..... **33. *C. tonellii***

17. Labellum mid-lobe purplish-black to black **18**
Labellum mid-lobe yellowish, reddish or purplish **19**

18. Plants to 50 cm tall; flower rich pink; labellum mid-lobe covered with a dense, congested mass of shiny black, sessile calli ..... **15. *C. congesta***
Plants to 16 cm tall; flowers cream-green to yellow-green or brownish; labellum mid-lobe with four irregular rows of stalked, purplish-black, papillate calli ..... **34. *C. transitoria***

19. Dorsal sepal broadly obovate, much wider than the labellum **20**
Dorsal sepal linear to oblong or narrowly obovate, about as wide as the labellum **21**

20. Flower solitary; leaf to 3 mm wide; labellum calli with small heads and very narrow stalks ..... **16. *C. cracens***
Flowers 1-4; leaf to 15 mm wide; labellum calli with large heads and thick stalks ..... **2. *C. alpina***

21. Flowers c. 18 mm across, intensely white internally, blackish or dark reddish externally; labellum calli strongly papillate ..... **5. *C. atrata***
Flowers c. 25 mm across, white or pink internally, dusky pink to brownish externally; labellum calli smooth or slightly papillate **22**

22. Plants to 12 cm tall; leaf to 1.5 mm wide; labellum lateral lobes obscure ..... **3. *C. angustata***
Plants to 25 cm tall; leaf to 5 mm wide; labellum lateral lobes broad and prominent ..... **23. *C. gracilis***

23. Tepals long and filamentous, often entangling, beset with terete glands much longer than wide; column lacking prominent yellow basal glands . . . . . **21. *C. filamentosa***
Tepals short to long, often caudate but not filamentous or entangling, beset with ovoid to globose glands; column with two prominent yellow basal glands **24**

24. Labellum margins entire or with one or two pairs of short teeth **25**
Labellum margins with numerous pairs of short to long teeth **26**

25. Labellum calli congested in a narrow, dense central cluster; sepal tips never with black osmophores . . . . . **11. *C. cardiochila***
Labellum calli well spaced in four or six rows; sepal tips usually with short, black terminal osmophores . . . . . **14. *C. clavigera***

26. Labellum margins with narrow, linear, green teeth to 6 mm long . . . . . **19. *C. dilatata***
Labellum margins with thickened, tapered, reddish or white-tipped teeth to 3 mm long . . . **27**

27. Sepals with prominent, thickened dark terminal osmophores **28**
Sepal tips glandular but lacking thickened dark osmophores **31**

28. Plants to 12 cm tall; petals with terminal osmophores . . . . . **9. *C. brachyscapa***
Plants to 40 cm tall; petals usually without terminal osmophores **29**

29. Flowers reddish; sepalline osmophores hardly thickened . . . . . **26. *C. lindleyana***
Flowers cream, yellowish or rosy pink; sepalline osmophores markedly thickened **30**

30. Flowers creamy yellow, c. 60 mm across; tepals obliquely decurved, tips drooping . . . . . **8. *C. australis***
Flowers yellowish to bright rosy pink, c. 45 mm across; tepals spreading . . . . **28. *C. pallida***

31. Flowers about 40 mm across **32**
Flowers 50 mm across or larger **33**

32. Labellum with a glandular apical cauda to 8 mm long; labellum marginal teeth to 1.5 mm long . . . . . **13. *C. caudata***
Labellum apex obtuse, non-caudate and non-glandular; labellum marginal teeth 0.3 - 0.7 mm long . . . . . **26. *C. lindleyana***

33. Plants short, usually < 20 cm **34**
Plants tall, usually > 25 cm **35**

34. Flower to 65 mm across; tepals stiffly spreading; tepalline caudae slender, black (midlands) . . . . . **4. *C. anthracina***
Flower to 90 mm across; tepals obliquely deflexed to drooping; tepalline caudae thick, blackish (west coast) . . . . . **18. *C. dienema***

35. Flowers greenish yellow to pale yellow or tawny **36**
Flowers white or reddish **37**

36. Tepals stiffly spreading; tepalline caudae slender, sparsely glandular flowering Sept.-Nov.). . . . . **20. *C. echidnachila***
Tepals drooping; tepalline caudae coarse, densely glandular (flowering Dec.-Jan.) . . . . . **24. *C. helvina***

37. Flowers white; tepalline caudae greyish . . . . . **31. *C. saggicola***
Flowers white to reddish; tepalline caudae blackish . . . . . **29. *C. patersonii***

1. *Caladenia alata* R. Br., *Prodr.* 324 (1810).
Caladenia carnea R. Br. var. *alata* (R. Br.) Domin, *Bibl. Bot. Heft* 85: 549 (1915).
TYPE: Sydney, Port Jackson, 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, E, FI, K, W).

Illustration: Page 52, Backhouse & Jeanes (1995).

Distribution and ecology: South-eastern Queensland, New South Wales, Victoria, Tasmania and New Zealand. Grows in open forest, heathy forest, coastal scrubs and heathland in sandy loams and peaty loams. Altitude: 0-50 m. Flowering period: October and November.

Notes: This species is characterised by small flowers; stiffly spreading acuminate segments; red-purple bars on the labellum lateral lobes; two flat orange calli on the basal margins of the labellum mid-lobe; and, two rows of orange lamina calli.

Specimens examined:
TASMANIA: Sisters Hills area, E. of Rocky Cape, 4 Nov. 1990, *Jones 6969 & Broers* (CANB); Police Point Rd, 23 Oct. 1994, *Jones 13633* (CANB); Pelverata Falls Tk, 2 Nov.1994,*Jones 13642* (CANB); Blackmans Bay, 9 Nov. 1994, *Jones 13674* (CANB); near Taroona,1 Nov. 1995, *Minchin* (CANB); 15 km N. of Coles Bay, 5 Oct. 1994, *Rubenach (Clements 8217)* (CANB); Surges Bay Rd to Killala Bay, 4 Nov. 1992, *Wapstra (Jones 10621)* (CANB); Lime Bay Nature Reserve, 21 Oct. 1993, *Wapstra (Jones 12488)* (CANB).

2. *Caladenia alpina* R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 51: 12 (1927).
TYPE: Victoria, Mount Hotham and Mount Bogong, Dec. 1921, Jan. 1924, *A.J. Tadgell* (lecto AD!, *fide* Jones 1996).
Caladenia lyallii auct non Hook. f.; W.M. Curtis, *The Students Flora of Tasmania* 4A: 111 (1979).

Illustration: Page 90, Backhouse & Jeanes (1995) - as *C. lyallii.*

Distribution and ecology: Southern New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in montane snowgum woodland, subalpine herbfield and moorland, and the margins of small streams and bogs. Altitude: 800-1500 m. Flowering period: November to February.

Notes: Records of *Caladenia lyallii* Hook. f. (a New Zealand endemic) from montane and subalpine areas of Tasmania are attributable to this species (Jones 1996). It can be distinguished by its robust habit (plants to 30 cm tall); broad leaves (7-15 mm wide); one to four flowers, 30-35 mm across, which are white internally, externally pink to red; and, lamina calli in four or six irregular rows (see also *C. cracens* entry).

Selected specimens: (20 seen):
TASMANIA: Old Mans Head, 7 Dec. 1974, *Allan* (HO); Meetus Falls, Eastern Tiers, 22 Nov. 1986, *Collier 1933* (HO); Mt St John, 13 Nov. 1988, *Collier 3784* (HO); Mt Rufus-Navarre, 7 Dec. 1982, *Moscal 1162* (HO); Ben Lomond Natl Pk, 28 Nov. 1978, *Noble 28043* (HO); Dove Valley, near Cradle Mtn, Jan. 1910, *Rodway* (HO); Lake Dobson, Mt Field, 6 Jan. 1978, *Smith 289* (HO).

3. *Caladenia angustata* Lindl., *Gen. sp. orchid. pl.* 420 (1840);
Caladenia testacea R. Br. var. *angustata* (Lindl.) Ewart, *Fl. Victoria* 354 (1931).
TYPE: Tasmania, Oct.-Nov., *R. Gunn 911* (holo specimen 8c, K-L photo!).
C. longii R.S. Rogers, *Pap. & Proc. Roy. Soc. Tasmania* 1931: 105 (1932).
TYPE: Railton Hills, NW. coastal Tasmania, 20 Oct. 1930, *F.A. Long in herb R.S. Rogers* (holo AD!). ***syn. nov.***

Illustration: None found.

Hirsute, tuberous, terrestrial *herb* growing in loose groups. *Leaf* filiform to narrowly linear, 60-100 mm long, 0.7-1.5 mm wide, erect, slightly reddish purple towards the base; trichomes a mixture of transparent, eglandular trichomes to 1 mm long and shorter glandular trichomes. *Scape* 8-12 cm tall, very slender, wiry, with short trichomes similar to those on the leaf. *Sterile bracts* closely sheathing, narrowly oblong-obovate, 5-8 mm long, 2.5-3.5 mm wide, subacute, externally hirsute. *Floral bracts* closely sheathing, similar but smaller. *Flowers* one or two, c. 25 mm across, intensely white to pinkish internally, slightly reddish or greenish brown externally from

sessile, ovoid glands; labellum white with reddish striae and spots and a purple apex; column greenish, spotted and blotched with red. Tepals glandular, denser towards the apex; dorsal sepal strongly incurved over the column, lateral sepals porrect and divergent, petals widely spreading. *Dorsal sepal* narrowly obovate, 10-12 mm long, 3-4 mm wide, cucullate, apex subacute to apiculate. *Lateral sepals* asymmetrically lanceolate, 15-17 mm long, 4-5.5 mm wide, falcate, subobtuse. *Petals* asymmetrically lanceolate, 13.5-15.5 mm long, 3-4 mm wide, falcate, acute to acuminate. *Labellum* articulated on a short claw. *Lamina* distinctly three-lobed, ovate in outline when flattened, 7-8 mm long, 4.5-5.5 mm wide, erect in the proximal third then curved forwards; apex recurved. Lateral lobes c. 1.3 mm wide, erect and column-embracing, entire. Mid-lobe 3-4 mm long, with 6-10 pairs of yellow-headed, narrowly linear marginal calli to 1 mm long, these decrescent to the apex where somewhat irregular. *Lamina calli* in four rows, extending nearly to the apex of the mid-lobe; stalks white; heads yellow to purplish. Basal calli two, c. 0.8 mm long, nearly sessile; head more or less obovoid, curved. Longest lamina calli c. 1.2 mm long, gammate; stalk c. 0.7 mm long; head ovoid, papillate. Distal calli subsessile to sessile, irregularly shaped and arranged. *Column* 6-7 mm long, 1.8-2 mm wide, erect, recurved away from the ovary at the base, incurved towards the apex, greenish, spotted and blotched with red, narrowly winged; central ridge c. 0.8 mm wide. *Anther* c. 1.4 mm long, 1 mm wide, papillate; rostrum short. *Pollinia* four, c. 1.2 mm long, cream, flat. *Stigma* elliptic, c. 1.4 mm wide, sunken, green. *Capsule* obovoid, 10-13 mm long, 3-4 mm wide, erect, greenish to reddish.
Fig. 2.1.

Distribution and ecology: Endemic to Tasmania where known mainly from northern areas, but exact distribution uncertain due to confusion with *C. gracilis* R. Br. Grows on low hills in open forest with a sparse to shrubby understorey. Soils are gravelly loams and clay loams often developed on shale. Altitude: 20-50 m. Flowering period: October and November.

Notes: *Caladenia angustata* is commonly confused with *C. gracilis* but can be distinguished by its very narrow, often filiform leaf; generally short stature; and, flowers which are intensely white to pinkish internally and sparsely to moderately glandular externally. The labellum has smaller (1.3 mm wide) lateral lobes than those of *C. gracilis*; smaller, widely spaced lamina calli; longer very slender marginal calli; and, a narrower (1.8-2 mm wide) column.

This is a very confused species which in a recent treatment has been wrongly synonymised with *Caladenia gracilis* (Clements 1989). Examination of the types shows the two species to be quite distinct.

Caladenia longii, described from a specimen collected at Railton Hills, is a good match for the specimens on the type sheet of *C. angustata*. Much of the area around Railton Hills has been cleared or converted to pine plantation, but the species is still relatively prevalent in the nearby Henry Somerset Orchid Conservation Area.

Conservation status: Moderately widespread but disjunct and reserved in Henry Somerset Orchid Conservation Area; suggest 2RC by the criteria of Briggs & Leigh (1996).

Specimens examined: TASMANIA: Sextus Ck, near Gladstone, 22 Oct. 1982, *Cameron* (QVM); Avoca, along Story's Ck Rd, 11 Oct. 1984, *Cameron* (QVM); Brown Ck, Dazzler Ra., 21 Sept. 1986, *Collier 1602* (HO); Henry Somerset Orchid Conservation Area, 29 Oct. 1988, *Collier 3680* (HO); Harford, 1 Oct. 1932, *Hamilton* (HO); Cray Ck, 17 Oct. 1983, *Moscal 3590* (HO); S. slopes, Mt Cameron, 21 Oct. 1983, *Moscal 4067* (HO); Fingal - Mangana Rd, near Tower Hill Rd turnoff, 7 Oct. 1985, *Rubenach* (HO).

4. *Caladenia anthracina* D.L. Jones, sp. nov.
C. patersonii R.Br. affinis, sed planta brevi (ad 20 cm alta); floribus minoribus (ad 6.5 cm latis); et tepalorum caudis prominentibus, crassis, glandulosissimis, saepe glandibus multiseriatis, atris, differt.

TYPUS: Tasmania, Near Ross, 9 Oct. 1995, *J.E. Wapstra (Jones 14487)* (holo CANB; iso HO).

Hirsute terrestrial *herb* growing singly or in small loose groups. *Leaf* narrowly lanceolate, 5-12 cm long, 0.3-0.7 cm wide, dull green;

base purple-blotched; trichomes dense on both surfaces, to 5 mm long, patent, transparent, eglandular. *Scape* 10-20 cm tall, wiry, densely hirsute, with a mixture of transparent, eglandular trichomes to 5 mm long and a few short glandular trichomes. *Sterile bracts* spreading, narrowly oblong-lanceolate, 15-25 mm long, 3-4 mm wide, acuminate, involute, externally hirsute. *Floral bracts* closely sheathing, narrowly ovate-lanceolate, 15-22 mm long, 4-7 mm wide, acuminate, externally shortly hirsute. *Flower* solitary, 4.5-6.5 cm across, heavily marked with crimson to purplish lines and suffusions; tepalline caudae black; labellum white to cream or red, with purplish calli; column translucent with reddish markings. Tepals heavily glandular; dorsal sepal erect; lateral sepals widely divergent, stiffly spreading to obliquely deflexed; petals stiffly spreading. *Dorsal sepal* 35-55 mm long, 2-3 mm wide, linear-oblong in the proximal quarter, then tapered to a thick, black, glandular cauda. *Lateral sepals* 35-55 mm long, 3.5-5 mm wide, lanceolate in proximal quarter, then tapered to thick, black, glandular caudae. *Petals* 35-45 mm long, 2-3 mm wide, lanceolate in proximal third, tapered to thick, black, glandular caudae. *Labellum* articulated on a short claw c. 0.6 mm long, c. 2.5 mm wide. *Lamina* obscurely three-lobed, broadly ovate-lanceolate in outline when flattened, 13-16 mm long, 7-9 mm wide, erect in proximal third then curved forwards; apex strongly recurved. Lateral lobes c. 4 mm across, erect; margins with 13-18 pairs of calli to 2 mm long; marginal calli linear, widely spreading, straight, head narrowly clavate, outer face white. Mid-lobe deltate in outline when flattened, obtuse, the margins with short, blunt teeth, decrescent towards the apex. *Lamina calli* in four or six rows, extending onto the base of mid-lobe, dark reddish purple, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1.3 mm long, stalked, erect; head swollen, linear-clavate. Longest lamina calli c. 1 mm long, hockey-stick-shaped, stalked; head c. 0.5 mm long, curved when viewed from the side, narrowly linear-tapered from above. *Column* 13-15 mm long, c. 5 mm wide, recurved in the proximal third then incurved, translucent with reddish markings, narrowly winged; basal glands ovoid, c. 1.2 mm long, c. 0.8 mm wide, yellow. *Anther* c. 2.5 mm long, c. 2.5 mm wide, burgundy; rostrum linear, c. 0.6 mm long. *Pollinia* four, c. 3.5 mm long, boomerang-shaped, flat, yellow, mealy. *Stigma* c. 2.5 mm wide, elliptical, sunken. *Capsule* not seen. **Fig. 2.2.**

Distribution and ecology: Endemic to Tasmania where apparently confined to the Midlands, the lowest rainfall region in the state. Grows amongst grasses and low shrubs in sparse woodland dominated by *Eucalyptus viminalis* Labill., also in sandstone outcrops. The soil is a well-drained sandy loam. Altitude: c. 200 m. Flowering period: Late September to early November.

Notes: *Caladenia anthracina* is close to *C. patersonii* and has undoubtedly been confused with it in the past. It can be distinguished by its short stature; smaller (4.5-6.5 cm across) flowers which are heavily marked with crimson to purplish lines and suffusions; stiffly spreading to obliquely deflexed segments; and, thinner, blackish, densely glandular caudae, frequently bearing multiseriate glands.

Etymology: Derived from the Latin *anthracinus*, coal black, in reference to the dense tepalline glands which produce black caudae.

Conservation status: Reduced to great rarity by alienation of its habitat and known only from private land; suggest 2V by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: New Norfolk, 1837, *Gunn* (QVM); *ibid*, 24 Oct.-4 Nov. 1842, *Gunn* (HO 120954, QVM); near Ross, 10 Oct. 1993, *Wapstra (Jones 12498)* (CANB); *ibid*, 20 Oct. 1995, *Wapstra (Jones 14538)* (CANB); Granton, Sept. 1920, *collector unknown* (QVM).

5. *Caladenia atrata* D.L. Jones, *Muelleria* 8(2): 178-181 (1994).
TYPE: Tasmania, hill 2.5 km NE. of Ferntree, 29 Oct. 1990, *D.L. Jones 6805 & C.H. Broers* (holo CANB!; iso AD!, CANB!, HO!, MEL!, NSW!).
Caladenia cucullata & *C. gracilis pro parte auct non* Fitzg. and R. Br.; W.M.Curtis, *The Student's Flora of Tasmania* 4A: 111 (1979).

Illustration: None found.

Distribution and ecology: Endemic to southern Tasmania. Grows on slopes and ridges in open forest, often with a sparse understorey. Soils are skeletal loams and loams. Altitude: 10-250 m. Flowering period: October to December.

Notes: A striking species which can be recognised by its flowers which are intensely white internally, externally with a dense covering of sessile black to reddish black glands and narrow (c. 2.3 mm wide), acute tepals.

Selected specimens: (13 seen):
TASMANIA: Pottery Rd, Hobart, 8 Nov. 1975, *Allen* (HO); Grove, 7 km N. of Huonville, 13 Nov. 1975, *Allen* (HO); The Waterworks, 5 Nov. 1931, *Atkinson* (HO); Mt Louis, Tinderbox, 2 Nov. 1986, *Collier 1807* (HO); Russell R., Upper Huon, 23 Nov. 1928, *Giblin* (HO).

6. ***Caladenia atrochila*** D.L. Jones, sp. nov., *C. prolatae* D.L. Jones affinis, sed folio breviore, angustiore; folio scapoque hirsutissimo; labello leniter curvato ad paene recto; labello columnaque vittis latis coalescentibus atro-sanguineis; labelli callis non confertis; et labelli lobo medio anguste triangulari, callorum paribus 2-4 in marginibus basalibus, differt.

TYPUS: Tasmania. Callaghans Scrub, S of Arthur River, 10 Nov. 1997, *J.E. & A. Wapstra (ORG 1014)* (holo CANB, iso HO).

Densely hirsute terrestrial *herb* growing singly or in small loose groups. *Leaf* narrowly linear to linear, 5-12 cm long, 1.8-3 mm wide, erect, dark green; apex acute to acuminate; trichomes moderately dense, c. 2 mm long, patent, glandular and eglandular. *Scape* 6-16 cm tall, relatively thick (c. 2 mm wide), with glandular and eglandular trichomes similar to those on the leaf. *Sterile bracts* closely sheathing, narrowly obovate, 8-12 mm long, 2.5-3.5 mm wide, subacute, externally hirsute. *Floral bracts* closely sheathing, oblong-obovate, 3-6 mm long, 1.5-2.5 mm wide, subobtuse, externally hirsute. *Flowers* 1 or 2, 12-16 mm across, whitish or pinkish internally, externally yellowish green; labellum cream with dark crimson bars, these mostly coalescent, apex yellowish; column green with dark crimson bars and suffusions. Tepals moderately glandular externally, with a darker central line; dorsal sepal erect and incurved; lateral sepals porrect, slightly divergent; petals spreading, tips incurved. *Dorsal sepal* narrowly obovate, 8-11 mm long, 2.5-3 mm wide, internally glabrous, apex obtusely apiculate. *Lateral sepals* oblanceolate, 8-13 mm long, 2.5-3 mm wide, internally glabrous, apex obtusely apiculate. *Petals* oblanceolate, 7-10 mm long, 2.5-3 mm wide, apex acute to acuminate. *Labellum* hinged at the base by a small claw. *Lamina* prominently three-lobed, transversely elliptical-obovate when flattened, 5.5-6.5 mm long, 6.5-7 mm wide, erect in the proximal third then porrect; apex porrect. Lateral lobes c. 2.7 mm wide, erect and column-embracing; margins entire. Mid-lobe narrowly deltate, 1.6-2.3 mm long, c. 1.5 mm wide, with two to four pairs of basal marginal calli to 0.7 mm long, the rest irregular to entire; apex irregularly obtuse. *Lamina calli* in two rows, yellow with dark red stalks, extending nearly to the base of the mid-lobe. Basal calli two or four, c. 0.9 mm long; stalk c. 0.2 mm long; head oblong-ovoid, c. 0.7 mm long, dark yellow. Longest lamina calli c. 0.6 mm long, erect, the distal ones inclined forwards; stalk c. 0.3 mm long; head oblong-ovoid. *Column* 6-7 mm long, c. 2.5 mm wide, erect, curved forwards slightly near the apex, narrowly winged, the wings incurved; central anterior ridge 1.3 mm wide. *Anther* c. 1.5 mm long, 1.4 mm wide, pale pink, densely papillate; rostrum prominent. *Pollinia* four, c. 1.2 mm long, roughly boomerang-shaped, white, mealy. *Stigma* more or less circular, c. 1.2 mm wide, sunken, green. *Capsule* narrowly obovoid, 14-22 mm long, 4-5 mm wide, dark green, glandular hairy. **Fig. 2.3.**

Distribution and ecology: Endemic to Tasmania where apparently restricted to coastal and near-coastal areas in the west. Grows in dense forests dominated by *Eucalyptus* and *Leptospermum* spp. in sandy loam and red clay loam. Altitude: c. 50 m. Flowering period: November.

Notes: Similar to *Caladenia prolata* D.L. Jones from South Australia and Victoria but with shorter, narrower (to 12 cm x 3 mm) leaves; densely hairy leaves and scapes (sparsely hairy in *C. prolata*); broad coalescent dark crimson bars on the labellum and column; lamina calli

moderately widely spaced (crowded in *C. prolata*); narrowly deltate mid-lobe with two to four pairs of calli on the basal margins, the rest entire or slightly irregular (broadly deltate in *C. prolata* with crowded basal calli and numerous smaller calli decrescent to the apex); and, gently curved, nearly straight labellum (sharply arcuate in *C. prolata*).

The flowers of this species open for a very short period, usually one or two days, before self-pollinating.

Conservation status: Poorly known and easily overlooked; suggest 2K by the criteria of Briggs & Leigh (1996).

Etymology: From a combination of the Latin prefix *ater*, dark, and the Greek *cheilos*, lip, in reference to the dark appearance of the labellum caused by the broad coalescent dark crimson bars.

Specimens examined:
TASMANIA: Rebecca Ck crossing, Heemskirk Rd, S of Arthur R., 10 Nov. 1997, *J.E. & A Wapstra (ORG 1013)* (CANB); Black Bull Scrub, Arthur R. Rd, 10 Nov. 1997, *J.E. & A. Wapstra (ORG 1016)* (CANB).

7. *Caladenia aurantiaca* (R.S. Rogers) Rupp, *Proc. Linn. Soc. New South Wales* 71: 280 (1947);
Caladenia carnea R. Br. var. *aurantiaca* R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 46: 154 (1922).
TYPE: Alberton, Gippsland, Oct. 1920, *A.J. Tadgell* (holo AD!).

Illustration: Page 55, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria and Tasmania (Deal Island). Grows in heathy forests, coastal scrubs and heathland, in sandy loams and peaty sands. Altitude: 0-30 m. Flowering period: September and October.

Notes: This species has been recently discovered on Deal Island by John Whinray. It can be recognised by the small (15-20 mm across), white flowers; tepal arrangement (petals spreading widely, lateral sepals held close together); orange lamina calli; and, an orange tip on the labellum mid-lobe.

The flowers are autogamous and are usually open for only a short period.

Specimen examined:
TASMANIA: Deal Island, Kent Group, gully NW. of highest eastern peak, 5 Nov. 1992, *J.S.Whinray* (CANB).

8. *Caladenia australis* G.W. Carr, *Indigenous Flora & Fauna Association, Miscellaneous Paper* No. 1: 2 (1991).
TYPE: Victoria, Wilsons Promontory, 17 Oct. 1933, *J.H. Willis* (holo MEL 577737!).

Illustration: Page 56, Backhouse & Jeanes (1995).

Distribution and ecology: Southern Victoria and Tasmania, where known only from Flinders Island. Grows in coastal forests with a heathy understorey and in coastal scrubs. Soils are usually sandy loams. Altitude: 0-50 m. Flowering period: September-November.

Notes: This species is characterised by the greenish-cream flower about 5 cm across; stiffly spreading to decurved lateral sepals and petals; dark red sepalline osmophores to 12 mm long; petals entire, or with short red osmophores, or with small clusters of red glands; and, a dark red labellum.

Specimen examined:
TASMANIA: Flinders Island, Furneaux Group, Lady Barron, 9 Nov. 1968, *Whinray 1868* (CANB 342227).

9. *Caladenia brachyscapa* G.W. Carr, *Muelleria* 6(6): 439-42 (1988).
TYPE: "Nirrand", c. 32 km SE. of Warrnambool, Victoria, 16 Oct. 1959, *Mathieson family & A.C. Beauglehole 18642* (holo MEL!).

Illustration: Page 57, Backhouse & Jeanes (1995) - of the pressed type specimen.

Distribution and ecology: Victoria and Tasmania. Herbarium specimens were recently located in the collection of Whinray at CANB. The species is presently known with certainty only from Clarke Island in the Furneaux Group of islands, Bass Strait, Tasmania. It grows

among grasses and low shrubs in sparse coastal scrub. The soil is a sandy loam. Altitude: 0- c. 50 m. Flowering period: October and November.

Notes: Previously recorded from a few populations in southern Victoria but live plants were unknown in the wild at the time of its description (Carr 1988). It was believed to be extinct until the collection by Whinray from Clarke Island.

Specimens in the Tasmanian collection have longer marginal calli on the labellum than in mainland material. One specimen has a short elongated glandular cauda on the labellum apex.

C. brachyscapa is characterised by its short scape and small (c. 40 mm across), reddish flowers with prominent dark osmophores on all the perianth segments.

Conservation status: This is the only known population of this species; it occurs on private land and is reduced to great rarity by grazing of its habitat; suggest 2E by the criteria of Briggs & Leigh (1996).

Specimen examined:
TASMANIA: Robin Hill, Clarke Island, Furneaux Group, 7 Nov. 1979, *Whinray 2390* (CANB).

10. *Caladenia campbellii* D.L. Jones, sp. nov.
C. alatae R.Br. affinis, sed folio latiore (2-3 mm lato), concavo; pedunculis crassioribus (c. 1.5 mm diam.); floribus cremeis vel albis; tepalis majoribus (sepalo dorsali ad 10 x 3 mm, sepalis lateralibus ad 11 x 3.5 mm, petalis ad 10 x 3 mm); labelli lobis lateralibus late rotundatis, late patentibus; et columna majore (ad 6.5 x 3.5 mm), differt.

TYPUS: Tasmania, Sisters Hills, 6 Nov. 1996, *J. Campbell 96024* (holo CANB; iso HO).

Sparsely hirsute, terrestrial *herb* growing singly or in small groups. *Leaf* narrowly linear, 4-9 cm long, 2-3 mm wide, erect, dark green; apex acute; trichomes sparse, c. 0.5 mm long, patent, glandular. *Scape* 8-14 cm tall, relatively thick (c. 1.5 mm wide), with glandular trichomes similar to those on the leaf. *Sterile bracts* closely sheathing to spreading, narrowly obovate, 7-11 mm long, 2-3 mm wide, subacute, externally hirsute. *Floral bracts* closely sheathing, narrowly obovate, 5-8 mm long, 2-3 mm wide, obtuse, externally hirsute. *Flowers* one or two, 15-18 mm across, cream internally, externally pinkish; labellum cream with reddish bars and a yellowish apex; column green with red bars. Tepals moderately glandular externally; dorsal sepal erect and incurved; lateral sepals porrect, slightly divergent; petals incurved. *Dorsal sepal* narrowly ovate-oblong, 8-10 mm long, c. 3 mm wide, internally glabrous, apex obtuse. *Lateral sepals* oblanceolate, 8.5-11 mm long, 3-3.5 mm wide, internally glabrous, apex acute. *Petals* narrowly obovate, 8.5-10 mm long, c. 3 mm wide, apex subacute. *Labellum* hinged at the base by a small claw. *Lamina* prominently three-lobed, broadly ovate when flattened, 5.5-6.5 mm long, 6-7 mm wide, erect in the proximal third, then porrect; apex recurved. Lateral lobes c. 2.5 mm wide, obliquely erect; margins shallowly irregular. Mid-lobe narrowly ovate, 2.3-2.8 mm long, c. 2 mm wide, with one broad pair of marginal calli to 0.5 mm long; apex irregularly obtuse. *Lamina calli* in two somewhat irregular rows, yellow to orange, extending to the base of the mid-lobe. Basal calli four, c. 0.3 mm long; stalk c. 0.2 mm long, white; head ovoid, c. 0.6 mm long, orange. Longest lamina calli c. 0.7 mm long, the distal ones inclined forwards; stalk c. 0.4 mm long, white; head yellow. *Column* 5-6.5 mm long, c. 3.5 mm wide, more or less erect, curved forwards near the apex, broadly winged; central ridge 1.6 mm wide. *Anther* c. 2 mm long, 1.5 mm wide, pink, densely papillate; rostrum prominent. *Pollinia* four, c. 1 mm long, roughly boomerang-shaped, white, mealy. *Stigma* more or less circular, c. 1.5 mm wide, sunken, green. *Capsule* not seen. **Fig. 2.4.**

Distribution and ecology: Endemic to northern Tasmania. Grows on slopes and ridges on rolling hills among shrubs in stunted coastal and near-coastal scrub. The soils are grey sandy loam and gravelly loam over clay. Altitude: c. 40 m. Flowering period: October and November.

Notes: Similar to *Caladenia alata* R. Br. but with broader (2-3 mm wide cf. 1-1.5 mm) concave leaves; thicker scape (c. 1.5 mm wide cf. 0.5 mm); cream to white flowers (pink in *C. alata*); larger tepals (dorsal sepal to 10 x 3 mm cf. to 8 x 2 mm; lateral sepals to 11 x 3.5 mm cf. to 8 x 2.5 mm; petals to 10 x 3 mm cf. 8 x 3 mm); broadly rounded, widely spreading labellum lateral lobes (angular, erect and

column-embracing in *C. alata*); and a larger column (to 6.5 x 3.5 mm cf. 5 x 2.5 mm).

Conservation status: Extremely rare, poorly known, and known with certainty only from the vicinity of the type locality where much of the habitat is under threat; suggest 2KV by the criteria of Briggs & Leigh (1996).

Etymology: Named after Jeff Campbell, who has made significant collections of Orchidaceae in Tasmania, has assisted with my research over a number of years and who discovered this species.

Specimens examined:
TASMANIA: Newhaven Rd, Sisters Hills, 11 Nov. 1995, *Campbell 94136* (CANB); *ibid*, 6 Nov. 1996, *Campbell 96025* (CANB); track N. off highway A2, Sisters Hills, 16 Oct. 1994, *D.L. Jones 13570 & B.E. Jones* (CANB); Devils Elbow Rd, 12 Nov. 1997, *Wapstra (ORG 1035)* (CANB).

11. *Caladenia cardiochila* Tate, *Trans. & Pap. Roy. Soc. South Australia* 9: 60, t. 2 (1887).
TYPE: 'Sandy ground under the shade of casuarinas and eucalypts, Golden Grove', 2 Oct. 1886, *collected by various members of Field Naturalists Club* (lecto AD!, *fide* Clements 1989).

Illustration: Page 60, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania (Flinders Island) and South Australia. Grows in mallee shrubland, heathy open forest, open forest, coastal scrubs and heathland. Altitude: 10-50 m. Flowering period: September and October.

Notes: This species, recently confirmed as occurring in Tasmania, is known from a single collection. It can be distinguished from all other Tasmanian species of *Caladenia* by its prominent cordate labellum which has entire margins and the absence of terminal osmophores on the perianth segments.

Conservation status: Common on the Australian mainland but possibly extinct in Tasmania.

Specimen examined:
TASMANIA: Flinders Island, Oct. 1947, *Biggs 1947-59* (QVM).

12. *Caladenia carnea* R. Br., *Prodr.* 324 (1810);
C. catenata (Smith) Druce forma *carnea* (R. Br.) Hallé, *Fl.Nov.-Cal.* 8: 460 (1977).
TYPE: Port Jackson, 1803-5, *R. Brown* (lecto specimen a, BM!, *fide* Clements 1989; isolecto E, G, L, K-L, MEL!, W).

Illustration: Page 61, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Victoria, Tasmania and South Australia. Grows in a wide range of forested habitats and heathland, in many soil types. Altitude: 10-300 m. Flowering period: August to November.

Notes: This species is characterised by one to five flowers per scape; red bars on the labellum and column; and, the labellum lateral lobes usually not incurved towards the column (see also *C. fuscata* entry).

Where the species grows sympatrically with *C. fuscata*, the latter species begins flowering about two weeks before *C. carnea*. Sporadic hybrids may occur between these taxa in some areas of Tasmania.

Selected specimens: (30 seen):
TASMANIA: Apsley R., 2 Nov. 1985, *Collier 934* (HO); Valley Rivulet, N. of Broadmarsh, 15 Oct. 1988, *Collier 3602* (HO): Sisters Hills, inland from Bakers Beach, 21 Oct. 1990, *Collier 4822* (HO); Eaglehawk Neck, Nov. 1949, *Curtis* (HO); Natone Hill, Lindisfarne, 22 Oct. 1937, *Long* (HO); Mt Walter, 31 Oct. 1983, *Moscal 3825* (HO); Mt Cameron, 18 Nov. 1983, *Moscal 4156* (HO); Flinders Island, Tanners Bay Tinfield, 29 Oct. 1967, *Whinray* (HO).

13. *Caladenia caudata* Nicholls, *Victorian Naturalist* 64: 231 (1948).
TYPES: Tasmania, Bellerive, Oct. 1947, *W.M. Curtis* (syn MEL, not found); Tasmania, Bellerive, Sept. 1945, *W.M. Curtis* (syn MEL, not found).
NEOTYPE: *fide* Clements (1989): Railton, Henry Somerset Reserve, 4 Nov. 1984, *M.A. Clements 3557* (CANB!).

Illustration: Plate 249, Nicholls (1969).

Distribution and ecology: Endemic to Tasmania. Grows in open forest, heathy open forest and coastal scrubs in sands, sandy loams and shallow clay loam. Altitude: 0-50 m. Flowering period: September and October.

Notes: This species is characterised by moderately small (c. 40 mm across) red flowers; dark red to blackish osmophores on all tepals; and, a dark glandular caudate labellum apex.

Clements (1989) selected a neotype from northern Tasmania without realising that an additional specimen, not part of the type collection but from the type locality, was lodged in HO (*viz* Bellerive, 14 Sept. 1946, *W.M. Curtis*, HO 65053). This collection would have been eminently suitable as a neotype.

Selected specimens: (10 seen):
TASMANIA: S. of Humbug Hill, 22 Sept. 1985, *Collier 722* (HO 94054); near Round Tip, S. of Bicheno, 18 Sept. 1988, *Collier 3354* (HO 118974); Sisters Hills, inland from Bakers Beach, 21 Oct. 1990, *Collier 4823* (HO 126079); Georgetown, Oct. 1842, *Gunn* (HO); Pittwater Bluff, 8 Sept. 1984, *Moscal 8423* (HO 89394); North Bruny Island, 4 Sept. 1938, *Olsen* (HO 61989); Austins Ferry, 6 Sept. 1953, *Wall* (HO 65054).

14. *Caladenia clavigera* A. Cunn. ex Lindl., *Gen. sp. orch. pl.* 422 (1840).
TYPE: N. Hollandia, Vale of Clwyd, Blue Mountains, Oct. 1825, *A. Cunningham* (lecto specimen 48b, K-L, *fide* Clements 1989, photo!; isolecto K).
Caladenia cordiformis R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 44: 330 (1920).
TYPE: Ringwood, Victoria, 30 Sept. 1920, *E.E. Pescott & R.S. Rogers 3736* (lecto AD!, *fide* Clements 1989).

Illustration: Page 66, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forests, coastal scrubs and heathland in sand, sandy loams, clay loams and skeletal loams. Altitude: 10-250 m. Flowering period: September to November.

Notes: This species is characterised by moderately small (c. 40 mm across) yellowish-green and red flowers; short dark red sepalline osmophores; and, a cordate labellum with entire or sparsely toothed margins.

Selected specimens: (11 seen) :
TASMANIA: Flinders Island, S. of Brougham, 20 Oct. 1985, *Collier 806* (HO): Knopwood Hill, Howrah, 2 Oct. 1988, *Collier 3454* (HO); Banana Ridge, 20 km NNW. of Lady Barron, Flinders Island, 26 Oct. 1990, *Collier 4865* (HO); Glen Leith, Nov. 1842, *Gunn* (HO); 1.5 km S. of Cleveland, Midlands Hghy, 16 Oct. 1980, *Morris 80103* (HO): Bellerive, 23 Oct. 1937, *Olsen* (HO); Flinders Island, Tanners Bay Tinfield, 22 Oct. 1967, *Whinray 173* (HO).

15. *Caladenia congesta* R. Br., *Prodr.* 324 (1810).
TYPE: Port Dalrymple, Nov. 1804, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!).

Illustration: Page 69, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in open forests, woodland, coastal scrubs and heathland in sandy loams and clay loams. Altitude: 50-1100 m. Flowering period: November to January.

Notes: This species is characterised by a generally tall habit; bright pink flowers; strongly cucullate dorsal sepal; and, densely congested black lamina calli extending to the apex of the mid-lobe.

Specimens examined:
TASMANIA: Harford, 27 Nov. 1932, *Hamilton* (HO); slopes SE. of Rossarden, 20 Nov. 1978, *Moscal* (HO); Fingal, 10 Nov. 1975, *Palmer & Raynor* (HO); Georges Bay, no date, *Rodway* (HO); Meander River flats, S. of Long Hill, 2 Jan.1959, *Somerville* (HO).

16. *Caladenia cracens* D.L. Jones, *Muelleria* 9: 46-48 (1996).
TYPE: Tasmania, Lenah Valley, near Hobart, 29 Oct. 1990, *D.L. Jones 6833 & C.H. Broers* (holo CANB!; iso CANB!, HO!, MEL!, NSW!).

Illustration: None found.

Distribution and ecology: Endemic to lowland areas and coastal districts of southern Tasmania. Grows in open forests, coastal scrubs and heathland sandy loam, clay loams and skeletal loams. Altitude: 0-250 m. Flowering period: October and November.

Notes: Records attributed to *Caladenia lyallii* (a New Zealand endemic) from lowland areas of southern Tasmania are most likely of this recently described species (Jones 1996). It is characterised by a slender habit; narrow leaves (1-3 mm wide); solitary pink to reddish flower, 20-25 mm across, with heavily glandular segments; thin lamina calli in two or four irregular rows; and, a short relatively broad (2.5 mm wide) column. See also the entry for *C. alpina*.

Selected specimens: (16 seen):
TASMANIA: Little Lagoon Beach, Southport, 1 Nov. 1986, *Collier 1781* (HO); Huon Hghy, Hobart, 2 Nov. 1986, *Collier 1805* (HO); Snug, mudstone bank, 1 Nov. 1931, *Long* (HO); Dunns Ck, 6 Nov. 1991, *Minchin* (HO); Longley, 13 Oct. 1984, *Moscal 8626* (HO); Standard Hill, 4 km W. of Mole Ck, 14 Nov. 1986, *Moscal 13387* (HO); Blackmans Bay, Oct. 1927, *Rodway* (HO).

17. *Caladenia deformis* R. Br., *Prodr.* 324 (1810).
TYPE: Tasmania, Port Dalrymple, *W. Paterson* (lecto specimen a, BM, *fide* Clements 1989, photo!)

Illustration: Page 71, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania, South Australia and Western Australia. Grows in mallee shrubland, open forest, coastal scrubs and heathland, in sands, sandy loam and clay loam. Altitude: 0-200 m. Flowering period: August and September.

Notes: This species is characterised by a narrow very sparsely hairy leaf; bright blue flower; erect or recurved dorsal sepal; widely spreading petals; and, four to eight rows of slender congested blue papillate lamina calli extending to the labellum apex.

Selected specimens: (15 seen):
TASMANIA: S. of Humbug Hill, Georges Bay, 22 Sept. 1985, *Collier 720* (HO); Killiecrankie, 25 Sept. 1989, *Collier 4167* (HO); Penquite, 1840, *Gunn* (HO); Ancanthe, 15 Sept. 1842, *Milligan* (HO); Kalanga Ave, Newtown, 23 Sept. 1991, *Minchin* (HO); E. of Bluemans Bay, 2 km N. of Big Bedding Hill, 5 Sept. 1980, *Moscal 453* (HO); Eaglehawk Neck, Sept. 1913, *Rodway* (HO); c. 200 m. N. of Chain of Lagoons, 30 Aug. 1987, *Rubenach* (HO).

18. *Caladenia dienema* D.L. Jones, sp. nov. *C. patersonii* R. Br. affinis, sed planta brevi, robusta; floribus fuscis (plerumque atro-rufis); tepalis pendentibus; et tepalorum caudis crassis, glandulosissimis, nigellis, differt.

TYPUS: Tasmania, Rebecca Ck, 14 Oct. 1994, *D.L. Jones 13550 & B.E. Jones*; (holo CANB; iso AD, HO, MEL, NSW).

Hirsute terrestrial *herb* growing singly or in small, loose groups. *Leaf* narrowly lanceolate, 4-9 cm long, 0.3-0.7 cm wide, dull green, base purple-blotched; trichomes dense on both surfaces, to 5 mm long, patent, transparent, eglandular. *Scape* 5-12(-16) cm tall, wiry, densely hirsute, with a mixture of transparent, eglandular trichomes to 6 mm long and a few short glandular trichomes towards the apex. *Sterile bracts* spreading, narrowly ovate-lanceolate, 13-20 mm long, 3-5 mm wide, acuminate, involute, externally hirsute. *Floral bracts* closely sheathing, ovate-lanceolate, 13-22 mm long, 5-7 mm wide, acuminate, externally shortly hirsute. *Flower* solitary, 6-9 cm across, usually dark red (occasionally paler red), with darker red lines; tepalline caudae black; labellum wholly maroon or white to cream with a maroon apex, with reddish calli; column translucent with reddish markings. Tepals heavily glandular; dorsal sepal erect; lateral sepals divergent, stiffly obliquely deflexed to drooping; petals obliquely deflexed to drooping. *Dorsal sepal* 40-60 mm long, 2-3.5 mm wide, linear-oblong in the proximal third, then gradually tapered to a

thick, blackish, glandular cauda. *Lateral sepals* 40-60 mm long, 3.5-5 mm wide, lanceolate in proximal quarter, then gradually tapered to thick, blackish, glandular caudae. *Petals* 35-60 mm long, 3-4 mm wide, lanceolate in proximal third, gradually tapered to thick, blackish, glandular caudae. *Labellum* articulated on a short claw c. 0.4 mm long, c. 2.5 mm wide. *Lamina* obscurely three-lobed; broadly ovate-lanceolate in outline when flattened, 13-20 mm long, 7-11 mm wide, erect in proximal third then curved forwards; apex strongly recoiled. Lateral lobes c. 4 mm across, erect; margins with 13-18 pairs of calli to 2 mm long; marginal calli linear, widely spreading, straight, head narrowly clavate, outer face white. Mid-lobe ovate-deltate in outline when flattened, obtuse; margins with very short, blunt teeth, becoming fused and decrescent towards the apex. *Lamina calli* in four or six rows, extending onto the base of mid-lobe, dark reddish purple, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1.5 mm long, stalked, erect; head linear-clavate. Longest lamina calli c. 1.5 mm long, hockey-stick-shaped, stalked, head c. 0.8 mm long, curved when viewed from the side, narrowly linear-tapered from above. *Column* 12-14 mm long, c. 6.5 mm wide, recurved in the proximal third then incurved, broadly winged; basal glands ovoid-orbicular, c. 1.3 mm long, c. 1.2 mm wide, yellow. *Anther* c. 2.5 mm long, c. 2.5 mm wide, burgundy; rostrum linear, c. 0.6 mm long. *Pollinia* four, c. 3 mm long, boomerang-shaped, flat, yellow, mealy. *Stigma* c. 3 mm wide, elliptical, sunken. *Capsules* obovoid, 12-18 mm long, 4-6 mm wide, reddish. **Fig. 2.5.**

Distribution and ecology: Endemic to Tasmania where apparently restricted to the west coast. Grows in low heathland among dwarfed shrubs and sedges in moist to well-drained sandy loam and shallow clay loam. Altitude: 0-30 m. Flowering period: October and November.

Notes: *Caladenia dienema* is similar to *C. patersonii* and has undoubtedly been confused with it in the past. It can be distinguished by its short sturdy habit; dark usually reddish flowers; drooping perianth segments; and, thick, densely glandular blackish tepalline caudae. It also has similarities with *C. anthracina*, but that species has small (45-65 mm across) flowers and stiffly spreading segments with slender caudae.

In Lindley's Herbarium at Kew, there are four specimens collected by R.C. Gunn (no. 908) at Woolnorth in Oct. 1837 and labelled in Lindley's hand "*Caladenia patersonii* var. *beta*", together with a sketch of a labellum. This variety was not published but these specimens are, from their dwarf habit and heavily glandular tepals, clearly *C. dienema*. Duplicates of this collection ('Woolnorth, 16-10-1837, 908') are in the collection of Charlotte Smith at QVM. These were presumably collected by Gunn and may be part of the collection sent to Lindley.

Cultivated plants of *C. dienema* retain their dwarf stature, even when grown in the protected confines of a glasshouse.

Etymology: Derived from the Latin *dienemus*, bleak, windswept, in reference to the habitat of this species.

Conservation status: Grows in small localised patches; its habitat has been greatly reduced over recent years and the species is considered to be vulnerable; suggest 3V by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: between mouth of Pieman R. and Conical Rocks, 18 Oct. 1983, *Bayley-Stark* (HO); 5 km S. of Marrawah, 5 Oct. 1995, *Buchanan 13999* (HO 411937); Black Bull Scrub, Marrawah-Temma Rd, 30 Oct. 1982, *Cameron* (QVM); Tiger Flats, Marrawah-Temma Rd, 30 Oct. 1982, *Cameron* (QVM); c. 8 km S. of Arthur R., 5 Nov. 1990, *Jones 7014 & Broers* (CANB); Rebecca Ck, 5 Nov. 1990, *Jones 7028 & Broers* (CANB); Bottle Flat, S. of Arthur R., 14 Oct. 1994, *Jones 13544 & Jones* (CANB); near Sardine Ck, S. of Arthur R., 14 Oct. 1994, *Jones 13548 & Jones* (CANB); between Detention and Black River, 31 Oct. 1841, *Milligan 956* (HO 61991).

19. *Caladenia dilatata* R. Br., *Prodr.* 325 (1810).
TYPE: Port Dalrymple, *R. Brown* (lecto specimen a, BM!, *fide* Clements 1989).
Caladenia corynepetala D.L. Jones, *Austral. Orch. Res.* 2: 22-23, f. 24 (1989).
TYPE: Tasmania, Murdunna, 2 Jan. 1987, *R. Bates 8764* (holo AD!; iso AD!).
Caladenia simulans G.W. Carr, *Indigenous Flora and Fauna Association Miscellaneous Paper* No. 1: 14 (1991).
TYPE: Eastern Hill, Long Island, Furneaux Group, Tasmania, 19 Nov. 1969, *J.S. Whinray 968* (holo MEL 533260!).

Illustration: Page 88, Jones (1991) - as *C. corynepetala*.

Distribution and ecology: Southern Victoria and Tasmania. Grows in heathy woodlands, coastal forests and heathland in sands, sandy loam and clay loam. Altitude: 0-200 m. Flowering period: November to January.

Notes: This species is characterised by greenish-yellow tepals with red median stripes; slender yellowish-brown osmophores on the sepals and petals; large mobile labellum with a comb-like fringe of long slender teeth; and, dark red stalked, clubbed lamina calli.

On some specimens the petalline osmophores are reduced to a few scattered glands.

Selected specimens: (13 seen) :
TASMANIA: Arthur Hghy, 5 km SE. of Forcett, 8 Dec. 1989, *Buchanan 11552* (HO); Lake Martha Lavinia, King Island, Dec. 1965, *Cameron* (HO); Dunalley, 20 Dec. 1944, *Curtis* (HO); Yorktown, Jan. 1843, *Gunn* (HO); Long Island, off NW. corner of Cape Barren Island, 1 Dec. 12986, *Harris* (HO); Scamander, Oct. 1910, *Rodway* (HO); Cape Barren Island, 23 Dec. 1968, *Whinray 481* (HO).

20. *Caladenia echidnachila* Nicholls, *Pap. & Proc. Roy.Soc. Tasmania* 1932: 13, t.6 (1933).
TYPE: Tasmania,. Lenah Valley, Hobart, *H.M. Atkinson* (holo HO!; ?iso MEL!)

Illustration: Plate 264, Nicholls (1969).

Hirsute terrestrial *herb* growing singly or in loose groups. *Leaf* narrowly lanceolate, 7-14 cm long, 0.4-0.8 cm wide, dull green; base purple-blotched; trichomes dense on both surfaces, to 5 mm long, patent, transparent, eglandular. *Scape* 15-40 cm tall, wiry, hirsute, with a mixture of long transparent, eglandular trichomes and short glandular trichomes. *Sterile bracts* spreading, narrowly oblong-lanceolate, 15-25 mm long, 3-5 mm wide, acuminate, involute, externally hirsute. *Floral bracts* closely sheathing, narrowly ovate-lanceolate to narrowly obovate-lanceolate, 12-22 mm long, 4-8 mm wide, acuminate, externally shortly hirsute. *Flowers* one or two, 7-11 cm across, opening pale lime green, fading to fawn or pale tawny yellow, with pale reddish lines; sepalline caudae dark; labellum cream to yellowish, sometimes with red suffusions; calli dark red; column translucent with reddish markings. Tepals densely glandular; dorsal sepal erect and incurved; lateral sepals widely divergent, stiffly spreading; petals stiffly spreading. *Dorsal sepal* 45-80 mm long, 2-3 mm wide, linear-oblong in the proximal quarter, then tapered to a very slender dark, glandular cauda. *Lateral sepals* 45-80 mm long, 3.5-5 mm wide, lanceolate in proximal quarter, then tapered to slender, dark, glandular caudae. *Petals* 35-65 mm long, 2-4 mm wide, lanceolate in proximal third, tapered to filiform glandular caudae. *Labellum* articulated on a short claw c. 0.6 mm long, c. 0.8 mm wide. Lamina obscurely three-lobed, broadly ovate-lanceolate in outline when flattened, 13-19 mm long, 6-9 mm wide, erect in proximal third then curved forwards; apex strongly recurved. Lateral lobes c. 3 mm across, erect, the margins with 13-18 pairs of calli to 2 mm long; marginal calli linear, widely spreading, straight, head narrowly clavate, outer face white. Mid-lobe oblong-deltate in outline when flattened, obtuse, the margins with short, blunt teeth, decrescent towards the apex. *Lamina calli* in four or six rows, the central ones extending onto the base of mid-lobe, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1 mm long, stalked, erect; head swollen, linear-clavate. Longest lamina calli c. 1.2 mm long, hockey-stick-shaped, stalked; head c. 1 mm long, curved when viewed from the side, narrowly linear-tapered from above. *Column* 12-13 mm long, c. 4 mm wide, recurved in proximal third then incurved, narrowly winged; basal glands ovoid, c. 1.3 mm long, c. 0.8 mm wide, yellow. *Anther* c. 2.5 mm long, c. 2 mm wide, yellow, sometimes with reddish markings; rostrum linear, c. 0.6 mm long. *Pollinia* four, c. 3 mm long, boomerang-shaped, flat, yellow, mealy.

Stigma c. 2.5 mm wide, elliptical, sunken. *Capsules* obovoid, 12-15 mm long, 3-5 mm wide. **Fig. 2.6.**

Distribution and ecology: Endemic to Tasmania where widely distributed in southern areas. Commonly found in coastal scrub (often dense) and heathland, less commonly in open forest dominated by *Eucalyptus pulchella* Desf. Grows among bracken and low shrubs, sometimes colonising the margins of tracks and road embankments. Soils are commonly well-drained, grey tertiary sands and sandy loams, less commonly clay loams and shales. Altitude: 10-150 m. Flowering period: September to November.

Notes: *Caladenia echidnachila* is close to *C. patersonii* and has undoubtedly been confused with it in the past. It can be distinguished by its fawn to tawny yellow flowers; stiffly spreading perianth segments; lateral sepals and petals with very slender apical caudae; sparse elongate glands on the apical caudae; and, a narrowly winged column. It is not characterised by an elongated apical labellum cauda as noted by Nicholls (1933) - see below.

As originally envisaged by Nicholls, *C. echidnachila* was characterised by a long echinate caudate apex on the labellum. My studies show that the presence of such an apical labellum growth, in this and related species, is pelorial, the extra growth being very similar to the glandular caudae of the tepals. Very few specimens in a population are pelorial in this way and there is a strong tendency for collectors to seek out such specimens, resulting in biased herbarium collections (pers. obs.). Although Nicholl's specimens had very long labellum caudae, the length of this structure is variable ranging from about 2 mm to about 30 mm. Such pelorial labellum growths are not restricted to *C. echidnachila* but occur in similar taxa such as *C. anthracina, C. brachyscapa*, *C. dienema, C. oenochila* and *C. patersonii*.

Although Nicholl's original concept of *C. echidnachila* was narrow and is based on a monstrosity, the taxon, which is widespread and common in south-eastern Tasmania, is valid but requires a broader circumscription.

The flowers of this species open with a distinct green tinge and change to fawn or pale tawny yellow within a few days (J.E. Wapstra pers. comm.).

Etymology: Derived from the Greek *echidnos*, viper, and *cheilos*, *chilos*, lip, in reference to the long caudate labellum apex.

Conservation status: Relatively widely distributed, locally common and conserved in State Reserves.

Selected specimens: (37 examined):
TASMANIA: Pottery Rd, Hobart, 5 Oct. 1974, *Allen* (HO 106472); Snug, 11 Oct. 1931, *Atkinson* (HO 61990); Eaglehawk Neck, Sept. 1932, *Clemes* (HO 62001); Safety Cove, S. of Port Arthur, 5 Oct. 1986, *Collier 1712* (HO 113847); Mt Bleak, Bruny Island, 100 m., 23 Oct. 1988, *Collier 3671* (HO 118596); Lenah Valley, 12 Oct. 1989, *Collier 4211* (HO 117320); Ridgeway, 21 Oct. 1928, *Giblin* (HO); one mile [1.6 km] N. of Church Hill, 6 Oct. 1987, *Hemsley* (HO 90576); Ferntree, 1 Dec. 1946, *Hope* (HO 62034); Nierinna Rd, Margate, 8 Oct. 1994, *Jones 13452, Jones, Wapstra & Wapstra* (CANB); Cloudy Bay Lookout, Bruny Island, 19 Oct. 1994, *Jones 13589 & Jones* (CANB); Forcett, 12 Nov. 1931, *Long 976* (HO 105766); Bellerive, 13 Oct. 1929, *Long* (HO 61995); Sorell Ck, Nov. 1895, *Rodway* (HO).

21. ***Caladenia filamentosa*** R. Br. var. ***filamentosa***, *Prodr.* 324 (1810).

TYPE: Tasmania, Port Dalrymple, 1805, *W. Paterson* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM).

Illustration: Page 73, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in open forest, coastal scrubs and heathland in sands, sandy loam, gravelly loams, clay loams and skeletal loam. Altitude: 0-300 m. Flowering period: September to November.

Notes: This species is characterised by red flowers with glandular filamentous caudae on all of the tepals; long, terete tepalline glands; obscurely three-lobed labellum with very short marginal calli; and, two rows of prostrate oblong labellum calli.

Selected specimens: (12 seen) :
TASMANIA: Bellerive, 5 Nov. 1950, *Cruickshank* (HO); Lindisfarne, 12 Oct. 1946, *Curtis* (HO 62026); Eaglehawk Neck, 19 Oct. 1933, *Fletcher* (HO); Launceston, Oct. 1841, *Gunn* (HO 62012); Georges Bay, 11 Nov. 1890, *Rodway* (HO 62016); Kingston, Oct. 1944, *Somerville* (HO 62027); Triabunna, 11 Nov. 1966, *Vaughan* (HO 62028).

22. *Caladenia fuscata* (Rchb. f.) M.A. Clem. & D.L. Jones, *Austral. Orch. Res*. 1: 25 (1989); *Caladenia carnea* R. Br., var *fuscata* Rchb. f., *Beitr. Syst. Pflanzenk*. 630 (1871).
TYPE: Australasia [from Argyle to Parramatta], *Hügel* (holo W, photo!; iso W, photo!).

Illustration: Page 81, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in open forest, woodland and coastal scrub in clay loams, gravelly loam and stony, skeletal loams. Altitude: 0-500 m. Flowering period: September to November.

Notes: This species is characterised by a solitary flower per scape; red bars on the labellum and column; and, the labellum lateral lobes usually incurved and closely embracing the column (see also *C. carnea* entry).

Where this species grows sympatrically with *C. carnea*, the latter begins flowering about two weeks later than *C. fuscata*. Sporadic hybrids may occur between these taxa in some areas of Tasmania.

Selected specimens: (23 seen) :
TASMANIA: near Orford, 28 Sept. 1974, *Allan* (HO); near SE. boundary of East Risdon Nature Reserve, 21 Oct. 1984, *Buchanan 3770* (HO); Macquarie Rd, 15 km SSE. of Cressy, 25 Sept. 1988, *Collier 3389* (HO); Deep Bay, Cape Barren Island, 9 Oct. 1988, *Collier 3567* (HO); Circular Head, Nov. 1837, *Gunn* (HO); Cray Ck, 10 Sept. 1983, *Moscal 2621* (HO); Stumpys Bay, 12 Sept. 1983, *Moscal 2652* (HO); Reeves Ck, Picnic Rocks, 17 Sept. 1983, *Moscal 2674* (HO); Risdon, Oct. 1897, *Rodway* (HO).

23. *Caladenia gracilis* R. Br., *Prodr.* 324 (1810).
TYPE: Tasmania, Port Dalrymple, Nov. 1804, *R. Brown*
(lecto specimen a, BM!, *fide* Clements 1989)
Caladenia carnea R. Br. var. *quadriseriata* Benth., *Fl. Austral.* 6: 387 (1873).
TYPE: South Port, 20 Oct. 1930, *C. Stuart ex herb F. Muell.* (lecto K, *fide* Clements 1989, photo!).

Illustration: None found.

Hirsute, tuberous, terrestrial *herb* growing in loose groups. *Leaf* filiform to narrowly linear, 6-20 cm long, 0.1-0.5 cm wide, erect, slightly reddish purple towards the base; trichomes moderately dense, a mixture of transparent, eglandular trichomes to 1 mm long and shorter glandular trichomes. *Scape* 10-25 cm tall, very slender, wiry, with trichomes similar to those on the leaf. *Sterile bracts* closely sheathing, narrowly oblong-obovate, 6-12 mm long, 2-3 mm wide, acuminate, externally hirsute. *Floral bracts* similar but smaller. *Flowers* one or two, c. 25 mm across, white to pinkish internally, reddish brown or greenish brown externally from sessile, ovoid glands; labellum wholly white or cream, or often with reddish to purplish striae and spots, the apex cream or more usually pinkish purple to dark purple; column greenish, spotted and blotched with red or purple. Tepals glandular, denser towards the apex; dorsal sepal strongly incurved over the column; lateral sepals porrect to obliquely decurved and divergent; petals widely spreading. *Dorsal sepal* narrowly elliptical-oblong to narrowly obovate, 10-14 mm long, 3-4 mm wide, cucullate, apex subacute to apiculate. *Lateral sepals* asymmetrically oblong-lanceolate, 11-17 mm long, 3.5-5.5 mm wide, falcate, acute. *Petals* asymmetrically lanceolate, 9-16 mm long, 2.5-5 mm wide, falcate, acute to acuminate. *Labellum* articulated on a short claw. *Lamina* distinctly three-lobed, broadly ovate in outline when flattened, 6-8 mm long, 4.5-6.5 mm wide, erect in the proximal third then curved forwards; apex sharply recurved. Lateral lobes c. 2 mm wide, erect and column-embracing, entire. Mid-lobe 2-3 mm long; marginal calli 6-12 pairs, narrowly linear, to 0.6 mm long,

purple-headed, decrescent to the apex where somewhat irregular. *Lamina calli* in four rows, extending well onto the the mid-lobe; stalks white; heads yellow to purplish. Basal calli four, c. 1 mm long, nearly sessile; head more or less ovoid, curved. Longest lamina calli c. 1.2 mm long, gammate; stalk c. 0.3 mm long; head ovoid, papillate. Distal calli subsessile to sessile, irregularly shaped and arranged. *Column* 6.5-7.5 mm long, c. 3 mm wide, erect, recurved away from the ovary at the base, incurved towards the apex, narrowly winged; central ridge c. 1.5 mm wide. *Anther* c. 1.6 mm long, 1.5 mm wide, papillate; rostrum short. *Pollinia* 4, c. 2 mm long, cream, flat. *Stigma* elliptic, c. 1.5 mm wide, sunken, green. *Capsules* obovoid, 10-14 mm long, 3-4 mm wide, erect, greenish to reddish. **Fig. 2.7.**

Distribution and ecology: Widespread in Tasmania; also recorded from Victoria, New South Wales and South Australia, but the status of mainland collections is currently under study. Grows in a wide range of habitats in open forest and woodland with a sparse to shrubby understorey; also in coastal scrubs and heathland. Soils are sandy loams and shallow clay loams. Altitude: 5-1000 m. Flowering period: October and November.

Notes: *Caladenia gracilis* is frequently confused with *C. angustata* but can be distinguished by its usually broader leaf; generally taller stature; and, flowers which are white to pinkish internally and moderately to densely glandular externally. The labellum has larger (2 mm wide) lateral lobes than those of *C. angustata*; larger crowded lamina calli; shorter marginal calli and a broader (3 mm wide) column.

Tasmanian populations of this species are variable in their floral fragrance, with some having a strong musky odour (for example Epping Forest), whereas others have a scarcely noticeable scent (for example Waterworks near Hobart).

Conservation status: Widespread and well conserved.

Etymology: Derived from the Latin *gracilis*, slender.

Selected specimens: (40 seen):
TASMANIA: Great Lake, N. end, 3 Jan. 1930, *Blackwood* (HO); Birchs River, Plains, 15 Nov. 1983, *Buchanan 1364* (HO); Prossers Forest, 5 Nov. 1959, *Burns* (HO); Avoca, 14 Nov. 1988, *Collier 3796 (*HO); 15 km NW. of Lady Barron, Flinders Island, 28 Oct. 1990, *Collier 4915* (HO); Claremont, 19 Oct. 1930, *Long* (HO); S. end of The Neck, Bruny Island, 12 Nov. 1986, *Minchin* (HO); King William Ra., 26 Nov. 1933, *Rodway* (HO); N. of Coles Bay, close to Old Mine, 6 Nov. 1985, *Rubenach* (HO).

24. *Caladenia helvina* D.L. Jones, *Austral. Orch. Res.* 2: 26, f. 30 (1991).
TYPE: Tasmania, Fingal, 14 Dec. 1988, *L. Rubenach (Jones 3449*) (holo CANB!; iso CANB!).

Illustration: Page 89, Jones (1991).

Distribution and ecology: Endemic to Tasmania. Grows in tall open forest and stunted forests in shallow clay loam and stony, skeletal loam. Altitude: 10-600 m. Flowering period: December and January.

Notes: Several localities can now be cited for this species which is widely distributed in Tasmania. It can be recognised by its late flowering habit and greenish yellow to tawny or creamy yellow flowers with strongly drooping, heavily glandular tepals.

Specimens seen:
TASMANIA: Tower Hill Rd, opposite Malahide Golf Course, 16 Dec. 1984, *Cameron* (QVM); Prossers Forest, 20 Dec. 1986, *Campbell* (QVM); Austins Ferry, 25 Oct. 1946, *Champion* (HO 85723); Turners Marsh, Dec. 1951, *Lawrence* (QVM); 7 km along Lake Leake Rd, 19 Dec. 1952, *Melville, Willis, Barber & Paton* (AD, MEL, NSW); 2 km NW. of Fingal, 15 Dec. 1985, *Rubenach* (HO 95168) (QVM); Fingal, Tower Hill Rd, 9 Dec. 1986, *Rubenach* (QVM); Mt Brown, 20 Dec. 1995, *Wapstra* (CANB).

25. *Caladenia latifolia* R. Br., *Prodr.* 324 (1810).
TYPE: Port Dalrymple, 1805, *Paterson* (lecto BM, *fide* Clements 1989, photo!; isolecto BM).

Illustration: Page 87, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in open forests, coastal scrubs and heathland, usually in sand or sandy loams. Altitude: 0-50 m. Flowering period: September and October.

Notes: This species is characterised by the colonial habit; large lax leaf; bright pink flowers; widely spreading tepals; narrow labellum with linear lateral teeth; and, the calli united on a plate.

Selected specimens: (13 seen):
TASMANIA: Bridport, Oct. 1949, *Cameron* (HO); W. end, Trouser Point Beach, Flinders Island, 19 Oct. 1985, *Collier 776* (HO 95843); Falmouth, 30 Sept. 1937, *Cruickshank* (HO); Circular Head, 15 Nov. 1837, *Gunn* (HO); Forsyth Island, 6 km E. of Clarke Island, 23 Nov. 1986, *Harris* (HO 107868); Cape Portland, 8 Oct. 1983, *Moscal 3255* (HO 69863); N. end of Little Musselroe Bay, 20 Sept. 1983, *Orchard 5902* (HO 72086).

26. *Caladenia lindleyana* (Rchb. f.) M.A. Clem. & D.L. Jones, *Austral. Orch. Res.* 1: 27 (1989);
Caladenia patersonii R. Br. var. *lindleyana* Rchb. f., *Beitr. Syst. Pflanzenk.* 66 (1871).
TYPE: Tasmania, Circular Head, 1837, *R. Gunn 910* (holo W, photo!; iso FI, K!, K-L, P, W).

Illustration: None found.

Hirsute terrestrial *herb*. *Leaf* narrowly elliptical to narrowly lanceolate, 6-11 cm long, 3-5 mm wide, dull green; trichomes dense on both surfaces, to 3 mm long, patent, transparent, eglandular. *Scape* 12-35 cm tall, wiry, hirsute, with a mixture of transparent, eglandular trichomes to 3 mm long and short glandular trichomes. *Sterile bracts* spreading, lanceolate, 10-22 mm long, 5-7 mm wide, involute, externally hirsute, long-acuminate. *Floral bracts* closely sheathing, narrowly ovate-lanceolate, 10-15 mm long, 4-6 mm wide, acuminate, externally shortly hirsute. *Flowers* one or two, 4-5 cm across, greenish yellow suffused with reddish hues; sepalline caudae dark; labellum cream with dark red stripes and suffusions, the apex wholly dark red to maroon; calli dark red; column greenish, translucent. Tepals glandular; dorsal sepal erect; lateral sepals divergent, spreading or slightly drooping; petals spreading or slightly drooping. *Dorsal sepal* oblong to oblong-lanceolate in the proximal third 25-40 mm long, 2.5-3 mm wide, tapered to a very slender dark, glandular cauda. *Lateral sepals* lanceolate in the proximal third, 25-40 mm long, 2.5-3 mm wide, tapered to very slender, dark, glandular caudae. *Petals* narrowly lanceolate, 20-25 mm long, c. 1.5 mm wide, tapered to long-acuminate apices. *Labellum* articulated on a short claw c. 1 mm long, c. 0.8 mm wide. *Lamina* obscurely three-lobed, narrowly ovate in outline when flattened, 10-12 mm long, 5.5-7 mm wide, erect in the proximal third then curved forwards, apex recurved to incoiled. Lateral lobes c. 2 mm across, erect; marginal calli 3-6 pairs, linear, to 1.5 mm long, spreading, straight or curved, head narrowly clavate, outer face white. Mid-lobe deltate in outline when flattened, acute to acuminate; marginal teeth few, short, blunt, decrescent and irregular towards the apex. *Lamina calli* in four rows, the central ones extending onto the mid-lobe, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1 mm long, stalked, erect; head linear-clavate. Longest lamina calli c. 1.2 mm long, hockey-stick-shape, stalked; head curved when viewed from the side, narrowly linear-tapered from above. *Column* 9-11 mm long, c. 5 mm wide, recurved in the proximal third then incurved, broadly winged; basal glands ovoid, c. 1 mm long, c. 0.8 mm wide, yellow. *Anther* c. 2.3 mm long, c. 1.8 mm wide, yellow; rostrum linear, c. 0.4 mm long. *Pollinia* four, clavate, c. 2.5 mm long, flat, yellow, mealy. *Stigma* c. 2.5 mm wide, elliptical, sunken. *Capsule* not seen. **Fig. 2.8.**

Distribution and ecology: Endemic to Tasmania where recorded from the west coast, central north and northern midlands, with numerous collections in the 1830's by Ronald Gunn and Charlotte Smith from around Circular Head. Apparently restricted to lowland areas with a rainfall less than 1400 mm per annum. It grows in open forest and under low shrubs.

Altitude: 0-50 m. Flowering period: November to January.

Notes: *Caladenia lindleyana* is a distinctive species which can be recognised by its relatively small flowers (4-5 cm across); tepals spreading or drooping slightly and with very slender dark caudae; narrowly ovate labellum (to 12 mm x 7 mm), with a dark maroon mid-lobe; relatively few marginal calli; and, a narrow (c. 5 mm across) column.

Caladenia lindleyana was overlooked until recently when it was raised to specific rank (Clements 1989). The species is well represented in European herbaria by types and there are also two excellent collections in QVM made by Charlotte Smith and labelled 'Back of Lagoon, 2-1-1838' and 'Neck, 26-12-1837', referring to local collecting sites around Circular Head where she was active (Buchanan 1990).

Conservation status: *Caladenia lindleyana* appears to have suffered drastically from habitat destruction and is now very rare. The last specimen was collected in 1985; suggest 2E by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: Barbers Bottom, 11 Dec. 1981, *Buchanan 320* (HO 47995); Conara, 7 Nov. 1985, *Campbell* (QVM); Lilydale Rd, 17 Dec. 1985, *Campbell*
1985-309 (QVM); no locality, Field Naturalists Club Flower Show, Nov. 1955, *King* (QVM); Neck, 26 Dec. 1837, *Smith* (QVM); back of Lagoon, 2 Jan. 1838, *Smith* (QVM).

27. *Caladenia mentiens* D.L. Jones, sp. nov.,
C. pusillae W.M. Curtis affinis, sed folio angustiore (0.8-1.3 mm lato); scapo elatiore, tenuiore (ad 16 x 1 mm); tepalis acuminatis vel apiculatis; labelli laminae callis seriebus 2 vel 4 irregularibus; et lobi medii labelli callis comparate latis paribus 3 vel 4, differt.

TYPUS: Tasmania. Carr Villa Reserve, 2 Nov. 1993, *J. Campbell 93138* (holo CANB).

Sparsely hirsute, terrestrial *herb* growing singly or in small loose groups. *Leaf* narrowly linear to filiform, 3-9 cm long, 0.8-1.3 mm wide, erect, dark green; apex acute; trichomes sparse, c. 0.5 mm long, patent, glandular. *Scape* 4-16 cm tall, very thin (c. 1 mm wide), with glandular trichomes similar to those on the leaf. *Sterile bracts* closely sheathing, narrowly obovate, 6-11 mm long, 1.3-2 mm wide, subacute, externally hirsute. *Floral bracts* closely sheathing, narrowly obovate, 3-6 mm long, 1-1.5 mm wide, obtuse, externally hirsute. *Flower* single, 10-14 mm across, whitish or pinkish internally, externally darker; labellum cream with reddish bars and a yellowish apex; column green with broad red bars. Tepals moderately glandular externally, with a darker central line; dorsal sepal erect and incurved; lateral sepals porrect, slightly divergent; petals spreading, tips incurved. *Dorsal sepal* narrowly ovate-oblong, 7-9 mm long, c. 2.5 mm wide, internally glabrous, apex acute to apiculate. *Lateral sepals* united at the base, oblong-oblanceolate, 7-9 mm long, 2.5-3 mm wide, internally glabrous, apex acute to apiculate. *Petals* narrowly oblanceolate, 7-9 mm long, c. 2.5 mm wide, apex acute to acuminate. *Labellum* hinged at the base by a small claw. *Lamina* prominently three-lobed, transversely elliptical-ovate when flattened, 5-5.5 mm long, 5-6 mm wide, erect in the proximal two-thirds, then porrect; apex recurved. Lateral lobes c. 2 mm wide, erect and column-embracing; margins slightly irregular. Mid-lobe narrowly oblong-ovate, 1.6-2 mm long, c. 1 mm wide, with two to four pairs of broad marginal calli to 0.3 mm long; apex irregularly obtuse. *Lamina calli* in two irregular rows, yellow with red stalks, extending to the base of the mid-lobe. Basal calli four, c. 0.7 mm long; stalk c. 0.2 mm long; head ovoid, c. 0.5 mm long, dark yellow. Longest lamina calli c. 0.7 mm long, erect, the distal ones inclined forwards; stalk c. 0.4 mm long; head oblong-ovoid. *Column* 5-6 mm long, c. 2 mm wide, green with broad red bars, more or less erect, curved forwards near the apex, narrowly winged; central ridge 0.8 mm wide. *Anther* c. 1.5 mm long, 1.2 mm wide, dark pink, densely papillate; rostrum prominent. *Pollinia* four, c. 0.8 mm long, roughly boomerang-shaped, white,

mealy. *Stigma* more or less circular, c. 0.8 mm wide, sunken, green. *Capsule* narrowly obovoid, 8-12 mm long, 3-4 mm wide, dark green, glandular hairy. **Fig. 2.9.**

Distribution and ecology: Occurs on mainland Tasmania, King Island, Flinders Island and southern Victoria but readily overlooked and probably more widespread. Grows in dense coastal and near-coastal forests in grey sandy loam. Altitude: c. 50 m. Flowering period: October and November.

Notes: Part of a complex of taxa currently under study. Similar to *Caladenia pusilla* but with narrower (0.8-1.3 mm wide) leaves; taller, thinner (to 16 x 1 mm) scapes; apices of perianth segments acute to apiculate; lamina calli in two irregular rows; and a relatively broad mid-lobe with two to four pairs of broad marginal calli. Also generally similar to *C. minor* J.D. Hook. from New Zealand but that species has relatively thick scapes, blunt sepals and petals and a prominently subulate, narrow labellum mid-lobe with numerous marginal calli.

The flowers of this species open for a very short period, usually one or two days, before self-pollinating. In inclement weather the flowers may be cleistogamous. Because of its cryptic nature and the often dense habitat, this species is rarely seen in flower, however, plants become more conspicuous as the capsule enlarges prior to seed dispersal.

Conservation status: Poorly known and easily overlooked; suggest 3K by the criteria of Briggs & Leigh (1996).

Etymology: From the Latin *mentiens*, counterfeiting, imitating, in reference to the general overall appearance of this species and its similarity to *C. minor* and *C. pusilla*.

Specimens examined:
TASMANIA: near One Tree Hill, 21 Nov. 1983, *Buchanan 1577* (HO 88598); Apsley, 2 Nov. 1985, *Collier 934* (HO 116791); Mt Strzelecki Track, 19 Oct. 1985, *Collier 893* (HO 95853); 2 km N. of Strzelecki Peaks, Flinders Island, 25 Oct. 1990, *Collier 4839* (HO 126094); Banana Ridge, 20 km NW. of Lady Barron, Flinders Island, 26 Oct. 1990, *Collier 4863* (HO 127021); 1.5 km SW. of Cape Naturaliste, 14 Oct. 1983, *Moscal 3480* (HO 88497); Tanners Bay Tinfield, Flinders Island, 22 Oct. 1967, *Whinray 174* (HO 25826).

28. *Caladenia pallida* Lindl., *Gen. sp. orchid. pl.* 421 (1840).
TYPE: Tasmania. Circular Head, Oct.-Nov. 1837, *R. Gunn 907* (holo K-L, photo!; iso E, HO!, L, MO, NSW!).
Caladenia patersonii R, Br. var. *rosea* Rupp, *Victorian Naturalist* 56:143 (1940), *nom. illeg.*-no latin diagnosis.
TYPES: Ouse, central Tasmania, 1921, *T. Bethune* (syn NSW!);
Tasmania, Circular Head, Glen Leith, 25 Nov.-18 Dec. 1837 & 24 Oct. 1840, *R. Gunn* (syn NSW!). ***syn nov.***

Illustrations: None found.

Hirsute terrestrial *herb*. *Leaf* lanceolate, 8-14 cm long, 0.7-0.8 cm wide, dull green, base green; trichomes dense on both surfaces, to 4 mm long, patent, transparent eglandular. *Scape* 15-40 cm tall, wiry, densely hirsute with a mixture of transparent, eglandular trichomes to 4 mm long and short glandular trichomes. *Sterile bracts* spreading, lanceolate, 16-24 mm long, 5-7 mm wide, involute, externally hirsute, long-acuminate. *Floral bracts* closely sheathing, obovate, 13-18 mm long, 4-6 mm wide, acute to subacute, externally sparsely hirsute. *Flowers* one or two, c. 4.5 cm across, yellowish to bright rosy pink; sepalline osmophores dark; labellum cream to yellowish; calli cream to reddish; column yellowish, translucent. Tepals sparsely glandular at the base; dorsal sepal erect; lateral sepals divergent, spreading stiffly, not drooping; petals obliquely erect to widely spreading. *Dorsal sepal* linear-oblong to oblong-lanceolate in proximal third then tapered to the osmophore, 30-45 mm long, 3-3.5 mm wide; osmophore 5-20 mm long, c. 0.7 mm wide, brownish, sparsely glandular. *Lateral sepals* lanceolate in the proximal third then tapered to the osmophore, 30-45 mm long, 3.5-4.5 mm wide; osmophore 5-15 mm long, c. 0.7 mm wide, brownish, sparsely glandular. *Petals* narrowly lanceolate, 20-25 mm long, c. 2 mm wide, tapered to long-acuminate apices. *Labellum* articulated on a short claw c. 1.3 mm long, c. 0.8 mm wide. *Lamina* obscurely three-lobed, narrowly ovate in outline when flattened, 9-11 mm long, 5-6 mm wide, erect in the

proximal third then curved forwards; apex recurved to incoiled. Lateral lobes c. 1.5 mm across, erect; marginal calli 5-8 pairs, linear, to 2 mm long, spreading, straight or curved; head narrowly clavate, curved forwards, slightly darker than the stalk. Mid-lobe deltate in outline when flattened, broadly obtuse; margins with numerous calli, decrescent towards the apex; proximal calli linear; distal calli tooth-like. *Lamina calli* in four rows, the central ones extending onto the base of the mid-lobe, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1 mm long, stalked, erect; head linear-clavate, c. 0.3 mm across. Longest lamina calli c. 1.3 mm long, hockey-stick-shape, stalked; head flat or curved when viewed from the side, narrowly linear from above. *Column* 8-10 mm long, c. 5 mm wide, recurved in the proximal third then incurved, broadly winged; basal glands obovoid, c. 1 mm long, c. 0.8 mm wide, yellow. *Anther* c. 2 mm long, c. 1.8 mm wide, yellow; rostrum linear, c. 0.4 mm long. *Pollinia* four, clavate, c. 2.6 mm long, flat, yellow, mealy. *Stigma* elliptic, c. 2.6 mm wide, sunken. *Capsule* not seen.

Distribution and ecology: Endemic to Tasmania where recorded mainly from the central north and the north-west around Circular Head. Appears to be restricted to lowland areas with a rainfall less than 1000 mm per annum, growing in open forest. Altitude: 0-50 m. Flowering period: October and November.

Notes: *Caladenia pallida* can be distinguished by the following combination of features; late spring flowering habit; relatively small (c. 45 mm across) flowers which are yellowish to bright rosy pink; stiffly spreading tepals; sepals with prominent terminal osmophores; relatively small labellum (to 11 mm x 6 mm); and, small (to 10 mm x 5 mm) column.

Caladenia pallida has long been a confused entity but there are abundant early collections, particularly those of Ronald Gunn and Charlotte Smith, which clearly show the taxon to be very distinctive. Material which is identical, or even similar, does not occur on the mainland and two previously confused taxa from New South Wales and Victoria have been segregated (Carr 1991, Jones 1991). For some obscure reason early workers associated *C. pallida* with a late (December and January) flowering period (for example Nicholls 1969, Willis 1970), but this is not borne out by herbarium records.

From the abundance of specimens collected by Gunn and Smith, *C. pallida* would seem to have been once abundant in the vicinity of Circular Head. The species appears to have suffered drastically from habitat destruction and is now very rare, possibly verging on extinction. The last specimen collected was from near Railton Hills in 1987.

Caladenia helvina is an endemic Tasmanian species which does flower late and was also previously confused with *C. pallida* (Jones 1991).

Conservation status: Suggest 2E by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: Railton, 1 Nov. 1987, *Bates 11049* (AD); Epping, 19 Nov. 1979, *Cameron* (QVM); Tasmania, no date, *Gunn* (K); Woolnorth, no date, *Gunn* (K); Circular Head, Oct. and early Nov. 1837, *Gunn 907* (HO 120955, K, QVM); *ibid*, 28 Oct. 1837, 4 Nov. 1837, *Gunn 909* (K); Glen Leith, Dec. 1840, *Gunn* (HO 61986); Woolnorth, Oct. 1842, *Milligan* (K); near Glenora, Oct. 1893, *Rodway* (HO); end of Lagoon, 1837, *Smith* (QVM)

29. *Caladenia patersonii* R. Br., *Prodr.* 324 (1810).
TYPE: Tasmania, Port Dalrymple, Nov. 1804, *W. Paterson* (lecto specimen a, BM!; isolecto BM!, *fide* Clements 1989)
Caladenia patersonii R.Br. var. *patersonii*, Rchb. f., *Beitr. Syst. Pflanzenk.* 66 (1871), autonym.
Caladenia patersonii R. Br. var. *typica* Benth., *Fl Austral.* 6:381 (1873) *p.p.* as to the type, not as to N.S.W., Vic., S.A. and W.A. specimens, *nom. inval.*

Illustration: Page 93, Backhouse & Jeanes (1995).

Hirsute terrestrial *herb* growing singly or in small, loose groups. *Leaf* lanceolate, 8-15 cm long, 1-1.5 cm wide, dull green, base red to purple-blotched; trichomes dense on both surfaces, to 6 mm long, patent, transparent, eglandular. *Scape* 25-35 cm tall, wiry, densely

hirsute, with a mixture of transparent, eglandular trichomes to 6 mm long and a few short glandular trichomes towards the apex. *Sterile bracts* spreading, narrowly ovate-lanceolate, 16-28 mm long, 3-5 mm wide, acuminate, involute, externally hirsute. *Floral bracts* closely sheathing, ovate-lanceolate, 12-22 mm long, 5-7 mm wide, acuminate, externally shortly hirsute. *Flowers* one or two, 7-10 cm across, commonly creamy white, less commonly pale yellowish or pinkish with darker red lines; tepalline caudae brown or reddish brown; labellum wholly white to cream, sometimes with a maroon apex; calli reddish; column translucent with reddish markings. Tepals densely glandular; dorsal sepal erect; lateral sepals divergent, obliquely deflexed to drooping; petals obliquely deflexed to drooping. *Dorsal sepal* 60-80 mm long, 2.5-3.5 mm wide, linear-oblong in the proximal third, then tapered to a thick, brownish, glandular cauda. *Lateral sepals* 40-60 mm long, 3.5-5.5 mm wide, lanceolate in proximal third, then gradually tapered to thick, brownish, glandular caudae. *Petals* 40-60 mm long, 3-4 mm wide, lanceolate in proximal third, gradually tapered to thick, brownish, glandular caudae. *Labellum* articulated on a short claw c. 0.8 mm long, c. 2 mm wide. *Lamina* obscurely three-lobed, broadly ovate-lanceolate in outline when flattened, 12-20 mm long, 7-11 mm wide, erect in proximal third then curved forwards; apex strongly recurved. Lateral lobes c. 4 mm across, erect; marginal calli 8-12, linear, 1-2 mm long, widely spreading, incurved; head narrowly clavate, outer face white. Mid-lobe ovate-deltate in outline when flattened, obtuse; margins with very short, blunt teeth, becoming decrescent and fused towards the apex. *Lamina calli* in four or six rows, extending nearly to the labellum apex, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1.5 mm long, stalked, erect; head linear-clavate. Longest lamina calli c. 1.5 mm long, hockey-stick-shape, stalked; head c. 1 mm long, curved when viewed from the side, narrowly linear-tapered from above. *Column* 12-14 mm long, c. 6.5 mm wide, recurved in the proximal third then incurved, broadly winged; basal glands ovoid, c. 1.3 mm long, c. 1 mm wide, yellow. *Anther* c. 2.5 mm long, c. 2.5 mm wide, cream-green, occasionally burgundy; rostrum linear, c. 0.6 mm long. *Pollinia* four, 2.5-3 mm long, boomerang-shaped, flat, yellow, mealy. *Stigma* elliptic, c. 3 mm wide, sunken. *Capsules* obovoid, 15-20 mm long, 5-7 mm wide, green to reddish. **Fig. 2.10**.

Distribution and ecology: Southern Victoria and Tasmania, where apparently restricted to the north. Grows in low heathland, among shrubs and sedges in moist to well-drained sandy loam and shallow clay loam. Altitude: 0-50 m. Flowering period: September to November.

Flowering in this species is greatly promoted by summer fires. The species was found by the author in great abundance near Smithton in 1990, on a patch of coastal scrub burnt during the previous summer. Visits to the same site in 1993 and 1994 failed to reveal a single specimen in the thick regrowth.

Notes: *Caladenia patersonii* can be distinguished by its moderately tall, robust habit; mostly creamy white to creamy yellow flowers; obliquely spreading segments to c. 8 cm long, with drooping, densely glandular, brownish to blackish tepalline caudae; and, a cream to white labellum with numerous, linear-tapered, white-tipped, marginal teeth to 2.5 mm long.

The original description of this species was brief and general (Brown 1810), but a study of the type specimens and recent collections has established the validity of the taxon as detailed here. Rogers (1920) noted that this species had become "a botanical dumping ground for almost every *Caladenia* with caudate sepals". This practice appears to have followed Bentham (1873) who also drew attention to the complexity of the filamentous sepaled taxa in *Caladenia*. Recent studies (for example Carr 1991, Jones 1991, Hopper & Brown in Hoffman & Brown 1992) have segregated taxa previously included in *C. patersonii* and two more are separated in this paper along with a broadened circumscription of *C. echidnachila*. The result of these studies is that *C. patersonii sensu stricto* is even more strictly circumscribed (see above) and, instead of being widely distributed as interpreted by earlier workers, its known distribution is quite limited.

Conservation status: Grows in small localised areas; its habitat has been greatly reduced over recent years and the species is considered to be vulnerable; suggest 3VC by the criteria of Briggs & Leigh (1996).

Specimens examined: TASMANIA: George Town, Dec. 1952, *Burrows* (QVM); George Town, 13 Nov. 1837, *Gunn* (QVM); Anthony Beach, near Stanley, 23 Oct. 1996, *Hyatt (ORG 329)*; *ibid*, 6 Nov. 1990, *Jones 7045 & Broers* (CANB); Lulworth, 8 Nov. 1990, *Jones 7116 & Broers* (CANB); back of Lagoon, 4 Nov. 1837, *Smith* (QVM).

30. *Caladenia pusilla* W.M. Curtis, *Student's Fl. Tas.* 4A: 133 (1979).
TYPE: The Plains, Naracoopa, King Island, Tasmania, 29 Oct. 1976, *P. Barnett & W.M. Curtis* (holo HO!).

Illustration: Page 98, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania and possibly South Australia. Grows in coastal scrubs and heathland in sands and sandy loam. Altitude: 0-20 m. Flowering period: September to November.

Notes: This species is characterised by dwarf (6-10 cm tall) habit; proportionately thick scape; small (10-12 mm across) pink flowers; red bars on the labellum and column; broad labellum lateral lobes; and, a small, narrow mid-lobe.

Specimens examined:
TASMANIA: King Island, 21 Oct. 1979, *Cameron* (HO 37480); Ettrick River, King Island, Oct. 1979, *Cameron* (HO 27155); Deep Bay, Cape Barren Island, 8 Oct. 1988, *Collier 3531* (HO 118355); c. 8 km S. of Arthur R., 5 Nov. 1990, *Jones 7012* (CANB); Naracoopa, King Island, 5 Nov. 1991, *Jones 8466* (CANB); Sea Elephant Rd, King Island, 5 Nov. 1991, *Jones 8482* (CANB); near Little Sundown Ck, S. of Marrawah, 14 Oct. 1994, *Jones 13546* (CANB); Rocky Cape, 16 Oct. 1994, *Jones 13566* (CANB).

31. *Caladenia saggicola* D.L. Jones, sp. nov. *C. venustae* G.W.Carr affinis, sed floribus minoribus (sepalis ad 6 cm longis); tepalis angustioris (sepalis ad 5 mm latis, petalis ad 3.5 mm latis); labello minore (ad 18 x 9 mm); labelli callis marginalibus brevioribus (c. 1 mm longis), grossioribus; et laminae callis brevioribus (c. 1 mm longis) crassioribus, differt.
TYPUS: Tasmania, Milford Estate, Cambridge, 8 Oct. 1994, *D.L.Jones 13469, B.E.Jones, J.& A.Wapstra & D.Ziegeler* (holo CANB; iso AD, BRI, HO, MEL, NSW).

Hirsute terrestrial *herb* growing singly or in small, loose groups. *Leaf* narrowly lanceolate, 4-13 cm long, 0.35-0.8 cm wide, dull green, base purple-blotched; trichomes dense on both surfaces, to 5 mm long, patent, transparent, eglandular. *Scape* 15-35 cm tall, wiry, densely hirsute, with a mixture of transparent, eglandular trichomes to 5 mm long and a few short glandular trichomes. *Sterile bracts* spreading, oblong-lanceolate, 12-20 mm long, 3-4 mm wide, acuminate, involute, externally hirsute. *Floral bracts* closely sheathing, ovate-lanceolate, 13-18 mm long, 4-5.5 mm wide, acuminate, externally shortly hirsute. *Flowers* one or two, 5-7 cm across, white to cream, with very pale reddish lines; tepalline caudae dark grey to blackish; labellum white to cream, sometimes the midlobe maroon; calli reddish purple to purplish; column translucent with reddish markings; Tepals glandular; dorsal sepal erect; lateral sepals widely divergent, drooping; petals drooping. *Dorsal sepal* 30-60 mm long, 2-3 mm wide, narrowly oblong-lanceolate in the proximal third, then tapered to a slender, grey to blackish, glandular cauda. *Lateral sepals* 30-60 mm long, 3.5-5 mm wide, lanceolate in proximal third, then tapered to slender, grey to blackish, glandular caudae. *Petals* 27-50 mm long, 2-3.5 mm wide, lanceolate in proximal third, tapered to slender, grey to blackish, glandular caudae. *Labellum* articulated on a short claw c. 0.4 mm long, c. 2.5 mm wide. *Lamina* obscurely three-lobed, ovate-lanceolate to broadly ovate-lanceolate in outline when flattened, 13-18 mm long, 7-9 mm wide, erect in the proximal third then curved forwards; apex strongly recurved. Lateral lobes c. 3 mm across, erect; marginal calli 7-11 pairs, linear, to 1 mm long, widely spreading, incurved; head narrowly clavate, outer face white. Mid-lobe deltate in outline when flattened, obtuse; margins with short, blunt teeth, decrescent towards the apex. *Lamina calli* in four rows, extending three-quarters of the distance towards the apex of the mid-lobe, most calli prominently stalked but those towards the apex sessile and irregularly arranged. Basal calli c. 1 mm long, stalked,

erect; head linear-clavate. Longest lamina calli c. 1 mm long, hockey-stick-shape, stalked; head c. 0.5 mm long, shallowly curved when viewed from the side, narrowly linear-tapered from above. *Column* 10-12 mm long, c. 6 mm wide, recurved in the proximal third then incurved, narrowly winged; basal glands ovoid, c. 1.2 mm long, c. 0.8 mm wide, yellow. *Anther* c. 2.5 mm long, c. 2.5 mm wide, green; rostrum linear, c. 0.5 mm long. *Pollinia* four, c. 2.8 mm long, boomerang-shaped, flat, yellow, mealy. *Stigma* c. 3 mm wide, elliptical, sunken. *Capsule* not seen. **Fig. 2.11.**

Distribution and ecology: Endemic in Tasmania where apparently confined to the south-east. Grows in sparse woodland dominated by large old trees of *Eucalyptus viminalis* Labill., with a dense groundcover of tussocks of *Lomandra longifolia* Labill. and scattered low shrubs. The orchid grows in and between the *Lomandra* tussocks. The soil is a grey, tertiary sandy loam. Altitude: c. 20 m. Flowering period: September and October.

Notes: *Caladenia saggicola* is similar to *C. venusta* but can be distinguished by its smaller flowers (sepals to 6 cm long, cf. to 10 cm long); narrower perianth segments (sepals to 5 mm wide, cf. to 7.5 mm wide; petals to 3.5 mm wide, cf. 6 mm wide); a smaller (to 18 x 9 mm, cf. to 23 x 14 mm) labellum; shorter (c. 1 mm long, cf. 3.5 mm), coarser marginal labellum calli; and, shorter (c. 1 mm long, cf. 1.4 mm), thicker lamina calli. It may also have been confused with *C. patersonii*, from which it can be distinguished by its white flowers, very slender perianth segments and sparse glands on the tepalline caudae.

One plant was collected of a putative hybrid between *C. saggicola* and *C. caudata* (*Jones 13471,* CANB).

Etymology: Derived from the common name of "Sagg" for *Lomandra longifolia*, and the Latin -*cola,* dweller, in reference to the dense groundstorey of Sagg where this orchid grows.

Conservation status: Reduced to great rarity by clearing of its habitat for farmland and now known only from private land; suggest 2E by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: Milford, 9 Sept. 1984, *Moscal 8452* (HO 89393, MEL); *ibid*, 9 Sept. 1984, *Moscal 8455* (HO 89395); Cambridge, 14 Oct. 1995, *Wapstra* (CANB).

32. *Caladenia sylvicola* D.L. Jones, sp. nov. *C. catenatae* (Smith) Druce affinis, sed floribus multo minoribus (17-22 mm latis); tepalis minoribus, angustioribus (sepalo dorsali ad 11 x 1.8 mm, sepalis lateralibus ad 11.5 x 2.8 mm, petalis ad 11.5 x 2.5 mm); labello multo breviore, ad 6.5 x 7 mm, lobis lateralibus angulatis; labelli laminae callis basalibus 2; et columna multo minore (ad 6.5 x 3 mm), differt.

TYPUS: Tasmania, Waterworks Reserve, Hobart, 1 Nov. 1994, *J.E. Wapstra (Jones 13661)* (holo CANB).

Sparsely hirsute, terrestrial *herb* growing singly or in small groups. *Leaf* narrowly linear, 10-15 cm long, 0.15-0.2 cm wide, erect, dark green; apex acute; trichomes sparse, c. 0.3 mm long, glandular, patent. *Scape* 10-16 cm tall, very slender, wiry, with glandular trichomes similar to those on the leaf. *Sterile bracts* closely sheathing, narrowly obovate, 10-14 mm long, 3-4 mm wide, subacute, externally hirsute. *Floral bracts* closely sheathing, narrowly obovate, 7-10 mm long, 3-4 mm wide, obtuse, externally hirsute. *Flower* solitary, 17-22 mm across, white internally, externally greenish; labellum white with a yellow to orange apex; calli yellow to orange; column whitish, greenish anteriorly; floral odour undetectable. Tepals sparsely glandular externally; dorsal sepal erect to slightly incurved; lateral sepals porrect to drooping, slightly divergent; petals widely spreading to drooping. *Dorsal sepal* narrowly oblong-obovate, 9-11 mm long, c. 1.8 mm wide, internally glabrous, obtuse. *Lateral sepals* narrowly oblanceolate, 9.5-11.5 mm long, 2.5-2.8 mm wide, internally glabrous, acute. *Petals* narrowly obovate, 10.5-11.5 mm long, c. 2.5 mm wide, subacute, often incurved. *Labellum* hinged at the base. *Lamina* prominently three-lobed, 5.5-6.5 mm long, 6.5-7 mm wide, erect in the proximal third then curved forwards; apex recurved. Lateral lobes c. 2.8 mm wide, erect and column-embracing, entire. Mid-lobe narrowly ovate-deltate, 2.5-3 mm long, c. 2 mm wide; marginal calli 3-5 pairs, to 0.8 mm long,

basal three or four pairs stalked, rest decrescent. *Lamina calli* in two rows, extending to the base of the mid-lobe. Basal calli two, c. 1.2 mm long; stalk c. 0.4 mm long, white; head ovoid, c. 0.8 mm long, orange. Longest lamina calli c. 1 mm long, the distal ones inclined forwards; stalk c. 0.5 mm long, white. *Column* 5-6.5 mm long, c. 3 mm wide, curved forwards from the ovary, broadly winged; central ridge 1.2 mm wide. *Anther* c. 1.5 mm long, 1.2 mm wide, green, densely papillate; rostrum prominent. *Pollinia* four, c. 1 mm long, roughly boomerang-shaped, white, mealy. *Stigma* more or less circular, c. 1 mm wide, sunken, green. *Capsule* not seen. **Fig. 2.12.**

Distribution and ecology: Apparently endemic to southern Tasmania. Grows among leaf litter and dense shrubs on moist sheltered slopes in tall open forest dominated by *Eucalyptus obliqua* L'He´rit. The soil is a shallow stony clay loam. Altitude: c. 200 m. Flowering period: October and November.

Notes: Similar to *Caladenia catenata* (Smith) Druce but with much smaller (17-22 mm across cf. 20-40 mm) flowers; smaller, narrow tepals (dorsal sepal to 11 x 1.8 mm cf. to 19 x 4 mm; lateral sepals to 11.5 x 2.8 mm cf. to 22 x 6.5 mm; petals to 11.5 x 2.5 mm cf. 22 x 5 mm); a much smaller (to 6.5 x 7mm cf. to 11 x 8 mm) labellum with angular lateral lobes (broadly rounded in *C.catenata*); two basal lamina calli (four in *C.catenata*); and a much smaller (to 6.5 x 3 mm cf. to 12 x 4 mm) column.

Its closest congener is the recently described *C. nothofageti* D.L. Jones, Molloy & M.A. Clem. from New Zealand (Jones *et al* 1997).

Conservation status: Extremely rare, poorly known and known with certainty only from two localities; suggest 2KV by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Latin *sylvicola*, an inhabitant of the forests or woods, in reference to the dense forested habitat of this species.

Specimen examined:
TASMANIA: Huon Rd, Hobart, 3 Nov. 1992, *Ziegeler (Jones 10603)* (CANB).

33. *Caladenia tonellii* D.L. Jones, sp. nov.
C. carneae R.Br. affinis, sed planta robusta, folio ad 25 x 3.5 mm; scapo ad 35 cm alto; floribus grandibus, 25-38 mm latis, vivide roseis; labello grandi, ad 10 x 9.5 mm, lobis lateralibus late rotundatis, lobo medio triangulari callis marginalibus anguste linearibus flavis; labelli callis basalibus 4-6, grandibus, aurantiacis; et columna grandi, ad 7.5 x 4.5 mm, differt.
TYPUS: Tasmania, Henry Somerset Orchid Conservation Area, near Latrobe, 16 Nov. 1994, *P. Tonelli (Jones 13709)* (holo CANB; iso HO, MEL).

Caladenia catenata var. *gigantea* auct non (R.S. Rogers) W.M. Curtis.; W.M. Curtis, *The Students Flora of Tasmania* 4A: 107 (1979).

Sparsely hirsute, terrestrial *herb* growing singly or in small to large groups. *Leaf* narrowly linear, 12-25 cm long, 0.25-0.35 cm wide, erect to semi-erect, dark green; base reddish-purple; apex acute to acuminate; trichomes sparse, to 0.5 mm long, glandular, patent. *Scape* 20-35 cm tall, relatively thick (c. 1.5 mm wide), with glandular trichomes similar to those on the leaf. *Sterile bracts* closely sheathing, oblong-obovate, 9-20 mm long, 3-4.5 mm wide, subacute to obtuse, externally hirsute. *Floral bracts* closely sheathing, narrowly obovate, 5-8 mm long, 2.5-4 mm wide, obtuse, externally hirsute. *Flowers* one to three, 25-38 mm across, bright pink internally, externally brownish; labellum white to pink with reddish bars and a yellowish to orange apex; column green with broad red bars; floral odour undetectable. Tepals moderately glandular externally; dorsal sepal erect, incurved or recurved; lateral sepals porrect, slightly divergent; petals spreading to incurved. *Dorsal sepal* narrowly ovate-oblong, 12-17 mm long, 3.5-4.5 mm wide, internally glabrous, apex obtuse. *Lateral sepals* narrowly ovate-lanceolate, 15-20 mm long, 3.5-6 mm wide, internally glabrous, apex acute. *Petals* narrowly lanceolate, 10-16 mm long, 3-4.5 mm wide, apex subacute. *Labellum* hinged at the base. *Lamina* prominently three-lobed, 7-10 mm long, 7-9.5 mm wide, erect in the proximal third to half, then porrect; apex recurved. Lateral lobes c. 4 mm wide, erect and column-embracing; margins entire to slightly irregular. Mid-lobe deltate, 3.5-4 mm long, c. 3.5 mm wide; basal marginal calli three or four pairs, to 0.5 mm long, narrow, then about three pairs of broad, truncate, tooth-like calli, then decrescent

to the subobtuse apex. *Lamina calli* yellow, in two somewhat irregular rows, extending onto the base of the mid-lobe. Basal calli four to six, c. 1.2 mm long; stalk c. 0.4 mm long, reddish; head ovoid, c. 0.8 mm long, dark yellow to orange. Longest lamina calli c. 1 mm long, the distal ones curved forwards; stalk c. 0.7 mm long, white, head yellow. *Column* 6.5-7.5 mm long, 3.5-4.5 mm wide, more or less erect, curved forwards near the apex, very broadly winged; central ridge 1.8 mm wide. *Anther* c. 2.2 mm long, 1.8 mm wide, pink, densely papillate, pink; rostrum linear, prominent. *Pollinia* four, c. 1.2 mm long, roughly boomerang-shaped, white, mealy. *Stigma* more or less circular, c. 1.8 mm wide, sunken, green. *Capsule* not seen. **Fig. 2.13.**

Distribution and ecology: Endemic to northern Tasmania. Grows on flat sites and gentle slopes among dense shrubs in open forest. The soils are a shallow clay loam or a shallow gravelly loam over clay. Altitude: c. 40 m. Flowering period: late October to early December.

Notes: This member of the *Caladenia carnea* complex can be distinguished from all other related taxa by the following combination of features; robust habit (leaves to 25 cm x 3.5 mm; inflorescence to 35 cm tall); large (25-38 mm across) bright pink flowers; large (to 10 mm x 9.5 mm) labellum which has broadly rounded lateral lobes and a deltate mid-lobe with narrowly linear yellow calli; four to six large orange basal calli; and a large column (to 7.5 mm x 4.5 mm).

Conservation status: Of very restricted distribution due to habitat conversion to pine plantations and known with certainty only from the vicinity of Latrobe; conserved in the Henry Somerset Conservation Area and Latrobe Water Reserve; suggest 2RC by the criteria of Briggs & Leigh (1996).

Etymology: Named after Peter Tonelli, professional horticulturist and enthusiastic student of flora and fauna, who discovered this species.

Specimens examined:
TASMANIA: Latrobe Water Reserve, 6 Nov. 1996, *Ziegeler (ORG 426)* (CANB); Latrobe State Forest, 7 Nov. 1996, *Ziegeler (ORG 427)* (CANB).

34. *Caladenia transitoria* D.L. Jones, sp. nov.
C. iridescentis R.S.Rogers affinis sed floribus minoribus (ad 20 mm latis), parumper aperientibus (interdum cleistogamis), pallide viride-cremeis vel viridi-flavis; tepalis minoribus (ad 11 x 3 mm) obtusioribus; labello minore, lobis lateralibus integris, callis laminae breviter stipitatis; et columna minore, angustiore (ad 6.5 x 2.5 mm), differt.

TYPUS: Tasmania, Carr Villa Reserve, Launceston, 7 Nov. 1990, *D.L.Jones 7052, C.Broers & R.Smith* (holo CANB; iso CANB, HO).

Hirsute, tuberous terrestrial *herb* growing in loose groups. *Leaf* narrowly linear, 6-10 cm long, 0.15-0.23 cm wide, erect; base slightly reddish; trichomes dense, a mixture of transparent, eglandular trichomes to 1 mm long and shorter glandular trichomes. *Scape* 8-16 cm long, very slender, wiry, with trichomes similar to those on the leaf. *Sterile bracts* spreading, narrowly obovate, 6-12 mm long, 2.5-3 mm wide, subacute, externally hirsute. *Floral bracts* closely sheathing, oblong-elliptical, 5-6 mm long, c. 3 mm wide, subacute, externally hirsute. *Flowers* one or two, c. 20 mm across, short-lasting (one to three days), sometimes cleistogmatic, internally creamish-green to yellowish-green, externally greenish-brown from sessile, ovoid glands; labellum whitish with purple transverse bars and a dark purplish-black apex; calli dark purplish black; column greenish, spotted and blotched with red. Tepals densely glandular; dorsal sepal strongly incurved over the column; lateral sepals porrect and divergent; petals widely spreading, often upcurved to obliquely erect. *Dorsal sepal* narrowly obovate, 7-11 mm long, 2-3 mm wide, cucullate, apex subacute to obtuse. *Lateral sepals* asymmetrically lanceolate, 7-11 mm long, 2-3 mm wide, falcate, acute to subobtuse. *Petals* narrowly oblanceolate, 7-10 mm long, 1.5-2 mm wide, asymmetrical, falcate, acuminate. *Labellum* articulated on a very short claw. *Lamina* distinctly three-lobed, ovate in outline when flattened, 5-6 mm long, 4-4.5 mm wide, erect in the proximal half then curved forwards; apex

recurved. Lateral lobes c. 1.5 mm wide, erect and column-embracing, entire. Mid-lobe c. 2 mm long; marginal calli 4-6 pairs, linear, c. 0.3 mm long, dark purplish-black, papillate, irregular and decrescent to the apex. *Lamina calli* in 4 irregular rows, extending about halfway onto the mid-lobe, stalks whitish, papillate. Basal calli two, c. 0.5 mm long, nearly sessile; head more or less ovoid, curved. Longest lamina calli c. 0.6 mm long; head c. 0.5 mm across, globose, papillate; stalk c. 0.3 mm long, slender. Distal calli subsessile to sessile, irregularly shaped and arranged. *Column* 6-6.5 mm long, 2-2.5 mm wide, erect, incurved towards the apex, narrowly winged; central ridge c. 0.8 mm wide. *Anther* c. 1.3 mm long, c. 0.8 mm, papillate; rostrum short. *Pollinia* four, c. 1 mm long, cream, flat, mealy. *Stigma* elliptic, c. 1 mm wide, sunken, green. *Capsule* narrowly obovoid, 18-24 mm long, 5-6 mm wide, green. **Fig. 2.14.**

Distribution and ecology: Southern New South Wales, south-eastern Victoria and Tasmania, where widespread but uncommon. Grows as individuals or in loose groups in shrubland and open forest with a shrubby to heathy understorey. Soils are clay loams, loams and sandy loams. Altitude: 30-300 m. Flowering period: October and November.

Notes: *Caladenia transitoria* has been confused with *C. iridescens* R.S. Rogers which is now known to be confined to western Victoria. *Caladenia iridescens* has relatively large (25-28 mm across) widely opening colourful (brownish cream tinged with rose pink and purple) entogamous flowers which are long-lasting (two to three weeks) unless pollinated. By contrast the flowers of *C. transitoria* are about 20 mm across, dull greenish-cream to greenish-yellow and are autogamous and short-lived, opening for one to three days. Often the upper flowers of an inflorescence of this species are cleistogamous and it is not uncommon for the perianth segments of most flowers to spread tardily and irregularly. Other differences exist between the two taxa with *C. transitoria* having smaller (to 11 mm x 3 mm), blunter tepals; a smaller labellum with entire lateral lobes; shortly stalked lamina calli; and, a smaller, narrower (to 6.5 mm x 2.5 mm) column.

Specimens from NSW, particularly from the Central Tablelands are tentatively included with the new species but require further study. Specimens from New Zealand attributed to *C. iridescens* are *C. atradenia* D.L. Jones, Molloy & M.A. Clem. (Jones *et al* 1997).

Etymology: Derived from the Latin *transitorius*, brief, passing, evanescent, in reference to the short flowering period of this species.

Conservation status: Widespread on the Australian mainland, locally common and conserved.

Selected specimens: (c. 30 seen):
NEW SOUTH WALES: Woodford, 13 Oct. 1992, *Bishop J231/1-12 & Riley* (CANB, NSW); Morton National Park, 28 Oct. 1990, *Clements 7369* (CANB).
VICTORIA: Chinamans Island, near Warneet, 21-22 Oct. 1980, *Archer* (MEL); Raymond Ck Falls, 23 Oct. 1973, *Beauglehole 43393* (MEL); Cranbourne Flora Reserve, 10 Nov. 1982, *Beauglehole 71354* (MEL); Mirboo Regional Park, 2 Nov. 1983, *Beauglehole 75054* (MEL); Croydon, 11 Nov. 1943, *Hart* (MEL); E. slopes, Mt Morton, 30 Oct. 1965, *Jones* (MEL 645091 & 645092); Traralgon South, Wildflower Sanctuary, 6 Nov. 1976, *Thompson* (MEL); Healesville, Nov. 1922, *Williamson* (MEL); French Island, N. of Tankerton, 10 Oct. 1983, *Yugoric* (MEL);
TASMANIA: Birchs Plains, 16 Nov. 1983, *Buchanan 1394* (HO); Tasman Arch, Waterfall Bay Tk, 2 Nov. 1984, *Cameron* (QVM); Liffey, 11 Nov. 1984, *Cameron* (QVM); Beaconsfield, 22 Nov. 1986, *Cameron* (QVM); Mole Ck, 20 Nov. 1968, *Miles* (MEL); Flinders Island, Tanners Bay Tinfield, 9 Nov. 1967, *Whinray 176* (HO, MEL); Deal Island, Lighthouse Gully, 19 Sept. 1970, *Whinray 1893* (MEL).

35. *Caladenia vulgaris* D.L. Jones, *Austral. Orch. Res.* 2: 34-35, f. 41 (1991).
TYPE: South Australia, Honan's Scrub via Glencoe, 20 Nov. 1988, *R. Bates 16103* (holo AD!; iso AD, CANB!).

Illustration: None found.

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in coastal scrubs and heathland in sandy soils. Some populations in Tasmania occur in wet sclerophyll forest and rainforest, sometimes growing on mossy logs and decaying logs. Altitude: 0-50 m. Flowering period: October to December.

Notes: This species is characterised by a long thin leaf; tall habit; small (10-15 mm across) pink flowers; red bars on the labellum and column; incurved lateral lobes; and, a short mid-lobe. Late-flowering Tasmanian populations from closed forests on the west coast warrant further study.

Selected specimens: (22 seen):
TASMANIA: Whites Mill Rd, Lilydale, 26 Oct. 1980, *Buchanan 283* (HO); Yarra Ck, King Island, 7 Nov. 1965, *Cameron* (HO); Flinders Ck, Forestier Pen., 20 Nov. 1974, *Chinnock* 2139 (HO); Barren Rock, 22 Oct. 1988, *Collier 3547* (HO); Single Hill, 7 Mile Beach, 18 Nov. 1928, *Giblin* (HO); Circular Head, Nov. 1837, *Gunn* (HO); Wedgetail Peak, 22 Oct. 1983, *Moscal 3764* (HO); The Clump, 9 Dec. 1983, *Moscal 4692* (HO).

EXCLUDED SPECIES

Most of the following species were included in Curtis (1979) but the majority were withdrawn from the Census (Buchanan 1995) on my advice. Some notes on their status and distribution are warranted.

Caladenia atkinsonii Rodway, *Pap. & Proc. Roy. Soc. Tasmania* for 1922, 77, t. 8 (1923).
TYPE: Natone Hill, Lindisfarne, Oct. 1922, *H.B. Atkinson* (holo HO!).

Notes: A peloric form of *C. carnea*.

Caladenia catenata (Smith) Druce, *Rep. Bot. Exch. Cl. Brit. Isles*, Suppl. 2: 611 (1917); *Arethusa catenata* Smith, *Exotic Bot.* 2: 89, t. 104 (1805).
TYPE: Port Jackson, *J. White* (holo LINN, photo!).
Caladenia alba R. Br., Prodr. 323 (1810);
Caladenia carnea R. Br. var. *alba* (R. Br.) Benth., *Fl. Austral*. 6: 387 (1873).
TYPE: Port Jackson, 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto AD!, BM, FI, K-L, W).

Notes: Occurs in Queensland, New South Wales and Victoria. This species was wrongly associated with *C. carnea* and 3 infraspecific combinations were made by Curtis (1979).

Caladenia cucullata Fitzg., *Austral. orch*. 1(2): t. 4(1876).
TYPE: Booroowa, Oct., *G.H. Sheaffe* (lecto Fitzgerald's plate!, *fide* Clements 1989).

Notes: Occurs in New South Wales, Australian Capital Territory, Victoria and South Australia. See also the entry for *C. atrata*.

Caladenia dimorpha Fitzg., *Austral. orch.* 1(1): t. 3 (1875).
TYPE: Swampy flats on the tops of mountains and on the stony talli of the cliffs known as walls round Bowenfels, Oct., *R.D. Fitzgerald* (lecto Fitzgerald's plate!, *fide* Clements 1989).

Notes: Endemic to New South Wales.

Caladenia iridescens R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 44: 328-9, t. 13 (1920).
TYPE: Halls Gap, Grampian Mtns, 30 Oct. 1913, *E.E. Pescott* (holo AD!).

Notes: Endemic to Victoria. Tasmanian collections previously assigned to this species are referrable to *C. transitoria.*

Caladenia lyallii Hook.f., *Fl. nov-zel.* 1: 247 (1853).
TYPE: On grassy hills, Otago, New Zealand, Dec. 1850, *Lyall* (holo K, photo!; iso K, K-L microfiche!).

Notes: Endemic to New Zealand. Although recorded in numerous botanical treatments as occurring in Australia (for example Curtis 1979, Clements 1989, Buchanan 1995), a recent study has established that this species is endemic to New Zealand (Jones 1996). See also the entries for *C. alpina* and *C. cracens*.

Caladenia minor Hook. f., *Fl. nov.-zel* 1: 247, t. 56b (1853).
Caladenia carnea R. Br. var *minor* (Hook. f.) Hatch, *Trans. & Proc. Roy. Soc. New Zealand*, 75(3): 368 (1945);
Caladenia catenata (Smith) Druce var. *minor* (Hook. f.) W.M. Curtis, *Student's Flora Tas*. 4A: 133 (1979).
TYPE: New Zealand, Northern Island, dry clay hills, *Edgerly* (lecto specimen a K!, *fide* Clements 1989; isolecto E, K-L).

Illustration: None found.

Notes: Endemic to New Zealand. (see also *C. mentiens*).

Caladenia oenochila G.W.Carr, *Indigenous Flora & Fauna Association Miscellaneous Pape*r No. 1: 11 (1991).
TYPE: Officer, c. 5 km N. of township, 20 Oct. 1985, *G.W. Carr 10083* (holo MEL 223597).

Notes: Endemic to Victoria. *Caladenia oenochila* G.W. Carr is here reinstated. This species was recently synonymised under *C. lindleyana* (Clements 1993), a course of action at the time I supported. Since studying the collections of *C. lindleyana* held at the Queen Victoria Museum, Launceston, however it is obvious that the two taxa are distinct. *Caladenia oenochila* has larger flowers (to 8 cm across) than *C. lindleyana*; much thicker coarser caudae on the tepals; broadly ovate labellum (to 15 mm x 12 mm) with numerous marginal teeth; and, a broader column (c. 6 mm across).

Caladenia praecox Nicholls, *Victorian Naturalist* 43: 156 (1926);
Caladenia testacea R. Br. var. *praecox* (Nicholls) Nicholls, *Victorian Naturalist* 55:168 (1939).
TYPE: Croydon, Aug. 1926, *W.H. Nicholls* (lecto MEL!, *fide* Clements 1989).

Notes: Occurs in Victoria and possibly New South Wales.

Caladenia reticulata Fitzg., *Gard. Chron.* (new ser.) 17: 462 (1882);
Caladenia huegelii Rchb. f. var. *reticulata* (Fitzg.) J. Weber & R. Bates in Black, *Fl. S. Austral.* (ed. 3) 1: 397 (1978).
TYPE: Mt Lofty, South Australia, 25 Oct., *R.D. Fitzgerald* (holo BM, photo!).

Notes: Occurs in South Australia and western Victoria.

ACKNOWLEDGEMENTS

As for paper 1 in this series.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Bentham, G. (1873). *Flora Australiensis*, vol. vi.(L. Reeve & Co., London).
- Briggs, J.D and Leigh, J.H. (1996). *Rare or Threatened Australian Plants*, Revised Edition, CSIRO and Australian Nature Conservation Agency.
- Brown, R. (1810). *Prodromus Florae Novae Hollandiae, et Insulae van Diemen*, London.
- Buchanan, A.M. (1990). In P.Short ed. *History of Systematic Botany in Australasia* (Australian Systematic Botany Society, Collingwood) 179-192.
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Carr, G.W. (1988). New Species of *Caladenia* R.Br. (Orchidaceae) from Victoria and New South Wales, Australia. *Muelleria* 6(6): 439-447.
- Carr, G.W. (1991). New Taxa in *Caladenia* R.Br., *Chiloglottis* R.Br. and *Gastrodia* R.Br. (Orchidaceae) from south-eastern Australia, *Indigenous Flora & Fauna Association, Miscellaneous Paper* No 1.

- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Clements, M.A. (1993). The status of recently named orchids from south-eastern Australia, *Muelleria* 8(1): 69-72.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*. (Government Printer, Hobart).
- Hoffman, N. & Brown, A. (1992). *Orchids of South-west Australia.* (University of Western Australia Press).
- Jones, D.L. (1991). New Taxa of Australian Orchidaceae, *Australian Orchid Research* 2: 1-108.
- Jones, D.L. (1994). New Species of Orchidaceae from South-eastern Australia, *Muelleria* 8(2): 177-192.
- Jones, D.L. (1996). Reinstatement of *Caladenia alpina* R.S.Rogers (Orchidaceae) as distinct from *Caladenia lyallii* Hook.f. and the description of *Caladenia cracens*, a related new species from southern Tasmania, *Muelleria* 9: 41-50.
- Jones, D.L., Molloy, B.P.J. & Clements, M.A. (1997). Three new species and a new combination in *Caladenia* R. Br. (Orchidaceae) from New Zealand. *The Orchadian* 12(3): 221-228.
- Nicholls, W.H. (1933). A New Tasmanian Terrestrial Orchid, *Papers & Proceedings of the Royal Society of Tasmania* for 1932: 13-14, t.6 (1933).
- Nicholls, W.H. (1969). *Orchids of Australia*. (Thomas Nelson, Melbourne).
- Rogers, R.S. (1920). Contributions to Australian Orchidology, *Transactions & Proceedings of the Royal Society of South Australia* 44: 322-359.
- Willis, J.H. (1970). *A Handbook to Plants in Victoria.* Vol. 1 (2nd edition). (Melbourne University Press, Carlton).

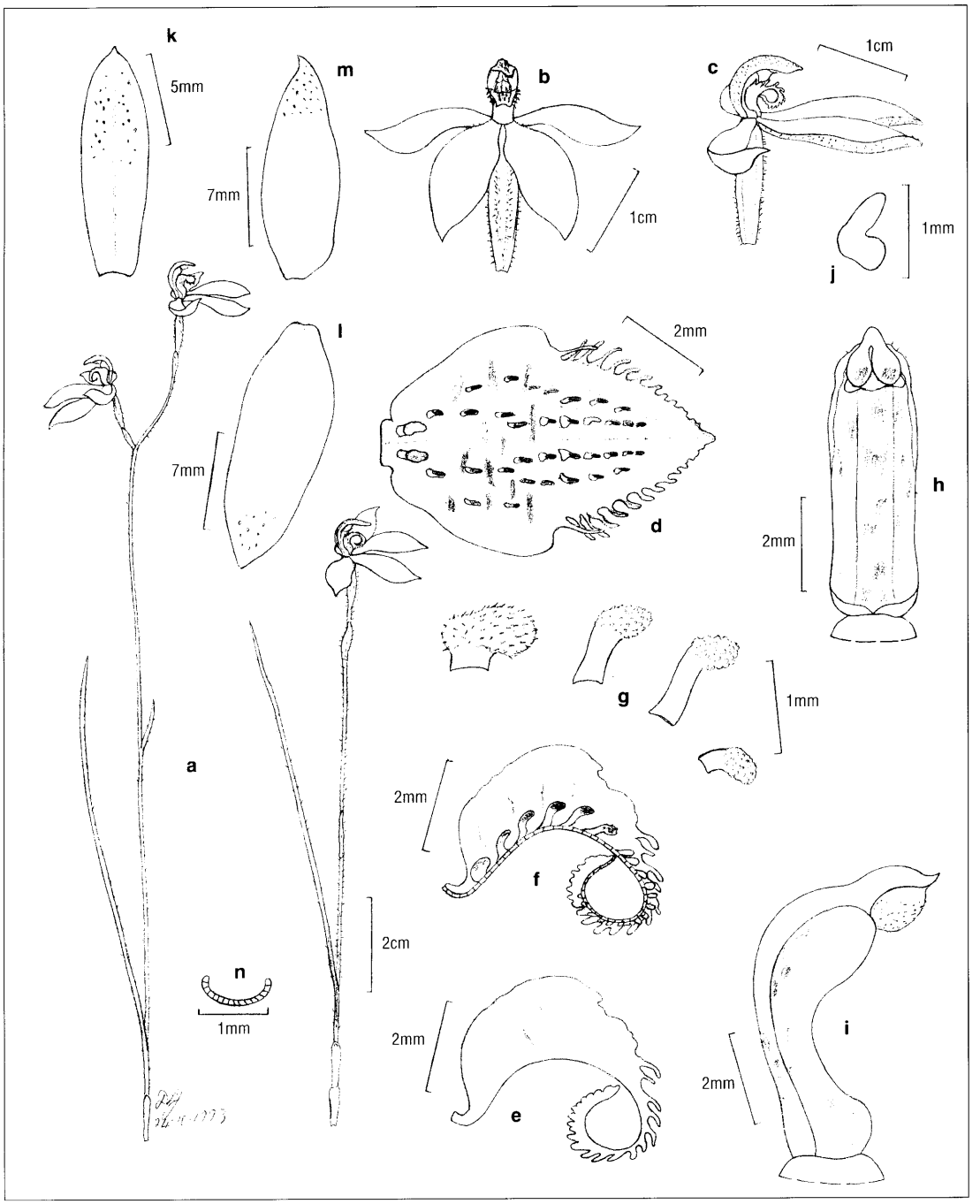


Fig. 2.1

Caladenia angustata

Latrobe, Tasmania.

P.Tonelli.

a. plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. longitudinal section of labellum; g. labellum calli; h. column from front; i. column from side; j. pollinium; k. dorsal sepal; l. lateral sepal; m. petal; n. transverse section of leaf

Drawing 24/10/1993 by D.L. Jones.©

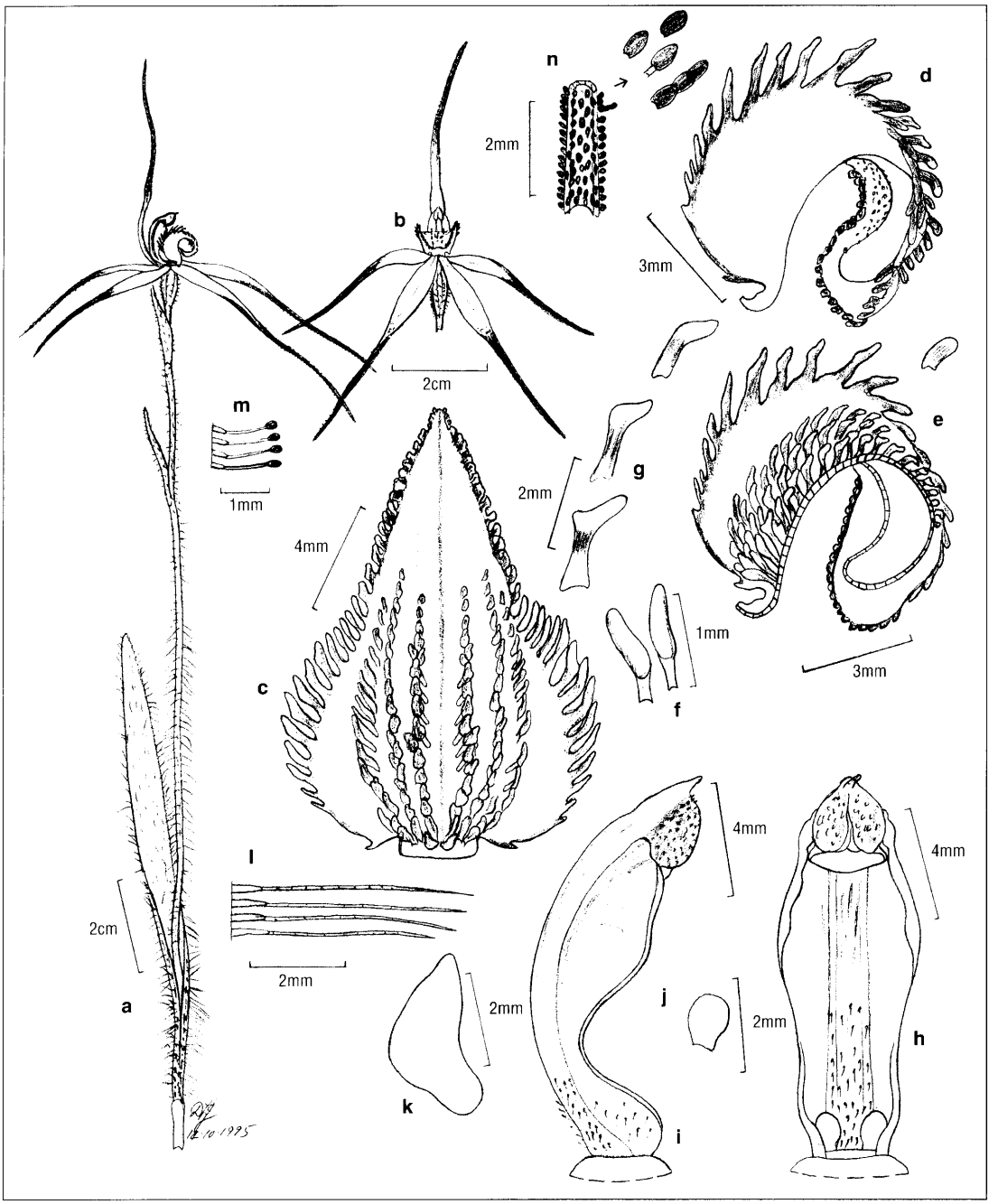


Fig. 2.2

Caladenia anthracina

Ross, Tasmania.

D.L. Jones 14538.

a. plant; b. flower from front; c. labellum from above; d. labellum from side; e. longitudinal section of labellum; f. basal labellum calli; g. labellum calli; h. column from front; i. column from side; j. column gland; k. pollinium; l. leaf trichomes; m. ovary trichomes; n. section of sepalline cauda and glands.

Drawing 12/10/1995 by D.L. Jones.©

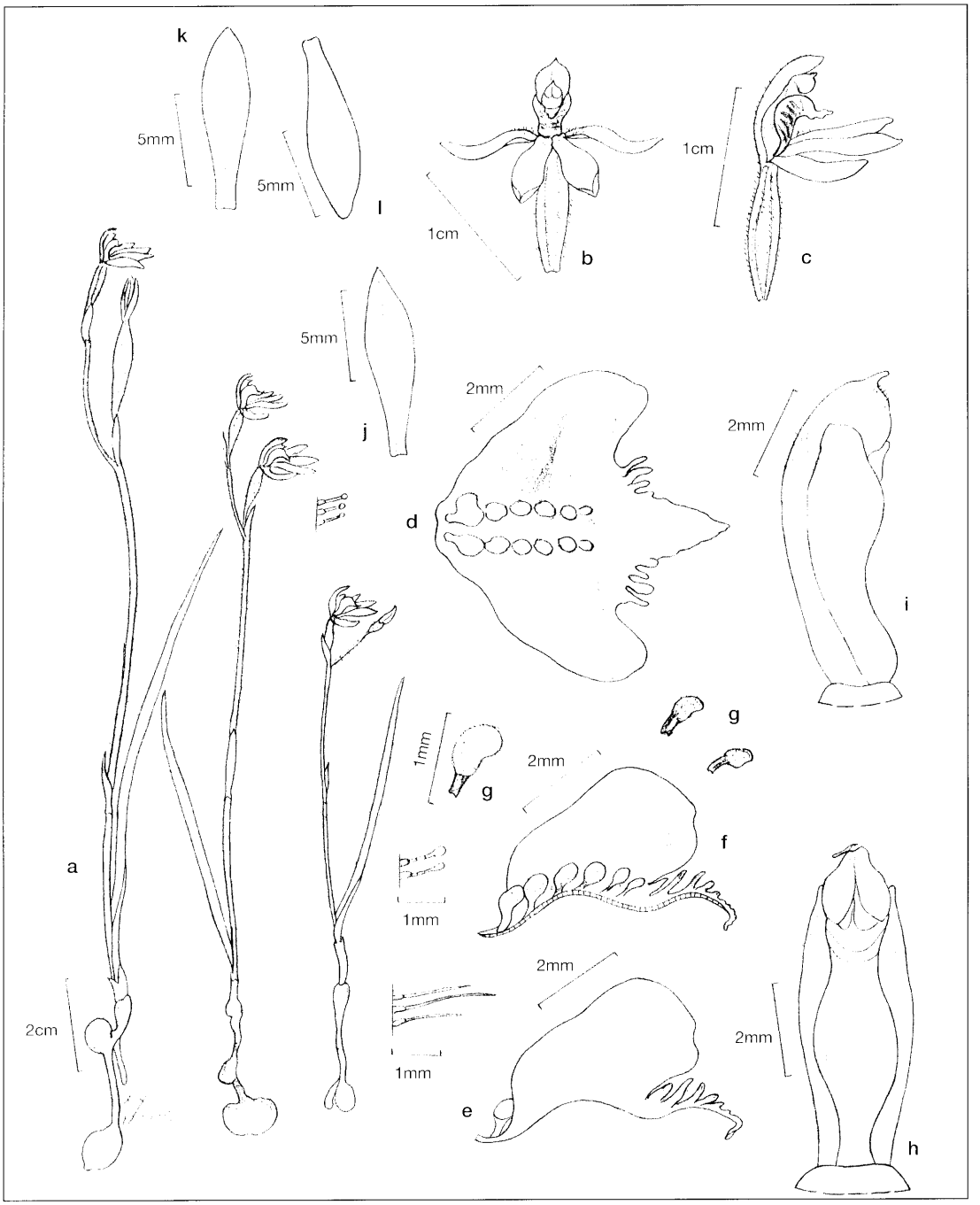


Fig. 2.3

Caladenia atrochila

Callaghan's Scrub, Tasmania.

J.E & A. Wapstra (ORG 1013).

a. plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. calli; h. column from front; i. column from side; j. petal; k. dorsal sepal; l. lateral sepal.

Drawing 12/11/1997 by D.L. Jones.©

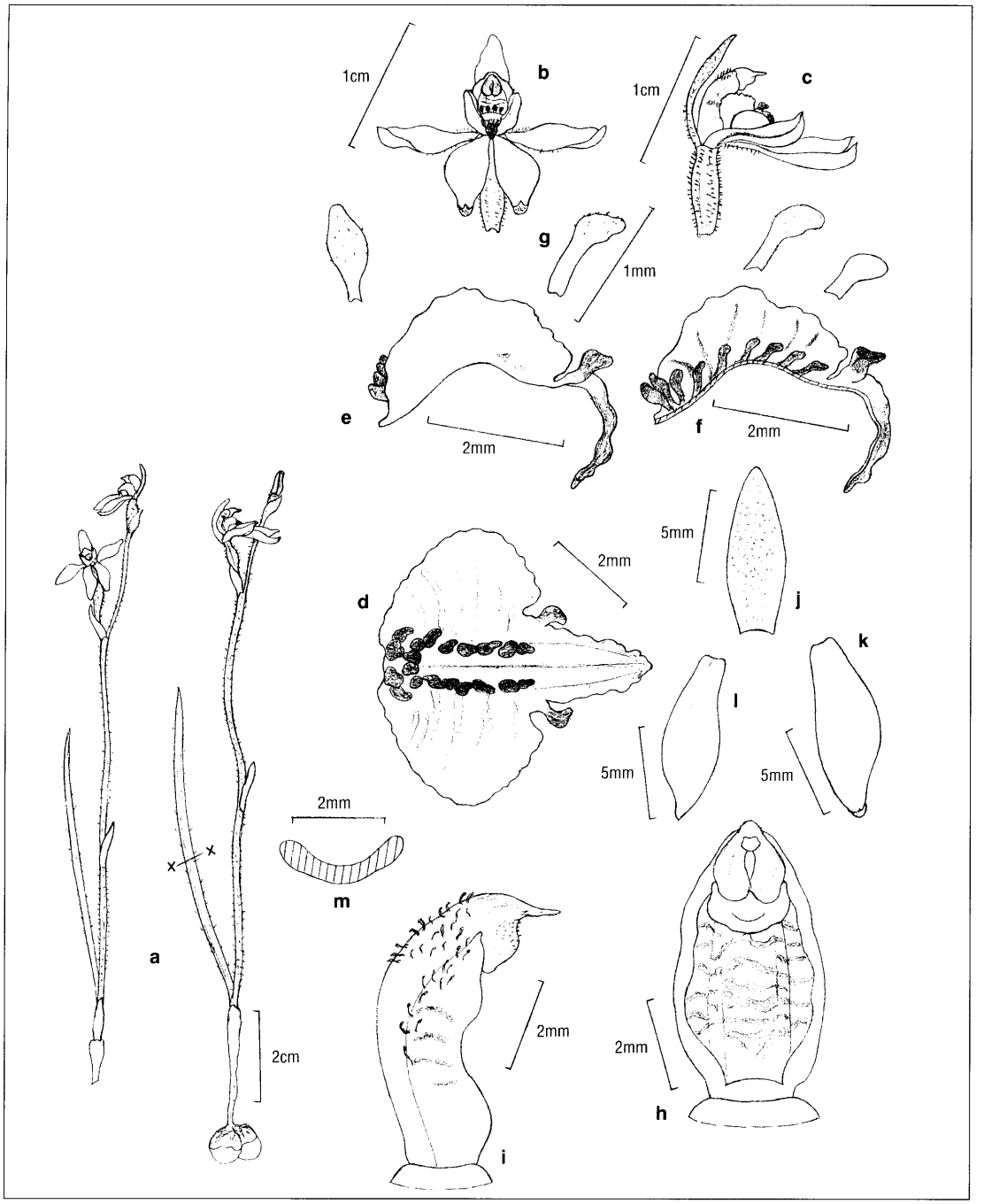


Fig. 2.4

Caladenia campbellii

Sisters Hills, Tasmania.

D.L. Jones 13570.

a. plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. longitudinal section of labellum; g. labellum calli; h. column from front; i. column from side; j. dorsal sepal; k. lateral sepal; l. petal; m. transverse section of leaf.

Drawing 28/10/1994 by D.L. Jones.©

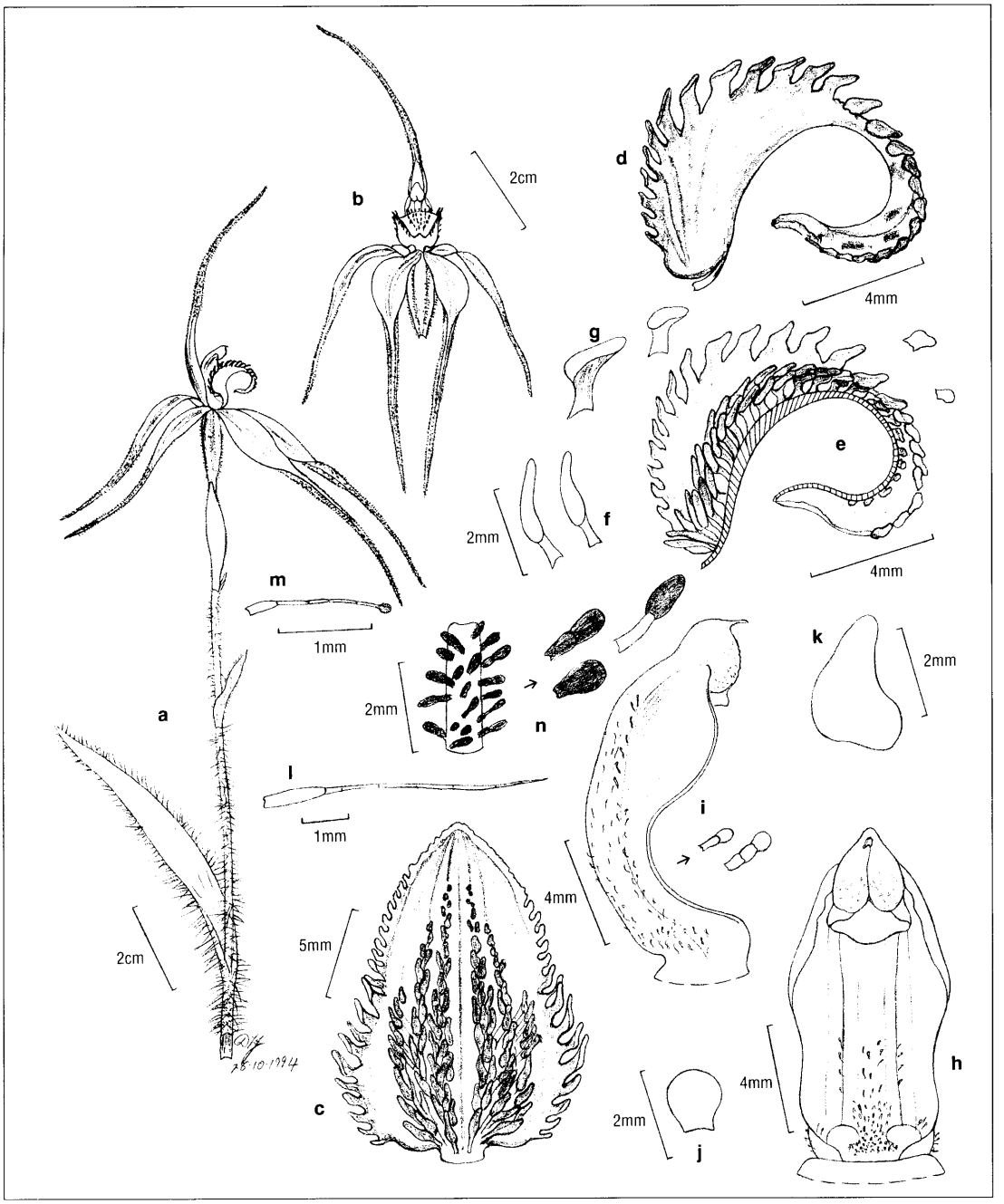


Fig. 2.5

Caladenia dienema

Rebecca Creek, Tasmania.

D.L. Jones.

a. plant; b. flower from front; c. labellum from above; d. labellum from side; e. longitudinal section of labellum; f. basal labellum calli; g. labellum calli; h. column from front; i. column from side; j. column gland; k. pollinium; l. leaf trichome; m. ovary trichome; n. section of sepalline cauda and glands.

Drawing 28/10/1994 by D.L. Jones.©

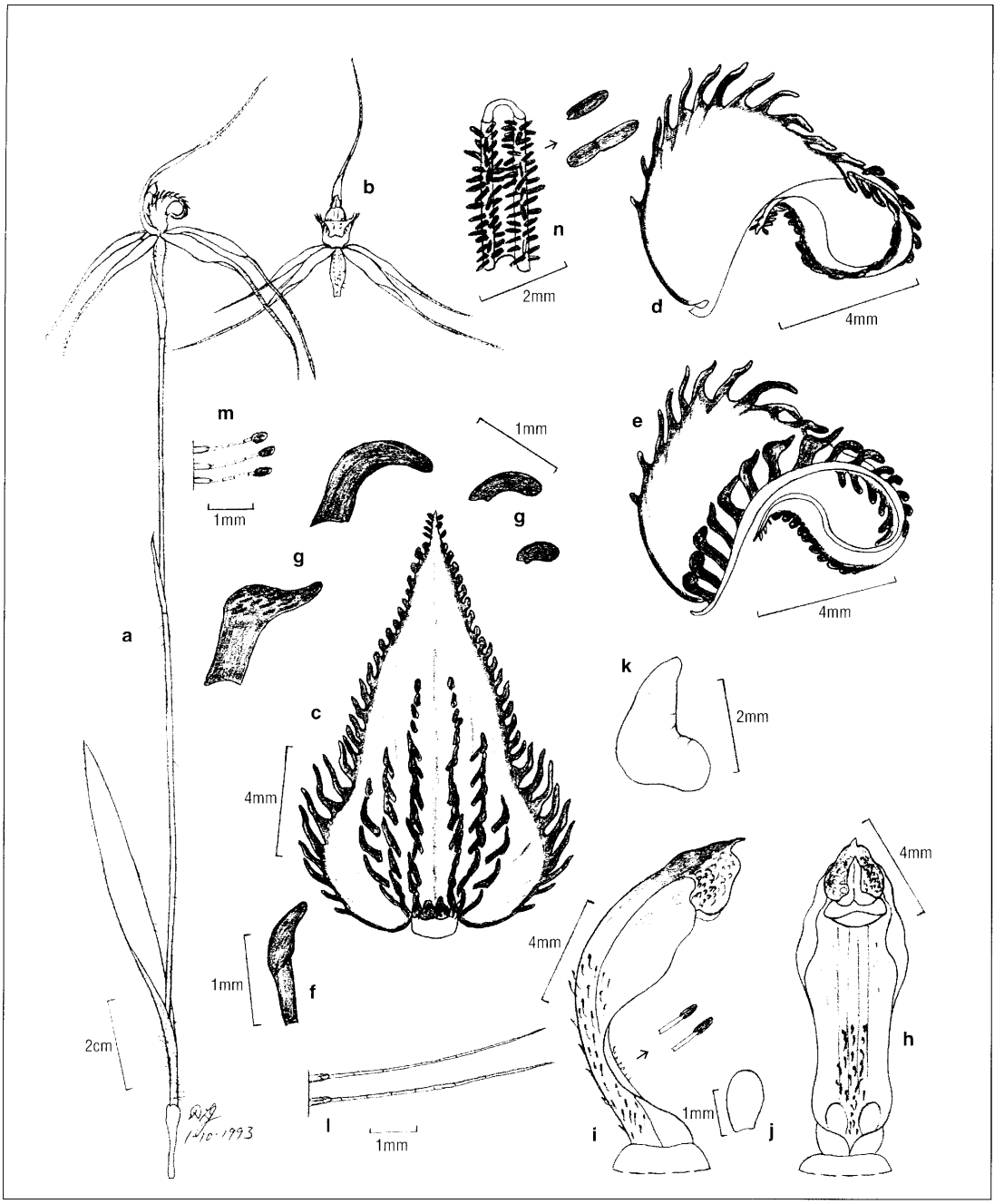


Fig. 2.6

Caladenia echidnachila

Margate, Tasmania.

D.L. Jones 12058.

a. plant; b. flower from front; c. labellum from above; d. labellum from side;
e. longitudinal section of labellum; f. basal labellum calli; g. labellum calli
h. column from front; i. column from side; j. column gland; k. pollinium;
l. leaf trichomes; m. ovary trichomes; n. section of sepalline cauda and glands.

Drawing 1/10/1993 by D.L. Jones.©

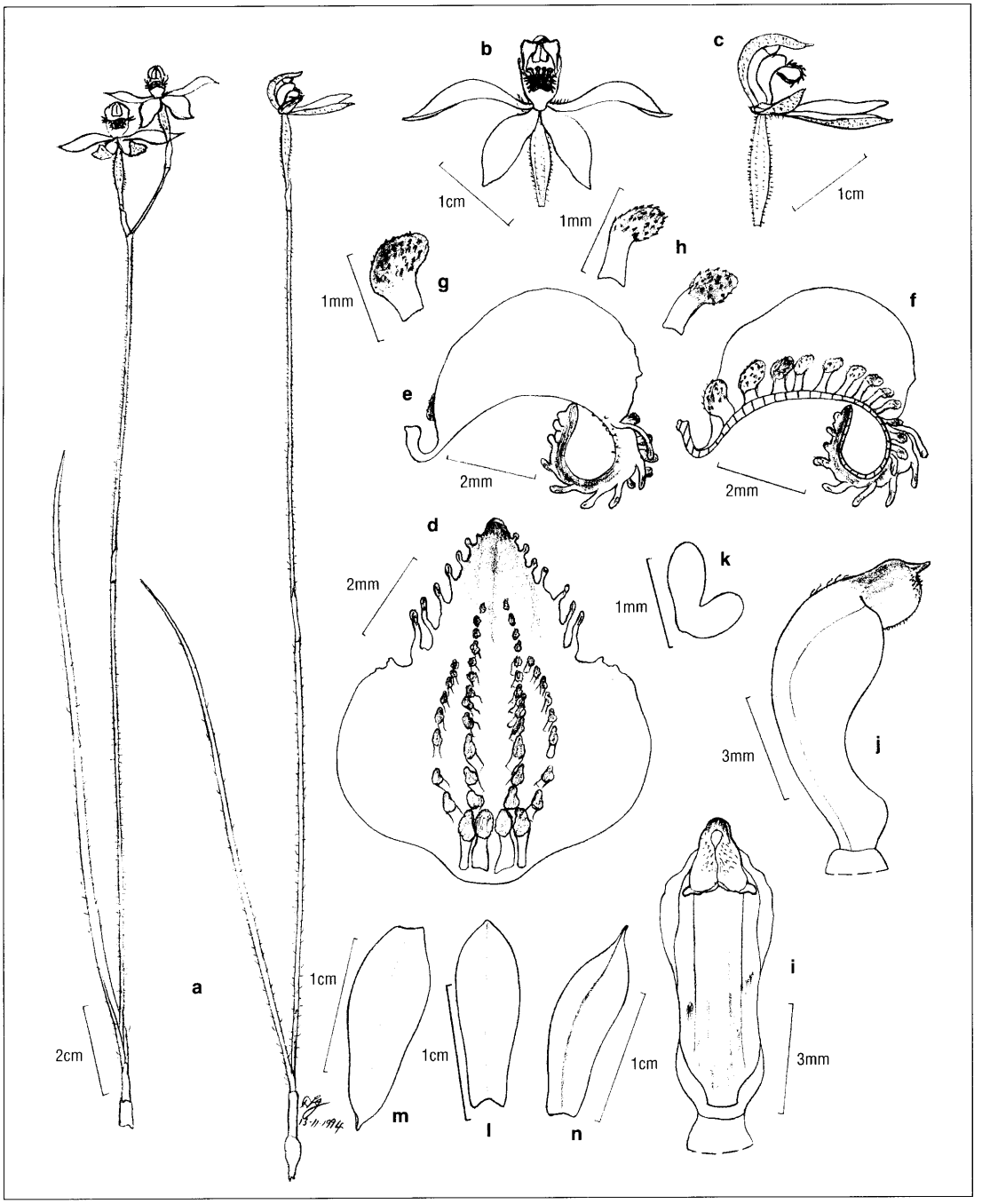


Fig. 2.7

Caladenia gracilis

Waterworks Reserve, Hobart, Tasmania.

D.L. Jones.

a. plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. longitudinal section of labellum; g. basal labellum calli; h. labellum calli; i. column from front; j. column from side; k. pollinium; l. dorsal sepal; m. lateral sepal; n. petal.

Drawing 13/11/1994 by D.L. Jones.©

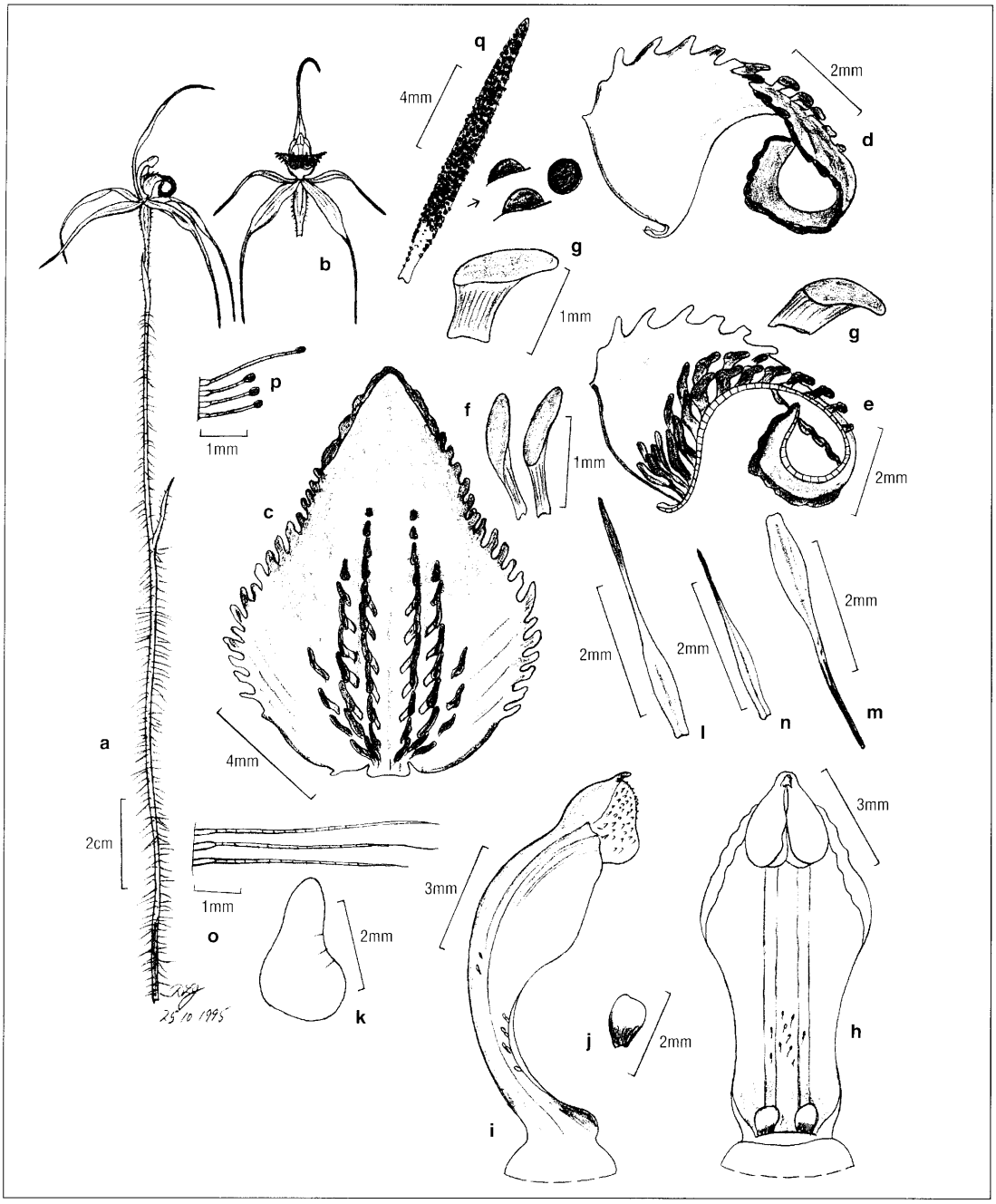


Fig. 2.8

Caladenia lindleyana

near Cleveland, Tasmania.

D.L. Jones 14562.

a. flowering stem; b. flower from front; c. labellum from above; d. labellum from side; e. longitudinal section of labellum; f. basal labellum calli; g. labellum calli; h. column from front; i. column from side; j. column gland; k. pollinium; l. dorsal sepal; m. lateral sepal; n. petal; o. stem trichomes; p. ovary trichomes; q. sepalline osmophore and glands.

Drawing 25/10/1995 by D.L. Jones.©

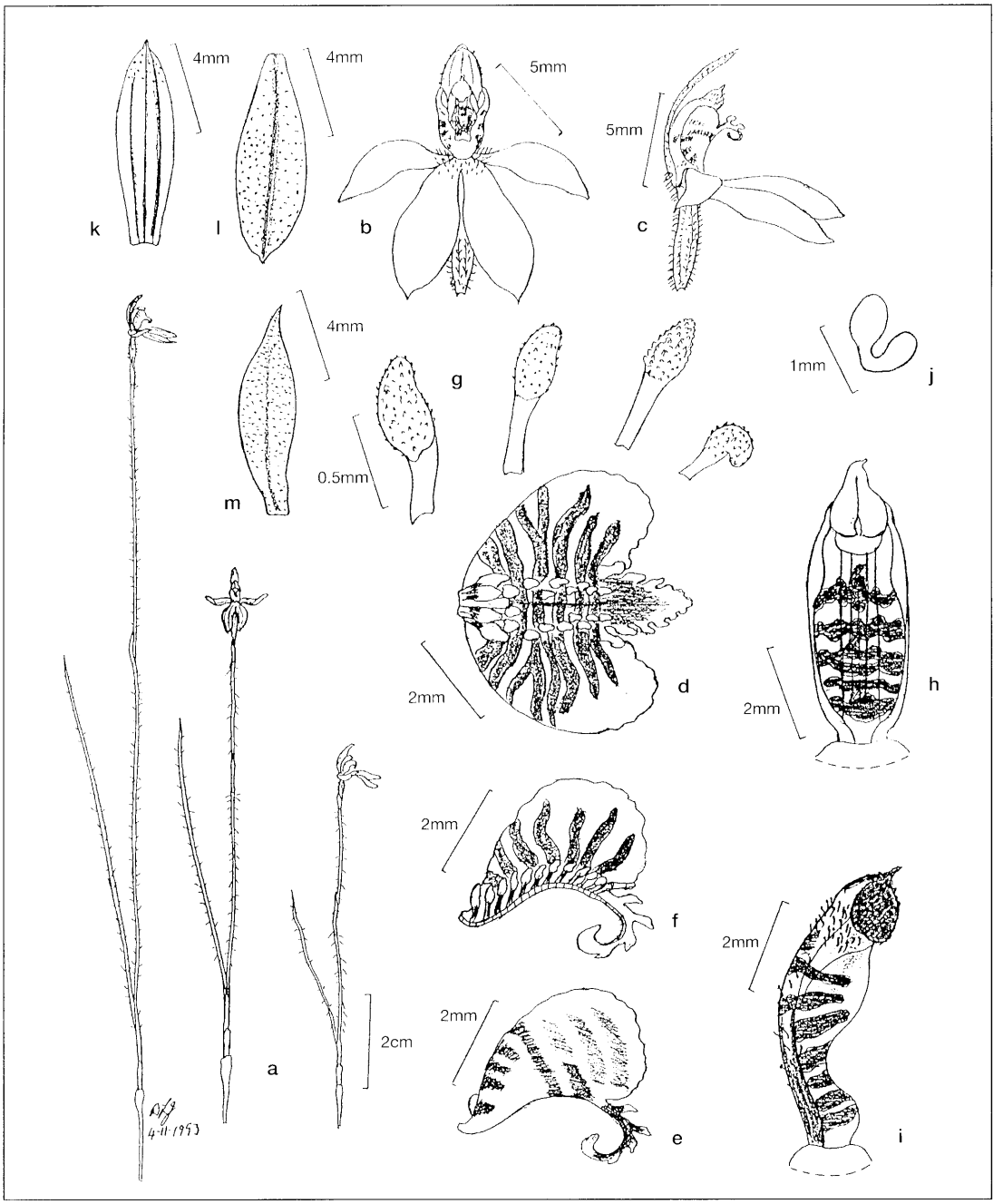


Fig. 2.9

Caladenia mentiens

Carr Villa Reserve, Launceston, Tasmania.

Campbell 93138.

a. plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. calli; h. column from front; i. column from side; j. pollinium; k. dorsal sepal; l. lateral sepal; m. petal.

Drawing 4/11/1993 by D.L. Jones.©

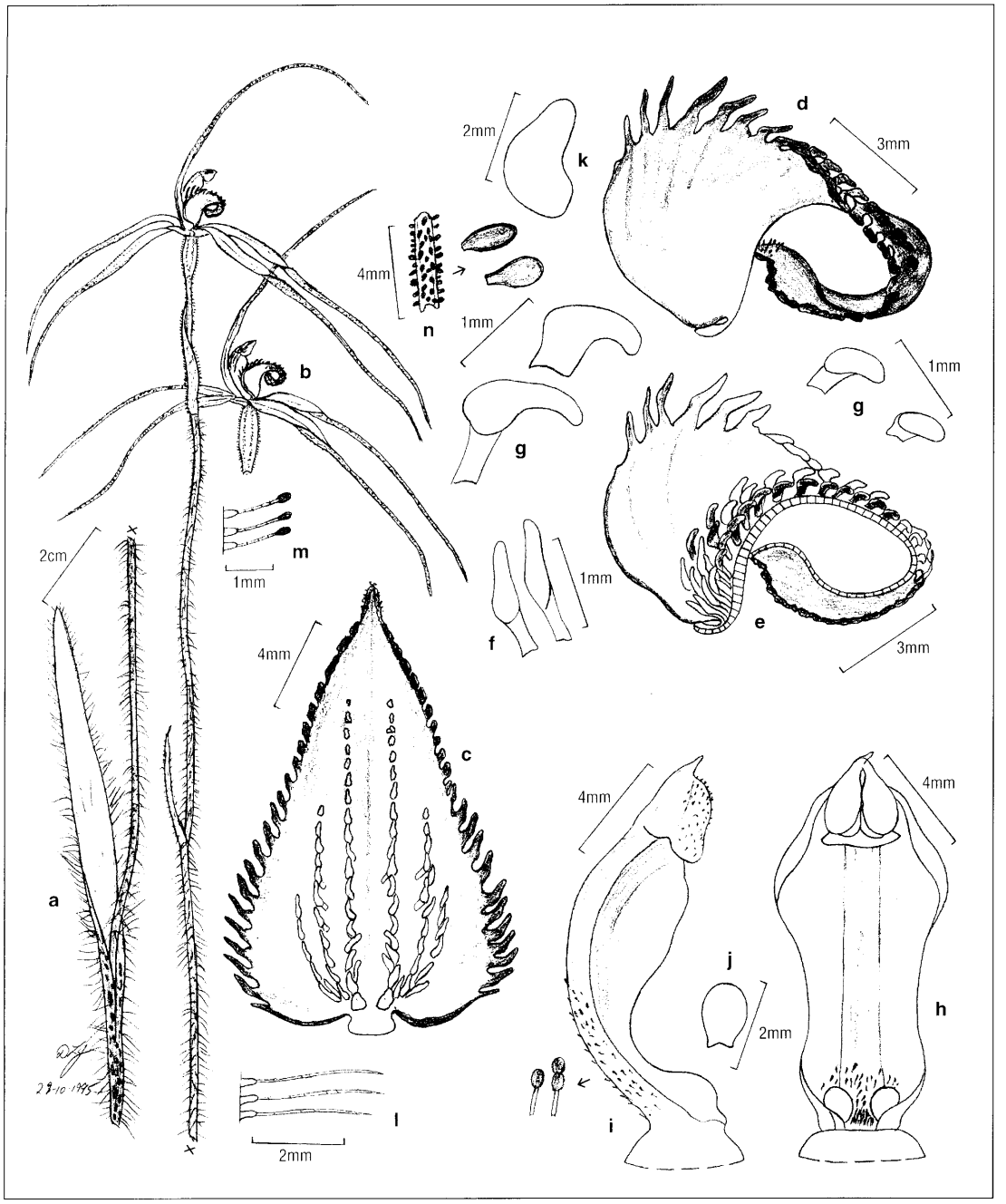


Fig. 2.10

Caladenia patersonii

Anthony Beach, Tasmania.

D.L. Jones.

a. plant; b. another flower from side; c. labellum from above; d. labellum from side; e. longitudinal section of labellum; f. basal labellum calli; g. labellum calli; h. column from front; i. column from side; j. column gland; k. pollinium; l. leaf trichomes; m. ovary trichomes; n. section of sepalline cauda and glands.

Drawing 14/10/1995 by D.L. Jones.©

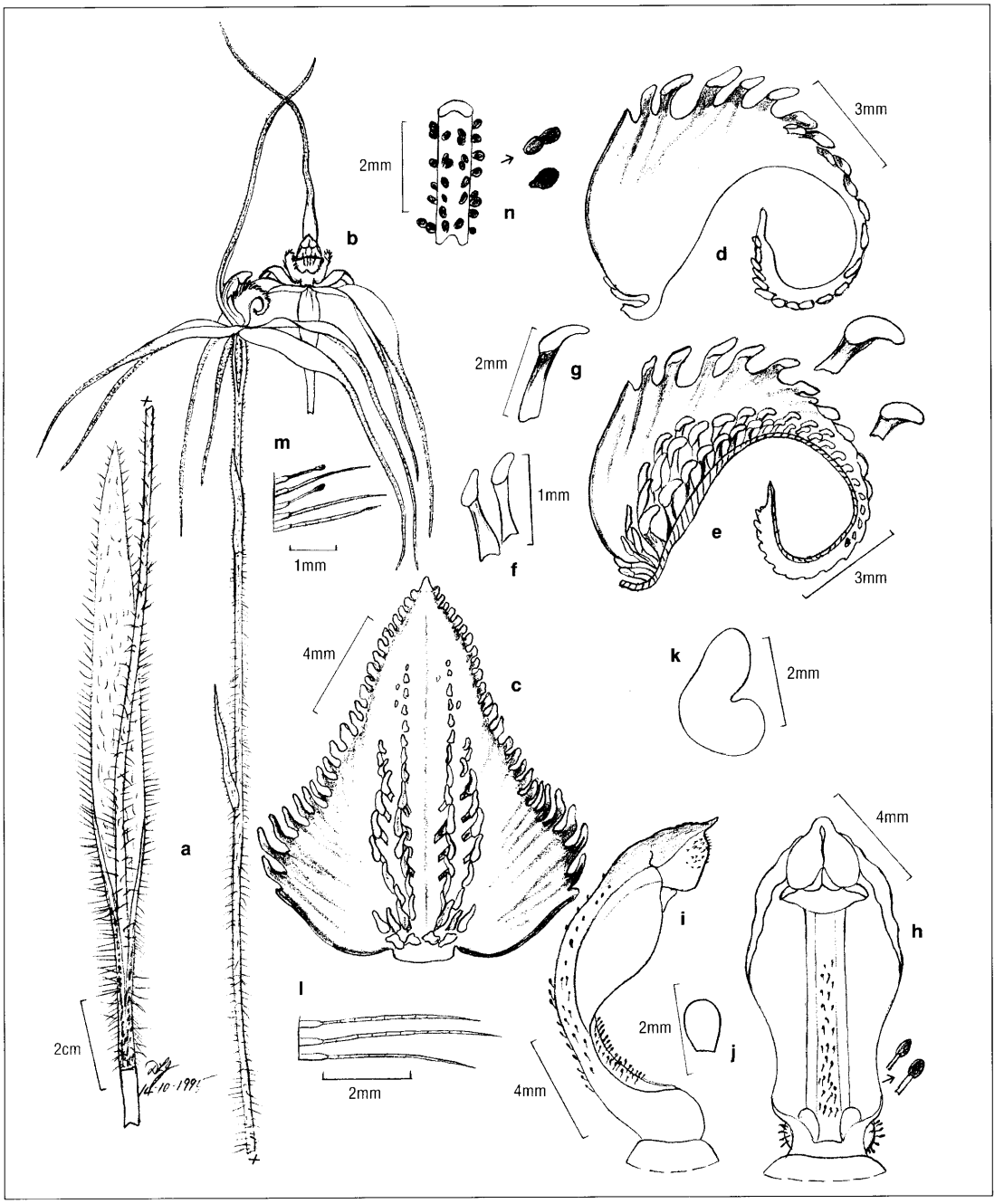


Fig. 2.11

Caladenia saggicola

Milford, Tasmania.

J.E. Wapstra.

a. plant; b. flower from front; c. labellum from above; d. labellum from side;
e. longitudinal section of labellum; f. basal labellum calli; g. labellum calli;
h. column from front; i. column from side; j. column gland; k. pollinium; l. leaf trichomes;
m. ovary trichomes; n. section of sepalline cauda and glands.

Drawing 14/10/1995 by D.L. Jones.©

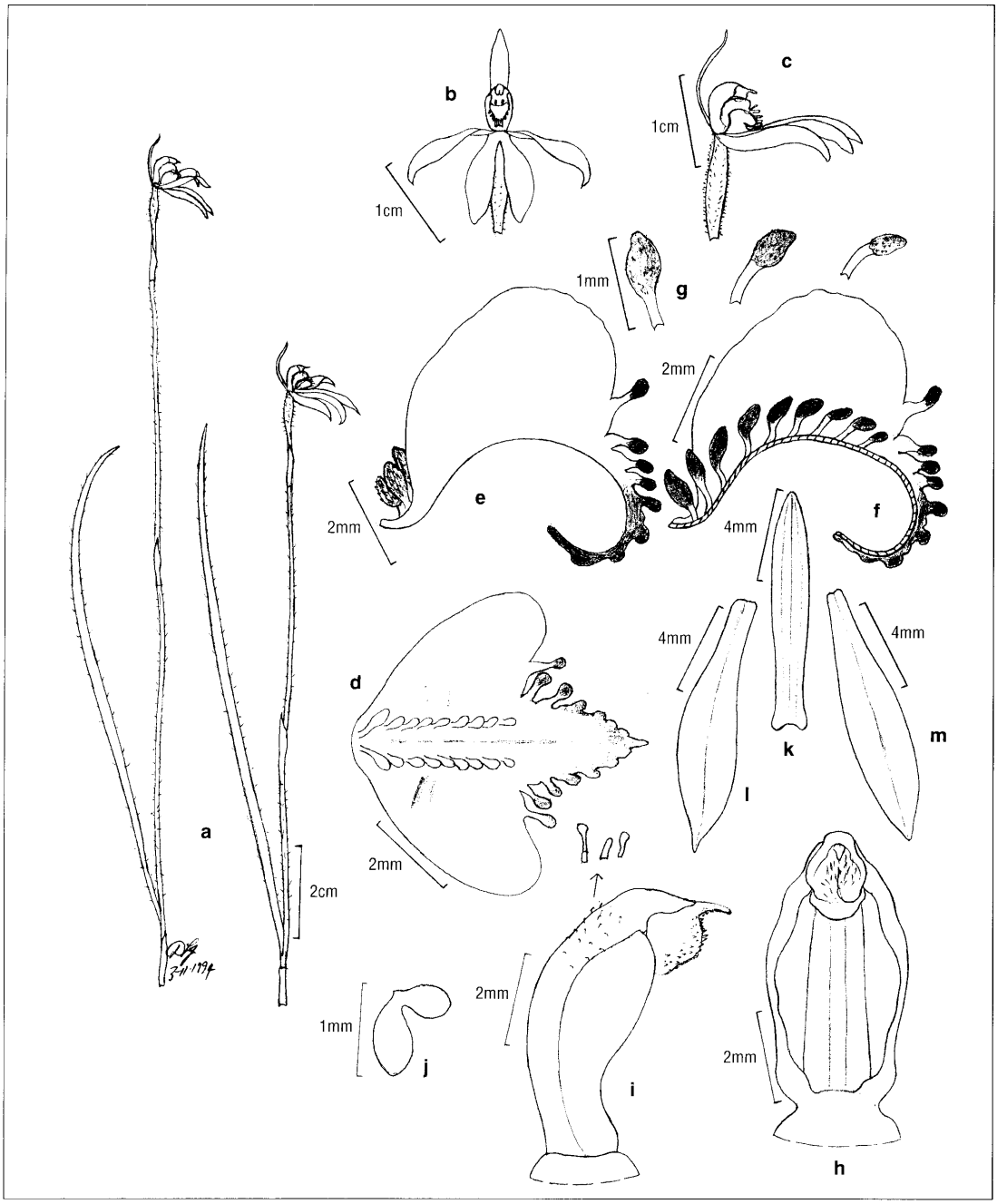


Fig. 2.12

Caladenia sylvicola

Waterworks Reserve, Tasmania.

(*D.L. Jones 13661*); from the type collection.

a. plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. longitudinal section of labellum; g. labellum calli; h. column from front; i. column from side; j. pollinium; k. dorsal sepal; l. lateral sepal; m. petal.

Drawing 3/11/1994 by D.L. Jones.©

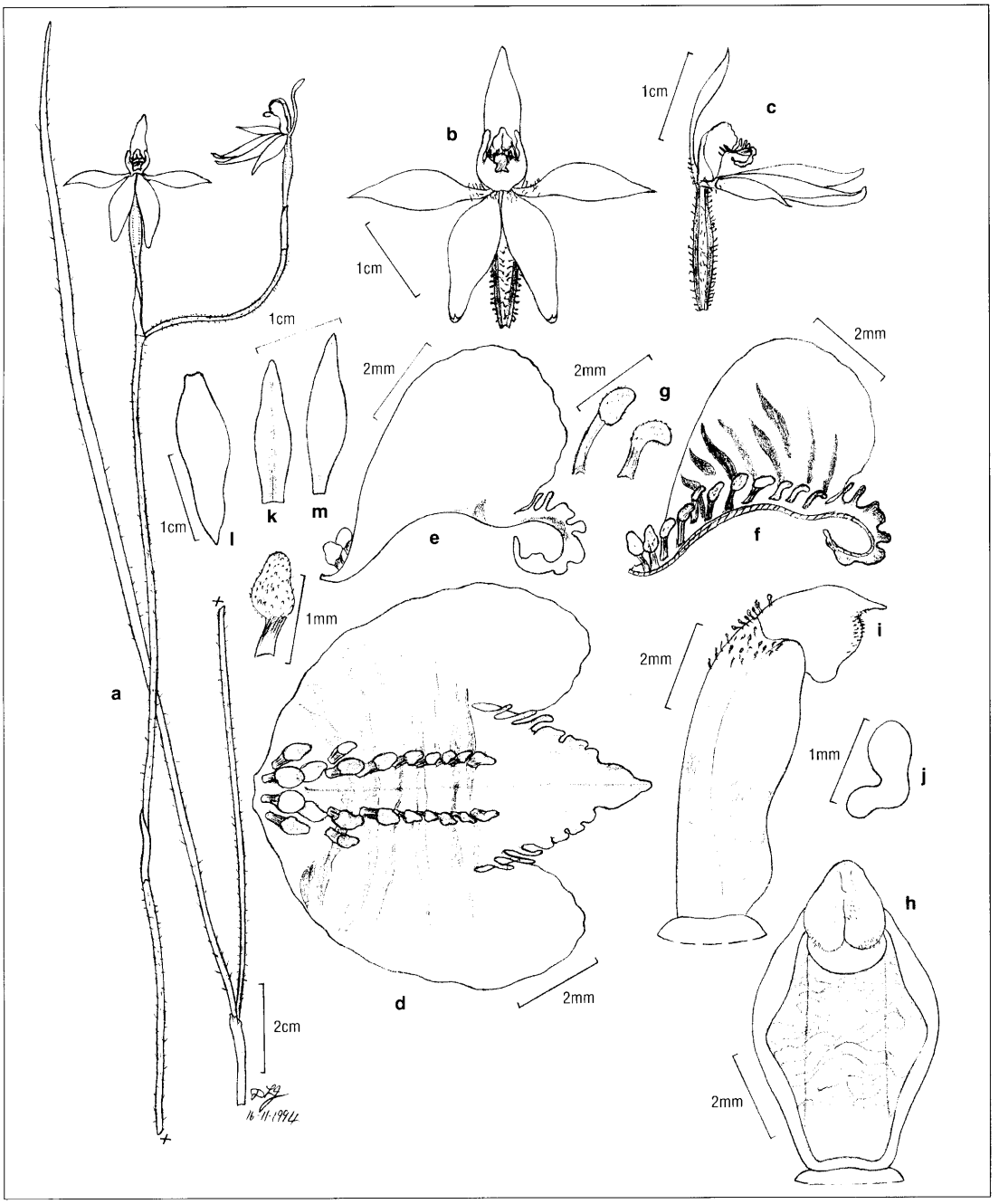


Fig. 2.13

Caladenia tonellii

Latrobe, Tasmania.

P. Tonelli (*D.L. Jones 13709*); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. longitudinal section of labellum; g. labellum calli; h. column from front; i. column from side; j. pollinium; k. dorsal sepal; l. lateral sepal; m. petal.

Drawing 16/11/1994 by D.L. Jones.©

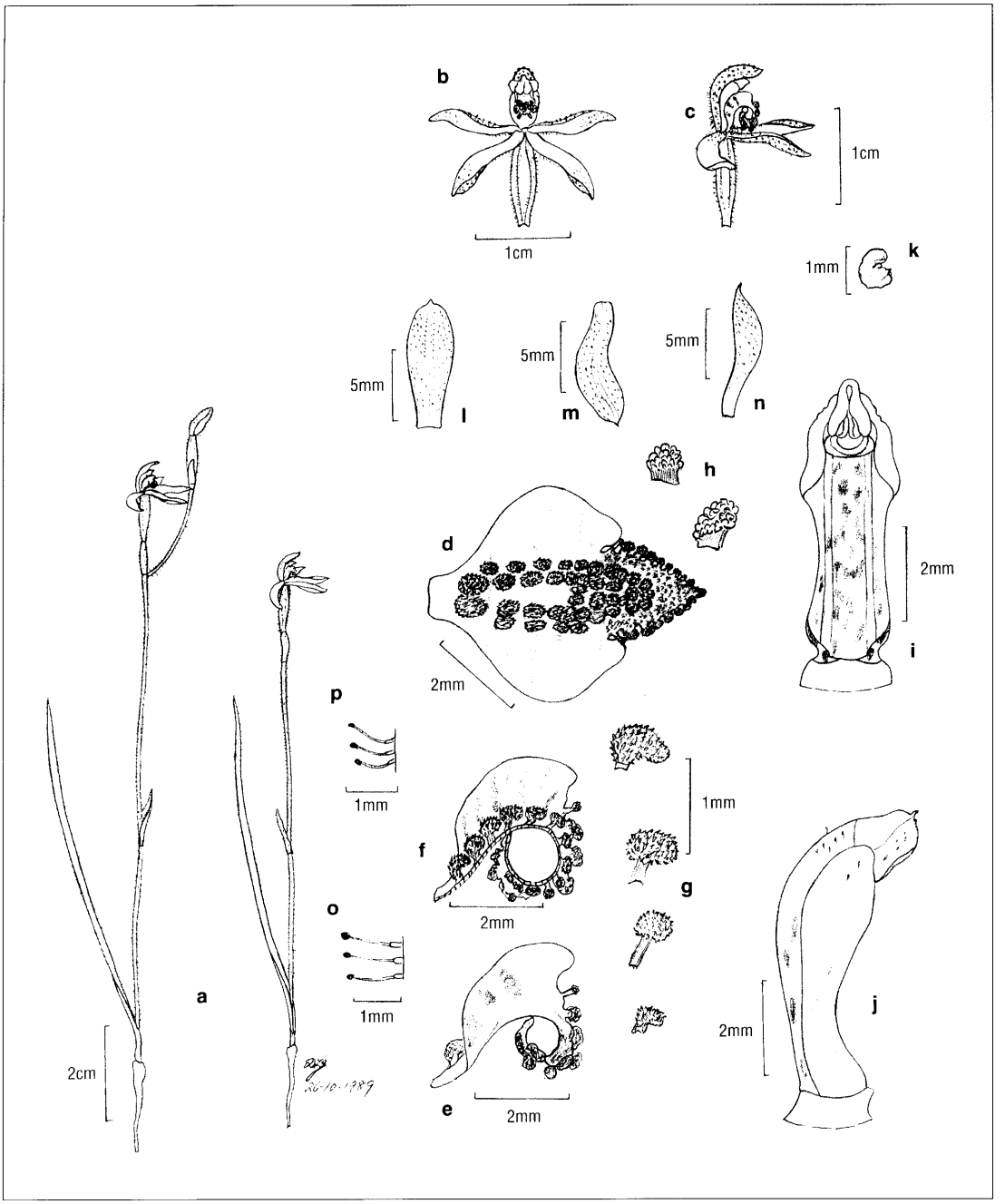


Fig. 2.14

Caladenia transitoria

Croydon & Mt. Morton, Victoria.

H.M.E. Richards.

a. plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. longitudinal section of labellum; g, h. labellum calli; i. column from front; j. column from side; k. pollinium; l. dorsal sepal; m. lateral sepal; n. petal.

Drawing 26/10/1989 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 3:

A Taxonomic Review Of *Chiloglottis* R.Br. In Tasmania

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

Chiloglottis is reviewed for Tasmania. *C. triceratops* D.L. Jones is described as new; *C. gunnii* Lindl. is characterised in the narrow sense; *C. grammata* G.W. Carr is reinstated and described fully for the first time and *C. trilabra* Fitzg. is newly recorded for Tasmania. A key is provided to the species of *Chiloglottis* in Tasmania.

INTRODUCTION

The genus *Chiloglottis* R. Br., which is endemic to eastern Australia and New Zealand, is an interesting group of small geophytes which reproduce vegetatively and grow in sparse to extensive clonal colonies. They are restricted to mesic situations and the various species are distributed in a range of habitats from the lowlands to subalpine regions.

The majority of *Chiloglottis* species are entomophilous and are pollinated by male thynnine wasps in an highly evolved, intricate relationship (Stoutamire 1975, Bower 1992) which involves the sexual deception of male flower wasps (Tiphidae: Thynninae). Choice baiting experiments by Bower (1992, 1996) have shown that a high degree of specificity exists between the pollinating vectors and the orchid species. These studies have provided additional information which has been valuable in the taxonomic elucidation of the genus.

Chiloglottis has been the subject of intensive morphological studies on the mainland resulting in the description of several new species (Jones 1991, Jones 1997). Other possible new taxa are currently under investigation and a revision of the genus is in preparation. Carr (1991) described two species from Tasmania but failed to take into account *C. gunnii* Lindl. Field studies by the author in Tasmania, supported by numerous field operatives, have resulted in a better appreciation of the genus in that state, and the results of that study are reported here.

Buchanan (1995) lists five species of *Chiloglottis*. All were described by Curtis (1979), but *C. gunnii* was recognised in the broad sense. In this study *C. gunnii* is characterised in the narrow sense and related taxa are examined, with one being reinstated from synonymy and another described as new. A natural hybrid, recorded in Curtis and treated in the Census as a synonym of *C. gunnii*, is discounted. This treatment brings the number of species in Tasmania to seven.

MATERIALS AND METHODS

As for paper 1 in this series.

TAXONOMIC TREATMENT

Chiloglottis

Chiloglottis R. Br., *Prodr.* 322 (1810).
Type species: *Chiloglottis diphylla* R. Br.

Tuberous terrestrial *herbs* growing in clonal colonies, sympodial. *Roots* filamentous. *Tubers* ovoid-globose, fleshy; replacement tubers absent; daughter tubers formed at the end of long lateral stolonoid roots. *Leaves* basal, usually two per shoot, convolute, opposite, petiolate. *Inflorescence* racemose, one-flowered, terminal. *Flowers* resupinate. *Dorsal sepal* free, broader than the lateral sepals and about as long, with a terminal osmophore. *Lateral sepals* connate at the very base, each with a terminal osmophore. *Petals* free, about as long as the dorsal sepal. *Labellum* free, attached to the underside of the column foot by a short, non-irritable ligulate claw; *lamina* not lobed, adorned with various polymorphic and polychromic, sessile or stalked calli in an insectiform arrangement. *Column* lacking free filament and style; *column wings* fused throughout to the column, sometimes apically projecting above the anther as short teeth. *Column foot* much reduced. *Anther* erect, persistent. *Pollinia* four, yellow, soft and mealy. *Stigma* entire, sunken, situated apically. *Rostellum* obscure, ventral. *Capsule* held erect on an enlarged and elongate pedicel.

A genus of 22 described species distributed in Australia and New Zealand. Seven species occur in Tasmania.

Key to *Chiloglottis* in Tasmania

1. Labellum fixed and immobile; lamina rhomboid to trapezoid; petals reflexed against the ovary **2**
Labellum hinged and mobile; lamina elliptic, ovate or cordate; petals spreading or incurved **4**

2. Labellum calli in a single compact central cluster; labellum held obliquely erect; sepalline osmophores c. 1 mm long ..... **5. *C. trapeziformis***
Labellum calli spread over most of the ventral surface of the labellum; labellum held more or less horizontal; sepalline osmophores 3 mm or longer **3**

3. Lateral sepals 10-13.5 mm long, recurved or reflexed beneath the labellum; sepalline osmophores to 3.5 mm long; main labellum gland entire or shallowly notched; labellum apex entire ..... **4. *C. reflexa***
Lateral sepals 13-18 mm long, usually projecting vertically beneath the labellum; sepalline osmophores to 7 mm long; main labellum gland conspicuously notched; labellum apex often caudate ..... **7. *C. trilabra***

4. Labellum triangular; flowers green; all calli humped or prostrate on the labellum surface ..... **1. *C. cornuta***
Labellum cordate to ovate-cordate; calli mostly erect with rounded heads; basal calli erect and columnar **5**

5. Scape usually >50 mm tall; central gland much larger than the rest, with a swollen, anvil-like head; basal columnar calli two ..... **3. *C. gunnii***
Scape usually <50 mm tall; central gland no larger or smaller than the rest; basal columnar calli three **6**

6. Labellum to 11 x 10 mm; basal columnar calli to 2 mm long ..... **2. *C. grammata***
Labellum to 15 x 13 mm; basal columnar calli to 4 mm long ..... **6. *C. triceratops***

1. *Chiloglottis cornuta* Hook. f., *Fl. antarct.* 1: 69 (1844).
TYPE: Campbell Islands, *Lyall* (holo K, photo!)
Chiloglottis muelleri Fitzg., *Austral. Orch.* 2(2): t.6 (1885).
TYPE: Loddon, Victoria, Nov., *C. French ex F. Mueller* (lecto Fitzgerald's plate, *fide* Clements 1989).

Illustration: Plate 185, Nicholls (1969).

Distribution and ecology: Southern New South Wales, Victoria, Tasmania, south-eastern South Australia and New Zealand. Grows in wet sclerophyll forest, fern gullies, moist areas of open forest and snowgum woodland in clay loams and rotting logs; also in sphagnum mounds in subalpine meadows. Plants also colonise the fibrous trunks of the tree-fern, *Dicksonia antarctica* Labill. Altitude: 50-2000 m. Flowering period: November to February.

Notes: This species is characterised by small green flowers; triangular labellum; and, sessile green to black calli. The labellum often, but not always, has a reddish apex.

Chiloglottis cornuta exhibits a degree of variation which is currently under study.

Selected specimens (34 seen)**:**
TASMANIA: Magnet, Jan. 1923, *Atkinson* (QVM); N. side, Gog Ra., 1 Oct. 1991, *Barker* (QVM); Mt Hobbs, 14 Dec. 1986, *Collier 2051* (HO); track to Mavista Falls, South Bruny Island, 4 Nov. 1990, *Collier 4932* (HO); Loyetea, 26 km S. of Burnie, 19 Nov. 1981, *Harris 34* (HO); Liffey district, Dec. 1951, *King* (QVM); The Clump, 9 Dec. 1983, *Moscal 4693* (HO).

2. *Chiloglottis grammata* G.W. Carr, *Indigenous Flora & Fauna Association Miscellaneous Paper* No. 1: 20-21 (1991).
TYPE: Tasmania, Jackeys [as Jackys] Marsh, 20 November 1982, *G.W. Carr* (holo MEL 223596!; iso CANB, HO, K, NSW).
Chiloglottis X *pescottiana auct non* R.S. Rogers; P. Messmer in W.M. Curtis, *The Student's Flora of Tasmania* 4A:86 (1979).

Tuberous terrestrial *herb* growing in colonies. *Leaves* broadly elliptical, 5-8 cm long, 1.5-2.5 cm wide, dark green above, paler and glaucous beneath with prominent longitudinal veins; margins entire; apex apiculate; petioles 5-20 mm long. *Peduncle* 20-40 mm long, c. 2 mm thick, green, fleshy. *Floral bract* broadly obovate, 15-20 mm long, 10-12 mm wide, closely sheathing, acuminate. *Pedicel* 8-20 mm long. *Ovary* c. 8 mm long, green to purplish-red. *Flower* solitary, c. 30 mm across, green to greenish-purple or dark purple, held stiffly erect; dorsal sepal erect and incurved; lateral sepals erect in proximal half then porrect or recurved, more or less parallel; petals widely spreading. *Dorsal sepal* broadly obovate to obovate-spathulate, 15-19 mm long, 8-11 mm wide; osmophore linear-terete 0.5-1 mm long. *Lateral sepals* narrowly linear-lanceolate, 14-16 mm long, c. 2 mm wide, green to dark purplish-brown, broadest near the base then tapered to the apex; osmophore linear-terete, 0.5-1 mm long. *Petals* asymmetrically lanceolate, 13-16 mm long, 3.5-4.5 mm wide, falcate, acuminate. *Labellum* articulated on a short claw c. 1 mm long; lamina ovate-cordate, 8-11 mm long, 7-10 mm wide, greenish to dark purplish-red, paler near the margins, veins slightly darker; anterior surface with irregular bands; lamina callus occupying the central half to two-thirds of the lamina, with a narrow, central, slightly raised plate; calli greenish to reddish or black, shiny; main central gland 2-3 mm long, erect, with a thick stalk and a slightly swollen head c. 1 mm across; basal glands two, c. 2 mm long, similar to main central gland but partially connate with the labellum margin and often curving outwards; lateral glands linear-clavate, c. 1 mm long, three or four pairs on the margin of the central plate and, often accessory glands on adjacent parts of the lamina; distal gland sessile, c. 1.2 mm across; distal and anterior parts of the lamina often with irregular, elongated calli-like bands. *Column* curved away from the ovary in the proximal half then erect and incurved, 13-15 mm long, 4.5-6 mm wide, greenish brown with dark red streaks on the anterior surface; wings narrow, as long as the anther, subacute. *Anther* c. 2.6 mm long, 2 mm wide, smooth, entire, yellow. *Pollinia* c. 3 mm long, strongly falcate, yellow, mealy. *Stigma* elliptic, c. 3 mm across, sunken. *Capsule* obovoid, 8-12 mm long, 4-6 mm wide, on a thickened pedicel 6-10 cm long. **Fig. 3.1.**

Distribution and ecology: Endemic to Tasmania where widely distributed in high rainfall regions and particularly abundant in the mountains. Grows among shrubs and in open areas in rainforest, tall open forest and wet sclerophyll forest. Forms extensive, often dense colonies. Soils are moist but well-drained loams. Altitude: 100-1200 m. Flowering period: October to January.

Notes: *Chiloglottis grammata* can be readily distinguished from its congeners by its widely spreading petals; relatively small (to 11 mm x 10 mm), ovate-cordate labellum; the basal lamina calli being confluent with the labellum margins; short relatively thick lamina calli and irregular, elongated low ridges and markings (resembling writing) on the anterior surface of the labellum.

Chiloglottis grammata is a distinctive species which has been confused with *C. gunnii* (see that species for details). Carr (1991) stated that *C. grammata* was of hybrid origin but did not assign hybrid status to the taxon. Putative parents are *Chiloglottis cornuta* Hook. f., which my studies show is autogamous, and *C. gunnii* (*sensu* Carr). In my experience, hybrids within *Chiloglottis* are extremely rare and I reject the notion of hybridity in this species. *Chiloglottis grammata* is very widely distributed in Tasmania, is often locally common, frequently grows in extensive colonies and is commonly the only species found in an area.

Conservation status: Widely distributed, common and well conserved.

Selected specimens: (33 examined):
TASMANIA: Grove, 13 Nov. 1975, *Allen* (HO); Mt Maurice Rd, 15 Dec. 1990, *Campbell* (CANB); Skemps, 14 Dec. 1992, *Campbell* (CANB); E. side of Pergatory Hill, Cape Pillar Track, 11 Nov. 1984, *Collier 37* (HO); Leprena Track, 12 Oct. 1985,*Collier 734* (HO); Cygnet River, 23 Nov. 1986, *Collier 1945* (HO); Coles Bay Reservoir, 21 Nov. 1990, *Jones 7192 & Broers* (CANB); Mt Bounty, Bruny Island, 19 Oct. 1994, *Jones 13601 & Jones* (CANB); Waterworks Reserve, Huon Rd, Ferntree, 20 Oct. 1994, *Jones 13612 & Jones* (CANB); Mt Cameron, 19 Nov. 1986, *Moscal 14216* (HO); Ben Lomond, 16 Dec. 1979, *Noble* (HO); Snug Falls, 4 Nov. 1990, *Wapstra* (CANB); St Marys Pass, 26 Oct. 1992, *Ziegeler* (CANB).

3. *Chiloglottis gunnii* Lindl., *Gen. sp. orchid. pl.* 387 (1840);
Caladenia gunnii (Lindl.) Rchb. f., *Beitr. Syst. Pflanzenk*. 67 (1871).
TYPE: Tasmania, Circular Head, 13 Nov. 1837, *R.Gunn 913* (holo K-L; iso AD!, HO!, K!, P).
Chiloglottis platychila G.W. Carr, *Indigenous Flora & Fauna Association Miscellaneous Paper* No. 1: 21 (1991).
TYPE: Tasmania, western city limits of Hobart at foot of Mt Wellington, 20 Dec. 1984, *G.W. Carr 10055* (holo MEL!; iso AD, CANB, HO, K, NSW). ***syn. nov.***

Tuberous terrestrial *herb* growing in colonies. *Leaves* broadly elliptical, 40-60 mm long, 10-20 mm wide, dark green above, paler beneath with prominent longitudinal veins; margins entire; apex apiculate; petioles 5-15 mm long. *Peduncle* 50-70 mm long, c. 2 mm thick, green, fleshy. *Floral bract* broadly obovate, 15-30 mm long, 10-14 mm wide, closely sheathing, acuminate. *Pedicel* 10-30 mm long, slender. *Ovary* c. 10 mm long, green to purplish red. *Flower* solitary, c. 25 mm across, green to greenish-purple or purplish-brown, held stiffly erect; dorsal sepal erect and incurved; lateral sepals curved forwards, slightly divergent; petals incurved. *Dorsal sepal* obovate-spathulate, 20-24 mm long, 7-11 mm wide; osmophore 0.5-1.5 mm long, linear-terete. *Lateral sepals* narrowly linear-lanceolate, 15-20 mm long, c. 2 mm wide, green to purplish-brown, broadest near the base then tapered to the apex; osmophore 0.5-1.5 mm long, linear-terete, green to brownish. *Petals* asymmetrically lanceolate, 15-17 mm long, 4.5-6 mm wide, strongly falcate, greenish brown to purplish brown, subacute. *Labellum* articulated on a short claw c. 1 mm long; lamina broadly ovate-cordate, 10-13 mm long, 10-15 mm wide, greenish brown to brownish with a narrow pale green marginal band; veins slightly darker; anterior surface smooth; lamina callus occupying a narrow central line, on a slightly raised plate, extending half to two-thirds of the distance to the apex; calli black and shiny; main central gland 3-3.5 mm long, erect, with a swollen globose head 1.5-2 mm across; basal glands two, c. 2 mm long, linear-clavate; lateral glands absent or one to three pairs, c. 1 mm long, linear-clavate; distal glands usually paired, one large and anvil-like, 1.5-2 mm across, sessile, often flanked by two smaller, linear-

clavate glands. *Column* strongly curved away from the ovary in the proximal half, then erect and incurved, 15-18 mm long, 5-6 mm wide, greenish-brown to reddish-brown with darker anterior markings; wings narrow, as long as the anther, subacute. *Anther* c. 3 mm long, 2.3 mm wide, smooth, entire, pale yellow. *Pollinia* c. 3 mm long, strongly falcate, yellow, mealy. *Stigma* elliptic, c. 4 mm across, sunken. *Capsule* obovoid, 10-13 mm long, 6-8 mm wide, on a thickened pedicel 8-14 cm long. **Fig. 3.2.**

Distribution and ecology: Endemic to Tasmania where widely distributed, mainly in coastal districts, but extending to the mountains in the south-east. Grows in moist, sheltered sites in tall open forests and wet sclerophyll forests dominated by *Eucalyptus obliqua* L'Herit and *E. nitida* Hook.f.; also rainforest, particularly those dominated by *Nothofagus cunninghamii* (Hook.) Oerst.; less commonly in shrubby woodland and coastal scrub. Soils are well-structured loams and sandy loams. Altitude: 10-700 m. Flowering period: October to January.

Notes: *Chiloglottis gunnii* has the tallest flowering scape (to 10 cm tall) of all the large-flowered Tasmanian species. It can also be distinguished by the labellum glands being confined to a narrow central band; the main central gland being larger than the rest, stalked and with a large swollen head; and, the distal gland sessile and anvil-like.

The identity of *Chiloglottis gunnii* has been subject to much confusion with most flora writers treating it in the broad sense (Rupp 1943, Firth 1965, Nicholls 1969, Burbidge & Gray 1970, Willis 1970, Curtis 1979). The mainland taxa have recently been reinterpreted (Jones 1991) based on morphological characters and supported by pollination studies (Bower 1992, 1996).

Field studies by the author in Tasmania have shown that three distinct taxa occur in the *C. gunnii* complex, all being endemic to the State. Carr (1991) described two of these taxa viz. *C. grammata* and *C. platychila*. After a study of the holotype of *C. gunnii* in K-L and after discussions with the author, Clements (1993) reduced *C. grammata* to a synonym of *C. gunnii*. Subsequent examination by the author of numerous specimens of *C. gunnii* in AD, HO and QVM, collected from the type locality by Ronald Gunn and Charlotte Smith, prompted a second study of the holotype by Clements. From these studies it is clear that *C. platychila* is a synonym of *C. gunnii* and *C. grammata* is distinct.

Conservation status: Widely distributed and well conserved in reserves.

Specimens examined:
TASMANIA: Near Waterworks, 21 Nov. 1931, *Atkinson* (HO); Spero Bay, SW. end of Red Reef Beach, 14 Jan. 1984, *Buchanan 2519 (*HO); Fern Tree, no date, *Giblin* (HO); Desgraves, Hobart Town, 14 & 20 Nov. 1840, *Gunn* (HO); Knocklofty, Hobart, 16 Nov. 1840, *Gunn* (HO); Harford, 29 Sept. 1932, *Hamilton 97* (HO); Smithton-Marrawah Rd, 5 Nov. 1990, *Jones 6992 & Broers* (CANB): Pelverata Falls Tk, 23 Oct. 1994, *Jones 13640, Jones & Ziegeler* (CANB); Relbia, Oct.-Jan. 1933, *Perrin* (HO); Hastings, 25 Nov. 1945, *Somerville* (HO); Oyster Cove, 23 Dec. 1992, *Wapstra* (CANB); Mt Wellington, 15 Jan. 1993, *Wapstra & Wapstra* (CANB); South Coast Walking Tk, 15 Jan. 1993, *Wapstra & Wapstra* (CANB); Pipeline Tk, Ferntree, 22 Dec. 1992, *Ziegeler* (CANB).

4. *Chiloglottis reflexa* (Labill.) Druce, *Rep. Bot. Exch. Cl. Brit. Isles Suppl.* 2: 614 (1917); *Epipactis reflexa* Labill., *Nov. Holl. pl.* 2: 60, t. 211 (1806).
TYPE: Van Diemen, *J. Labillardiere* (lecto FI, *fide* Clements 1989, photo!)

Illustration: Plate 12, Curtis (1979)

Distribution and ecology: New South Wales, Victoria and Tasmania. Grows in open forest, woodland, heathy forests, coastal scrubs and heathland in sands, sandy loams and shallow clay loams. Altitude: 0-600 m. Flowering period: December to June.

Notes: This species is characterised by small (to 30 mm long) flowers; lateral sepals reflexed or recurved beneath the labellum; short (to 3.5 mm long) sepalline osmophores; the main labellum gland entire or slightly notched; and, the labellum apex entire and rounded. See also the entry for *C. trilabra*.

Selected specimens: (55 seen):
TASMANIA: Lindisfarne, Oct. 1923, *Atkinson* (QVM); St Marys, 3 June 1984, *Cameron* (QVM); Bridport, 26 May 1984, *Cameron* (QVM); Rileys Hill, 30 May 1986, *Collier 1424* (HO); Orford, 14 May 1990, *Palmer* (CANB); c. 1 km N. of Fingal, 5 Feb, 1989, *Rubenach* (HO); Henry Somerset Reserve, 22 Apr. 1990, *Tonelli* (CANB); Ansons Bay Rd, 5 Feb. 1993, *Wapstra* (CANB); Tasman Peninsula, 19 Feb. 1996, *Wapstra* (CANB); Coles Bay, 6 May 1990, *Williamson* (CANB).

5. *Chiloglottis trapeziformis* Fitzg., *Austral. orch.* 1(3): t. 9 (1877).
TYPE: New South Wales, Liverpool, *C. King* (holo BM, photo!).

Illustration: Page 135, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in open forests, woodlands and heathy forests in sands, sandy loams and shallow clay loams. Altitude: 5-1000 m. Flowering period: August to November.

Notes: This species is characterised by brownish to brownish green erect flowers; widely divergent, recurved lateral sepals with very short osmophores; erect to semi-erect trapeziform labellum; and calli in a compact central group.

This species is apparently extinct on mainland Tasmania and the only extant record for the state is Great Dog Island in Bass Strait.

Specimens examined:
TASMANIA: Bridgenorth, near Launceston, Oct. 1923, *Atkinson* (MEL); Legana, 2 Nov. 1970, *ex Naturalists Herb.* (QVM); Great Dog Island, Furneaux Group, 10 Sept. 1992, *Spry* (HO).

6. *Chiloglottis triceratops* D.L. Jones, sp. nov.
C. validae D.L. Jones affinis sed floribus minoribus (ad 25 mm latis); sepalo dorsali angustiore (ad 11 mm lato); sepalis lateralibus brevioribus, angustioribus (ad 20 x 2.5 mm); petalis angustioribus (ad 6 mm latis); labello callis 3 magnis instructo; et columna angustiore (ad 7 mm lata), differt.
TYPUS: Tasmania, Coquette Ck, Scottsdale Rd, 7 Nov. 1990, *D.L. Jones 7060, C.H. Broers & J. Campbell* (holo CANB; iso AD, CANB, HO, MEL, NSW).

Tuberous terrestrial *herb* growing in colonies. *Leaves* broadly elliptical, 30-60 mm long, 10-25 mm wide, dark green above, paler and glaucous beneath, with prominent longitudinal veins; margins entire; apex apiculate; petioles 8-15 mm long. *Peduncle* 15-40 mm long, c. 2 mm thick, green to brownish, fleshy. *Floral bract* broadly obovate, 15-25 mm long, 9-12 mm wide, closely sheathing, acuminate. *Pedicel* 8-20 mm long. *Ovary* c. 8 mm long, brownish to purplish red. *Flower* solitary, c. 25 mm across, greenish brown to purplish-brown, held stiffly erect; dorsal sepal erect and incurved; lateral sepals erect in proximal half then porrect or recurved, more or less parallel; petals incurved. *Dorsal sepal* obovate-spathulate, 15-24 mm long, 8-11 mm wide; osmophore linear-terete, 2-3 mm long. *Lateral sepals* narrowly linear-lanceolate, 15-20 mm long, 2-2.5 mm wide, brownish-green to purplish-brown, broadest near the base then tapered to the apex; osmophore linear-terete, 1.5-2.5 mm long. *Petals* asymmetrically lanceolate, 15-20 mm long, 4-6 mm wide, falcate, acuminate. *Labellum* articulated on a short claw c. 1 mm long; lamina broadly ovate-cordate, 12-15 mm long, 9-13 mm wide, brownish-green to purplish-brown, paler near the margin; veins slightly darker, anterior surface smooth; lamina callus occupying the proximal central third of the labellum, with a central, slightly raised plate; calli brownish to black, shiny; main central gland columnar, 3-4 mm long, erect, slender (c. 0.5 mm across), uniformly cylindrical, tapered or with a slightly swollen apex; basal glands two, similar to main central gland but partially connate with the labellum margin; lateral glands linear-terete, c. 1.5 mm long, three to six pairs on the margins of the central plate; distal gland sessile, c. 1 mm across. *Column* curved away from the ovary in the proximal half then erect and incurved, 15-16 mm long, 5-7 mm wide, greenish brown with dark red streaks on the anterior surface; wings narrow, as long as the anther, subacute. *Anther* c. 3 mm long, 2 mm wide, smooth, entire, yellow. *Pollinia* c. 3 mm long, strongly falcate, yellow, mealy. *Stigma* elliptic, c. 3 mm across, sunken. *Capsule* obovoid, 10-13 mm long, 5-7 mm wide, on a thickened pedicel 8-15 cm long. **Fig. 3.3.**

Distribution and ecology: Endemic to Tasmania where widely distributed, mainly occurring in the lowlands, but in some districts extending into montane areas. Grows in dry to moist sclerophyll forest and tall open forest, with a grassy or shrubby understorey. Also in coastal scrubs. Forms small to extensive, sparse to dense colonies. Soils are sandy loams and well-structured clay loams. Altitude: 10-800 m. Flowering period: August to December.

Notes: *Chiloglottis triceratops* can be distinguished by the following combination of features; flowers about 25 mm across; dorsal sepal to 11 mm wide; petals spreading widely; arrangement of labellum calli - the proximal three calli (long, columnar and erect) forming a prominent basal group and with two longitudinal rows of well-developed columnar calli (without swollen heads) extending along the margin of the callus plate; and, the column to 7 mm wide.

Chiloglottis triceratops has been confused with *C. gunnii* (see that species for details), but is actually closer to *C. valida* from south-eastern Australia. It is generally smaller than that species in overall habit (*C. valida* to 7 cm tall), leaves (*C. valida* to 10 x 4 cm) and flowers (*C. valida* to 35 mm across) and has a very distinctive arrangement of labellum calli, with the three basal calli being prominent.

Conservation status: Widespread, common and well conserved.

Etymology: Named after *Triceratops*, the fabulous dinosaur with the three prominent horns which arch over its head; the tall, columnar basal calli of this new species have a similar arrangement.

Selected specimens: (45 examined):
TASMANIA: Cascades, 29 Nov. 1931, *Atkinson* (HO); Whites Mill Rd, Lilydale, 21 Oct. 1980, *Buchanan 285* (HO); Myrtle Bank, 10 Dec. 1995, *Campbell 95047* (CANB); Snow Hill, 12 Nov. 1988, *Collier 3755* (HO); 4 km S. of Ouse, 8 Oct. 1989, *Collier 4278* (HO); South Bruny Island, 4 Nov. 1990, *Collier 4934* (HO); Hellyer Gorge, 2 Nov. 1990, *Jones 6904 & Broers* (CANB); Mt Koonya, 1 Jan. 1984, *Moscal 5209* (HO); Punchbowl, Launceston, Nov. 1921, *Perrin* (HO); Melaleuca, Blackmans Bay, Nov. 1927, *Rodway* (HO); Myrtle Gully, 20 Sept. 1937, *Somerville* (HO); Van Moreys Rd, Margate, 13 Nov. 1993, *Wapstra* (CANB); Roaring Bay, Dover, 13 Nov. 1993, *Wapstra & Wapstra* (CANB): Pipeline Tk, Ferntree, 22 Dec. 1992, *Ziegeler* (CANB).

7. *Chiloglottis trilabra* Fitzg., *J. Bot.* 21: 204 (1883).
TYPE: Mount York, Blue Mountains, New South Wales, *R.D. Fitzgerald* (holo BM, photo!).

Illustration: Plate 291, Bishop (1996).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Found mainly on the ranges and tablelands. Grows in wet sclerophyll forest, woodland, open forest and heathy forest in shallow clay loams and well-structured brown loams. Altitude: 100-800 m. Flowering period: December to May.

Notes: Recent pollination studies by Colin Bower (pers. comm.) have shown this species to be present in Tasmania. It is very similar to *C. reflexa* but has slightly taller inflorescences; slightly larger (to 35 mm long) flowers; lateral sepals projecting vertically below the labellum; longer (to 7 mm long) sepalline osmophores; larger, notched main labellum gland; and, the labellum apex often extends as a short tail.

Specimen examined: TASMANIA: c. 8 km NW. of Winnaleah, 30 Mar. 1997, *Bower (ORG 690)* (CANB).

EXCLUDED TAXA

Chiloglottis* x *pescottiana R.S. Rogers, *Proc. Roy. Soc. Victoria* (new ser.) 30: 139, t.25 (1918).
TYPE: Cravensville near Tallangatta, 8 Oct. 1917, *A.B. Braine* (holo AD!; iso MEL!).

Distribution and ecology: New South Wales and Victoria. A natural hybrid involving *C. trapeziformis* and *C. valida*. Grows in open forest and coastal scrub. Flowering period: September to November.

Notes: The record by Messmer of *C.* X *pescottiana* from Tasmania (see Curtis 1979) is based on an erroneous interpretation of *C. grammata*.

ACKNOWLEDGEMENTS

As for paper 1 in this series.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Bishop, T. (1996). *Field Guide to the Orchids of New South Wales and Victoria* (University of New South Wales Press, Sydney).
- Bower, C.C. (1992). The use of pollinators in the taxonomy of sexually deceptive orchids in the subtribe Caladeniinae (Orchidaceae). *The Orchadian* 10: 331-338.
- Bower, C.C. (1996). Demonstration of pollinator-mediated reproductive isolation in sexually deceptive species of *Chiloglottis* (Orchidaceae: Caladeniinae), *Aust. J. Bot.* 44: 15-33.
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Burbidge, N.T. & Gray, M. (1970). *Flora of the Australian Capital Territory*. (Australian National University Press, Canberra).
- Carr, G.W. (1991). New Taxa in *Caladenia* R. Br., *Chiloglottis* R. Br. and *Gastrodia* R. Br. (Orchidaceae) from south-eastern Australia, *Indigenous Flora & Fauna Association, Miscellaneous Paper* No 1.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Clements, M.A. (1993). The status of recently named orchids from south-eastern Australia, *Muelleria* 8(1): 69-72.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*. (Government Printer, Hobart).
- Firth, M.J. (1965). *Native Orchids of Tasmania.* (C.L.Richmond & Sons, Devonport).
- Jones, D.L. (1991). New Taxa of Australian Orchidaceae, *Australian Orchid Research* 2: 1-108.
- Nicholls, W.H. (1969). *Orchids of Australia*. (Thomas Nelson, Melbourne).
- Rupp, H.M.R. (1943). *The Orchids of New South Wales.* (Australian Medical Publishing Coy, Sydney).
- Stoutamire, W.P. (1975). Pseudocopulation in Australian terrestrial orchids, *American Orchid Society Bulletin* 44: 226-233.
- Willis, J.H. (1970). *A Handbook to Plants in Victoria.* Vol. 1 (2nd edition). (Melbourne University Press, Carlton).

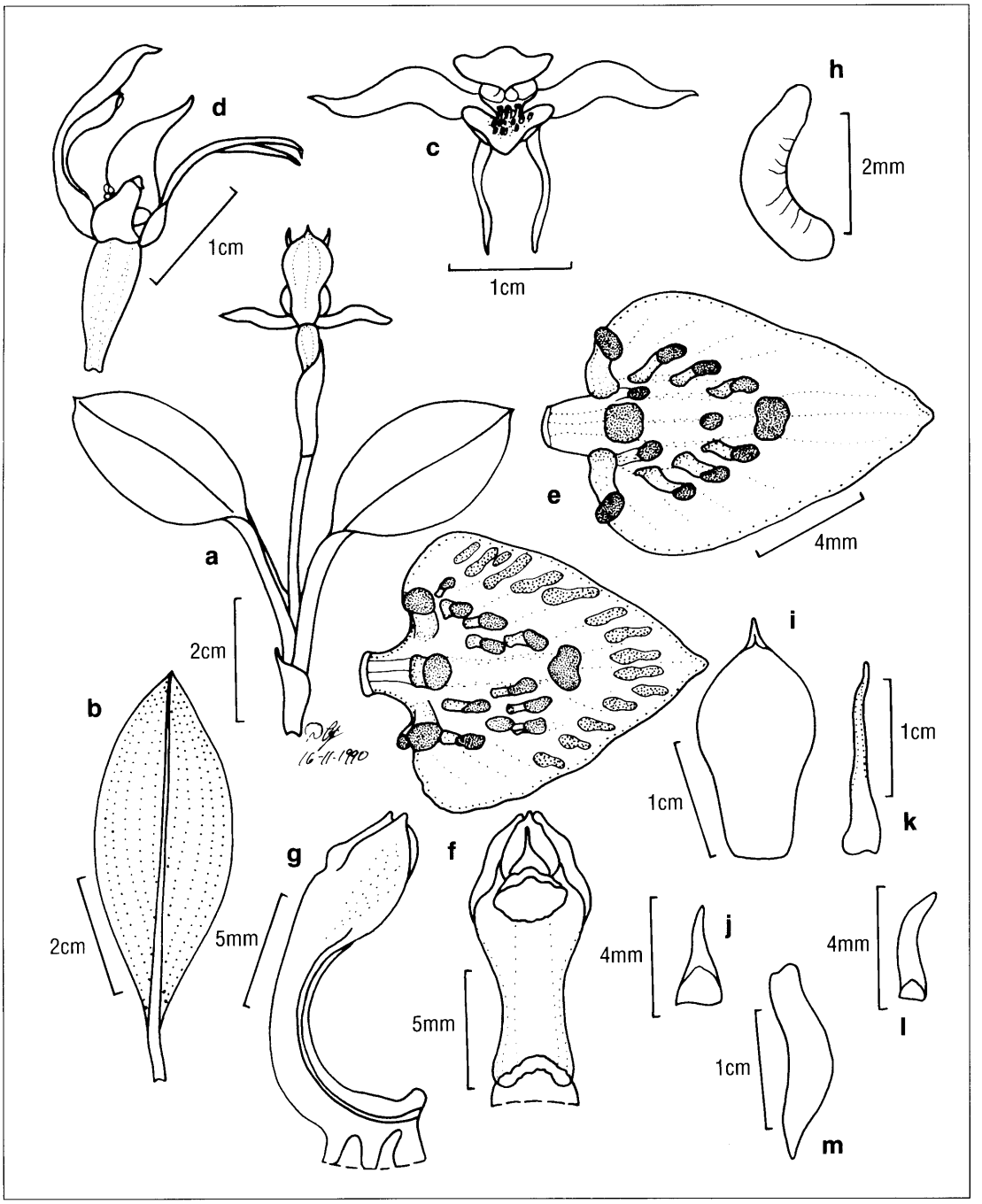


Fig. 3.1

Chiloglottis grammata

Fern Tree, Tasmania.

D.L. Jones 7215 & C.H. Broers.

a. plant; b. leaf; c. flower from front; d. flower from side; e. two labella from above; f. column from front; g. column from side; h. pollinium; i. dorsal sepal; j. osmophore of dorsal sepal; k. lateral sepal; l. osmophore of lateral sepal; m. petal.

Drawing 16/11/1990 by D.L. Jones.©

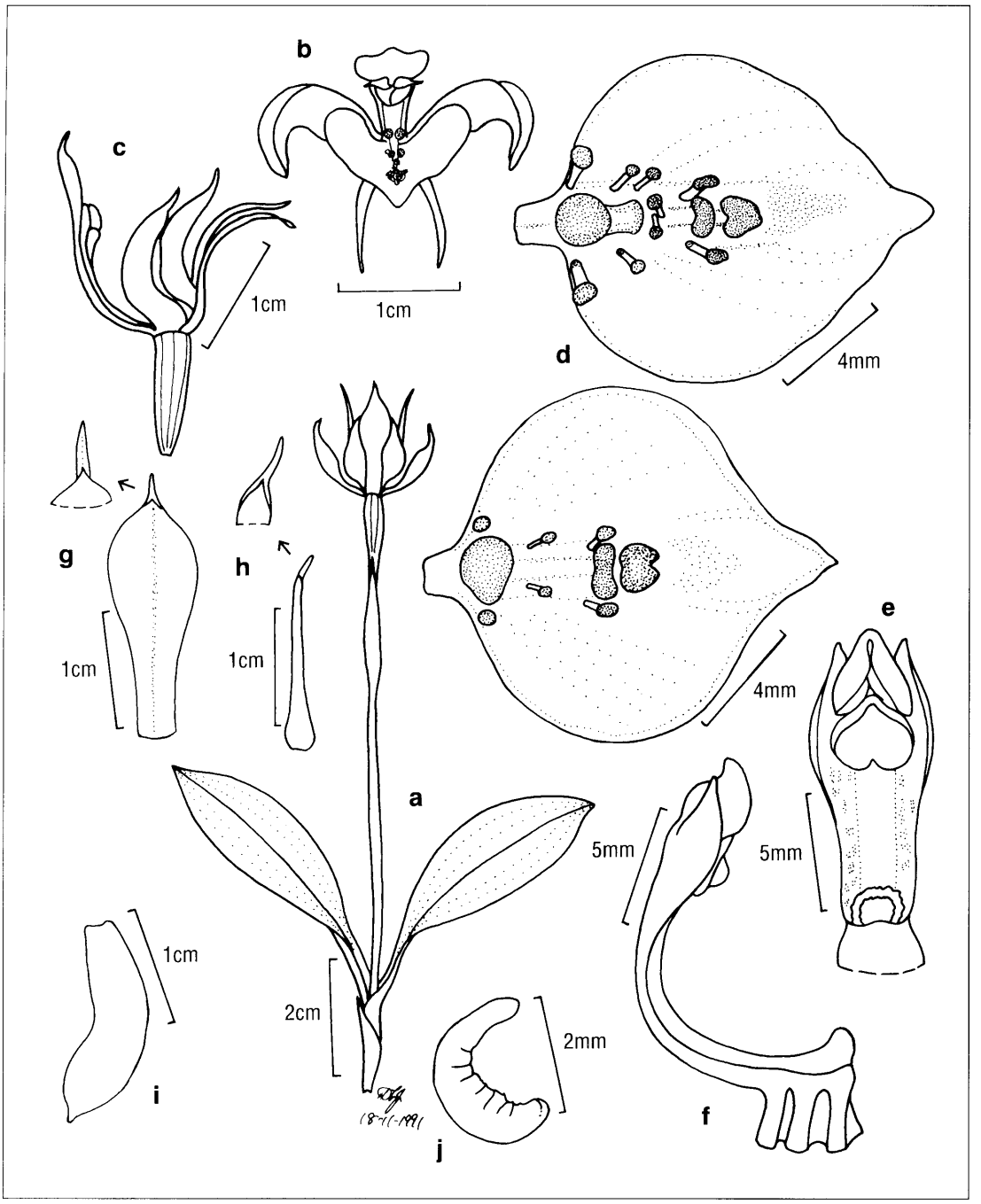


Fig. 3.2

Chiloglottis gunnii

west of Smithton, Tasmania.

D.L. Jones 6992 & C.H. Broers.

a. plant; b. flower from front; c. flower from side; d. two labella from above; e. column from front; f. column from side; g. dorsal sepal and terminal osmophore; h. lateral sepal and terminal osmophore; i. petal; j. pollinium.

Drawing 18/11/1991 by D.L. Jones.©

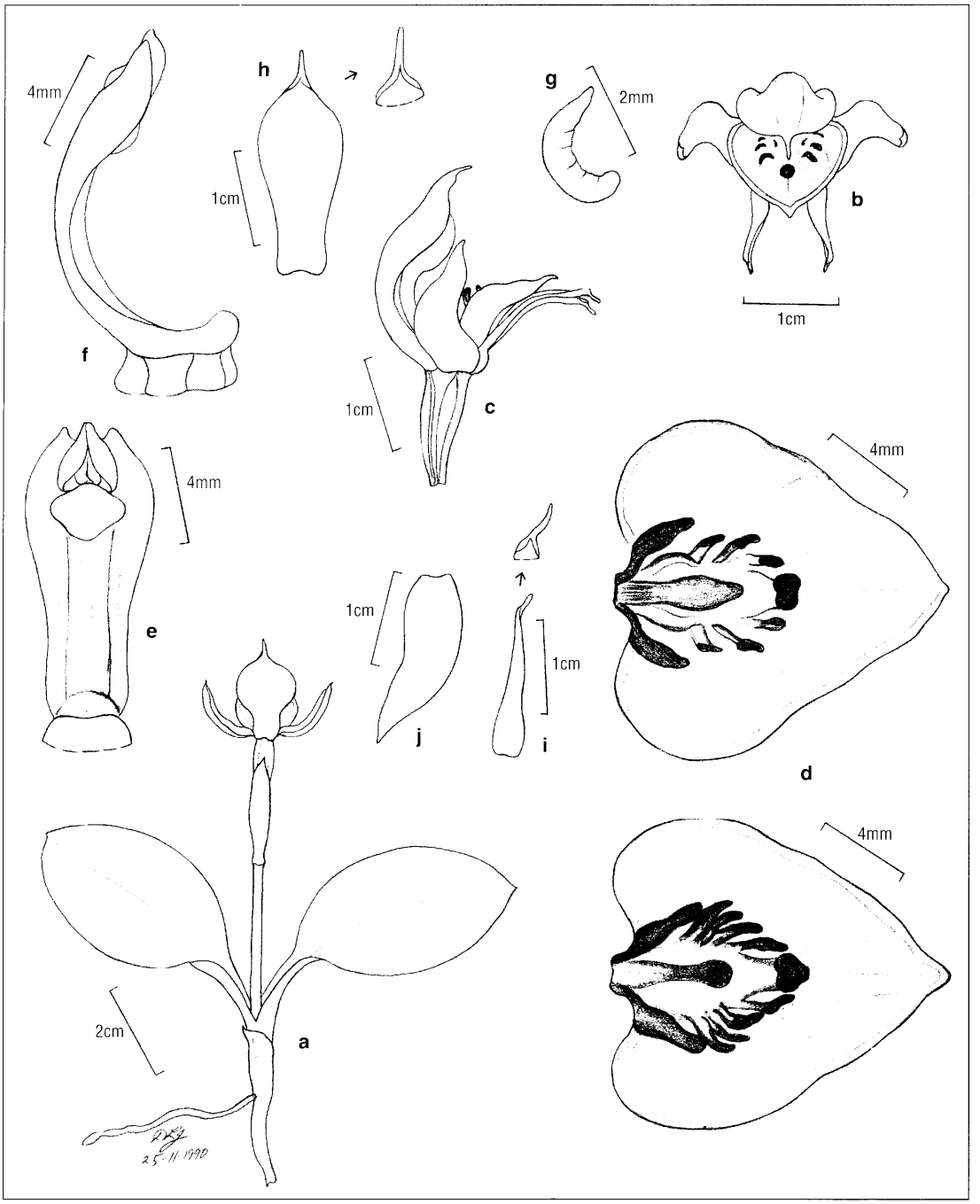


Fig. 3.3

Chiloglottis triceratops

Launceston, Tasmania.

D.L. Jones 7053 & C.H. Broers.

a. plant; b. flower from front; c. flower from side; d. two labella from above; e. column from front; f. column from side; g. pollinium; h. dorsal sepal and terminal osmophore; i. lateral sepal and terminal osmophore; j. petal.

Drawing 25/11/1990 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 4:

A Taxonomic Review Of *Diuris* Smith In Tasmania

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

Diuris is reviewed for Tasmania. *Diuris lanceolata* Lindl., is found to be a Tasmanian endemic and *D. chryseopsis* D.L. Jones, *D. monticola* D.L. Jones and *D. orientis* D.L. Jones are described as new.

INTRODUCTION

With the exception of *Diuris fryana* Ridley, which is from Timor, the genus *Diuris* Smith is essentially endemic to Australia. These orchids are geophytes which can grow as scattered individuals reproducing solely from seed or they exhibit degrees of vegetative increase, occurring either in clonal colonies or in localised tufts of several individuals. They exhibit a preference for open mesic or semi-mesic habitats which are often grassy, with various species being distributed from coastal lowlands to subalpine regions.

All species of *Diuris* are entomophilous and are pollinated by various species of native bees. A significant group within the genus mimics sympatric species of Fabaceae (Beardsell *et al* (1986), and other pollination systems also operate within the genus (see for example Coleman 1932, 1933, 1933a). Natural introgression is common between some species, especially where plants are growing on disturbed sites (Jones 1970a, Beardsell 1975).

With their colourful flowers of very distinctive floral morphology, members of this genus are difficult to confuse with any other. Identification of individual species however, can be much more difficult due to floral variation and other complicating factors which have been noted elsewhere (Jones 1970, 1991). In particular the difficulties encountered with floral colour variation and morphological variation, which is much greater than exists in other orchid genera, should not be underestimated. For these reasons the identification of species should be made on a population basis rather than on individual specimens.

Diuris has been under study for some years resulting in the description of new taxa (Jones 1991, Jones 1994). Many undescribed species remain within the genus and a revision is in preparation. Field studies in south-eastern Australia have revealed a number of problem taxa some of which also occur in Tasmania. The opportunity is taken here to reduce some of the confusion surrounding *D. lanceolata* Lindl. and to describe a new species in the *D. corymbosa* Lindl. complex.

Curtis (1979) details seven species of *Diuris* and Buchanan (1995) lists six. In this account one confused species, *D. lanceolata,* is interpreted correctly and characterised and three species are described as new, resulting in seven species being recognised from Tasmania, but in a different combination to that of Curtis.

MATERIALS AND METHODS

As for paper 1 in this series.

TAXONOMIC TREATMENT

Diuris

Diuris Smith, *Trans. Linn. Soc. London* 4: 222 (1798).
Type species: *Diuris aurea* Smith.

Tuberous terrestrial *herbs*, sympodial. *Roots* filamentous, short, irregular. *Tubers* linear, ovoid-globose, forked or palmate, fleshy; replacement tubers formed on the end of very short droppers; daughter tubers absent or formed similarly to replacement tubers. *Leaves* basal, much longer than wide, one to ten per shoot, distichous or spiral, conduplicate, sessile. *Inflorescence* racemose, one-several-flowered, terminal. *Flowers* resupinate, colourful. *Dorsal sepal* free, hooding the column, much broader and much shorter than the lateral sepals. *Lateral sepals* free, narrow, projecting beneath the labellum. *Petals* free, distinctly clawed, with a rounded to ovate lamina. *Labellum* free, attached directly to the column base; *lamina* deeply three-lobed, the base with one or two longitudinal keels. *Column* short, with stamen and style almost completely free; *column wings* almost completely free. *Column foot* absent. *Anther* erect, persistent, parallel to the axis of the filament. *Pollinia* two, white, soft and mealy, united by an apical viscidium. *Stigma* entire. *Rostellum* apical.

A genus of c. 40 species, all but one endemic to Australia, the other in Timor. Seven species occur in Tasmania.

Key to *Diuris* in Tasmania.

1. Petals spreading horizontally or incurved; labellum lateral lobes with irregularly toothed margins, the lobes much less than half the length of the mid-lobe; callus ridges densely pubescent **2**
   Petals obliquely erect or recurved; lateral lobes of the labellum with entire or minutely toothed margins, the lobes more than half the length of the mid-lobe; callus ridges glabrous **4**

2. Flowers pale yellow; petal lamina narrowly ovate-lanceolate, much longer than wide (flowering Aug.-Oct.). ..... ***1. D. chryseopsis***
   Flowers usually bright yellow to orange; petal lamina ovate, about as wide as long (flowering Nov.-Jan.) **3**

3. Flowers 25-40 mm across, bright golden yellow to orange (lowland, near-coastal species) ..... ***2. D. lanceolata***
   Flowers 15-28 mm across, usually bright yellow (montane to subalpine species) ..... ***3. D. monticola***

4. Labellum base with two callus ridges **5**
   Labellum base with a single callus ridge **6**
5. Leaves six to ten, erect; lateral sepals much longer than the petals ..... ***5. D. palustris***
   Leaves one to three, lax; lateral sepals and petals of similar length ..... ***6. D. pardina***

6. Flowers bright yellow; dorsal sepal with two large blackish blotches; labellum lateral lobes half as long as the mid-lobe ..... ***7. D. sulphurea***
   Flowers yellow, suffused throughout with brown and purple-brown markings; labellum lateral lobes nearly as long as the mid-lobe ..... ***4. D. orientis***

1. *Diuris chryseopsis* D.L. Jones, sp. nov., *D. lanceolatae* Lindl. affinis, sed florescentia vernali (Aug.-Oct.); floribus modice parvis (c. 18-27 mm latis), pallide citrinis; sepalo dorsali ovato-lanceolato, proportione angusto (ad 15 x 8 mm), et labelli lobis lateralibus parvis (ad 3.5 x 2 mm) margine antico irregulari, differt.

TYPUS: Tasmania, Symmons Plains Raceway, front paddock, 17 Oct. 1994, *D.L. Jones 13571 & B.E. Jones* (holo CANB 9410210; iso HO, MEL, NSW).

Illustration: Page 177, Backhouse & Jeanes (1995) - as *D. lanceolata*.

Tuberous terrestrial *herb* growing singly or in tufts of up to c. five plants. *Leaves* basal, semi-erect in a loose tuft, three to nine, narrowly linear, 5-15 cm long, 2-3.5 mm wide, green; base sheathing; apex acute. *Scape* 10-30 cm tall, slender, green to brownish, one-four-flowered. *Sterile bracts* closely sheathing, two, narrowly ovate-lanceolate, 40-80 mm long, 7-10 mm wide, acute to acuminate; basal bract sometimes extended and leaf-like. *Fertile bracts* closely sheathing to spreading, narrowly ovate-lanceolate, 30-50 mm long, 4-6 mm wide, acute to acuminate. *Pedicels* 20-50 mm long, very slender. *Ovaries* obovoid, 6-10 mm long, 2-4 mm wide. *Flowers* porrect, 17-30 mm across, light lemon yellow with dark striae on the base of the dorsal sepal, labellum and the lateral sepals; lateral sepals brownish green. *Dorsal sepal* porrect in the proximal third then obliquely erect, ovate-lanceolate, 10-15 mm long, 4-8 mm wide; apex obtuse to subacute or apiculate. *Lateral sepals* obliquely deflexed, narrowly linear-oblanceolate to ensiform, 15-25 mm long, 2-3.5 mm wide, parallel; margins involute; apex asymmetrically acute to acuminate. *Petals* spreading horizontally, widely divergent; lamina narrowly ovate-lanceolate to narrowly elliptic-lanceolate, 8-20 mm long, 3.5-7 mm wide; apex subobtuse to acute; claw 3-5 mm long, blackish, widest near the apex, tapered to the base. *Labellum* 14-20 mm long, porrect to obliquely decurved, deeply three-lobed; lateral lobes narrowly oblong to narrowly oblong-cuneate, 2-3.5 mm long, 1-2 mm wide, divergent, erect; outer margins shallowly and irregularly lobed, papillate; mid-lobe ovate-lanceolate to ovate-cordate, 9-16 mm long, 7-12 mm wide, flat apart from a shallow central longitudinal ridge; margins entire; apex subobtuse to apiculate. *Labellum callus* consisting of two densely papillate-hirsute rounded ridges, usually darker yellow than the lamina, well-developed on the labellum base and on the basal part of the mid-lobe, extending as a single narrow ridge most of the length of the mid-lobe. *Column* porrect from the end of the ovary, 3.5-4 mm long, 2.8-3 mm wide. *Column wings* oblong-lanceolate, c. 4 mm long, c. 1.5 mm wide. *Anther* ovate, c. 2.5 mm long, c. 2.2 mm wide, brown. *Pollinarium* c. 2.6 mm long, c. 2 mm wide; *viscidium* elliptic, c. 1 mm long; *pollinia* clavate, 2.5 mm long, white, mealy. *Stigma* cordate, c. 3 mm long, c. 2.5 mm wide. *Capsules* obovoid, 15-18 mm long, 4-6 mm wide, ribbed, the ribs often reddish to brown.
Fig. 4.1.

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows on moist sites in grassland, open forest and woodland. Soils are sands, sandy loams and shallow clay loams. Altitude: 0-800 m. Flowering period: August to October.

Notes: This species is characterised by spring flowering habit (August to October); moderately small, (c. 17-30 mm across) light lemon yellow flowers; ovate-lanceolate, proportionately narrow (to 15 x 8 mm) dorsal sepal; and, small (to 3.5 x 2 mm) labellum lateral lobes with irregular outer margins.

This species has had a very confused history. Prior to 1989 it was well known as *D. pedunculata* R. Br., however the correct identity of that species was established by Clements (1989) after examination of the type. From the same study Clements concluded that *D. lanceolata* Lindl. was the name to be applied to the species described as new here.

In 1990 I examined specimens of a late-flowering taxon on the west coast of Tasmania which was distinct from all species known to me at the time. Subsequent examination of Gunn's collections of *D. lanceolata* at QVM and HO, all flowering in November or December, showed these to be the same as the west coast species and its identity was confirmed by examination of a photograph of the type. Thus *D. lanceolata*, a

restricted Tasmanian endemic, has been misinterpreted as the widespread species described here as new. Lindley (1840) provided a significant clue to the correct identity of *D. lanceolata* when he noted that *D. lanceolata* had flowers about "four times larger than *D. pedunculata*".

Conservation status: Widely distributed, common and well conserved in National Parks and other reserves.

Etymology: From the Greek *chrys*, *chryso*, golden, *ses*, *seos*, moth, and *opsis*, resemblance, in reference to the appearance of the flowers; one common vernacular for this species is "golden moth orchid".

Selected specimens: (c. 60 seen):
NEW SOUTH WALES: Sofala Cemetery, 24 Sept. 1990, *Jones 6603* (CANB); Bookham, 27 Sept. 1992, *Jones 10189* (CANB);
VICTORIA: Chiltern State Forest, 17 Sept. 1990, *Jones 6503* (CANB); Lake Fyans Reserve, 18 Sept. 1990, *Jones 6533* (CANB); Deep Lead Reserve, 18 Sept. 1990, *Jones 6540* (CANB);
TASMANIA: S. of Seal Lagoon, Bay of Fires, 21 Sept. 1985, *Collier 693* (HO); Rocka Rivulet, SW. of Tooms Lake, 15 Oct. 1989, *Collier 4346* (HO); Ridgeway, 21 Oct. 1928, *Giblin* (HO); Tasman Arch, 23 Oct. 1929, *Giblin* (HO); Breadalbane, 21 Oct. 1991, *Morris 86453* (HO); 2 km SE. of St Marys, 27 Sept. 1987, *Rubenach* (HO).

2. *Diuris lanceolata* Lindl., *Gen. sp. orchid. pl*. 508 (1840).
D. pedunculata R. Br. var. *lanceolata* (Lindl.) Domin., *Bibl. Bot.* 20: 546 (1915).
TYPE: Tasmania, Circular Head, Nov. 1837, *R. Gunn 934* (holo K-L, photo!; iso BM, FI, K, L, P, SING).
Diuris pedunculata auct. non R. Br.: R.D. Fitzgerald, *Austral. Orch.* 1(7): t.3 (1882).

Tuberous terrestrial *herb*. *Tubers* linear-oblong to obovoid, 15-25 mm long, 7-10 mm wide, fleshy, brown. *Leaves* basal, semi-erect in a loose tuft, two to four, narrowly linear, 5-18 cm long, 1-3 mm wide, green; base sheathing; apex acute. *Scape* 6-25 cm tall, slender to moderately stout, one-three-flowered. *Sterile bracts* two, narrowly ovate-lanceolate, acute to acuminate, closely sheathing; lowest bract sometimes extended and leaf-like. *Fertile bracts* narrowly ovate-lanceolate, 2-5 cm long, 5-6 mm wide, acute to acuminate, closely sheathing. *Pedicels* 5-25 mm long, very slender. *Ovaries* obovoid, 4-8 mm long, 2-4 mm wide. *Flowers* porrect, c. 25-40 mm across, bright golden yellow to orange-yellow with a few short dark striae on the labellum and base of the dorsal sepal. *Dorsal sepal* porrect in the proximal third then obliquely erect, ovate, 9-17 mm long, 7-13 mm wide; apex obtuse to subacute or apiculate. *Lateral sepals* obliquely deflexed, narrowly linear-oblanceolate to ensiform, 15-25 mm long, 2-3 mm wide, parallel; margins involute; apex asymmetrically acute to acuminate. *Petals* spreading horizontally, widely divergent; lamina ovate-lanceolate, 10-18 mm long, 5-8.5 mm wide; apex obtuse to subacute; claw 3-6 mm long, green, widest near the apex, tapered to the base. *Labellum* 14-22 mm long, obliquely decurved, deeply three-lobed; lateral lobes erect, oblong-cuneate, 3-5.5 mm long, 2-3 mm wide; outer margins deeply and irregularly erose; mid-lobe ovate to broadly ovate, 10-15 mm long, 8.5-13 mm wide, flat apart from a shallow central longitudinal ridge; margins entire; apex acute to subobtuse. *Labellum callus* densely papillate-hirsute, well-developed on the labellum base and on the basal part of the mid-lobe, then narrowed and tapered, extending halfway along the mid-lobe. *Column* porrect from the end of the ovary, 4-4.5 mm long, 2.8-3.3 mm wide. *Column wings* more or less lanceolate, c. 4 mm long, c. 1.8 mm wide, irregularly lobed. *Anther* ovate, c. 3 mm long, c. 2.6 mm wide, dark brown. *Pollinarium* c. 3 mm long, c. 2.5 mm wide; *viscidium* elliptic, c. 1 mm ,long; *pollinia* clavate, c. 2.8 mm long, white, mealy. *Stigma* cordate, c. 2 mm long, c. 2.5 mm wide. *Capsule* not seen. **Fig. 4.2.**

Distribution and ecology: Endemic to Tasmania where known with certainty only from recent collections in the north-west; one locality is on the north coast and the other on the west coast. Grows in moist to wet grassland, on rock outcrops and in heathland and coastal scrub in sand and sandy loam. Altitude: c. 0-50 m. Flowering period: November to January.

Notes: This species is characterised by late

spring/early summer flowering habit (November to January); moderately large (c. 25-40 mm across), deep golden yellow to orange yellow flowers; ovate, proportionately broad (to 17 x 13 mm) dorsal sepal with a short basal portion; and, large (to 5.5 x 3 mm) labellum lateral lobes with deeply erose outer margins.

Diuris lanceolata has similarities with both *D. chryseopsis* and *D. behrii*. The latter species, which does not occur in Tasmania, is much more robust (plants to 50 cm tall), with larger flowers (to 50 mm across) which commonly have prominent bold stripes over much of the dorsal sepal and labellum. *Diuris chryseopsis*, described as new in this paper, is the species which has been commonly misinterpreted as *D. lanceolata* over recent years. Another new species, *D. monticola*, from montane and subalpine regions, also has similarities.

Conservation status: Reduced to rarity by clearing of its habitat; suggest 2KE by the criteria of Briggs and Leigh 1996.

Specimens examined:
TASMANIA: Marshy ground behind sandhills, Circular Head, 10 Dec. 1837, *Gunn* (HO); Anthony Beach, 12 Dec. 1996, *Hyatt* (CANB); Rebecca Ck, 5 Nov. 1990, *D.L.Jones 7038 & C.H.Broers* (AD, CANB, HO, MEL, NSW); marsh sandhills, Circular Head, 20 Nov. 1837, *Smith* (QVM).

3. *Diuris monticola* D.L. Jones, sp. nov.,
D. chryseopsis D.L. Jones affinis, sed florescentia vernali sera ad aestivali; floribus flavis clarioris; sepalo dorsali ovato, proportione lato (ad 12 x 9 mm); sepalis lateralibus obovatis ad oblanceolatis; petalorum lamina late ovata ad ovato-elliptica; et labelli lobo mediano ovato late ovato, differt.

TYPUS: New South Wales, c. 3 km along Tantangara Dam Rd, SW. of Adaminaby, 3 Dec. 1988, *D.L. Jones 3439* (holo CANB 8807102; iso HO, MEL, NSW).

Tuberous terrestrial *herb* growing singly or in tufts of up to c. ten plants. *Leaves* basal, semi-erect in a loose tuft, five to nine, narrowly linear, 5-20 cm long, 3-5 mm wide, green; base sheathing; apex acute. *Scape* 15-35 cm tall, slender, green to brownish, one-four-flowered. *Sterile bracts* closely sheathing, two, narrowly ovate-lanceolate, 40-90 mm long, 7-10 mm wide, acute to acuminate; basal bract sometimes extended and leaf-like. *Fertile bracts* closely sheathing, narrowly ovate-lanceolate, 20-40 mm long, 4-6 mm wide, acute to acuminate. *Pedicels* 20-50 mm long, very slender. *Ovaries* obovoid, 6-10 mm long, 2-4 mm wide. *Flowers* porrect, 15-28 mm across, pale yellow to bright yellow with dark striae on the base of the dorsal sepal and lateral sepals; lateral sepals brownish green. *Dorsal sepal* porrect in the proximal third then obliquely erect, ovate, 9-12 mm long, 7-9 mm wide; apex obtuse to subacute or apiculate. *Lateral sepals* obliquely deflexed, oblanceolate to obovate, 15-25 mm long, 2.5-4.5 mm wide, parallel; margins involute; apex asymmetrically acute to acuminate. *Petals* spreading horizontally, widely divergent; lamina ovate to ovate-elliptic, 7-13 mm long, 4-9 mm wide; apex obtuse to subobtuse; claw 3-5.5 mm long, blackish, widest near the apex, tapered to the base. *Labellum* 12-17 mm long, porrect to obliquely decurved, deeply three-lobed; lateral lobes linear to narrowly oblong-cuneate, 2-3.5 mm long, 1-2 mm wide, divergent, erect; outer margins shallowly and irregularly lobed, papillate; mid-lobe ovate to broadly ovate, 7-13 mm long, 6-12 mm wide, flat apart from a shallow central longitudinal ridge; margins entire; apex obtuse. *Labellum callus* consisting of two densely papillate-hirsute ridges, sometimes irregularly folded towards the apex, usually darker yellow than the lamina, well-developed on the labellum base and on the basal part of the mid-lobe, extending midway along the mid-lobe as a shallow ridge. *Column* porrect from the end of the ovary, 3.5-4 mm long, 2.5-3 mm wide. *Column wings* oblong-lanceolate, c. 3 mm long, c. 1 mm wide. *Anther* ovate, c. 2 mm long, c. 2 mm wide, brown. *Pollinarium* c. 2.3 mm long, c. 2 mm wide; *viscidium* elliptic, c. 1 mm long; *pollinia* clavate, 2 mm long, white, mealy. *Stigma* cordate-deltate, c. 2.5 mm long, c. 2.8 mm wide. *Capsules* obovoid, 12-16 mm long, 4-6 mm wide, ribbed, the ribs often reddish. **Fig. 4.3.**

Distribution and ecology: Southern New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in montane grassland, montane forest and woodland, particularly snow gum woodland, and especially in subalpine meadows and on the

margins of subalpine bogs and streams. Soils are moist clay loams, peaty loams and fibrous peats. Altitude: 800-1800 m. Flowering period: November to January.

Notes: This species is characterised by late spring and summer flowering habit (November to January); moderately small, (c. 15-28 mm across) pale yellow to bright yellow flowers; ovate, proportionately broad (to 12 x 9 mm) dorsal sepal; obovate to oblanceolate lateral sepals; ovate to ovate-elliptic petal laminae; and, ovate to broadly ovate labellum mid-lobe.

This species shares many features with *D. chryseopsis* but is differentiated by the characters detailed above. Some overlap may occur in the flowering period in regions where both species are sympatric.

Conservation status: Widely distributed, common and well conserved in National Parks and other reserves.

Etymology: From the Latin *mons*, mountain, and *cola*, dweller, in reference to the montane habitat.

Selected specimens: (20 seen):
NEW SOUTH WALES: Tinderry Mtns, 9 Dec. 1990, *Clements* 7383 (CANB); c. 10 km E. of Cathcart, 3 Dec. 1994, *Jones 13744 & Jones* (CANB); Upper Tuross R., 14 Dec. 1995, *Makinson 444* (CANB);
VICTORIA: The Stockyards, Wulgulmerang, 18 Dec. 1990, *Branwhite* (CANB);
TASMANIA: Great Lake, 2 Dec. 1992, *Buchanan 12676* (HO 410132); Middlesex Plains, 12 Dec. 1949, *Garner* (QVM); Gingers Hill, 30 Dec. 1984, *Moscal 9138* (HO 404065); Cradle Mt Reserve, 4 Jan. 1937, *Olsen* (HO 94773); Surrey Hills, 25 Dec. 1949, *Somerset* (QVM).

4. *Diuris orientis* D.L. Jones, sp. nov.,
D. corymbosae Lindl. affinis, sed floribus rufo-brunneis vel pallide purpureo-brunneis suffusis; petalorum ungue brevi (3-6 mm longo), lamina late ovata ad late elliptica, late obtusa; et labelli lobo mediano cuneato, ad apicem aequaliter dilatato, differt.

TYPUS: Tasmania, Beauty Point, 11 Oct. 1994, *D.L. Jones 13512, B.E. Jones & J. Campbell* (holo CANB; iso AD, HO, MEL, NSW).
D. longifolia auct non R. Br.: W.M. Curtis, *The Student's Flora of Tasmania* 4A: 36 (1979).
D. corymbosa auct non Lindl.: T.J. Entwisle, *Flora of Victoria,* vol. 2: 862 (1994).

Illustration: Page 173, Backhouse & Jeanes (1995) - as *D. corymbosa*.

Tuberous terrestrial *herb* growing singly or in loose groups. *Leaves* basal, semi-erect to lax, conduplicate, one to three, linear to linear-lanceolate, 10-30 cm long, 5-10 mm wide, green; base sheathing; apex acute. *Scape* 8-40 cm tall, slender, green, one-six-flowered. *Sterile bracts* closely sheathing, one or two, narrowly lanceolate, 20-80 mm long, 7-10 mm wide, acute to acuminate; basal bract sometimes extended and leaf-like. *Fertile bracts* closely sheathing, narrowly lanceolate, 15-40 mm long, 3-6 mm wide, acute to acuminate. *Pedicels* 5-30 mm long, very slender. *Ovaries* obovoid, 3-7 mm long, 2-4 mm wide. *Flowers* porrect, 30-50 mm across, yellow with reddish brown or light purplish brown suffusions and markings, occasionally wholly yellow; dorsal side of petal laminae usually with a yellow medial stripe; lateral sepals green to brownish green. *Dorsal sepal* porrect in the proximal third then erect, transversely ovate, 9-15 mm long, 9-15 mm wide; apex acute to apiculate. *Lateral sepals* obliquely deflexed, parallel, incurved, or crossed, narrowly oblong to oblanceolate, 12-22 mm long, 3-4 mm wide; margins involute; apex asymmetrically acute to obtuse. *Petals* obliquely erect to erect; lamina ovate to broadly ovate or broadly elliptic, 12-20 mm long, 8-11 mm wide; apex broadly obtuse; claw 3-6 mm long, blackish, widest near the apex, tapered to the base. *Labellum* 10-14 mm long, obliquely decurved, especially distally, three-lobed; lateral lobes asymmetrically oblong to narrowly oblong-cuneate, 7-11 mm long, 3-5 mm wide, widely divergent; outer margins entire; mid-lobe cuneate, 9-13 mm long, 6-8 mm wide; margins entire, recurved; apex emarginate. *Labellum callus* consisting of a single, narrow yellow ridge, smooth, confined to the basal third of the lamina. *Column* porrect from the end of the ovary, 4-4.5 mm long, 3.5-4 mm wide. *Column wings* obovate-lanceolate, c. 4.5 mm long, c. 1.8 mm wide; margins irregularly erose. *Anther* narrowly ovate, c. 4 mm long, c. 2.5 mm wide, reddish brown. *Pollinarium* c. 3.5 mm long, c. 2 mm wide; *viscidium* elliptic, c. 1 mm long; *pollinia* clavate, 3.5 mm long, white, mealy. *Stigma* cordate to quadrate, c. 3.5 mm long, c.

2.5 mm wide. *Capsules* obovoid, 15-20 mm long, 6-8 mm wide, ribbed. **Fig. 4.4.**

Distribution and ecology: Extreme south-eastern New South Wales, Victoria, Tasmania and South Australia. Grows in grassy open forest, heathy forest, heathland and woodland. Soils are sands, sandy loams and shallow clay loams. Altitude: 0-200 m. Flowering period: September to November.

Notes: This species is characterised by the floral colour which consists of a yellow base with suffusions of red brown or light purple brown; short (3-6 mm) petal claws; broadly ovate to broadly elliptic petal laminae which are broadly obtuse apically; labellum with the lateral lobes nearly as long as the mid-lobe; labellum mid-lobe cuneate, evenly widened to the apex; and, a single callus ridge.

Diuris orientis has been commonly confused with *D. corymbosa* Lindl. which is endemic to Western Australia. The latter species can be distinguished by heavy dark purple to dark purple brown floral suffusions; longer (5-9 mm) petal claws; narrowly elliptic to elliptic petal laminae with subacute apices; and, the labellum mid-lobe cuneate but suddenly expanded to a lunate-reniform apex. Several undescribed species occur in the *D. corymbosa* complex in Western Australia. Flowering in *D. orientis* is dramatically promoted by summer fires.

Conservation status: Widespread, common and well conserved.

Etymology: From the Latin *oriens*, *orientis*, east; this species is the most easterly distributed member of the *D. corymbosa* complex.

Selected specimens: (c. 150 seen):
NEW SOUTH WALES: 1 km W. of Wonboyn, 6 Oct. 1981, *Clements 2355* (CANB); Nadgee Nature reserve, 22 Sept. 1997, *Parris* (CANB).
VICTORIA: Bladin Quarries, Lysterfield, 24 Sept. 1965, *Jones* (MEL 645027); Macedon, Oct. 1932, *Lyell* (MEL 574453); Mirranatwa Gap, Grampians, 13 Oct. 1974, *Muir 5368* (MEL 1542171); Daylesford, Hepburn, Nov. 1933, *Nicholls* (MEL 649356); Churchill Natl. Park, 8 Oct. 1985, *Paget* (MEL 1539811); Creswick, 9 Nov. 1929, *Willis* (MEL 577637).
TASMANIA: Lulworth, 23 Sept. 1989, *Cameron* (QVM); Greens Beach, 9 Oct. 1946, *Campbell* (QVM); Mt Strzelecki Tk, 19 Oct. 1985, *Collier 889* (HO); Safety Cove, S. of Port Arthur, 5 Oct. 1986, *Collier 1704* (HO); Anthony Beach, near Smithton, 6 Nov. 1990, *Jones 7044* (CANB); Rebecca Ck, 14 Oct. 1994, *Jones 13551* (CANB); Circular Head Bluff, 10 Oct.1837, *Smith*(QVM);
SOUTH AUSTRALIA: Cape Jervis, Sept. 1948, *Brown* (AD); Belair, Oct. 1903, *Errey* (AD); Coromandel Valley, 20 Sept. 1932, *Goldsack* (AD); Stirling, 1 Oct. 1950, *Green* (AD); Port Elliot, 1894, *Hussey* (MEL 1542360); 3-Chain Rd, Kangaroo Island, 7 Sept. 1994, *Jones 13277 & Jones* (CANB).

5. *Diuris palustris* Lindl., *Gen. sp. orch. pl.* 507 (1840).
TYPE: Tasmania, Circular Head, Dec. 1837, *R. Gunn 933* (holo K-L, photo!; iso BM!, FI, HO!, K, P).

Illustration: Page 181, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in grassland, grassy woodlands, *Callitris* woodlands, mallee shrublands and heathland, often in moist situations, in sands, sandy loams and shallow clay loams. Altitude: 0-400 m. Flowering period: August to November.

Notes: A very distinctive species which is characterised by an erect tuft of three to ten narrow, twisted leaves; small (to 20 mm across) semi-nodding, fragrant flowers which are pale yellow heavily blotched with brown; proportionately long labellum lateral lobes; and, long lateral sepals.

Selected specimens: (15 seen):
TASMANIA: Eaglehawk Neck, Nov. 1922, *Atkinson* (QVM); Lulworth, 23 Sept. 1982, *Cameron & Gee* (QVM); Petal Point, 22 Sept. 1987, *Campbell* (QVM); Launceston, 9 Oct. 1843, *Gunn* (QVM); Semaphore Hill, Cape Portland, 3 Oct. 1983, *Moscal 3058* (HO); Lenah Valley, 22 Oct. 1939, *Robey* (HO); Mt Nelson, Nov. 1895, *Rodway* (HO); Glenorchy, Oct. 1918, *Rodway* (HO); Marsh Sandhills, 11 Dec. 1837, *Smith* (QVM).

6. *Diuris pardina* Lindl., *Gen. sp. orchid. pl.* 507 (1840).
TYPE: Nov. Holland meridional, Bugle Range [Mount Lofty Ranges], Oct., *ex herb. F. Mueller* (lecto K-L, *fide* Clements 1989, photo!; isolecto FI).
D. maculata auct non Smith: W.M. Curtis, *The Student's Flora of Tasmania* 4A: 34 (1979).

Illustration: Page 182, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, woodland and heathy forest in sandy loam, shallow clay loams and stony loams. Altitude: 10-500 m. Flowering period: August to November.

Notes: This species has been commonly confused with *D. maculata*, which does not occur in Tasmania. *Diuris pardina* is characterised by yellow flowers which are heavily spotted and blotched with dark red-brown markings and broad lateral lobes on the labellum.

Selected specimens: (18 seen):
TASMANIA: N. slope, Devils Backbone, 3 Nov. 1984, *Buchanan 3873* (HO); Knopwood Hill, Howrah, 11 Sept. 1988, *Collier 3332* (HO); East Bagdad Rd, 22 Oct. 1988, *Collier 3656* (HO); Rocky Rivulet, SW. Tooms Lake, 15 Oct. 1989, *Collier 4300* (HO); Cambridge, 20 Sept. 1931, *Long* (HO); St Marys, Oct. 1929, *Rees* (HO); Rosetta, 4 Oct. 1958, *Thompson* (HO).

7. *Diuris sulphurea* R. Br., *Prodr.* 316 (1810).
TYPE: Moist meadows towards Georges River, Oct. 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, E, K).
Diuris oculata F. Muell. ex Lindl., *Linnaea* 26: 241 (1854).
TYPE: Austr. felix, ad ripam graminosam coll. flurii Yarra, Oct. 1852, *F. Mueller* (holo K-L; iso MEL!), *nom. illeg.*
Diuris sulphurea forma *immaculata* Gand., *Bull. Soc. Bot. France* 47: 307 (1900).
TYPE: Tasmania, Winton, *Spicer* (holo LY).
Diuris sulphurea forma *tasmanica* Gand., *Bull. Soc. Bot. France* 47: 307 (1900).
TYPES: Tasmania, Launceston, *R. Gunn 932* (syn LY; isosyn K-L).
Diuris latifolia Rupp, *Contr. New South Wales Natl. Herb.* 1: 318 (1951)
TYPE: Baerami, via Denman, N.S.W., Oct. 1949, *R.D. Crockett* (holo NSW!).

Illustration: Page 184, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in open forests, woodlands, heathy forest, grasslands, coastal scrubs and heathland in sands, sandy loams, stoney loams, gravelly loams, shallow clay loams and well-structured clay loams. Altitude: 0-1500 m. Flowering period: October to December.

Notes: A very distinctive species which is characterised by bright yellow flowers; obliquely erect dorsal sepal with two prominent dark blackish brown blotches on the base; labellum mid-lobe much longer than the lateral lobes; and, the labellum callus consisting of a single ridge.

Selected specimens: (34 seen):
TASMANIA: near Red Gate, Bellerive, 8 Nov. 1931, *Atkinson* (HO 94803); Mt Amos, 7 Nov. 1981, *Buchanan 597* (HO47983); Aspley R., 2 Nov. 1985, *Collier 924* (HO); Royal George, 14 Nov. 1988, *Collier 3808* (HO); Jubilee Ra., Dec. 1928, *Giblin* (HO94805); Georgetown, 3 Dec. 1841, *Gunn* (HO94843); The Domain, 3 Nov. 1934, *Hickman* (HO94799); Orford, Oct. 1932, *Hood* (HO94840); Oakden Hill, 8 Nov. 1984, *Moscal 8806* (HO92126).

EXCLUDED TAXA

Diuris corymbosa Lindl. in *Edwards's Bot. Reg.* 1-23: *Swan Riv. Append.* li (1840);
D. longifolia var. *corymbosa* (Lindl.) Domin, *J. Proc. Linn. Soc., Bot.* 41: 249 (1912).
TYPE: Swan River, 1839, *J. Drummond*, (lecto K-L, *fide* George 1971, photo!; isolecto K).

Notes: Endemic to south-western Western Australia. See entry for *D. orientis*.

Diuris flavopurpurea Messmer, in Rupp, *Orchids New South Wales, Suppl.* 141 (1943).
TYPE: Mount Victoria, October 1943, *P.R. Messmer* (holo NSW!).

Notes: A synonym of *D. platichila* Fitzg. which is endemic to New South Wales. Tasmanian specimens referred to this species are *D. pardina*.

Diuris longifolia R. Br., *Prodr.* 316 (1810).
TYPE: King Georges Sound, west coast of New Holland, *A. Menzies 7* (lecto specimen a BM, *fide* Clements 1989, photo!).

Notes: Endemic to south-western Western Australia.

Diuris maculata Smith, *Exotic Bot.* 1: 57, t. 30 (1804-05).
TYPE: Port Jackson, *J. White in herb. J.E. Smith 1393.2* (holo LINN, photo!; iso LIV).

Notes: Endemic to central New South Wales. Tasmanian specimens referred to this species are *D. pardina.*

Diuris* x *palachila R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 31: 209-210 (1907).
TYPE: Blackwood, South Australia, 13 Sept. 1907, *R.S. Rogers* (lecto AD!, *fide* Clements 1989).

Notes: This taxon, from South Australia and Victoria, is a natural hybrid between *D. pardina* and *D. behrii* Schldl. A similar, but not identical, natural hybrid occurs in Tasmania originating between *D. pardina* and *D. chryseopsis*.

Diuris pedunculata R. Br., *Prodr.* 316 (1810).
TYPE: Near Sydney, towards Hawkesbury, Port Jackson, Sept.-Oct.
1803, *R. Brown* (lecto specimen a BM, *fide* Clements 1989, photo!).
Diuris pallens Benth., *Fl. Austral.* 6: 329 (1873).

TYPE: New England, Oct., *C. Stuart 1059* (holo K; iso MEL!).

Notes: Endemic to New South Wales. Tasmanian specimens referred to this species may be either *D. lanceolata, D. monticola* or *D. chryseopsis*.

ACKNOWLEDGEMENTS

As for paper 1 in this series.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Beardsell, D.V. (1975). Remnants of a *Diuris* series at Warrandyte, *Victorian Naturalist* 92: 244-246.
- Beardsell, D.V., Clements, M.A., Hutchison, J.F., & Williams, E.G. (1986). Pollination of *Diuris maculata* R. Br. (Orchidaceae) by floral mimicry of the native legumes *Daviesia* spp. and *Pultenaea scabra* R. Br., *Aust. J. Bot.* 34: 165-173.
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Coleman, E. (1932). Pollination of *Diuris pedunculata* R. Br., *Victorian Naturalist* 49: 179-186.
- Coleman, E. (1933). Further notes on the pollination of *Diuris pedunculata* R. Br., *Victorian Naturalist* 49: 243-245.
- Coleman, E. (1933a). Pollination of *Diuris sulphurea* R. Br., *Victorian Naturalist* 50: 3-8.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*. (Government Printer, Hobart).
- George, A.S. (1971). A Checklist of the Orchids of Western Australia. *Nuytsia* 1(2): 166-196.
- Jones, D.L. (1970). Some thoughts on the taxonomy of the genus *Diuris*, *The Orchadian* 3: 119-120.
- Jones, D.L. (1970a). *Diuris* X *palachila* - a natural hybrid, *The Orchadian* 3(9): 104-106.
- Jones, D.L. (1991). New Taxa of Australian Orchidaceae, *Australian Orchid Research* 2: 1-108.
- Jones, D.L. (1994). New species of Orchidaceae from south-eastern Australia, *Muelleria* 8(2): 177-192.
- Lindley, J. (1840). *The Genera and Species of Orchidaceous Plants*, p. 508, Ridgways, Piccadilly, London.

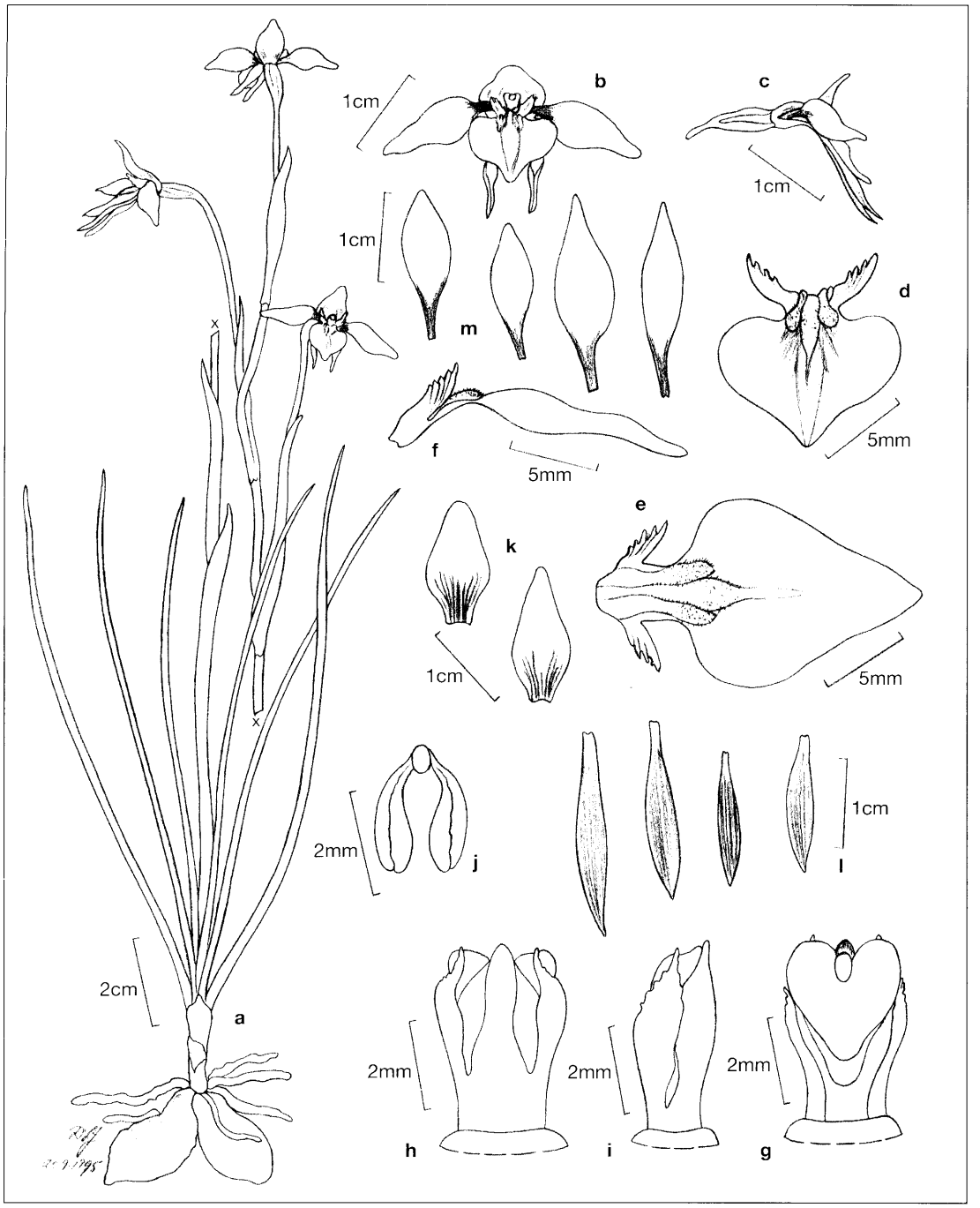


Fig. 4.1

Diuris chryseopsis

Symmons Plains Raceway, Tasmania.

D.L. Jones 13571 & B.E. Jones; from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from front; e. labellum from above, flattened out; f. labellum from side; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. two dorsal sepals; l. four lateral sepals; m. four petals.

Drawing 20/9/1995 by D.L. Jones.©

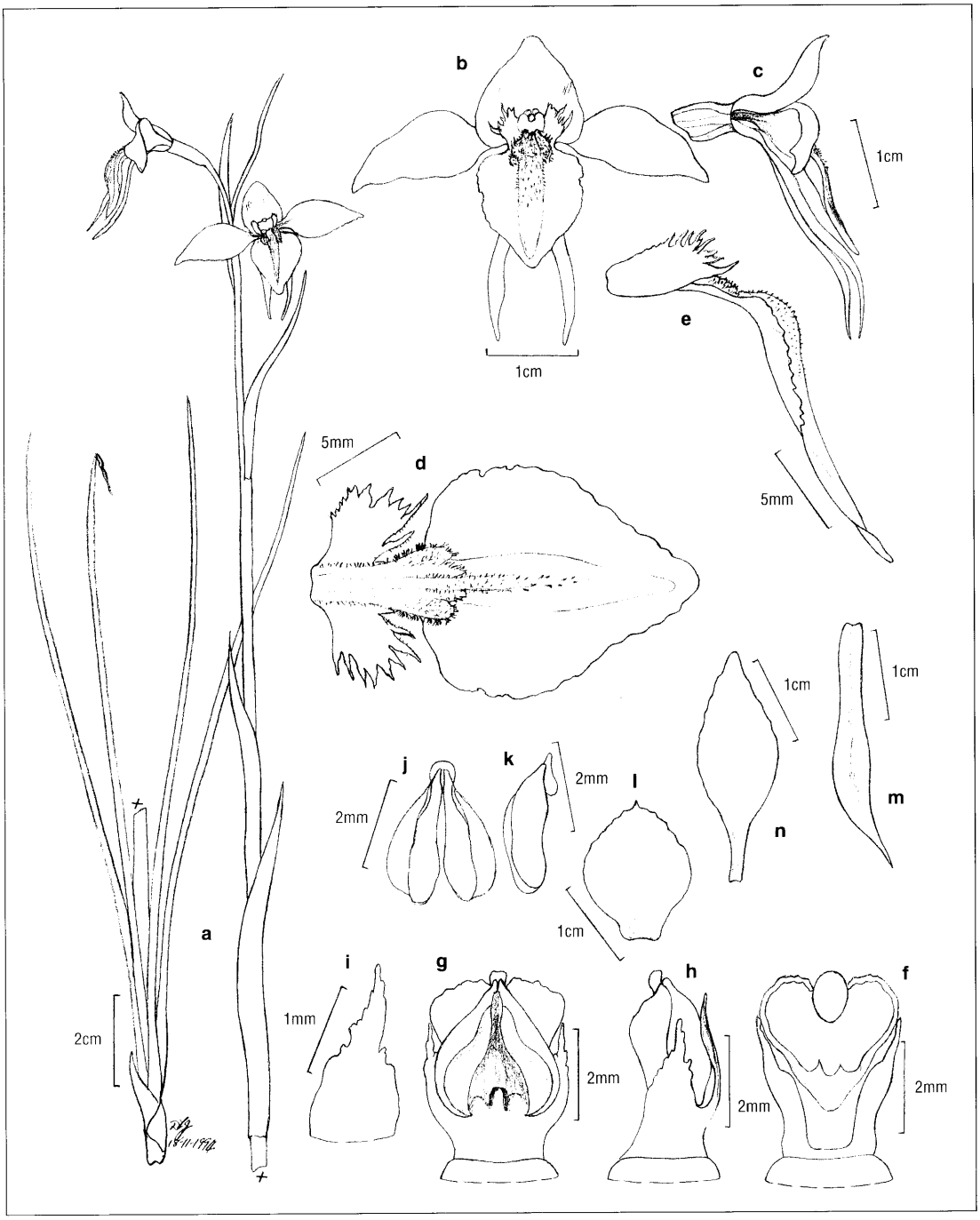


Fig. 4.2

Diuris lanceolata

Rebecca Creek, Tasmania.

D.L.Jones 7038 & C.H.Broers.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. column from front; g. column from rear; h. column from side; i. column appendage; j. pollinarium, front view; k. pollinarium from side; l. dorsal sepal; m. lateral sepal; n. petal.

Drawing 18/11/1994 by D.L. Jones.©

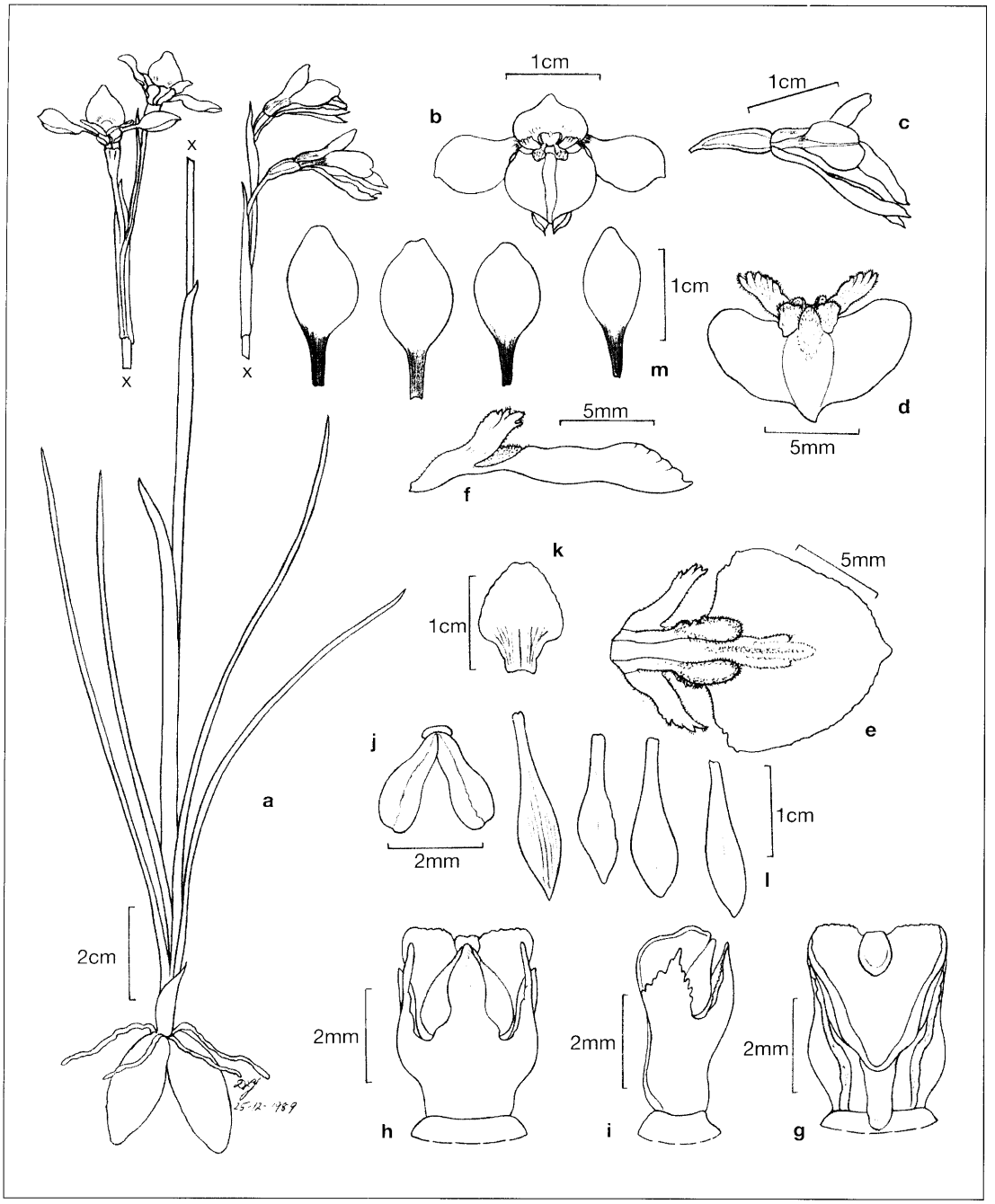


Fig. 4.3

Diuris monticola

near Guthega turn-off, Snowy Mountains, New South Wales.

D.L. Jones.

a. plant with flowers from the side and front; b. flower from front; c. flower from side; d. labellum from front; e. labellum from above, flattened out; f. labellum from side; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. four lateral sepals; m. four petals.

Drawing 25/12/1989 by D.L. Jones.©

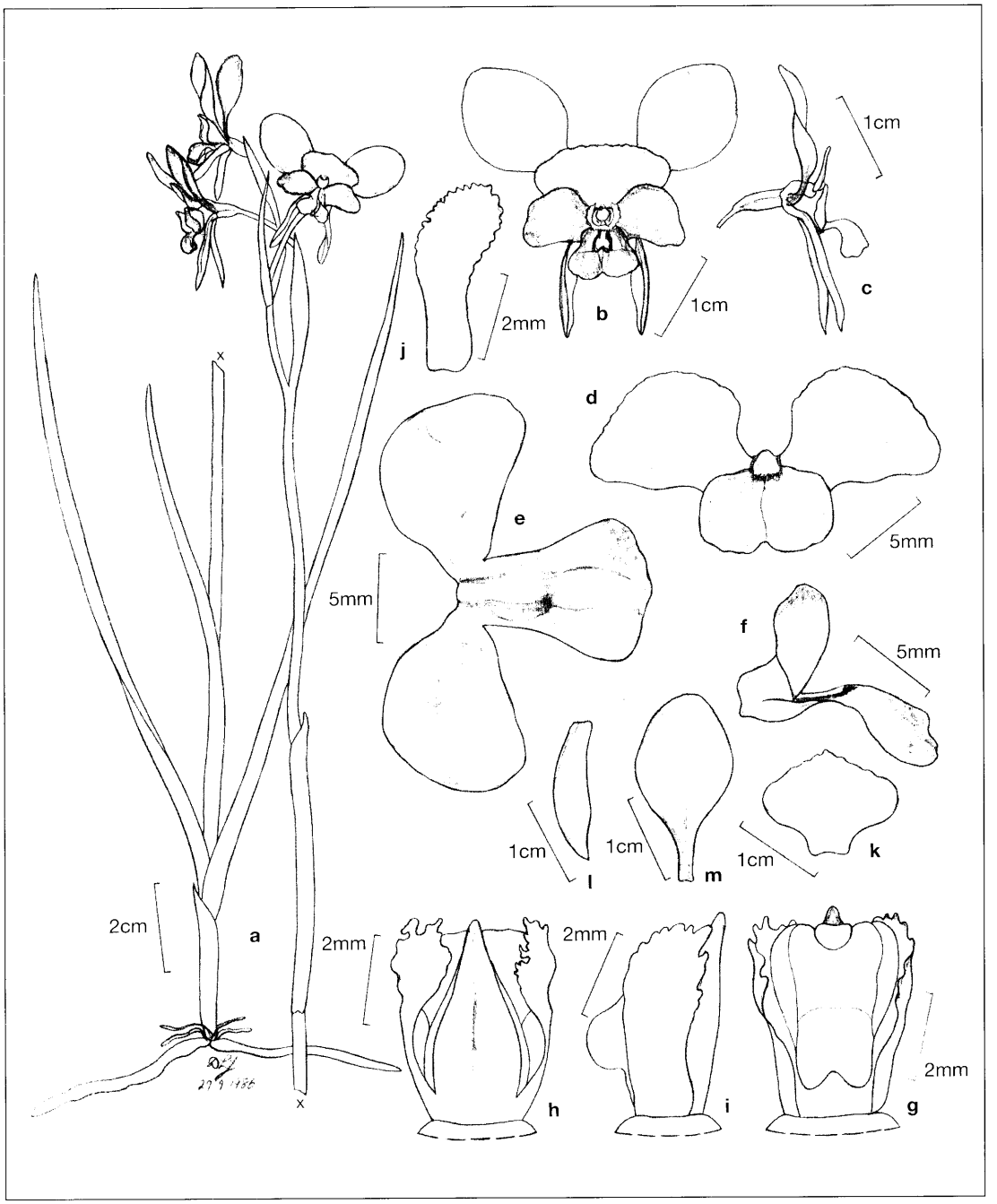


Fig. 4.4

Diuris orientis

Badger Head Road, Tasmania.

H. Ronken.

a. plant; b. flower from front; c. flower from side; d. labellum from front; e. labellum from above, flattened out; f. labellum from side; g. column from front; h. column from rear; i. column from side; j. column appendage; k. dorsal sepal; l. lateral sepal; m. petal.

Drawing 29/9/1986 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 5:

A Taxonomic Review Of *Genoplesium* R.Br. In Tasmania

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

Genoplesium is reviewed for Tasmania. *Genoplesium tasmanicum* D.L. Jones is described as new and a new combination in *Genoplesium* is made for *Prasophyllum firthii* L. Cady. A key to the nine species of *Genoplesium* in Tasmania is provided.

INTRODUCTION

Genoplesium R. Br. is a genus of slender geophytes which are endemic to Australia, New Zealand and New Caledonia. Reproduction in these orchids is solely from seed. The plants occur singly or in scattered groups and are sometimes locally common. Most species grow in mesic situations but a few extend into semi-arid regions. Altitudinally they range from near sea level to subalpine regions.

Many species of *Genoplesium* are autogamous whereas others are entomogamous and are pollinated by tiny drosophiloid flies. In the latter group the flowers release fruity perfumes to attract the pollinating vectors.

Genoplesium was recently reinterpreted and expanded to include a number of small-flowered species formerly included in *Prasophyllum* (Jones & Clements 1989). This change affected nine species that were detailed by Curtis (1979) under *Prasophyllum*. Field work and morphological studies have further clarified problem groups on the mainland and resulted in the description of new taxa (Jones 1991). Problems still remain in the complex of taxa surrounding *G. rufum* (R. Br.) D.L. Jones & M.A. Clem, one of which is addressed in this paper.

Buchanan (1995) lists eight species of *Genoplesium*, including *G. rufum* which is now known to be restricted to mainland Australia. The Tasmanian species which was confused with *G. rufum* is described here as new and a new combination is made for *G. firthii*.

MATERIALS AND METHODS

As for paper 1 in this series.

TAXONOMIC TREATMENT

Genoplesium

Genoplesium R. Br., Prodr. 319 (1810).
Type species: *Genoplesium baueri* R. Br.

Tuberous terrestrial *herbs*, sympodial. *Roots* short, filamentous, irregular. *Tubers* ovoid-globose, fleshy, partly covered by a multi-layered fibrous tunic which extends to the soil surface, replacement

tubers produced on the end of short droppers, daughter tubers absent. *Leaves* basal, one per shoot, cylindrical, completely fused to the scape so that both elongate together, the apical part free. *Inflorescence* racemose or spicate, multi-flowered. *Flowers* non-resupinate, dull-coloured, often with a fruity fragrance. *Dorsal sepal* free, cucullate, concave, margins entire or ciliate, with or without an apical gland. *Lateral sepals* free, often basally gibbous, divergent, with or without an apical gland. *Petals* free, smaller than the sepals, the margins entire or ciliate. *Labellum* free, attached to the apex of the column foot by a short flexible claw so that it is mobile, in some species the attachment is so balanced that the labellum is tremulous in a breeze; lamina entire, not-lobed, the margins entire, irregularly serrulate, glandular or ciliate. *Callus* often covering most of the lamina, raised, fleshy, often colluviate, often centrally channelled. *Column* lacking free filament and style, short; column wings lateral, fused basally to column, distally free, entire or deeply lobed, the anterior lobe developed more than the posterior lobe, this lobe often coloured and with short trichomes. *Anther* erect, with a long, filiform rostrum. *Pollinarium* consisting of four pollinia, an apical hamulus and a terminal viscidium; pollinia clavate, in two unequal pairs, sectile. *Stigma* entire sunken. *Rostellum* ventral. *Capsule* obovoid, erect, ribbed.

A genus of c. 45 species, one endemic to New Caledonia, two in New Zealand, both of which extend to Australia and the rest endemic to Australia. Nine species occur in Tasmania.

Key to *Genoplesium* in Tasmania.

1. Labellum margins fringed with long, dark cilia **2**
Labellum margins entire or with tiny cilia or irregularities **3**

2. Petals and dorsal sepal lacking cilia; labellum broadly elliptical ..... **1. *G. archeri***
Petals and dorsal sepal fringed with long, dark cilia; labellum narrowly oblong lanceolate ..... **5. *G. morrisii***

3. Labellum narrowly lanceolate, apex acuminate ..... **3. *G. despectans***
Labellum ovate to elliptical, apex obtuse or shortly acute **4**

4. Flowers wholly bright green to yellow green, sometimes flushed with red at the base ..... **8. *G. pumilum***
Flowers reddish, dark purple or brownish purple, sometimes greenish towards the base **5**

5. Flowers small, strongly cernuous; sepals <3 mm long; labellum margins with minute cilia or irregularities **6**
Flowers large, partly cernuous; sepals >4 mm long; labellum margins entire or slightly irregular **7**

6. Plants to 25 cm tall; flowers up to 20 ..... **7. *G. nudum***
Plants to 10 cm tall; flowers up to 6 ..... **4. *G. firthii***

7. Free leaf lamina projecting through the flower spike; flowers crowded, in a short spike ..... **6. *G. nudiscapum***
Free leaf lamina ending well below the inflorescence; flowers not crowded, in a moderately long spike **8**

8. Labellum gently curved, apex not sharply recurved; apical sepalline gland absent or vestigial; flowers 1-12 ..... **2. *G. brachystachyum***

Labellum apex sharply recurved; lateral sepals usually with a prominent, globose apical gland; flowers 5-25. ..... **9. *G. tasmanicum***

1. *Genoplesium archeri* (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989);
Prasophyllum archeri Hook. f., *Fl. Tasman.* 2: 14, t. 113, f. B (1858).
TYPE: Light soil near Cheshunt, *W. Archer* (holo K!; iso K!, K-L, NSW!).
Prasophyllum intricatum Benth., *Fl. Austral.* 6: 346 (1873).
TYPE: Southport, *C. Stuart*, (lecto specimen a, K!, *fide* Jones & Clements 1989)

Illustration: Fig. a, plate 159, Nicholls (1969).

Distribution and ecology: New South Wales, Victoria and Tasmania. Grows in shallow moss gardens over rock sheets, open forest, coastal scrub, heath and among rushes and sedges on swamp margins. Soils are moist sands, sandy loams and clay loams. Altitude: 0-200 m. Flowering period: December to April.

Notes: This species is characterised by widely opening cernuous purple flowers; non-ciliate petals; and, an ovate-oblong labellum with ciliate margins.

The flowers of this species are usually entogamous however plants from south-western Tasmania have autogamous flowers.

Specimens examined:
TASMANIA: Slope E. of Pursells Plain, 26 Jan. 1990, *Buchanan 11670* (HO 121118); Latana, 18 Jan. 1948, *Burrows* (QVM); Lefroy Rd, 27 Jan. 1986, *Cameron* (QVM); Arthur R., 11 Dec. 1990, *Campbell* (CANB); Rocky Cape, 9 Dec. 1996, *Hyatt (ORG 474)*; Smithton, Dec. 1951, *King* (QVM); near Fingal, 6 Jan. 1985, *Rubenach* (QVM); c. 1 km N. of Fingal, 5 Feb. 1989, *Rubenach* (HO 116585); c. 2 km N. of Coles Bay, 8 Jan. 1989, *Rubenach* (HO 112879); Coles Bay, near Old Tin Mine, *Ronken* (QVM); E. slope, Red Point Hills, 30 Jan. 1985, *Tyson* (HO 93942); Blackmans Bay, 12 Dec. 1995, *Wapstra (Jones 14697)* (CANB).

2. *Genoplesium brachystachyum* (Lindl.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989);
Prasophyllum brachystachyum Lindl., *Gen. sp. orchid. pl.* 513 (1840).
TYPE: Tasmania, Rocky Cape & Circular Head, Dec. 1837 & Feb. 1838, *R. Gunn 930* (lecto specimen a, K-L, *fide* Clements 1983, photo!; isolecto K!, MEL!, NSW!, P).

Illustration: Plate 154, Nicholls (1969).

Distribution and ecology: Endemic to northern Tasmania. Grows among low shrubs in near-coastal rocky areas. Soils are sandy and gravelly loams. Altitude: 0-20 m. Flowering period: February to April.

Notes: This species is characterised by few-flowered (1 - 12) inflorescence; light green to brownish green glabrous flowers with reddish petals; non-gibbous porrect to erect, usually obtuse, lateral sepals lacking an apical gland (sometimes a stalk present); and, a narrowly elliptic green to dark red labellum with irregular margins.

Specimens examined:
TASMANIA: Lighthouse Rd, Rocky Cape, 20 Mar. 1988, *Cameron & Campbell* (QVM); Rocky Cape, 20 Mar.1991, *Cameron* (QVM) ;*ibid*, 30 Mar. 1993, *Jones 11504 & Jones* (CANB).

3. *Genoplesium despectans* (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989);
Prasophyllum despectans Hook.f., *Fl. Tasman.* 2: 13, t. 113, f. A (1858).
TYPE: Sandy soil near Hobarton, Sept. *J.D. Hooker* (lecto specimen a, K!, *fide* Jones & Clements 1989).

Synonymy: See Jones & Clements (1989).

Illustration: Page 195, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales (south from the Wollongong region), Victoria, Tasmania and South Australia. Grows in open forests, coastal scrubs and heath. Soils are sandy loams, shallow clay loams, gravelly loams and stony, skeletal loams. Altitude: 10-300 m. Flowering period: February to April.

Notes: This species is characterised by the cernuous dark coloured glabrous flowers and acuminate apices on the tepals and labellum.

Specimens examined: TASMANIA: Glenorchy Reservoir, Hobart, July 1915, *Atkinson* (QVM); near Tasmania Ck, Storys Ck, 24 Mar. 1985, *Cameron* (QVM); Bridport, 11 Jan. 1986, *Cameron* (QVM); Fingal, Mathinna Rd, 6 Feb. 1986, *Cameron* (QVM).

4. *Genoplesium firthii* (L. Cady) D.L. Jones, **comb. nov.**

BASIONYM: *Prasophyllum firthii* L. Cady, *The Orchadian* 4(1): 8, f.9, A-K (1971).
TYPE: Friendly Beach Rd, Bicheno, Tasmania, 15 Jan. 1968, *J. Firth & B. Alford* (holo NSW!; iso *herb. Cady no. 2719!*).

Genoplesium brachystachyum auct. non Lindl.; D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989).

Illustration: Plate 219, page 424 (Curtis 1978), as *Prasophyllum firthii*.

Distribution and ecology: Endemic in eastern Tasmania. Grows in low coastal scrub and open forest with a heathy understorey. Altitude: 0-20 m. Flowering period: December to March.

Notes: *Prasophyllum firthii* was treated as a synonym of *Genoplesium brachystachyum* (Jones & Clements 1989), but further studies show that the two are distinct. *Genoplesium firthii* is characterised by small stature (to 10 cm tall); few-flowered (one to six) inflorescence; small flowers (dorsal sepal to 3 mm long; lateral sepals to 4 mm long); labellum oblong to oblong-obovate, thin-textured; column wings deeply bifid.

This species is very rare and of localised distribution.

Specimen examined:
TASMANIA: Coles Bay, 27 Feb. 1989, *Williamson* (CANB).

5. *Genoplesium morrisii* (Nicholls) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 143 (1989);
Prasophyllum morrisii Nicholls, Victorian Naturalist 48: 108, 111, f. d-g,i,j,n,o,r,s. (1931).
TYPES: Victoria, Springvale-Clayton, Mt Waverley, Ringwood-Bayswater, Lockwood, Oakleigh-Cheltenham, Cravensville, Dec.-May, *A.B. Braine*, Monbulk, Dec.-May, *D. Matthews*, Ballarat North, Dec.-May, *W.H. Nicholls*, Aireys Inlet, Dec.-May, *M. Sutherland*, Wonderland Range, Grampians, Dec.-May, *C.W. D'Alton* (syn MEL!).

Illustration: Page 197, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria and Tasmania. Grows in open forest, woodland, coastal scrubs and heath. Soils are sands, sandy loams, peaty sand, shallow clay loams and gravelly loams. Altitude: 0-200 m. Flowering period: January to April.

Notes: This species is characterised by large purple flowers; long cilia fringing the dorsal sepal, petals and labellum; and, an ovate-lanceolate labellum.

Specimens examined:
TASMANIA: Lefroy Rd, 27 Jan. 1986, *Cameron* (QVM); Coles Bay, 15 Feb. 1986, *Cameron* (QVM); Lune River Rd, 5 Feb. 1993, *Wapstra (Jones 11291)* (CANB); Horse Paddock, Coles Bay, 5 Mar. 1993, *Wapstra (Jones 11437)* (CANB); Coles Bay, sports ground, 10 Feb. 1986, *Williamson* (QVM); Coles Bay, 7 Feb. 1992, *Williamson (Jones 9010)* (CANB).

6. *Genoplesium nudiscapum* (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 143 (1989);
Prasophyllum nudiscapum Hook. f., *Fl. Tasman.* 2: 13 (1858).
TYPE: Tasmania, hill E. of Mt Wellington, 9 Feb. 1840, *J.D. Hooker* (holo K, photo!).

Synonymy: For full list see Jones & Clements (1989).

Illustration: Page 199, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria and Tasmania. Grows in open forest and woodland, among shrubs and in shallow soils over rock sheets. In Victoria it is mainly found in montane situations. Altitude: 10-1000 m. Flowering period: December to February.

Notes: The occurrence of this species in Tasmania is based solely on the type collection which is in good condition and the identity is unmistakeable. The nearest locality to the Tasmanian one is from the Otway Ranges in southern Victoria. This species needs to be searched for more thoroughly in southern areas of Tasmania, especially the hills around Mt Wellington.

7. *Genoplesium nudum* (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 144 (1989);
Prasophyllum nudum Hook. f., *Fl. nov.-zel.* 1: 242 (1853).
TYPE: New Zealand, Northern Island, Port Nicholson and Taupo Lake, *W. Colenso* (lecto specimen a, K!, *fide* Jones & Clements 1989).

Synonymy: See Jones & Clements (1989).

Illustration: Page 201, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria, Tasmania and New Zealand. Grows in moist grassy areas in wet sclerophyll forest, rainforest margins, swamp margins, buttongrass plains and along streams, less commonly on slopes in open forest; occurs in lowland situations but is often prominent in montane forests. Soils are moist sands, peaty sands, shallow clay loams, stony loams and deep, well-structured basalt loams. Altitude: 10-1000 m. Flowering period: December to February.

Notes: This species is characterised by small cernuous dark reddish flowers and an ovate labellum with minutely ciliate margins.

Specimens examined:
TASMANIA: Bridport, near Brid R., 10 Jan. 1986, *Cameron* (QVM); Bridport, garden of 6 Joseph St, 18 Feb. 1986, *Cameron* (QVM); Lake Crescent, 22 Jan. 1989, *Campbell* (QVM); Cottons Plain, Mt Victoria, 25 Feb. 1997, *Wapstra* (CANB).

8. *Genoplesium pumilum* (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 144 (1989);
Prasophyllum pumilum Hook. f., *Fl. nov.-zel.* 1: 242 (1853).
TYPE: "Northern Island, New Zealand", *Edgerley* (lecto specimen a, K!, *fide* Jones & Clements 1989)
Prasophyllum buftonianum J.H. Willis, *Pap. & Proc. Roy. Soc. Tasmania* 87: 81 (1953).
TYPE: Port Davey (Bathurst Harbour), Tasmania, early 1893, *J. Bufton* (holo MEL!; iso HO!, NSW!).

Synonymy: For full list see Jones & Clements (1989).

Illustration: Page 202, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland (south-east), New South Wales, Victoria, Tasmania and New Zealand. Grows in coastal scrubs, wallum, coastal plains dominated by *Xanthorrhoea hastilis* R. Br., buttongrass moorlands, damp to wet heath and swamp margins. Soils are sands, sandy loams and peaty sands. Altitude: 0-200 m. Flowering period: January to April.

Notes: This species is characterised by dense almost cylindrical spikes; green to yellowish-green glabrous flowers (sometimes with reddish markings); gland-tipped petals; and, an ovate labellum.

Specimens examined:
TASMANIA: Corinna-Savage River Rd, 22 Feb. 1985, *Cameron* (QVM); Lefroy Rd, 19 Feb. 1986, *Cameron* (QVM).

9. *Genoplesium tasmanicum* D.L. Jones, sp. nov.,
G. rufo (R.Br.) D.L. Jones & M.A. Clem. affinis, a qua habitu robustiore, floribus majoribus (ad 4.5 mm longis), viridibus et atro-purpureo-nigris; sepalibus lateralibus porrectis ad semi-nutantibus glande apicali prominenti alba ad flavescenti, et labello ovato-elliptico marginibus integris vel parum irregularibus, differt.

TYPUS: Tasmania, Maranoa Heights, Kingston, 5 Mar. 1997, *J.E. & A. Wapstra (ORG 593)* (holo CANB; iso AD, HO, MEL, NSW).
Prasophyllum nigricans auct. non R. Br.; W.M. Curtis, *The Student's Flora of Tasmania* 4A, 77 (1979), *pro parte.*

Terrestrial tuberous *herb*. *Leaf* terete, 8-18 cm long, c. 0.15 cm wide, green; base reddish; lamina subulate, 15-22 mm long, 1.5-2 mm wide, closely sheathing the scape, ending 5-40 mm below first flower. *Inflorescence* 10-20 cm tall, bearing 3-25 flowers in a moderately crowded spike 10-30 mm long. *Flowers* c. 3.5 mm across, dark purplish-black and green (rarely wholly green with a dark labellum), semi-deflexed. *Floral bracts* ovate-elliptical, c. 2 mm long, c. 2 mm wide, closely sheathing; apex laciniate. *Ovary* linear-obovoid, c. 2 mm long, asymmetrically arcuate. *Dorsal sepal* ovate-lanceolate, 3-3.5 mm long, c. 2 mm wide, concave, cucullate, greenish with darker

marginal bands and three central stripes; margins entire or slightly irregular; apex with a short filiform cauda. *Lateral sepals* linear-lanceolate, 4.5-5 mm long, c. 1.3 mm wide, gibbous and dark purplish at the base, greenish distally, porrect to drooping, nearly parallel to divergent; distal margins involute; apex subacute, usually with a prominent swollen whitish or yellowish globose gland. *Petals* widely spreading, ovate, 2.5-3 mm long, c. 1.3 mm wide, dark purplish, paler towards the base; margins entire; apex long-acuminate. *Labellum* hinged by a short claw, porrect, sharply recurved in the distal quarter. *Lamina* ovate-elliptical, c. 3 mm long, c. 1.5 mm wide, dark purplish-black, fleshy; margins irregular, especially distally; apex acuminate; *callus* occupying about two-thirds the area of the ventral surface of the lamina, extending nearly to the labellum apex, dark purplish-black, thickest and broadest just above the base then tapered to the apex; ventral surface colluviate. *Column* c. 3.5 mm long, c. 2.5 mm wide, reddish purple; foot ligulate, c. 1 mm long, slightly curved. *Column wings* notched in distal third, entire; lobes not divergent; posterior lobe linear-oblong, whitish, obtuse, pale, entire; anterior lobe narrowly linear, dark purplish, acuminate, curved. *Anther* c. 1 mm long, with a filiform rostrum c. 0.3 mm long. *Pollinarium* c. 1 mm long; pollinia c. 0.8 mm long, yellow, coarsely granular; caudicle c. 0.1 mm long; viscidium c. 0.2 mm across. *Stigma* ovate-elliptical, c. 1 mm long, c. 0. 6 mm wide. *Capsule* obovoid, c. 4 mm long, c. 2 mm wide, obliquely erect.
Fig. 5.1.

Distribution and ecology: Endemic to Tasmania where widely distributed in the lowlands. Grows in open forest and heathland in sandy loams or shallow clay loams, usually among herbs, grasses or shrubs. Altitude: 10-250 m. Flowering period: January to April (-June).

Notes: Previously confused with *Genoplesium rufum* but distinguished by its more robust habit, larger, green and dark purplish-black flowers, porrect to semi-nodding lateral sepals which usually have a prominent white to yellowish, globose apical gland and, an ovate-elliptical labellum with entire or slightly irregular margins. *Genoplesium rufum* has reddish flowers with porrect to erect lateral sepals with a small or vestigial apical gland and an obovate labellum, usually with very irregular margins.

Specimens from Greens Beach in northern Tasmania may warrant further study. The flowers are mostly greenish, the sepals have vestigial apical glands and the labellum is ovate-lanceolate and has irregular margins.

Flowering of *G. tasmanicum* is promoted by slashing or burning.

Conservation status: Widespread, locally common and conserved.

Etymology: The Latinisation of Tasmania.

Specimens examined:
TASMANIA: Lindisfarne, Mar. 1927, *Atkinson* (QVM); Prospect, 16 Mar. 1947, *Burrows* (QVM); N. of Priory, Ansons Bay Rd, 25 Jan. 1986, *Cameron* (QVM); Coles Bay, 23 Feb. 1986, *Cameron* (QVM); Avoca, Storys Ck Rd, 4 km from Avoca, 28 Feb. 1986, *Cameron* (QVM); Coles Bay Reserve, 4 Apr. 1993, *Jones 11509 & Jones* (CANB); Melaleuca, Blackmans Bay, June 1927, *Rodway* (HO 66286); Fingal, gravel pit, Mathinna Rd, 11 Feb. 1987, *Campbell* 1987-35 (QVM); 1 km N. of Fingal, 5 Feb. 1989, *Rubenach* (HO 116584); Pioneer, on old mine tailings, 12 Jan. 1986, *Taylor* (QVM); Blackmans Bay, 19 Feb. 1996, *Wapstra* (CANB); Coles Bay, 21 Mar. 1990, *Williamson* (CANB); *ibid,* 23 Mar. 1993, *Williamson* (HO 301004).

EXCLUDED SPECIES

Genoplesium nigricans (R. Br.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 143 (1989).
Prasophyllum nigricans R. Br., *Prodr.* 319 (1810).
TYPE: South Coast Bay, [Port Lincoln], 3 March 1802, R. Brown (lecto specimen a, BM!, *fide* Jones & Clements 1989)
Prasophyllum nigricans auct. non R. Br.; W.M. Curtis, *The Students Flora of Tasmania* 4A, 77 (1979).

Synonymy: See Jones & Clements (1989).

Notes: Occurs in Victoria, South Australia and Western Australia. Absent from Tasmania but in that state apparently confused, at least in part, with *G. tasmanicum*.

Genoplesium rufum (R. Br.) D.L. Jones & M.A.Clem., *Lindleyana* 4(3):144-145 (1989).
Prasophyllum rufum R. Br., *Prodr.* 319 (1810).
TYPE: Port Jackson, "in humidus subumbra fruticum prope Wallomolilla",Mar.-Apr. 1805, *R. Brown* (holo BM!; iso BM).
Prasophyllum rufum auct. non R. Br.; W.M. Curtis, *The Student's Flora of Tasmania* 4A, 78-79 (1979), *pro parte*.

Synonymy: See Jones & Clements (1989).

Notes: Occurs in New South Wales. Although recorded from Tasmania (for example Curtis 1979, Buchanan 1995) a recent study, to be reported elsewhere, shows that this species is restricted to the mainland. The species previously confused with *G. rufum* in Tasmania is described in this treatment as new.

ACKNOWLEDGEMENTS

As for paper 1 in this series.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Clements, M.A. (1983). Notes on the content of John Lindley's orchid herbarium - 2, *The Orchadian* 7(10): 242-245.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Austral. Orch. Res.* 1: 1-160.
- Curtis, W.M. (1978). *The Endemic Flora of Tasmania.* Part vi. (The Ariel Press, London).
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*. (Government Printer, Hobart).
- Jones, D.L. & Clements, M.A. (1989). Reinterpretation of the genus *Genoplesium* R.Br. (Orchidaceae: Prasophyllinae), *Lindleyana* 4(3): 139-145.
- Jones, D.L. (1991). New Taxa of Australian Orchidaceae, *Austral. Orch. Res.* 2: 1-208.
- Nicholls, W.H. (1969). *Orchids of Australia*. (Thomas Nelson, Melbourne).

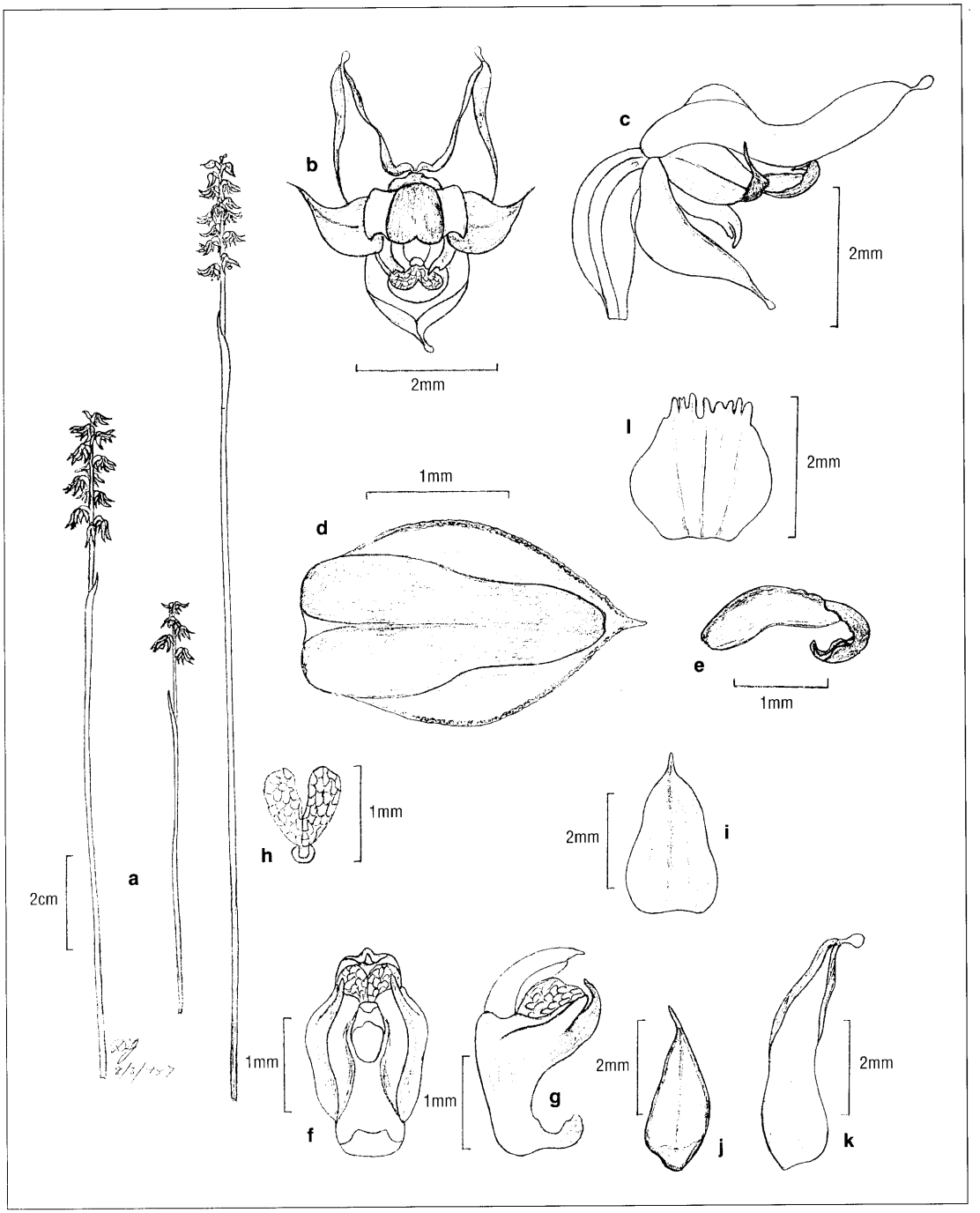


Fig. 5.1

Genoplesium tasmanicum

Fingal, Tasmania.

L. Rubenach.

a. plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. column from front; g. column from side; h. pollinarium; i. dorsal sepal; j. petal; k. lateral sepal; l. floral bract.

Drawing 8/3/1987 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 6:

A Taxonomic Review Of *Prasophyllum* R.Br. In Tasmania

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

This paper clarifies the status of *Prasophyllum* in Tasmania. Thirteen species are described as new: *Prasophyllum alpestre* D.L. Jones, *P. amoenum* D.L. Jones, *P. apoxychilum* D.L. Jones, *P. castaneum* D.L. Jones, *P. favonium* D.L. Jones, *P. incurvum* D.L. Jones, *P. milfordense* D.L. Jones, *P. olidum* D.L. Jones, *P. perangustum* D.L. Jones, *P. pulchellum* D.L. Jones, *P. secutum* D.L. Jones, *P. stellatum* D.L. Jones and *P. tunbridgense* D.L. Jones. Two poorly known species, *P. robustum* (Nicholls) M.A. Clem. & D.L. Jones and *P. truncatum* Lindl. are characterised and fully described. *Prasophyllum correctum* D.L. Jones, *P. montanum* R. Bates & D.L. Jones, *P. pyriforme* E. Coleman and *P. sphacelatum* D.L. Jones are recorded from Tasmania for the first time. A key to the species of *Prasophyllum* in Tasmania is provided.

INTRODUCTION

Prasophyllum R. Br. is taxonomically one of the most complex of the terrestrial orchid genera in Australia and consequently creates considerable difficulties for identification by taxonomists, ecologists and even orchid specialists. Particular difficulties are experienced with the identification of dried herbarium specimens and this in turn often leads to misidentification of fresh material. This process has been particularly pertinent in Tasmania where a significant number of taxa described from mainland localities have been identified as extending their range south over Bass Strait (Curtis 1979).

Field collections by the author in Tasmania, and a regular supply of fresh flowering specimens of *Prasophyllum* species from various localities in Tasmania by a number of field operatives, have considerably clarified the taxonomy of the genus in that state. This account, though by no means final in such a complex genus, makes considerable progress towards resolving the taxonomy of *Prasophyllum* in Tasmania.

Particular attention has been given to the complex of taxa surrounding *P. patens* R. Br. (described 1810), *P. truncatum* Lindl. (1840) and *P. odoratum* R.S. Rogers (1909). All three species share similar characters of a prominent white labellum with crispate/undulate margins and a short, raised callus. It has been a common practice by most modern flora writers to lump all plants having a prominent white labellum under one of these taxa. The chosen species is usually *P. odoratum*, despite it being the last of the three species to be described. After studying the types, herbarium collections and field collections it is clear that *P. patens* and *P. odoratum* do not occur in Tasmania. However, a complex of taxa, including *P. truncatum*, is found in Tasmania. Field studies and examination of fresh specimens have shown a number of very distinct entities with diagnostic characters and these are described as new in this paper.

Buchanan (1995) lists 15 species all of which are described, but not correctly interpreted, by Curtis (1979). This study leads to the recognition of 28 species in Tasmania.

MATERIALS AND METHODS

As for paper 1 in this series.

Prasophyllum

Prasophyllum R. Br., Prodr. 317 (1810).
Type species: *Prasophyllum australe* R. Br. (*fide* Clements 1989).

Terrestrial tuberous *herbs*, sympodial. *Roots* filamentous, short, often irregular. *Tubers* rounded, fleshy, partly covered by a fibrous tunic; replacement tubers formed on the end of a dropper near the parent tuber; daughter tubers formed at the end of stolonoid roots in very few species. *Leaf* solitary, basal, one per plant, erect, cylindrical, apetiolate, hollow, free from the scape, apex often withered at anthesis. *Inflorescence* racemose or spicate, terminal, multi-flowered, breaking through a membranous region on the distal part of the leaf. *Flowers* non-resupinate, dull coloured, nectariferous, often fragrant. *Dorsal sepal* free, broader than the lateral sepals. *Lateral sepals* free or connate by their inner margins to form a synsepalum. *Petals* free, porrect to divergent, often a different colour from the sepals. *Labellum* free, rigidly attached directly, or via a short immobile claw, to the column base; lamina entire or obscurely 3-lobed, with entire, crispate, undulate or crenulate margins. *Callus* fleshy, plate-like, usually channelled longitudinally, often with a basal cupulate area, smooth, papillate, wrinkled or ridged. *Column* lacking free filament and style, much reduced; column wings lateral, basally fused to column, distally free, often with a short basal lobe on the dorsal side. *Column foot* absent. *Anther* erect, close to the stigmatic plate, persistent. *Pollinarium* consisting of four pollinia joined to a ligulate hamulus with a terminal viscidium. *Pollinia* elongate, in two pairs, sectile. *Stigma* entire, plate-like. *Rostellum* terminal. *Capsules* obovoid, erect, smooth or ribbed.

A genus of *c.* 80 species distributed in Australia and New Zealand. Twenty-eight species occur in Tasmania.

Key to *Prasophyllum* in Tasmania

1. Ovary narrowly cylindrical to terete; appressed against the rachis, the outer margin of the ovary more or less parallel with the rachis 2
   Ovary ovoid, obovoid or pyriform; outer margin of the ovary angled away from the rhachis 5

2. Labellum reflexed at > 90° 3
   Labellum reflexed at < 90° 4

3. Labellum base saccate; apices of labellum callus glabrous, protruding outwards as prominent extensions ..... 5. ***P. australe***
   Labellum base not saccate; apices of labellum callus minutely papillate, not protruding beyond the lamina ..... 6. ***P. brevilabre***

4. Flowers yellowish-green; lateral sepals curved forwards and hooding the labellum; labellum narrow; with frilly margins ..... 12. ***P. flavum***
   Flowers greenish-mauve to blackish; lateral sepals erect, not hooding the labellum; labellum broad, with undulate margins ..... 10. ***P. elatum***

5. Labellum lamina and margins minutely papillate 6
   Labellum lamina and margins not papillate (although sometimes the callus apex is minutely papillate). 10

6. Labellum with a sigmoid flexure; tepals bright green ..... 14. ***P. lindleyanum***
   Labellum reflexed at right angles near the middle; tepal colouration various 7

7. Labellum purple or reddish ..... 11. ***P. favonium***
   Labellum white or whitish 8

8. Lateral sepals dark brown, usually connate; petals widely divergent ..... 3. ***P. amoenum***
   Lateral sepals light brown or greenish-red, always free; petals porrect and incurved 9

9. Flowers widely spaced; labellum callus ending in a long, drawn out point ..... 18. ***P. perangustum***
   Flowers crowded; labellum callus ending in a short, blunt point ..... 23. ***P. secutum***

10. Labellum lamina voluminous, commonly intensely white, rarely cream, margins undulate-crispate 11
    11
    Labellum lamina not voluminous, variously coloured, margins various 21

11. Lateral sepals connate 12
    Lateral sepals free 13

12. Labellum reflexed at about right angles near the middle; petals oblanceolate (alpine and subalpine plants) ..... 1. ***P. alpestre***
    Labellum reflexed sharply back on itself near the middle; petals linear or lanceolate (lowland to montane plants) ..... 6. ***P. brevilabre***

13. Flowers 3-12, widely spaced; labellum cream ..... 19. ***P. pulchellum***
    Flowers 10-25 or more, crowded; labellum white 14

14. Petals oblanceolate to spathulate 15
    Petals linear to lanceolate 17

15. Flowers 17-25 mm across ..... 28. ***P. tunbridgense***
    Flowers 8-15 mm across 16

16. Labellum much longer than wide; labellum callus oblong (lowlands) . . . **15. *P. milfordense***
Labellum not much longer than wide; labellum callus ovate (alpine and subalpine) . . . . . **1. *P. alpestre***

17. Flowers 14-20 mm across **18**
Flowers 7-12 mm across **19**

18. Labellum ovate-lanceolate, obliquely reflexed near the middle; labellum callus ovate-oblong,not projecting out from the labellum bend (north coast, flowering Nov.-Dec.) . . . . . **21. *P. robustum***
Labellum oblong, reflexed sharply back on itself near the middle; labellum callus oblong, the apex projecting out from the labellum bend (Ben Lomond, flowering Jan.-March) . . . . . **25. *P. stellatum***

19. Labellum reflexed at about 90° near the middle, the tip projecting through the lateral sepals; labellum apex acute . . . . . **4. *P. apoxychilum***
Labellum reflexed at about 170° near the middle, the tip not projecting through the lateral sepals; labellum apex obtuse **20**

20. Labellum base narrowly cordate; apex of labellum callus glabrous; petals spreading (lowland plants, flowering Nov.-March) . . . . . **27. *P. truncatum***
Labellum base broadly cordate; apex of labellum callus papillate; petals incurved (alpine and subalpine plants, flowering Jan.-March) . . . . . **13. *P. incurvum***

21. Tepals expanding very widely; labellum base obliquely erect; callus base broad, disc-shaped; column thrust prominently forward . . . . . **9. *P. correctum***
Tepals not expanding widely; labellum base horizontal; basal part of callus narrow; column not thrust prominently forward **22**

22 Flowers to 7 mm long; labellum erect in distal quarter, column wings c. half as long as anther . . . . . **2. *P. alpinum***
Flowers 10 mm or more long; labellum erect in distal half; column wings as long as or longer than the anther **23**

23. Labellum suddenly contracted medially to a slender, tail-like portion **24**
Labellum tapered gradually from below the middle to the apex **26**

24. Flowers dark brown; labellum callus dark brown; labellum base deeply saccate . . . . . **7. *P. castaneum***
Flowers green or light brown; labellum callus green or brownish; labellum base shallowly saccate **25**

25. Flowers strongly perfumed; tepals thin-textured . . . . . **17. *P. olidum***
Flowers lightly perfumed; tepals thick-textured . . . . . **22. *P. rostratum***

26. Plants to 80 cm tall; flowers to 50, densely crowded, often in pastel shades **27**
Plants to 40 cm tall; flowers to 30, moderately crowded, greenish brown to light brown **28**

27. Labellum lamina usually constricted just beyond the bend; labellum callus dull, wrinkled (montane plants flowering in summer) . . . . . **16. *P. montanum***
Labellum lamina not constricted; labellum callus smooth, shiny (lowland plants flowering in late spring) . . . . . **20. *P. pyriforme***

28. Leaf tip usually not withered at anthesis; flowers 10-12 mm long . . . . **26. *P. tadgellianum***
Leaf tip usually withered at anthesis; flowers 14-18 mm long **29**

29. Stigmatic plate narrower than the anther; labellum margins usually pinched in to the callus (lowland regions) . . . . . **8. *P. concinnum***
Stigmatic plate wider than the anther; labellum margins not pinched in to the callus (montane and subalpine regions) . . . . . **24. *P. sphacelatum***

1. *Prasophyllum alpestre* D.L. Jones, sp. nov.,
P. incurvi D.L. Jones affinis, sed spicis comparate brevibus, floribus, floribus confertis, virido-brunneis petalis lilacino-notatis; sepalis lateralibus plerumque connatis, rectis; petalis obovatis ad obovato-spathulatis, distaliter valde dilatatis; labello brevi (c. 7-10 mm longo), oblongo-ovato, marginibus undulato-crispatis; et labelli callo brevi, lato (c. 4.5-5.5 x 3-3.7 mm), differt.

TYPUS: New South Wales; Charlottes Pass, Kosciusko National Park, 1880 m, 7 Mar. 1997, *D.L. Jones 15106 & M. Garratt* (holo CANB; iso AD, BRI, CANB, HO, MEL, NSW).

Illustration: Page 253, Backhouse & Jeanes (1995) - as *P. suttonii*.

Tuberous terrestrial *herb* growing singly or in small, loose groups. *Tubers* ovoid to globose, c. 12 mm long, c. 8 mm diam., fleshy. *Leaf* terete, 15-35 cm long, 4-8 mm wide, bright-green, shiny; base c. 3 mm across, whitish; free lamina erect, 4-10 cm long, often distally withered at anthesis. *Inflorescence* a dense spike 3-8 cm long, consisting of c. five-25 flowers. *Floral bracts* more or less ovate, c. 3 mm long, 3 mm wide, closely embracing the ovary; apex obtusely apiculate. *Ovaries* at about 30° to the rachis, narrowly obovoid, 3-4.5 mm long, 2-2.5 mm wide, green, shiny. *Flowers* subsessile, 10-15 mm across, brownish green with white and purplish petals and a white labellum. *Dorsal sepal* narrowly ovate-lanceolate, 7.5-10 mm long, 3-4.5 mm wide, porrect to decurved, with three to five fine darker stripes; apex acuminate to apiculate. *Lateral sepals* connate, forming a synsepalum behind the labellum, occasionally divergent, linear-lanceolate, 7.5-10 mm long, 2-2.5 mm wide, gibbous, straight or slightly falcate, obliquely erect to erect; distal margins involute; apex entire or shortly bidentate, often recurved. *Petals* widely spreading, linear-obovate to obovate-spathulate, 8-12 mm long, 1.8-3 mm wide, with a purplish central stripe; distal margins slightly irregular; apex obtuse. *Labellum* sessile, porrect in the proximal half, recurved sharply in the distal half; apex not projecting through the lateral sepals; *lamina* ovate-oblong when flattened, 6.5-10.5 mm long, 4-6 mm wide, white; base not gibbous; proximal margins entire; distal margins strongly undulate/crispate; apex broadly obtuse. *Callus* more or less ovate-oblong, 4.5-5.5 mm long, 3-3.7 mm wide, yellowish green, with a dark green central area towards the base; apex emarginate, slightly papillate. *Column* porrect from the end of the ovary, c. 4 mm long, c. 2.5 mm wide, mostly purple; appendages narrowly oblong, c. 4 mm long, c. 0.7 mm wide, strongly falcate, purple; apex obtuse. *Anther* much shorter than the stigmatic plate, ovate, c. 2.5 mm long, c. 1.5 mm wide, brownish purple. *Pollinarium* c. 3.5 mm long; viscidium ovate, c. 0.4 mm long; hamulus ligulate, c. 1.2 mm long; pollinia c. 2 mm long, yellow, sectile. *Stigma* quadrate, c. 2 mm long, c. 2 mm wide, set very high on the column; rostellum slightly higher than the appendages. *Capsules* obovoid, 7-10 mm long, 4-6 mm wide, suberect, green, shiny. **Fig. 6.1.**

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in tussock grassland in subalpine and alpine herbfield, moist to wet areas around streams and bogs and woodland dominated by *Eucalyptus pauciflora*. Soils include well-structured red loams, fibrous or peaty loams and gravelly loams. Flowering occurs freely in the absence of fire. Altitude: 1200-2000 m. Flowering period: Late December to March.

Notes: This species is characterised by subalpine habitat; relatively short, usually crowded spikes; greenish-brown flowers with mauve suffusions, especially in the petals; lateral sepals usually (but not always) connate and forming an erect synsepalum behind the labellum; petals obovate to obovate-spathulate, strongly dilated distally; short (c. 7-10 mm long), ovate-oblong white labellum with undulate/crispate margins; and, a short broad (c. 4.5-5.5 mm x 3-3.7 mm) callus.

This species has been commonly confused with *P. suttonii* R.S. Rogers & B. Rees but an examination of the type shows that species to be quite distinct. It differs from *Prasophyllum alpestre* by broadly obovoid/pyriform turgid ovaries, free and divergent, non-gibbous lateral sepals and an obovate, slightly crenulate labellum. It would appear that *P. suttonii* flowers earlier than *P. alpestre*, probably finishing as the latter is just starting. *Prasophyllum suttonii* has apparently not been collected since Dr C.S. Sutton secured the type specimen on 28 Dec. 1902

(Barnard & Sutton 1903). The species may well be endemic to the Buffalo Plateau.

Prasophyllum alpestre and *P. incurvum* have probably been commonly confused. Both occupy similar subalpine habitats and are generally alike in their overall appearance. *Prasophyllum alpestre* commonly (but not always) has connate lateral sepals whereas those of *P. incurvum* are free and widely divergent. *Prasophyllum alpestre* has smaller flowers than *P. incurvum* and a shorter inflorescence with the flowers neatly arranged. The divergent petals are a useful recognition feature for *P. alpestre*, contrasting with the incurved petals of *P. incurvum*.

Conservation status: Widely distributed, locally common and conserved.

Etymology: From the Latin *alpestris*, of high mountains.

Selected specimens: (36 seen):
NEW SOUTH WALES: Mt Selwyn, 6 Feb. 1991, *Tunstall* (CANB): AUSTRALIAN CAPITAL TERRITORY: VICTORIA: Mt Buffalo, 24 Jan. 1996, *Tunstall* (CANB); near Tatra Inn, Mt Buffalo, 6 Jan. 1998, *Jones 15683 & Garratt* (CANB); TASMANIA: Pine Lake, 28 Feb. 1970, *Curtis* (HO); near Lake Ball, Cradle Mtn, 15 Feb. 1952, *Gulline* (HO 65994); Devils Gullet, Mar. 1969, *Johnson* (HO); Mt Nelson Ra., Feb. 1902, *Rodway* (HO 66345); Mt Wellington, 1913, *Rodway* (HO 66348); Lake Explorer Tk, 3 Mar. 1997, *Tonelli (ORG 611)* CANB); Dead Island, Mt Wellington, 5 Mar. 1997, *Wapstra (ORG 614)* (CANB).

2. *Prasophyllum alpinum* R. Br., *Prodr.* 318 (1810).
TYPE: Top of Table Mountain near Derwent River, Tasmania, *R. Brown*, (lecto BM, *fide* Clements 1989, photo!).

Illustration: Fig. 1, Jones (1996).

Distribution and ecology: Endemic to central and southern Tasmania, growing in subalpine herbfield, sedgeland and in moist grassy areas among *Eucalyptus coccifera* Hook.f.; occasionally in feldmark; sometimes in the cushions of *Abrotanella forsterioides* (Hook. f.) Benth. Altitude: 650-1200 m. Flowering period: December to February.

Notes: This species, which has been recently circumscribed in a narrow sense (Jones 1996), is characterised by small (5.5-7.5 mm long), green to greenish brown apparently scentless flowers; a stalked ovate labellum recurved in the distal third; and, the column wings much shorter than the anther.

The flowers of this species are autogamous and in some localities (for example *Jones 11072*) plants may have cleistogamous flowers with excessively swollen ovaries.

Selected specimens: (28 examined):
TASMANIA: Hill 4, Moonlight Ridge, 10 Feb. 1985, *Collier 318* (HO 116630); Mt Sedgewick, 27 Dec. 1987, *Collier 355* (HO 120382); Hartz Plateau, 31 Jan. 1972, *Curtis* (HO 66020); Lake Esperance, Hartz Mtns, 6 Feb. 1975, *Morris & Stebbins* (HO 66021); Pine Lake, 23 Feb. 1976, *Moscal* (HO 65967); Lake Mtn, N. of Pindars Peak, 12 Jan. 1982, *Moscal 899* (HO 52324); Cradle Mtn, no date, *Sutton, Herb W.H. Nicholls* (MEL); Mt Wellington, 13 Jan. 1993, *Wapstra (Jones 11177)* (CANB); Mt Wellington, 22 Dec. 1992, *Ziegeler (Jones 11072)* (CANB).

3. *Prasophyllum amoenum* D.L. Jones, sp. nov.
P. fitzgeraldii R.S. Rogers affinis, sed planta gracillima; racemis brevibus; floribus sparsis comparate parvis (c. 10 mm longis); petalis late divergentibus; sepalibus lateralibus fuscis plerumque connatis, monadem post labellum formantibus; labello oblongo-ovato, minute papillato; columnae appendicibus curvatis; et stigmate anthera multo majore.

TYPUS: Tasmania, Snug Plains, 600 m., 13 Jan. 1997, *J.E. & A. Wapstra (ORG 515)*, (holo CANB; iso HO).

Tuberous terrestrial *herb* growing singly or in small loose groups. *Tubers* not seen. *Leaf* terete, 12-30 cm long, 2-4 mm wide, dark green; base 1-3 mm across, purplish; free lamina erect, 4-6 cm long, often partly withered at anthesis. *Inflorescence* a sparse raceme 3-5 cm long, consisting of five-12 flowers. *Floral bracts* broadly ovate, c. 2 mm long, c. 2.2 mm wide, closely embracing the ovary; apex obtusely apiculate. *Ovaries* spreading from the rachis at about 20°, linear-obovoid to obovoid, 3-5 mm long, 2-4 mm wide, green. *Flowers* shortly pedicellate, 7-9 mm across, greenish

with dark brown lateral sepals, white petals with reddish, median bands and a white labellum. *Dorsal sepal* ovate-lanceolate, 4-5 mm long, c. 2.5 mm wide, decurved, with three fine darker stripes; apex apiculate, often recurved against the ovary. *Lateral sepals* connate throughout forming a synsepalum 5.5-6.5 mm long, 3-3.5 mm wide, erect behind the labellum, or fused centrally, occasionally breaking free and then widely divergent, oblong-lanceolate; apex bidentate. *Petals* narrowly linear-lanceolate, 5-6 mm long, 1-1.5 mm wide, widely divergen; tips often incurved; distal margins slightly irregular; apex obtuse. *Labellum* sessile, white; base porrect, erect in the distal third; apex close to the lateral sepals; *lamina* oblong-obovate when flattened, 5.5-6.5 mm long, 3-3.5 mm wide; distal ventral surface and margins with minute papillae; base not gibbous; proximal margins entire; distal margins undulate-crenulate; apex obtuse. *Callus* narrowly ovate-oblong, greenish yellow, narrowed distally and ending just beyond the bend, raised above the lamina, minutely papillate; apex emarginate. *Column* porrect from the end of the ovary, c. 3 mm long, c. 2.5 mm wide, wholly purplish; appendages scimitar-shaped, c. 2 mm long, c. 0.8 mm wide; apex obtuse, much shorter than the stigmatic plate. *Anther* much shorter than the stigmatic plate, ovate, c. 1.6 mm long, c. 1 mm wide, slightly rugose, brownish purple. *Pollinarium* c. 2.6 mm long; viscidium ovate c. 0.4 mm long; hamulus ligulate, c. 0.6 mm long; pollinia c. 1.6 mm long, pale yellow, sectile. *Stigma* quadrate, c. 1.5 mm long, c. 2 mm wide; rostellum much higher than the appendages. *Capsules* obovoid, 5-8 mm long, 3.5-4.5 mm wide, turgid, suberect, green to brownish. **Fig. 6.2.**

Distribution and ecology: Apparently endemic to south-eastern Tasmania. Grows in low scrub mixed with areas dominated by rushes and sedges or grasses. Soils are stony clay loams developed on dolerite. Altitude: c. 600 m. Flowering period: January.

Notes: This species is characterised by slender habit; short sparse racemes; flowers relatively small (about 10 mm long) with widely divergent, narrow petals, dark-coloured lateral sepals that are usually connate and form a synsepalum behind the labellum; labellum oblong-obovate, erect in the distal third, the distal surface and margins minutely papillate; labellum callus yellowish green, papillate near the emarginate apex; and, column purplish, with curved appendages, the stigmatic plate much larger than the rest.

The affinities of this remarkable species are unclear. The papillate labellum and callus suggest a relationship with *P. lindleyanum* or *P. fitzgeraldii* but these similarities are probably superficial. The connate lateral sepals are reminiscent of *P. brevilabre*.

In most flowers seen to date the lateral sepals remain connate, but in a few these organs break apart and then diverge very widely in an almost horizontal plane.

Conservation Status: Poorly known and not conserved; suggest 2K by criteria of Briggs & Leigh (1996).

Etymology: From the Latin *amoenus*, pleasant, delightful.

4. *Prasophyllum apoxychilum* D L. Jones, sp. nov.,
P. truncato Lindley affinis, sed petalis angustis (1.6-2 mm latis); labello longo, comparate angusto (ad 10 x 4 mm), acuto, dimidio distali recto, callo ovato (ad 5.3 x 3 mm) emarginato apice papillato; et columna comparate longo (c. 4.5 x 3 mm).

TYPUS: Tasmania. Arthur Hghy, Murdunna, Eaglehawk Neck, 24 Dec. 1996, *R. Minchin (ORG 495)* (holo CANB).

Tuberous terrestrial *herb* growing singly or in small, loose groups. *Tubers* not seen. *Leaf* terete, 15-25 cm long, 3-6 mm wide, dark green; base c. 2-3 mm across, purplish; free lamina erect, 2-12 cm long, often partly withered at anthesis. *Inflorescence* an open to moderately crowded spike 6-10 cm long, consisting of c. 8-20 flowers. *Floral bracts* ovate, 2.5-3 mm long, 3-3.5 mm wide, closely embracing the ovary; apex subobtuse. *Ovaries* spreading at about 50° to the rachis, obovoid, 5-7 mm long, c. 3 mm wide, green. *Flowers* sessile, 8-11 mm across, light green with whitish petals and a white labellum, fragrant. *Dorsal sepal* narrowly ovate-lanceolate, 8-9.5 mm long, 3-3.5 mm wide, abruptly decurved,

with three or five darker stripes; apex subobtusely apiculate. *Lateral sepals* free, widely divergent, linear-lanceolate, 8-10 mm long, 2-2.5 mm wide, slightly falcate, obliquely erect; distal margins involute; apex recurved. *Petals* porrect to spreading, narrowly linear-lanceolate, 7-9 mm long, 1.6-2 mm wide, with a dark central band; distal margins narrowed, entire; apex subobtuse. *Labellum* sessile, white or pinkish, porrect in the proximal half, erect in the distal half; apex often projecting through the lateral sepals; *lamina* narrowly ovate-lanceolate when flattened, 8.5-10 mm long, 3.5-4 mm wide; base not gibbous; proximal margins entire; distal margins undulate/crispate; apex acute or acutely apiculate. *Callus* more or less ovate, 4.5-5.3 mm long, c. 3 mm wide, green, shiny, with a dark green ovate basal area; distal margins papillate; apex emarginate. *Column* porrect from the end of the ovary, c. 4.5 mm long, c. 3 mm wide; appendages narrowly oblong, c. 4 mm long, c. 0.8 mm wide, falcate, white; apex obtuse. *Anther* much shorter than the stigmatic plate, ovate, c. 3 mm long, c. 2.3 mm wide, purplish. *Pollinarium* c. 3 mm long; viscidium ovate, c. 0.4 mm long; hamulus ligulate, c. 8 mm long; pollinia c. 2 mm long, yellow, sectile. *Stigma* quadrate, c. 2.2 mm long, c. 2.2 mm wide; rostellum higher than the appendages. *Capsules* obovoid, 6-8 mm long, 3-4.5 mm wide, suberect, green, shiny. **Fig. 6.3.**

Distribution and ecology: Endemic to Tasmania where known only from areas around Hobart and to the south-east. Grows in open forest with a groundstorey ranging from grassland to densely shrubby. Soils include sandy loams, clay loam and gravelly loam. Altitude: 10-250 m. Flowering period: October to December.

Notes: *Prasophyllum apoxychilum*, part of the *P. truncatum* complex, can be distinguished by the following combination of features; narrow (1.6-2 mm wide) petals; long, proportionately narrow (to 10 x 4 mm) labellum erect in the distal half and with a pointed apex; an ovate callus (to 5.3 x 3 mm) with an emarginate papillate apex; and, proportionately long (c. 4.5 x 3 mm) column.

Useful recognition features include the long narrow labellum with a pointed apex. All other members of this group in Tasmania have an obtuse apex. Flowering is stimulated by fire.

Conservation status: Narrowly distributed and apparently not conserved; suggest 2RK by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Greek, *apoxys*, tapered to a point, and *cheilos*, a lip, in reference to the pointed labellum.

Specimens examined:
TASMANIA: Knocklofty, 16 Dec. 1993, *Bonham (Jones 12765)* (CANB); Murdunna, 20 Nov. 1996, *Minchin* (CANB); Eaglehawk Neck, 21 Oct. 1993, *Wapstra (Jones 12482)* (CANB).

5. *Prasophyllum australe* R. Br., *Prodr.* 318 (1810).
TYPE: Adventure Bay, Van Diemens Land, 26-30 Jan. 1777, *D. Nelson* (lecto BM, *fide* Clements 1983,
photo!).
Prasophyllum lutescens Lindl., *Gen. sp. orch. pl.* 514 (1840).
TYPE: Tasmania, Rocky Cape, Dec. 1837, *R. Gunn 922* (lecto specimen 20A, K-L, *fide* Clements 1989, photo!).
Prasophyllum australe R. Br. var. *viscidum* R.S.Rogers, *Trans. & Proc. Roy. Soc. South Australia* 46: 154 (1922).
TYPE: Alberton, Gippsland, Victoria, Jan. 1922, *A.J. Tadgell* (holo AD!).

Illustration: Page 231, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland (south-east), New South Wales, Victoria, Tasmania and South Australia. Commonly grows in moist areas of open forest, heathland, treed heath and swamps, less commonly as a component of drier forests. Soils include peaty sand, sands, sandy loams and shallow clay loams. Flowering is stimulated by summer fires. Altitude: 10-1000 m. Flowering period: October to January.

Notes: This species is characterised by long ovaries appressed to the rachis; large pale yellowish green to brownish green flowers with reddish stripes; connate lateral sepals; and, white labellum with crispate margins.

Selected specimens: (25 examined) :
TASMANIA: Lake Strahan, 7 Jan. 1984, *Buchanan 2248* (HO 77008); Bridport, 11 Jan. 1948, *Curtis* (HO 66307); Orford, 28 Dec. 1970, *Hood* (HO 66282); Smithton, 30 Dec. 1971, *Johnson* (HO 66280); Flinders Island, between Coast Rd and Samphire Rd, 13 Jan. 1982, *Morris 8207* (HO 60186); Eaglehawk Neck, Feb. 1917, *Rodway* (HO 66278); Stanley, 18 Dec. 1947, *Trethewie* (HO 65970).

6. ***Prasophyllum brevilabre*** (Lindl.) Hook. f., *Fl. Tasman.* 2: 11, t.110, f.A (1858);
Prasophyllum lutescens Lindl. var. *brevilabre* Lindl., *Gen. sp. orchid. pl.* 514 (1840).
TYPE: Tasmania, Rocky Cape, Dec. 1837, *R. Gunn 923* (lecto specimen a, K-L, *fide* Clements 1983, photo!; isolecto P).

Illustration: Page 232, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland (south-east), New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in open forest, wet sclerophyll forest, coastal scrub, treed heath and heath, in sands, sandy loams, stony loams, shallow clay loams and deep red clay loams. Flowering is dramatically stimulated by fire. Altitude: 10-1000 m. Flowering period: August to December.

Notes: This species is characterised by short leaf lamina; odourless flowers well-spaced in the spike; connate lateral sepals; and, labellum reflexed sharply in the distal half, with the apex almost touching the base.

Selected specimens: (33 seen):
TASMANIA: Eaglehawk Neck, Nov. 1949, *Curtis* (HO 66257); Low Head, 19 Dec. 1955, *Curtis* (HO 66256); Desgraves, 14 Nov. 1840, *Gunn* (HO 66255); Harford, 18 Dec. 1932, *Hamilton 191* (HO 66262); Bruny Island, 22 Nov. 1969, *Rayner* (HO 65955); Ridgeway, Mt Wellington, Oct. 1959, *Thompson* (HO 97692); Stanley, 18 Dec. 1947, *Trethewie* (HO 66259).

7. ***Prasophyllum castaneum*** D.L. Jones, sp. nov.
P. frenchii F. Muell. affinis, sed floribus majoribus (c. 16 mm longis, c. 7.5 mm latis); tepalibus atro-brunneis; labello in dimidio proximali transverse elliptico, deinde ad dimidio distali abrupte contracto, anguste decrescente, caudiformi; et labelli callo prope apicem terminante, differt.

TYPUS: Tasmania, Bruny Island, Labillardiere Peninsula, 20 Dec. 1995, *J.E. Wapstra (Jones 14732)* (holo CANB; iso AD, HO, MEL).

Slender, terrestrial, tuberous *herb* 10-50 cm tall. Tubers not seen. *Leaf* terete, 8-40 cm long, dark green to brownish green; base 3-4 mm across, dark purplish red; free lamina 10-16 cm long, erect to suberect. *Inflorescence* a narrow spike 8-12 cm long, consisting of 10-20 flowers. *Floral bracts* ovate, c. 1.8 mm long, c. 2 mm wide, acutely apiculate. *Ovary* oblong-obovoid, c. 6 mm long, c. 3 mm wide, set at c. 20° to the rachis. *Flowers* sessile or subsessile, 14-17 mm long, 7-8 mm wide, dark brown, opening widely, slightly fragrant. *Dorsal sepal* broadly ovate-lanceolate, 8-9 mm long, c. 4 mm wide, deflexed, held nearly vertical; apex subacute to apiculate. *Lateral sepals* oblong-lanceolate, 8-9 mm long, c. 3 mm wide, falcate, free from the base, erect, recurved above the middle; apex subacute. *Petals* narrowly ovate-lanceolate, 7-8 mm long, c. 1.4 mm wide, with a dark median line, porrect; tips incurved, subacute. *Labellum* with a basal claw c. 0.5 mm long, c. 1.5 mm wide; proximal half porrect to slightly erect, suddenly recurved at right angles above the middle; distal half erect or shallowly recurved; apex not reaching the lateral sepals; *lamina* when flattened 6.5-7.5 mm long, 4.5-5 mm wide, transversely elliptic in the proximal half then suddenly contracted near the middle, tapered narrowly to the apex; proximal half very broadly concave; proximal margins entire; distal margins irregularly crenulate; apex obtuse. *Callus* broadly ovate-lanceolate, c. 5 mm long, c. 1.5 mm wide, dark brownish green, shiny, thickened, fleshy, broadly channelled at the base, extending well beyond the bend in the labellum nearly to the apex. *Column* porrect from the end of the ovary, c. 3 mm long, c. 3.5 mm wide; column appendages oblong, c. 3 mm long, c. 1.2 mm wide, obiiquely truncate. *Anther* ovate, c. 1.8 mm long, c. 1.8 mm wide, dark purple-brown. *Pollinarium* c. 2 mm long;

viscidium ovate, c. 0.3 mm long, white; hamulus c. 0.5 mm long; pollinia linear-clavate, c. 1.6 mm long, falcate, yellow, sectile. *Stigma* quadrate, c. 1 mm long, c. 1.6 mm wide; rostellum about as high as the appendages. *Capsules* obovoid, 7-9 mm long, 4-6 mm wide, green to dark brown, shiny. **Fig. 6.4**.

Distribution and ecology: Endemic in south-eastern Tasmania. Grows among low shrubs in damp heath. Soils are grey to blackish sandy loam. Flowering is promoted by the advent of summer fires. Altitude: 10-50 m. Flowering period: late November to January.

Notes: Differs from all other species of *Prasophyllum* by the following combination of features; large flowers (c. 16 mm long, c. 7.5 mm wide); tepals dark brown, labellum paler with a dark brown callus; labellum shape when flattened, transversely elliptic in proximal half, suddenly contracted medially to a narrowly tapered, tail-like distal half; callus ovate-lanceolate, extending well beyond the bend of the lamina and ending near the labellum apex; column wings broadly oblong.

This species is close to *P. frenchii* F. Muell, which has smaller (c. 10 mm long, c. 8 mm across) squatter flowers which are greenish to reddish with a paler labellum; an ovate-lanceolate labellum which is tapered throughout when flattened; the callus extending just beyond the bend in the lamina and narrowly oblong column wings.

Etymology: Derived from the Latin *castaneus*, chestnut coloured, in reference to the dark brown flowers.

Conservation status: Known from only two sites, both in State Reserves; suggest 2KC by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: Pineapple Track, Bruny Island, 8 Dec. 1995, *Potts (Jones 14693)* (CANB); Tasman Peninsula, 8 Dec. 1995, *Potts (Jones 14694)* (CANB); Mt Brown, Tasman Peninsula, 20 Dec. 1995, *Wapstra (Jones 14741)* (CANB).

8. *Prasophyllum concinnum* W.H. Nicholls, *Victorian Naturalist* 64: 232, f. A-E (1948).
TYPE: Tasmania, at Blackmans Bay, 30 Nov. 1947, *W.M. Curtis* (holo MEL!).

Illustration: Plate 140, Nicholls (1969).

Distribution and ecology: Apparently endemic to southern Tasmania, but specimens possibly of this species from the central-east coast and north-east are in need of further checking. Grows in open forest, coastal scrubs and heath. Soils include moist to wet sands, peaty sands, loamy sands and gravelly loam. Flowering is dramatically stimulated by summer fires with a rapid decline in numbers as the vegetation becomes denser. Altitude: 0-50 m. Flowering period: late October to December.

Notes: This species is characterised by greenish to greenish brown flowers; ovate-lanceolate labellum which tapers from below the middle to the apex, with the distal margins entire or sometimes pinched in to the level of the callus; and, the callus with prominent wing-like basal extensions.

Prasophyllum concinnum is closely related to *P. rostratum* Lindl.and *P. olidum* D.L. Jones, but in these latter species the labellum is suddenly constricted near the middle and ends in a narrow caudate section. At the extremes, *P. rostratum* and *P. concinnum* are readily distinguishable, but some dried specimens are particularly difficult to identify.

In some localities, particularly in near-coastal sites, the plants are extremely slender, have smaller than usual flowers which are greenish, and the distal margins of the labellum are very narrow or much reduced leaving the callus to dominate the upper part of the labellum. This latter character is also found in *P. constrictum* R.S. Rogers which is endemic to South Australia.

Specimens from western Tasmania from such areas as Corinna Plains and Mt Zeehan, attributed to *P. concinnum*, may only grow to 8-15 cm tall and have less than five flowers. Both of these variations warrant further study.

Selected specimens (c. 40 seen)**:**
TASMANIA: Cape Sorell, 8 Jan. 1984,

Buchanan 2308 (HO 120880); Moth Ck, Melaleuca Inlet, no date, *Davis 1161* (HO 66285); Bridport, 14 Nov. 1948, *Hart* (HO 65961); Corinna, Long Plains, Jan. 1954, *Jackson* (HO 66289); Cox's Bight, Port Davey, June 1938, *King* (HO 318326); Bruny Island, 8 Dec. 1995, *Potts (Jones 14693)* (CANB); Tasman Pen., 8 Dec. 1995, *Potts (Jones 14694)* (CANB); Eaglehawk Neck, 21 Oct. 1993, *Wapstra (Jones 12481)* (CANB); Lighthouse Rd, Bruny Island, 22 Oct. 1993, *Wapstra (Jones 12515)*(CANB); Blackmans Bay, 31 Oct. 1993, *Wapstra (Jones 12537)* (CANB); Labillardiere State Reserve, Bruny Island, 31 Oct. 1993, *Wapstra (Jones 12539)* (CANB).

9. *Prasophyllum correctum* D.L. Jones, *Novon* 4: 106-108 (1994).
TYPE: Victoria, near Munro, 5 Nov. 1992, *J. Jeanes (Jones 10689)* (holo MEL!; iso CANB!).

Illustration: Page 235, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria and Tasmania. Grows in grassland. Altitude: c. 50 m. Flowering period: October and November.

Notes: This species is newly recorded for Tasmania. It can be recognised by its widely gaping flowers with the lateral sepals and petals being widely separated from the dorsal sepal; an erect and often strongly recurved labellum; and, the column, which is exposed when the flower is viewed from the side, having the column wings much shorter than the stigmatic plate.

Plant habit and floral morphology of the Tasmanian specimens are a good match for collections from Victoria. Some specimens from Tasmania were unusual in having dark reddish brown flowers.

Specimens examined:
TASMANIA: Campbell Town Golf Course, 20 Oct. 1995, *Wapstra (Jones 14539)* (CANB, HO); *ibid*, 21 Nov 1995, *Wapstra (Jones 14681)* (CANB).

10. *Prasophyllum elatum* R. Br., *Prodr.* 318 (1810).
TYPE: Port Jackson, Sept.-Oct. 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto E, K, P).
Illustration: Page 237, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland (south-east), New South Wales, Victoria, Tasmania, South Australia and Western Australia. Grows in heath, treed heath, coastal scrubs and open forests in sands, peaty sand, sandy loams and shallow clay loams. Flowering is promoted dramatically by summer fires. Altitude: 0-100 m. Flowering period: September to January.

Notes: This species is characterised by robust habit; blackish stem and leaf; long ovaries appressed to the rachis; connate lateral sepals forming a broad synsepalum behind the labellum; labellum mostly erect and with undulate margins; and, broad callus plate with raised margins.

Selected specimens: (23 seen):
TASMANIA: Bruny Island airstrip, 25 Nov. 1975, *Allen* (HO 78039); Cape Pillar Tk, 11 Nov. 1984, *Collier 39* (HO 115690); E. end, Little Lagoon Beach, near Recherche, 1 Nov. 1986, *Collier 1847* (HO 101978); Taranna, 16 Nov 1975, *Ferris* (HO 78040); Campania, 9 Jan. 1985, *Minchin* (HO 96422); Zeehan, Dec. 1891, *Rodway* (HO 66310); Scamander, Oct. 1910, *Rodway* (HO 66312).

11. *Prasophyllum favonium* D.L. Jones, sp. nov.
P. fitzgeraldii affinis, sed floribus comparate angustis (c. 12 x 6 mm); sepalibus brunneis; labello ovato-lanceolata, c. 5 x 3 mm, purpureo, prope medio ad angulum 90° recurvo; callo ovato-oblongo, c. 4 x 2 mm; anthera late ovato-oblonga, columnae appendicibus aequilonga; et hamulo pollinarii brevissime, differt.

TYPUS: Tasmania, Rebecca Ck, 11 Nov. 1993, *L. Rubenach (Jones 12693)* (holo CANB 9603602).

Slender, terrestrial, tuberous *herb* 15-30 cm tall. *Tubers* not seen. *Leaf* terete, 12-28 cm long, pale green to dark green; base 2-3 mm across, reddish; free lamina 6-13 cm long, erect to suberect. *Inflorescence* a condensed spike 3-7 cm long, consisting of 5-15 flowers. *Floral bracts* transversely ovate-quadrangular, c. 1.3 mm long, c. 1.7 mm wide; apex bluntly

apiculate. *Ovary* obovoid, c. 5 mm long, c. 3 mm wide, at c. 45° to the rachis. *Flowers* sessile, 11-13 mm long, 5-6 mm wide, brownish with a dark purple labellum, opening widely, slightly fragrant. *Dorsal sepal* narrowly ovate-lanceolate, 5-7 mm long, 2.5-3 mm wide, brownish with darker striae, held nearly vertical; apex subacute. *Lateral sepals* narrowly linear-lanceolate, 7-8 mm long, c. 2 mm wide, free from the base, erect or slightly recurved; distal margins involute; apex subacute. *Petals* linear-oblong, 5-6 mm long, c. 1.5 mm wide, falcate, with a dark median line, porrect; tips incurved, obtuse. *Labellum* sessile; proximal half broadly concave, porrect, suddenly recurved at right angles near the middle; distal half erect; *lamina* ovate-lanceolate in outline when flattened, 4.5-5.5 mm long, 3-3.5 mm wide, purple, most of the ventral surface and margins covered with small elongate papillae; proximal margins entire; distal margins undulate-crenulate; apex obtuse, erect or slightly recurved. *Callus* oblong-ovate, 3.5-4 mm long, 1.5-2 mm wide, thickened, fleshy, green, broadly channelled, extending just beyond the labellum bend, the ventral surface bearing small elongate papillae. *Column* porrect from the end of the ovary, c. 1.8 mm long, c. 2 mm wide; column appendage oblong, c. 1.5 mm long, c. 0.5 mm wide, broadly obtuse to truncate. *Anther* broadly ovate-oblong, c. 1.2 mm long, c. 1.2 mm wide, brown to purple-brown. *Pollinarium* c. 1 mm long; viscidium elliptic, c. 0.2 mm long, white; hamulus c. 0.1 mm long; pollinia linear-clavate, c. 0.8 mm long, falcate, yellow, sectile. *Stigma* quadrate, c. 1 mm long, c. 1.2 mm wide; rostellum higher than the appendages. *Capsules* obovoid, 6-7 mm long, 4-5 mm wide, pale green, shiny.
Fig. 6.5.

Distribution and ecology: Endemic in western Tasmania, between West Point and Sandy Cape. Grows among shrubs in dense low heathland in dark grey to black sandy peaty loam. Flowers without the intervention of fire, but flowering is probably stimulated by summer fires. Altitude 10-30 m. Flowering period: October and November.

Notes: Differs from all other species of *Prasophyllum* by the following combination of features; narrow flowers (c. 12 mm long, c. 6 mm across); tepals brownish, labellum dark purple; labellum porrect in proximal half, recurved at right angles near the middle, the distal half erect; labellum ovate-lanceolate when flattened, with an obtuse apex; ventral surface and margins of the lamina covered with small, elongate papillae; and, the callus broadly ovate-oblong, papillate, extending just beyond the bend in the lamina.

This species is part of the *P. fitzgeraldii* complex. Four species from this complex are described in this study and further research is needed on the mainland.

Etymology: Derived from the Latin *favonius*, west wind, in reference to the bleak westerly habitat occupied by this species.

Conservation status: Of restricted distribution, poorly known and not conserved; suggest 2KC by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: West Point, Marrawah, 30 Oct. 1987, *Cameron* (QVM); *ibid*, 6 Nov. 1988, *Cameron* (QVM); *s. loc.*, no date, *Curtis* (HO 114931); between Rebecca Ck and Sardine Ck, 5 Nov. 1988, *Rubenach* (QVM); West Point, near Marrawah, 6 Nov. 1988, *Rubenach & Cameron* (HO 112354).

12. *Prasophyllum flavum* R. Br., *Prodr.* 318 (1810).
TYPE: Port Jackson, between Sydney towards South Head, Nov. 1804, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, E).

Illustration: Page 239, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland (south-east), New South Wales, Victoria and Tasmania. Grows in open forests, coastal scrubs, wet sclerophyll forest and montane woodland, usually close to the base of eucalypts or in decaying wood and litter. Altitude: 50-1000 m. Flowering period: December to February.

Notes: This species is characterised by the reduced brownish or purplish leaf lamina appressed to the scape; long green ovaries appressed to the rachis; green or yellowish green flowers; connate lateral sepals; and, short whitish labellum with crispate margins.

Specimens examined:
TASMANIA: Huon Rd, beyond Ferntree, 2 Feb. 1931, *Atkinson* (HO 66301); 2 miles [5.2 km] from Hastings Cave Reserve, 15 Jan 1949, *Burbidge* (HO 66329); near Hastings Caves, 15 Jan. 1949, *Burbidge* (HO 66330); Hartz Rd, 11 Jan. 1970, *Curtis* (HO 65973); East Coast, Jan. 1966, *Himson* (HO); road to Arve River, 12 Jan. 1969, *Palmer* (HO 65974); Sandfly, Dec. 1893, *Rodway* (HO 66328).

13. *Prasophyllum incurvum* D L. Jones, sp. nov.,
P. truncato Lindl. affinis, sed petalis incurvis linearibus ad lineari-oblongis acuminatis ad apiculatis; labello oblongo marginibus parum undulatis vel crispatis; et callo brevi ovato-oblongo ad apicem papillato.

TYPUS: Tasmania, Liawenee, Lake Hghy, near Great Lake, Central Plateau, 1060 m, 15 Feb. 1997, *J.E. & A. Wapstra (ORG 583)* (holo CANB; iso AD, BRI, CANB, MEL, NSW, HO).

Tuberous terrestrial *herb* growing singly. *Tubers* not seen. *Leaf* terete, 15-35 cm long, 3-5 mm wide, bright-green; base c. 3 mm across, purplish; free lamina erect, 8-15 cm long, often partly withered at anthesis. *Inflorescence* a moderately dense spike 3-9 cm long, consisting of c. five-40 flowers. *Floral bracts* more or less ovate, c. 3 mm long, 3 mm wide, closely embracing the ovary; apex obtusely apiculate. *Ovaries* at about 30° to the rachis, obovoid, 3-5 mm long, 2.5-3.5 mm wide, green, shiny. *Flowers* shortly pedicellate, 7-12 mm across, brownish green with white or purplish petals and a white or purplish labellum. *Dorsal sepal* narrowly ovate-lanceolate, 7.5-9 mm long, 3-3.5 mm wide, porrect to decurved, with three to five fine darker stripes; apex acuminate to apiculate. *Lateral sepals* free, widely divergent, linear-lanceolate, 8-10 mm long, 1.8-2.2 mm wide, falcate, obliquely erect; distal margins involute; apex entire or shortly bidentate, often incurved. *Petals* porrect, linear to linear-oblong, 8-10 mm long, 1.8-2 mm wide, purplish in the proximal half; distal margins entire or slightly irregular; apex acuminate, strongly incurved. *Labellum* sessile, porrect in the proximal half, recurved sharply in the distal half; apex not projecting through the lateral sepals; *lamina* oblong when flattened, 8.5-10.5 mm long, 4-5 mm wide, white; base not gibbous; proximal margins entire; distal margins slightly undulate/crispate; apex obtuse to apiculate. *Callus* more or less ovate-oblong, 4.4-5.5 mm long, 2.3-2.6 mm wide, yellowish green, with a dark green narrow central area towards the base; apex emarginate, papillate. *Column* porrect from the end of the ovary, c. 3.5 mm long, c. 2.5 mm wide, mostly purple; appendages narrowly oblong, c. 3.5 mm long, c. 1 mm wide, strongly falcate, purple; apex obtuse. *Anther* much shorter than the stigmatic plate, ovate, c. 2 mm long, c. 1.6 mm wide, brownish purple. *Pollinarium* c. 2.6 mm long; viscidium ovate, c. 0.4 mm long; hamulus ligulate, c. 0.7 mm long; pollinia c. 1.8 mm long, yellow, sectile. *Stigma* quadrate, c. 1 mm long, c. 1.5 mm wide, set very high on the column; rostellum higher than the appendages. *Capsules* obovoid, 5-7 mm long, 3.5-5 mm wide, suberect, green.
Fig. 6.6.

Distribution and ecology: Endemic to Tasmania where known from highland and subalpine regions, particularly in the Central Plateau but also in such southern areas as the Snug Tiers. Grows in poorly drained loam in montane and subalpine grassland consisting mainly of *Poa* sp. and the sedge *Lepidosperma filiforme* Labill., with scattered shrubs of *Hakea microcarpa* R. Br. Some of the orchid plants were growing in the cushions of *Donatia novae-zelandiae* Hook. Altitude: {600-} 1000-1200 m. Flowering period: January to March (but in one locality as late as May).

Notes: *Prasophyllum incurvum* can be distinguished by the following combination of features; montane to subalpine habitat; incurved linear to linear-oblong petals with an acuminate to apiculate apex; an oblong labellum with slightly undulate/crispate distal margins; and, short ovate-oblong callus with emarginate papillate apex.

Plants were noticeably more abundant in habitat that had been burnt about 8 years previously than they were in unburnt habitat (J.E. Wapstra pers. comm.).

This species and *P. alpestre* have probably been commonly confused, as both occupy similar habitats and are very alike in general appearance. *Prasophyllum alpestre* commonly (but not always) has connate lateral sepals whereas those of *P. incurvum* are free and widely divergent. *Prasophyllum incurvum*

has larger flowers than *P. alpestre* and a noticeably untidy arrangement of the flowers in the raceme. The incurved petals are a useful recognition feature for *P. incurvum*, contrasting with the divergent petals of *P. alpestre*.

Conservation status: Locally common and conserved.

Etymology: From the Latin, *incurvus*, incurved, in reference to the petals which on most flowers are strongly incurved.

Specimens examined:
TASMANIA: Liawenee, Central Plateau, 11 Feb. 1997, *Ziegeler* (ORG 580) (CANB); Snug Tiers, 28 Apr. 1996, *Wapstra* (CANB); Snug Plains, 3 May 1996, *Wapstra* (CANB); Poatina Intake Rd, Great Lake, 22 Feb. 1997, *Wapstra (ORG 587)* (CANB); Poatina Intake Rd, Great Lake, 22 Feb. 1997, *Wapstra (ORG 591)* (CANB); Snug Tiers, 3 Mar. 1997, *Wapstra (ORG 608)* (CANB).

14. *Prasophyllum lindleyanum* Rchb. f., *Beitr. Syst. Pflanzenk.* 3: 58 (1871).
TYPE: Tasmania, *R. Gunn 929*, (holo W, photo!; iso BM, K-L, P).
Prasophyllum brainei R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 46: 149 (1922).
TYPE: Ringwood, Victoria, 22 Oct. 1920, *A.B. Braine* (holo MEL!; iso BM).

Illustration: Page 241, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria and Tasmania. Grows in open forests, coastal scrub, treed heath and heath in sands, sandy loam and shallow clay loams. Flowering is stimulated by summer fires. Altitude: 0-500 m. Flowering period: September to December.

Notes: This species is characterised by the overall bright green colouration of the tepals; small papillae on the ventral surface and margins of the labellum surface and, callus; and, the white labellum lamina held in a sigmoid curve. It is related to *P. favonium* D.L. Jones, *P. perangustum* D.L. Jones and *P. secutum* D.L. Jones.

Selected specimens (18 seen):
TASMANIA: Lake Leake Rd, Nov. 1969, *Cameron* (HO 66003); Copping, 20 Nov. 1943, *Curtis* (HO 66248); North Huon, 23 Nov. 1928, *Giblin* (HO 66356); Safety Cove, 3 Dec. 1983, *Moscal 4601* (HO 83631); Eaglehawk Neck, 17 Nov. 1974, *Palmer* (HO 66001); Bruny Island, 27 Oct. 1978, *Palmer* (HO 124500).

15. *Prasophyllum milfordense* D.L. Jones, sp. nov.
P. odorati R.S.Rogers affinis, sed petalis oblanceolatis; labello oblanceolata, ad 9 x 4 mm, marginibus crispatissimis vel undulatissimis; labelli callo late emarginato; et columna angusta, c. 2.2 mm lato, differt; etiam *P. truncato* Lindley affinis, sed labello oblanceolato ad angulum 90° recurvo, differt.

TYPUS: Tasmania, Milford Estate, Cambridge, 21 Nov. 1994, *J.E. Wapstra (Jones 13708)* (holo CANB; iso AD, CANB, HO, MEL).

Slender, terrestrial tuberous *herb* 25-60 cm tall. *Tubers* not seen. *Leaf* terete, 30-65 cm long, dark green; base 4-6 mm across, red to purple; free lamina suberect, often withered at anthesis. *Inflorescence* a narrow loose spike 6-22 cm long, consisting of 12-25 flowers. *Floral bracts* ovate, c. 2 mm long, c. 1.5 mm wide, shortly apiculate. *Ovary* obovoid, c. 3.5 mm long, c. 2.5 mm wide, shiny green, at an angle of c. 30° to the rachis. *Flowers* subsessile, 8-10 mm across, greenish brown and white, opening widely, slightly fragrant. *Dorsal sepal* ovate-lanceolate, 7-8 mm long, 3.5-4 mm wide, greenish brown with darker striae, obliquely decurved; apex subacute. *Lateral sepals* linear-lanceolate, 7-8 mm long, c. 2 mm wide, greenish brown, free from the base, obliquely erect, widely divergent, somewhat fleshy; anterior margins involute throughout. *Petals* linear-oblanceolate to oblanceolate, 7-8 mm long, 1.8-2.2 mm wide, white with greenish or purplish markings, upswept, spreading to incurved, obtuse. *Labellum* sessile, white, porrect in the proximal half, sharply recurved at right angles near the middle; apex level with the lateral sepals or protruding through them; *lamina* narrowly oblanceolate in outline when flattened, 8-9 mm long, 3.5-4 mm wide, slightly gibbous at the base when viewed from the side; proximal half linear-oblong with mostly entire margins; distal half elliptical with deeply and irregularly crispate/undulate margins; apex subobtuse to apiculate. *Callus* linear-oblong, c. 5 mm long, c.

2.3 mm wide, raised, fleshy, green, channelled centrally, extending just beyond the bend on the lamina; base fleshy, dark green, subtending a shallow basin; apex emarginate and irregular. *Column* c. 4 mm long, c. 2.2 mm wide, partially exposed by the expansion of the tepals; appendages narrowly linear, c. 2.5 mm long, c. 0.5 mm wide, greenish-white, obtuse. *Anther* ovate, c. 2.3 mm long, c. 1.8 mm wide, purplish-brown. *Pollinarium* c. 3 mm long; viscidium ovate, c. 0.25 mm long, white; hamulus c. 0.7 mm long, ligulate; pollinia linear-clavate, c. 2 mm long, yellow, sectile. *Stigma* elliptic, c. 1.5 mm long, c. 1.5 mm wide; rostellum higher than the appendages. *Capsules* obovoid, 6-7 mm long, 4-5 mm wide, shiny green. **Fig. 6.7.**

Distribution and ecology: Apparently endemic to southern Tasmania, where known only from the type locality, but locally common. It grows in old growth woodland dominated by large trees of *Eucalyptus viminalis* Labill., with a dense groundstorey consisting mainly of *Lomandra longifolia* Labill. The soil is a grey sandy loam. This vegetation type has largely been cleared for agriculture. Altitude: c. 20 m. Flowering period: Late October to early December.

Notes: *Prasophyllum milfordense*, part of the *P. truncatum* complex, can be distinguished from all other related taxa by the following combination of characters; slightly fragrant moderate-sized (8-15 mm across) flowers; oblanceolate petals; oblanceolate strongly undulate/crispate labellum to 9 mm x 4 mm, recurved at right angles in the distal half; a broadly emarginate lamina callus; and, an elongated narrow (to 4 mm x 2.2 mm) column.

Conservation status: Locally common at the type locality; suggest 1KE by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the type locality of the property `Milford'.

Specimen examined:
TASMANIA: Milford Estate, Cambridge, 11 Nov. 1994, *Wapstra* (CANB).

16. *Prasophyllum montanum* R. Bates & D.L. Jones, *Austral. Orch. Res.* 2: 79-80 (1991). TYPE: Australian Capital Territory, Mt Franklin, near Ski Chalet, 3 Feb. 1967, *L.G.Adams 1675* (holo CANB!; iso CANB!, NSW).

Illustration: Page 243, Backhouse & Jeanes (1995).

Distribution and ecology: Australian Capital Territory, Victoria and Tasmania. Grows in montane forests, usually on drier slopes and often among rocks. Soils are well-drained stony loams or gravelly loams. Flowering occurs freely in the absence of fire. Altitude: 300-1200 m. Flowering period: December to February.

Notes: This species is newly recorded for Tasmania. It is a robust montane species which is characterised by large crowded pastel-coloured flowers; usually connate lateral sepals; crenulate labellum margins; rugulose callus plate; and, linear-oblong column appendages.

Specimens examined:
TASMANIA: Mt Roland Plateau, 16 Jan. 1983, *Cameron* (QVM); Central Plateau, 13 Jan. 1993, *Smith (Jones 11184)* (CANB, HO).

17. *Prasophyllum olidum* D.L. Jones, sp. nov.,
P. rostrato Lindl. affinis, sed floribus viridibus ad virido-brunneis; tepalis textura tenui; labello elliptico ad medio abrupte contracto in dimidium distalem angustum caudiformem; et callo ovato-lanceolato prope apicem labelli terminante.

TYPUS: Tasmania, Campbell Town, 3 Dec. 1996, *J.E. Wapstra (ORG 465)* (holo CANB; iso AD, HO, MEL).

Slender, terrestrial, tuberous *herb* growing singly or in clumps of up to ten plants. *Tubers* not seen. *Leaf* terete, 20-45 cm long, green to yellowish green; base 3-5 mm across, pinkish red; free lamina 12-22 cm long, erect to suberect, the tip often withered. *Inflorescence* a dense spike 6-12 cm long, consisting of 10-30 flowers. *Floral bracts* transversely ovate, c.2.5 mm long, c. 3 mm wide; apex bluntly apiculate. Ovary obovoid, c. 4.5 mm long, c. 2.5 mm wide,

at c. 40° to the rachis. *Flowers* sessile, 14-16 mm long, 7-9 mm wide, bright green or yellowish green to brownish green, opening widely, very strongly fragrant. *Tepals* thin-textured. *Dorsal sepal* ovate-lanceolate, 7-10 mm long, 3-4 mm wide, deflexed, held nearly vertical, uniformly coloured or with three faint stripes; apex subacute to apiculate. *Lateral sepals* narrowly linear-lanceolate, 8-10 mm long, 1.5-2 mm wide, falcate, free from the base, parallel or slightly divergent, erect, recurved above the middle; distal margins involute; apex subacute. *Petals* porrect, linear to narrowly linear-lanceolate, 7-9 mm long, c. 1 mm wide, sometimes with a dark median line; tips incurved, subacute. *Labellum* with a basal claw c. 0.3 mm long, c. 1 mm wide; proximal half porrect to slightly erect, suddenly recurved at right angles near the middle; distal half erect or shallowly recurved; *lamina* when flattened 6-8 mm long, 3-4 mm wide, elliptic in the proximal half then suddenly contracted near the middle and tapered narrowly to the apex; proximal half concave; proximal margins entire or slightly irregular; distal margins irregularly crenulate; apex obtusely apiculate to acuminate. *Callus* ovate-lanceolate, c. 6.5 mm long, c. 2.5 mm wide, green, shiny, thickened, fleshy, broadly channelled at the base, extending well beyond the bend nearly to the labellum apex. *Column* porrect from the end of the ovary, c. 3 mm long, c. 3 mm wide; column appendages oblong, c. 2.5 mm long, c. 1 mm wide, truncate to emarginate. *Anther* ovate-oblong, c. 2 mm long, c. 1.6 mm wide, purple-brown. *Pollinarium* c. 2.2 mm long; viscidium ovate, c. 0.3 mm long, white; hamulus c. 0.4 mm long; pollinia linear-clavate, c. 1.6 mm long, falcate, yellow, sectile. *Stigma* quadrate, c. 1 mm long, c. 1.8 mm wide; rostellum about as high as the appendages. *Capsules* obovoid, 6-9 mm long, 4-6 mm wide, green, shiny. **Fig. 6.8.**

Distribution and ecology: Endemic to Tasmania where confined to the lowest rainfall region in the state (c. 500 mm per annum), known only from the vicinity of Campbell Town. Grows in native grassland on sandy loam. Altitude: c. 200 m. Flowering period: late November and December.

Notes: Differs from all other species of *Prasophyllum* by the following combination of features; green to greenish brown flowers with a very strong, almost overpowering fragrance; thin-textured tepals; labellum shape when flattened, elliptic and concave in the proximal half, suddenly contracted medially to a narrow, sharply tapered, tail-like distal half; callus ovate-lanceolate, extending well beyond the bend of the lamina and ending near the labellum apex.

Similar to *P. rostratum* Lindl., which has much darker, lightly fragrant flowers; thick-textured tepals and a much thicker almost bulbous labellum callus. Both species have a similar shaped labellum which is suddenly contracted medially ending in a narrow tail-like section.

Prasophyllum olidum flowers freely in the absence of fires. Its perfume is remarkably similar to that of *P. diversiflorum* Nicholls.

Etymology: Derived from the Latin *olidus*, strongly fragrant, in reference to the very strong, almost overpowering floral fragrance.

Conservation status: Known only from the type locality and not reserved; suggest 2EK by the criteria of Briggs & Leigh (1996).

Specimens examined:
TASMANIA: Campbell Town, *Wapstra (Jones 14682)*, 21 Nov. 1995; *ibid*, 27 Nov. 1996, *Wapstra* (ORG 462).

18. *Prasophyllum perangustum* D.L. Jones, sp. nov.
P. fitzgeraldii R.S. Rogers affinis, sed floribus angustis (c. 13 x 7 mm); tepalibus viridibus; labello ovato-lanceolata, albo, apice attenuato-caudato, in dimidio proximali porrecto, prope medio ad angulum 90°recurvo; et callo ovato-lanceolato, fere ad apiceum labelli extenso, differt.

TYPUS: Tasmania, Knocklofty, 14 Dec. 1936, *Olsen*, (holo HO 66336; iso HO 65959).
Prasophyllum rogersii auct., non Rupp (1928); W.M. Curtis, *The Student's Flora of Tasmania* 4A: 72 (1979).

Slender, terrestrial tuberous *herb* 15-40 cm tall. *Tubers* not seen. *Leaf* terete, 18-25 cm long, dark green; base 2-3 mm across, reddish; free

lamina erect to suberect. *Inflorescence* a narrow loose spike 6-10 cm long, consisting of 7-15 flowers. *Floral bracts* transversely ovate, c. 1.5 mm long, c. 1.5 mm wide; apex acutely apiculate. *Ovary* obovoid, c. 6 mm long, c. 3 mm wide, at c. 45° to the rachis. *Flowers* sessile to subsessile, 12-14 mm long, 6-8 mm wide, greenish or light reddish green with a white labellum, opening widely, lightly fragrant. *Dorsal sepal* narrowly ovate-lanceolate, 5.5-7 mm long, c. 3 mm wide, greenish with red-brown striae, held nearly vertical or recurved; apex subacutely apiculate. *Lateral sepals* narrowly linear-lanceolate, 7-8 mm long, c. 2 mm wide, free from the base, erect or slightly recurved; distal margins involute; apex subacute. *Petals* porrect, narrowly linear, 5-6 mm long, c. 1.2 mm wide, greenish with a red-brown central line; tips incurved, acute to obtuse. *Labellum* sessile, white, sometimes flushed with pink; proximal half porrect, suddenly recurved at right angles near the middle; distal half erect; apex often recurved through the lateral sepals; *lamina* ovate-lanceolate in outline when flattened, 6-7 mm long, 2.6-3.2 mm wide, most of the ventral surface and margins covered with small elongate papillae; proximal half deeply concave; margins entire; margins of the distal half slightly irregular; apex attenuate-caudate. *Callus* very narrowly ovate-lanceolate, 5-5.5 mm long, 1.5-1.8 mm wide, thickened, fleshy, green, broadly channelled, extending to within c. 1.5 mm of the labellum apex; ventral surface with small elongate papillae. *Column* porrect from the end of the ovary, c. 2 mm long, c. 2 mm wide; column appendages oblong-lanceolate, c. 1.8 mm long, c. 0.7 mm wide, obtuse. *Anther* ovate-elliptic, c. 1.5 mm long, c. 1 mm wide, reddish brown, colliculate. *Pollinarium* c. 1 mm long; viscidium elliptic, c. 0.2 mm long, white; hamulus c. 0.1 mm long; pollinia linear-clavate, c. 0.9 mm long, falcate, yellow, sectile. *Stigma* quadrate, c. 1 mm long, c. 1.5 mm wide; rostellum higher than the appendages. *Capsules* obovoid, c. 8 mm long, c. 4.5 mm wide, green, shiny.
Fig. 6.9.

Distribution and ecology: Endemic to southern Tasmania where known with certainty only from the vicinity of the type locality, but represented by several collections. Grows on steep slopes and ridges among grass and shrubs in sparse forest. Flowers only after fires. Soils are clay loams and skeletal clay loams. Altitude: 220-250 m. Flowering period: November and December.

Notes: Differs from all other species of *Prasophyllum* by the following combination of features; narrow flowers (c. 13 mm long, c. 7 mm across); tepals greenish or light reddish green, labellum white; labellum porrect in proximal half, recurved at right angles near the middle, the distal half erect; labellum ovate-lanceolate when flattened, with an attenuate-caudate apex; ventral surface and margins of lamina covered with small, elongate papillae: callus narrowly ovate-lanceolate, papillate, extending nearly to the labellum apex, ending in a drawn-out point.

This species has been confused with *P. rogersii* Rupp (Curtis 1979), a rather puzzling determination since the labellum of *P. rogersii* is completely glabrous.
Prasophyllum rogersii occurs in northern New South Wales but does not extend to Tasmania.

Conservation status: Known only from the type locality but represented by several collections; suggest 1KE by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Latin *perangustus*, very narrow, in reference to the drawn out apex of the labellum and the labellum callus.

Specimens examined:
TASMANIA: Knocklofty, 2 Dec. 1939, *Olsen* (HO 66337); *ibid*, 16 Dec. 1939, *Olsen* (HO); cult. ex ? Knocklofty, 22 Oct. 1973, *Rayner* (HO 66338); Near Hobart, 21 Dec. 1936, *Rodway* (MEL 56646); Knocklofty, South of Hobart, 27 Nov. 1993, *D. Ziegeler (Jones 12614)* (CANB).

19. *Prasophyllum pulchellum* D.L. Jones, sp. nov.
P. odorati R.S. Rogers affinis, sed racemo paucifloro, 3-12 floribus; tepalis rufo-brunneis et labello cremeo; floribus comparate parvis (5.5-7 mm latis), non late aperientibus; labello prope medio ad angulum c. 90° recurvo; labelli callo obscuro, emarginato; et columna angusta appendicibus angustis (c. 0.4 mm latis) curvatis, differt.
TYPUS: Tasmania, Labillardiere State Reserve,

South Bruny Island, 10 Nov. 1994, *D.L.Jones 13694*, *J.E. & A.Wapstra*, (holo CANB; iso AD, CANB, HO, MEL).

Slender terrestrial tuberous *herb* 12-30 cm tall. *Tubers* not seen. *Leaf* terete, 15-25 cm long, mid green; base 1.5-3 mm across, purplish-red; free lamina erect, slender, green at anthesis. *Inflorescence* a narrow loose spike 4-12 cm long, consisting of 3-12 flowers. *Floral bracts* ovate, c. 2.5 mm long, 2 mm wide; apex apiculate. *Ovary* obovoid, c. 4.5 mm long, 2 mm wide, shiny green, at c. 50° to the rachis. *Flowers* sessile, 5.5-7 mm across, light reddish brown with a cream to whitish labellum, slightly fragrant, opening moderately wide. *Dorsal sepal* narrowly ovate-lanceolate, 5.5-6.5 mm long, c. 3 mm wide, reddish brown, with 3-5 darker striae, incurved; apex subacute to obtuse. *Lateral sepals* narrowly linear-lanceolate, 6-7 mm long, c. 2 mm wide, free from the base, obliquely erect, reddish-brown; anterior dorsal surface minutely verrucose; anterior margins involute; apex subacute. *Petals* porrect, linear, 5-6 mm long, c. 1.5 mm wide, reddish-brown with paler margins; apex slightly incurved, obtuse. *Labellum* sessile, cream to whitish; proximal half porrect; distal half recurved at right angles, erect; apex touching the sepals or protruding through them; *lamina* ovate-lanceolate in outline when flattened, 6-7 mm long, 3-3.5 mm wide; base cordate, gibbous when viewed from the side; proximal margins entire or slightly irregular; distal half with strongly and irregularly crispate-undulate margins; apex apiculate. *Callus* elliptical at the base then oblong, c. 4 mm long, 2 mm wide, dark green and shiny at the base, cream towards the apex (c. 1.2 mm across), channelled centrally, extending just beyond the bend in the lamina; apex emarginate. *Column* porrect from the end of the ovary, c. 3.2 mm long, 2 mm wide, partly visible in the flower when viewed from the side; appendages linear, c. 2.2 mm long, 0.4 mm wide, slightly falcate, whitish, obtuse. *Anther* ovate, c. 1.4 mm long, 1.6 mm wide, dark reddish-brown with paler margins. *Pollinarium* abortive; viscidium elliptical; hamulus c. 0.4 mm long, ligulate; pollinia abortive, cream to whitish, sectile. *Stigma* ovate, c. 1.5 mm wide, 1.3 mm wide; rostellum higher than the appendages. *Capsules* obovoid, c. 7 mm long, 3.5 mm wide, shiny, green. **Fig. 6.10.**

Distribution and ecology: Known from three localities in southern Tasmania but difficult to locate in its habitat and probably more widespread. Grows in low heath which becomes extremely dense in the years following fire. The original plants were found among rushes and sedges on gentle slopes just above colonies of stunted *Melaleuca squarrosa* Donn. ex Sm. Soils are moist to wet sandy loams or peaty loams. Altitude: c. 20 m. Flowering period: Late October and November.

Notes: *Prasophyllum pulchellum* can be distinguished by the following combination of features; flower colour (reddish-brown tepals and a cream labellum); relatively small (5.5-7 mm across), moderately opening flowers; three-12 uncrowded flowers in the spike; labellum recurved near the middle at about right angles; labellum callus relatively obscure, emarginate; and, a narrow (2 mm wide) column with narrow (0.4 mm wide), curved appendages.

Prasophyllum pulchellum is a distinctive species which could be loosely included in the *P. truncatum* complex. As with other species in this genus its flowering is probably stimulated by fire.

Conservation status: Conserved in the Labillardiere State Reserve; suggest 2KC by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Latin *pulchellus*, beautiful.

Specimens examined:
TASMANIA: Bruny Island, 15 Nov. 1969, *Palmer* (HO 65957); near Ida Bay, 10 Nov. 1996, *Rubenach (ORG 446)* (CANB); Tasman Peninsula, Dec. 1961, *Somerville* (HO 66296); Southport Lagoon, 24 Nov. 1994, *Ziegeler (Jones 13731)* (CANB).

20. *Prasophyllum pyriforme* E. Coleman, Victorian Naturalist 49: 195, t. 14 (1932).
TYPE: Wonga Park, Doncaster, Oct. 1931, F. Bullock (holo MEL!).

Illustration: Page 248, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria and Tasmania. Grows in grassy open forest and woodland, heathland and grassland in sandy loams and clay loams. Altitude: 0-200 m. Flowering period: November and December.

Notes: Newly recorded for Tasmania (collections and photograph from Flinders Island), this species is characterised by relatively large greenish to reddish brown fragrant flowers; free or connate recurved lateral sepals; broad pink or white labellum lamina with wavy margins; and, a prominently raised, fleshy green labellum callus which extends nearly to the labellum apex.

21. *Prasophyllum robustum* (Nicholls) M.A. Clem. & D.L. Jones, *Austral. Orch. Res.* 1:117 (1989).
Prasophyllum patens R.Br. var. *robustum* Nicholls, *Victorian Naturalist* 57: 84 (1940).
TYPE: Tasmania, Smithton, Oct.-Nov., *Atkinson* (holo MEL!).

Illustration: Plate 124, Nicholls (1969) - as *P. patens* var. *robustum*.

Slender, glabrous, terrestrial, tuberous *herb* 40-110 cm tall. *Tubers* not seen. *Leaf* terete 30-85 cm long, dark green; base 5-6 mm across, dark red to purple; free lamina erect to suberect, often withered at anthesis. *Inflorescence* a loose spike 15-25 cm long, consisting of 15-30 flowers. *Floral bracts* ovate-quadrate, c. 3 mm long, c. 3 mm wide, closely sheathing, apiculate. *Ovary* narrowly obovoid, 8-12 mm long, 3-4 mm wide, green, shiny, set at c. 60° to the rachis. *Flowers* subsessile, 16-20 mm across, opening widely, not noticeably fragrant; tepals greenish brown to brownish; labellum white. *Dorsal sepal* ovate-lanceolate, 9.5-11 mm long, c. 5 mm wide, 3-5 dark brown striae prominent, deflexed, recurved from near the middle, subobtuse. *Lateral sepals* linear-lanceolate, 10-12 mm long, c. 2.5 mm wide, erect, very widely divergent; distal margins involute. *Petals* narrowly linear, 10-11 mm long, c. 2.3 mm wide, whitish with a brown median band, widely spreading, subobtuse. *Labellum* sessile, white; proximal half porrect, sharply recurved back on itself at c. 135° near the middle; distal half obliquely erect; apex recurved through the lateral sepals; *lamina* ovate-lanceolate in outline when flattened, 11-13 mm long, 5.5-6.5 mm wide, slightly gibbous when viewed from the side; proximal margins entire; distal margins irregularly crispate/crenulate; apex obtusely apiculate. *Callus* ovate-oblong, green, c. 5.5 mm long, c. 3.5 mm wide, raised, fleshy, channelled centrally, extending to the bend in the lamina; apex shallowly emarginate. *Column* porrect from the end of the ovary, c. 3.5 mm long, c. 3.5 mm wide, visible from the side in the gap between the dorsal sepal and the petals; appendages oblong-obovate, c. 3 mm long, c. 1.4 mm wide, white, truncate, apex irregular. *Anther* ovate, c. 2.5 mm long, c. 2 mm wide, purplish brown, about as wide as the stigmatic plate. *Pollinarium* c. 3.5 mm long; viscidium ovate, c. 0.3 mm long; hamulus ligulate, c. 1 mm long; pollinia narrowly clavate, c. 2.2 mm long, yellow, sectile. *Stigma* broadly elliptic, c. 2 mm long, c. 2 mm wide; rostellum as high as the appendages. *Capsules* narrowly obovoid, 12-16 mm long, c. 6 mm wide, shiny. **Fig. 6.11.**

Distribution and ecology: Endemic to northern Tasmania, between Latrobe and Smithton. Grows among shrubs and grass in tall eucalypt forest. The soil is a well-structured, brown loam. Altitude: c. 10-40 m. Flowering period: November and December.

Notes: Distinguished from all other species of *Prasophyllum* by the following combination of features; moderately large (16-20 mm long, 16-20 mm across) flowers with widely spreading perianth segments; narrowly linear petals; ovate-lanceolate labellum (to 13 x 6.5 mm) with the distal half obliquely erect, the tip protruding through the lateral sepals; ovate-oblong (c. 5.5 x 3.5 mm) labellum callus which extends to the labellum bend; column (c. 3.5 x 3.5 mm) with the anther of similar width to the stigmatic plate.

Prasophyllum robustum is part of the *P. truncatum* complex but is readily distinguished by the moderately large flowers with widely spreading perianth segments and a long, relatively narrow labellum. It is most similar to *P. stellatum*, but that species grows in a montane habitat; is later flowering (Jan.-Mar.); has an oblong to narrowly elliptical-oblong labellum (to 14 x 5.5 mm) with the distal half nearly flat against the basal portion; a narrow (c.

7 x 3 mm) labellum callus which projects past the bend in the lamina; and, a column with the anther narrower than the stigmatic plate.

Conservation status: Reduced to rarity by land clearing and urbanisation; suggest 2KR by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Latin, *robustus*, strong, vigorous, robust.

Specimen examined:
TASMANIA: Dooleys Hill, near Latrobe, 15 Nov. 1995, *Tonelli (Jones 14648)* (CANB, HO).

22. *Prasophyllum rostratum* Lindl., *Gen. sp. orchid. pl.* 516 (1840).
TYPE: Tasmania, *R. Gunn 353* (lecto K-L, *fide* Clements 1983, photo!; isolecto K).

Illustration: None found.

Distribution and ecology: Endemic to northern Tasmania. Grows in open forest and coastal scrubs, often in disturbed sites such as along embankments and road verges. Soils include sands, sandy loam and clay loam. Flowering is stimulated to a limited degree by summer fires, but the species continues flowering in their absence. Altitude: 0-50 m. Flowering period: Late October to early December.

Notes: This species is characterised by greenish to greenish brown flowers; elliptical labellum in the proximal half, suddenly contracted medially and ending in a sharply tapered tail-like apical portion; and, a thick labellum callus which is almost bulbous towards the apex.

Prasophyllum rostratum is closely related to *P. olidum* but the flowers of the latter species have a very strong, almost overpowering fragrance, thin-textured tepals and a shallower labellum callus. *Prasophyllum rostratum* has also often been confused with *P. concinnum* but that species has an ovate-lanceolate labellum which tapers to the apex from just below the middle and lacks the prominent medial constriction of the former. Some herbarium specimens however, are particularly difficult to identify (see also *P. concinnum* entry).

Prasophyllum rostratum is also similar to *P. pyriforme* E. Coleman, from mainland Australia and Flinders Island, but that species has an ovate-lanceolate white to pink tapered labellum with a shallow labellum callus.

Lindley has a drawing of the characteristic labellum shape on the type sheet of this species and it is apparent that he derived the epithet *rostratum* (= beaked) from the tail-like apical portion of the labellum.

Selected specimens (30 seen)**:**
TASMANIA: Sisters Hills, 20 Nov. 1992, *Campbell 92267* (CANB); Duck Bay area, 4 Nov. 1996, *Hyatt (ORG 448)* (CANB); Western Explorer, between Balfour turnoff and Couta Rocks, 19 Nov. 1996, *Hyatt (ORG 453)* (CANB); Rocky Cape, 26 Nov. 1973, *Johnson* (HO 66314); Tullah, 21 Nov. 1976, *Johnson* (HO 65991); Wet Cave Beach, 3 Nov. 1990, *Jones 6956 & Broers* (CANB); Sisters Hills, 11 km E. of Rocky Cape turnoff, 4 Nov. 1990, *Jones 6961 & Broers* (CANB); between Smithton & Wynyard, 20 Nov. 1968, *Palmer* (HO 66323); Flinders Island, Tanners Bay Tinfield, 11 Nov. 1967, *Whinray 166* (HO 25818).

23. *Prasophyllum secutum* D.L. Jones, sp. nov.
P. fitzgeraldii R.S. Rogers affinis, sed floribus parvis, comparate latis (c. 8 mm x 4.5 mm); tepalibus brunneis; labello ovato-elliptico, c. 5 x 3 mm, albido; callo ovato-oblongo, c. 3 x 2 mm; anthera late ovata, quam appendicibus columnae breviore; et pollinarii hamulo distincte ligulato, differt.

TYPUS: Tasmania, Anthony Beach, between Smithton and Stanley, 4 Nov. 1990, *D.L.Jones 6985 & C.H.Broers* (holo CANB; iso AD, CANB, HO, MEL).

Slender terrestrial tuberous *herb* 12-35 cm tall. *Tubers* ovoid, 8-15 mm long, 7-10 mm wide, fleshy. *Leaf* terete, 10-25 cm long, pale green to dark green; base 3-4 mm across, purple; free lamina 4-8 cm long, erect to suberect. *Inflorescence* a narrow moderately dense spike 3.5-14 cm long, consisting of 9-30 flowers. *Floral bracts* transversely oblong, c. 0.5 mm long, c. 1 mm wide, bluntly apiculate. *Ovary* obovoid, c. 4 mm long, c. 5 mm wide, strongly

gibbous, at c. 45° to the rachis. *Flowers* sessile to subsessile, 7-9 mm long, 4-5 mm wide, light brown with a whitish labellum, opening widely, strongly fragrant. *Dorsal sepal* ovate-lanceolate, 5-6 mm long, 2.5-2.8 mm wide, brownish with darker striae, obliquely deflexed, obtuse. *Lateral sepals* narrowly linear-lanceolate, 6-7 mm long, c. 2 mm wide, free from the base, erect to obliquely erect; distal margins involute; apex bidentate. *Petals* porrect, narrowly oblong-obovate, 4.5-5.5 mm long, c. 1.3 mm wide, with a brown central line; tips incurved, obtuse. *Labellum* sessile, whitish; proximal two-thirds porrect, suddenly recurved at more than right angles near the middle; distal third usually recurved; apex often protruding through the lateral sepals; *lamina* ovate-elliptic in outline when flattened, 4.5-5.5 mm long, c. 3 mm wide, most of the ventral surface and margins covered with small elongate papillae; proximal two-thirds broadly concave; proximal margins entire; distal margins very slightly irregular; apex subacute to apiculate. *Callus* ovate-oblong, 3-3.6 mm long, 1.5-2 mm wide, thickened, fleshy, green, broadly channelled, extending beyond the bend of the lamina; ventral surface with small elongate papillae. *Column* porrect from the end of the ovary, c. 1.5 mm long, c. 2 mm wide; column appendages narrowly oblong, c. 1.5 mm long, c. 0.6 mm wide, truncate. *Anther* broadly ovate, c. 1.2 mm long, c. 1.2 mm wide, dark brown, colliculate. *Pollinarium* c. 0.8 mm long; viscidium ovate, c. 0.1 mm long, white; hamulus c. 0.2 mm long, ligulate; pollinia linear-clavate, c. 0.7 mm long, falcate, yellow, sectile. *Stigma* quadrate, c. 0.5 mm long, c. 1 mm wide; rostellum about as high as the appendages. *Capsules* obovoid, 4.5 mm long, 3-4 mm wide, green, shiny. **Fig. 6.12.**

Distribution and ecology: Endemic to northern Tasmania, between Lulworth and Smithton. Grows in dense coastal scrub in the swales of stabilised sand dunes near the coast. Flowers only after fires. Soils are white to grey sands and sandy loam. Altitude: 10-30 m. Flowering period: October to December.

Notes: Differs from all other species of *Prasophyllum* by the following combination of features; small relatively broad flowers (c. 8 mm long, c. 4.5 mm across); tepals brown, labellum whitish; labellum porrect in the proximal two-thirds, sharply recurved above the middle, the distal third recurved; labellum ovate-elliptic when flattened, with an apiculate apex; ventral surface and margins of lamina covered with small elongate papillae; callus ovate-oblong, papillate, extending just beyond the bend in the lamina; anther broadly ovate; anther much shorter than column appendages; pollinarium with a distinct ligulate hamulus.

Prasophyllum secutum is part of the *P. fitzgeraldii* complex (see also *P. favonium* and *P. perangustum*).

Conservation status: Relatively disjunct and locally common but not conserved and abundant only after fire; suggest 3KE according to the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Latin, *sequor, secutus*, follow, in reference to the habit of the orchid flowering after fire.

Specimens examined:
TASMANIA: S. side of Croppies Point Rd, 24 Nov. 1983, *Buchanan 1730*, (HO 88302); near Launceston, 19 Nov. 1971, *Burrows* (HO 66014); Anthony Beach, 6 Nov. 1990, *Jones 7043 & Broers* (AD, CANB, HO, MEL); Lulworth, 8 Nov. 1990, *Jones 7097, Broers & Smith* (CANB, HO); Georges Bay, no date, *Rodway* (HO 66343); near Stone Cottage, 24 Nov. 1837, *Smith* (QVM).

24. *Prasophyllum sphacelatum* D.L. Jones**,** *Muelleria* 9: 59-61, fig. 4 (1996).
TYPE: New South Wales: Southern Tablelands; c. 7 km along Tantangara Dam Rd, 3 Jan. 1993, *D.L. Jones 1102 & B.E. Jones* (holo CANB; iso AD, CANB, MEL, NSW).

Illustration: Page 248, Jones (1988) - as *P. alpinum*.

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows mainly in subalpine herbfield and tussock grassland, less commonly in snowgum woodland; in Tasmania also in buttongrass plain. Altitude: 800-1700 m. Flowering period: December to early February.

Notes: Newly recorded for Tasmania. These collections have been made between 790 and 860 m altitude but those on the mainland occur

between 1400 and 1700 m. (Jones 1996). At one Tasmanian site this species grew sympatrically with *P. alpinum*, the first record of these two species growing together.

Specimens examined:
TASMANIA: Mathinna Plains Rd, Mathinna Plains, 9 Dec. 1997, *M. Wapstra (ORG 1067)* (CANB); *ibid*, 13 Dec. 1997, *Wapstra (ORG 1070)* (CANB); corner Mathinna Plains Rd and Ben Ridge Rd, Mathinna Plains, 13 Dec. 1997, *Wapstra (ORG 1071)*; 500 m N. of Ben Ridge Rd, Mathinna Plains, 13 Dec. 1997, *Wapstra (ORG 1072)* (CANB); Ben Ridge Rd, Paradise Plains, 13 Dec. 1997, *Wapstra (ORG 1073)* (CANB); near Newitts Ck crossing, Ben Ridge Rd, Paradise Plains, 13 Dec. 1997, *Wapstra (ORG 1074)*, (CANB).

25. *Prascphyllum stellatum* D.L. Jones, sp. nov.
P. robusti (Nicholls) M.A. Clem. & D.L. Jones affinis, sed floribus comparate grandibus (15-17 mm longis, 14-18 mm latis), tepalis late patentibus; petalis anguste linearibus, labello oblongo ad anguste elliptico-oblongo (ad 14 x 5.5 mm) ad medium abrupte recurvo ad angulum 155°, dimidio distali fere plano juxta basin; labelli callo angusto, c. 7 x 3 mm, labelli flexum excedente; et columna c. 3.5 x 3.3 mm, anthera quam disco stigmatico angustiore, appendicibus truncatis, differt.

TYPUS: Tasmania, Ben Lomond, above Storys Ck township, 20 Feb. 1992, *L. Rubenach (Jones 9083)* (holo CANB 9220366).

Slender, glabrous, terrestrial, tuberous *herb* 40-80 cm tall. *Tubers* not seen. *Leaf* terete, 30-70 cm long, dark green; base 4-5 mm across, dark red to purple; free lamina erect to suberect, often withered at anthesis. *Floral bracts* broadly ovate, c. 3 mm long, c. 2.3 mm wide, closely sheathing. *Ovary* obovoid, 8-10 mm long, 2.5-3.5 mm wide, green, shiny, at c. 40° to the rachis. *Inflorescence* a loose spike 9-15 cm long, consisting of 10-20 flowers. *Flowers* subsessile, 14-18 mm across, opening widely, not noticeably fragrant; tepals greenish brown to brownish; labellum white. *Dorsal sepal* narrowly ovate-lanceolate, 9.5-11 mm long, c. 4 mm wide, 3-5 dark brown striae prominent, deflexed, recurved from near the middle; apex subobtuse to subacute. *Lateral sepals* linear-lanceolate, 10-12 mm long, c. 2.4 mm wide, erect, very widely divergent; distal margins involute. *Petals* narrowly linear, 11-12 mm long, c. 1.5 mm wide, whitish with a brown median band, widely spreading, subobtuse. *Labellum* sessile, white; proximal half porrect, sharply recurved back on itself at c. 155° near the middle; distal half nearly parallel to the basal portion; apex recurved and touching the base; *lamina* oblong to narrowly elliptical-oblong in outline when flattened, 12-14 mm long, 5-5.5 mm wide; base narrowly cordate, not gibbous when viewed from the side; proximal margins entire; distal margins irregularly crispate/crenulate; apex obtusely apiculate. *Callus* greenish yellow, c. 7 mm long, c. 3 mm wide, elliptical at the base then oblong, raised, fleshy, channelled centrally, projecting just beyond the bend in the lamina; apex emarginate, papillate. *Column* porrect from the end of the ovary, c. 4 mm long, c. 3.3 mm wide, visible from the side in the gap between the dorsal sepal and the petals; appendages obovate-oblong, c. 3.5 mm long, c. 1.3 mm wide, brownish, truncate, apex irregularly toothed. *Anther* ovate, c. 2 mm long, c. 1.5 mm wide, purplish brown, much narrower than the stigmatic plate. *Pollinarium* c. 3 mm long; viscidium ovate, c. 0.3 mm long; hamulus ligulate, c. 1 mm long; pollinia narrowly clavate, c. 1.8 mm long, yellow, sectile. *Stigma* ovate, c. 2 mm long, c. 2 mm wide; rostellum higher than the appendages. *Capsules* narrowly obovoid, 12-16 mm long, c. 6 mm wide, shiny. **Fig. 6.13.**

Distribution and ecology: Endemic to Tasmania where known with certainty only from Ben Lomond, south-east of Launceston. Grows in moist to wet grassy areas in tall eucalypt forest. The soil is a brown loam. Altitude: c. 1000 m. Flowering period: January to March.

Notes: Distinguished from all other species of *Prasophyllum* by the following combination of features; moderately large (15-17 mm long, 14-18 mm across) flowers with widely spreading perianth segments; narrowly linear petals; oblong to narrowly elliptical-oblong labellum (to 14 x 5.5 mm) with the distal half nearly flat against the basal portion; narrow (c. 7 x 3 mm) labellum callus which projects beyond the labellum bend; column (c. 3.5 x 3.3 mm) with

the anther narrower than the stigmatic plate and truncate appendages.

Prasophyllum stellatum is part of the *P. truncatum* complex but is readily distinguished by the moderately large flowers with widely spreading perianth segments and a long relatively narrow labellum. It is most similar to *P. robustum*, but that species has a lowland distribution; is earlier flowering (Nov.-Dec.); has an ovate-lanceolate labellum (to 13 x 6.5 mm) with the distal half obliquely erect, the tip protruding through the lateral sepals; an ovate-oblong (c. 5.5 x 3.5 mm) labellum callus which extends to the bend in the lamina; and a column (c. 3.5 x 3.5 mm) with the anther of similar width to the stigmatic plate.

Conservation status: Poorly known and not conserved; suggest 1K by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Latin, *stellatus*, starry, radiating from the centre like the rays of a star, in reference to the widely spreading perianth segments.

26. *Prasophyllum tadgellianum* R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 47: 338-339 (1923).
TYPE: Victoria, Mt Bogong, 7 Feb. 1923, *A.J. Tadgell in herb.R.S. Rogers 2954a* (lecto AD!, *fide* Clements
1989).

Illustration: Page 229, Backhouse & Jeanes (1995) - as *P. alpinum*.

Distribution and ecology: Australian Capital Territory, New South Wales, Victoria and Tasmania. Grows in tussock grassland in subalpine herbfield, moist to wet areas around streams and bogs, snowgum woodland; rarely in feldmark. Flowering occurs freely in the absence of fire. Altitude: 1000-2000 m. Flowering period: January to March.

Notes: This species, which has been reinstated (Jones 1996), is recently recorded for Tasmania. It is a subalpine species which has been confused with *P. alpinum*, but can be distinguished by larger (10-12 mm long), brownish flowers; a nearly sessile ovate-lanceolate labellum with a thinner more tapered lamina callus and, the column wings about as long as the anther. The leaves on this species do not wither on the apex as readily as do other species of subalpine *Prasophyllum*, with the leaf tip usually remaining stiff and turgid. This character, which is a very useful identification guide, is often obvious on plants until seed dehiscence or even later.

Specimens examined:
TASMANIA: Fury Plains, c. 6 km before Waldheim, 24 Jan. 1974, *Allen* (HO); near Bastion Bluff, 12 Jan. 1994, *Collier* (CANB); February Plains, 28 Jan. 1983, *Moscal 1547* (HO).

27. *Prasophyllum truncatum* Lindl., *Gen. sp. orchid. pl.* 513 (1840).
TYPE: Circular Head, Tasmania, Dec. 1837, *R.Gunn 924* (lecto K-L; isolecto BM!, *fide* Clements 1989).

Slender terrestrial tuberous *herb* 20 - 40 cm tall. *Tubers* not seen. *Leaf* terete, 15-35 cm long, dark green; base 3-5 mm across, red to purple; free lamina suberect, often withered at anthesis. *Floral bracts* ovate, c. 2 mm long, c. 1.7 mm wide, apiculate. *Ovary* obovoid, c. 5 mm long, c. 3 mm wide, shiny green, at c. 30° to the rachis. *Inflorescence* a narrow loose spike 7-11 cm long, consisting of 10-20 flowers. *Flowers* sessile, 7-9 mm across, predominately whitish with purple suffusions, opening widely, fragrant. *Dorsal sepal* narrowly ovate-lanceolate, 7-8.5 mm long, c. 3.5 mm wide, brownish-green with purplish suffusions, three purplish striae prominent, held nearly vertical or recurved near the middle, subacute. *Lateral sepals* linear-lanceolate, 7-8.5 mm long, c. 1.5 mm wide, brownish-tan, erect, slightly divergent; anterior margins involute throughout. *Petals* narrowly linear to linear-oblong, 7-8 mm long, 1-1.2 mm wide, white with a purple median band and purple suffusions, upswept, divergent, obtuse. *Labellum* sessile, white; proximal half porrect, suddenly recurved sharply near the middle and bending back at about 25°; apex more or less level with the lateral sepals; *lamina* narrowly to broadly elliptical-oblong in outline when flattened, 7.5-8 mm long, 3.5-4 mm wide, anterior surface minutely papillate; base cordate, shallowly gibbous when viewed from the side; proximal margins entire; distal margins irregularly crispate/crenulate; apex obtuse to

apiculate. *Callus* ovate at the base, more or less oblong in the distal half, 4-4.5 mm long, 2-2.3 mm wide, raised, fleshy, yellowish green, extending just beyond the bend in the lamina; base dark green, channelled centrally; margins slightly irregular; apex broadly emarginate. *Column* c. 3 mm long, c. 2.4 mm wide, porrect from the end of the ovary, visible from the side in the gap between the dorsal sepal and the petals; appendages linear-oblong, c. 2 mm long, c. 0.6 mm wide, falcate, purple. *Anther* ovate, c. 1.8 long, c. 1.4 mm wide, dark purple-brown, surface verrucose-papillate narrower than the stigmatic plate. *Pollinarium* c. 3 mm long; viscidium ovate, c. 0.25 mm long, white; hamulus c. 1 mm long, ligulate; pollinia linear-clavate, c. 2 mm long, yellow, sectile. *Stigma* quadrate, bilobed, c. 1 mm long, c. 1 mm wide; rostellum about as high as the appendages. *Capsules* obovoid, c. 8 mm long, 5 mm wide, shiny, green.
Fig. 6.14.

Distribution and ecology: Endemic to Tasmania where widely distributed in the north and the south. Grows among shrubs and herbs in open forest and heathland. Flowering is stimulated by fire. Altitude: 0-100 m. Flowering period: November to March.

Notes: *Prasophyllum truncatum* can be distinguished by the following combination of features; late flowering period; relatively small colourful flowers (greenish-brown sepals, purple and white petals and a white labellum); linear upswept petals; a sharply recurved labellum with the angle of flexure about 25°; an emarginate labellum callus; strongly falcate column lobes; and, the anther cap being narrower than the stigmatic plate.

Prasophyllum truncatum is a neglected species which has been overlooked, mainly because it is part of a complex group of species which includes *P. patens* and *P. odoratum*. It was described much earlier than the latter species (1840 *cf.* 1909) but until recently has been overlooked or confused with other taxa. Recent collections indicate that the species is more widespread in Tasmania than was previously thought.

Conservation status: Poorly known and conserved; suggest 3KC by the criteria of Briggs & Leigh (1996).

Selected specimens: (20 examined):
TASMANIA: Fortescue Bay, Cape Hauy Tk, 18 Dec. 1980, *Brown 70* (HO 44602); Prossers Forest, 11 Nov. 1995, *Campbell 95034* (CANB); Fluted Cape, South Bruny Island, 3 Mar. 1985, *Collier 403* (HO 115511); Southport Lagoon, 6 Dec. 1989, *Collier 4400* (HO 119780); East Coast, Dec. 1946, *Curtis* (HO 66258); Huon, 1 Apr. 1969, *Palmer* (HO 66349); near Ellendale, Feb. 1905, *Rodway* (HO 66254); Sand Hills, 4 Dec. 1836, *Smith* (QVM); Marsh Neck, 25 Dec. 1837, *Smith* (HO 99247, QVM); Forestier Pen., 1 Feb. 1996, *Wapstra* (CANB); Poatina, 1 Mar. 1996, *Wapstra* (CANB); Wielangta Forest, Jacob Hill, between Orford and Marion Bay, 25 Mar. 1996, *Wapstra* (CANB).

28. *Prasophyllum tunbridgense* D L. Jones, sp. nov.,

P. truncato Lindl. affinis, sed floribus magnis (17-25 mm latis); petalis oblanceolatis late divergentibus, marginibus expansis; labello oblongo-ovato, callo brevi oblongo; et columna comparate longa (c. 4 x 3 mm).

TYPUS: Tasmania, Tunbridge, Township Lagoon Nature Reserve, 24 Oct 1996, *J.E. Wapstra (ORG 324)* (holo CANB; iso HO).

Tuberous terrestrial *herb* growing singly or in small, loose groups. *Tubers* not seen. *Leaf* terete, 20-30 cm long, 4-6 mm wide, terete, bright-green; base c. 3 mm across, purplish; free lamina erect, 8-15 cm long, often partly withered at anthesis. *Inflorescence* a dense spike 6-9 cm long, consisting of c. 10-25 flowers. *Floral bracts* more or less ovate, 2.5-3 mm long, 1.3-1.6 mm wide, closely embracing the ovary; apex acuminate. *Ovaries* spreading at about 35° to the rachis, obovoid, 5-7 mm long, 3-3.5 mm wide, green, shiny. *Flowers* sessile, 17-25 mm across, green to light greenish brown with prominent white petals and a white labellum, fragrant. *Dorsal sepal* ovate-lanceolate, 9-12 mm long, 4-4.5 mm wide, decurved to deflexed, with three fine darker stripes; apex subobtuse to apiculate. *Lateral sepals* free, widely divergent, linear-lanceolate, 9-12 mm long, 2-2.5 mm wide, slightly falcate, obliquely erect; distal margins involute; apex slightly recurved. *Petals* widely spreading, linear-oblanceolate, 10-12 mm long, c. 3 mm wide, white, brownish in the proximal half distal margins flared, slightly irregular; apex

subobtuse. *Labellum* sessile, porrect in the proximal third, erect in the distal two-thirds; apex recurved and usually projecting through the lateral sepals; lamina ovate-oblong when flattened, 9-12 mm long, 5.5-6 mm wide; base not gibbous; proximal margins entire; distal margins intensely undulate/crispate; apex obtuse. *Callus* more or less oblong, 4.4-5 mm long, 3-3.5 mm wide, ending just beyond the bend in the lamina, greenish yellow, yellower towards the apex and distal margins, with a dark green narrow central area towards the base; margins slightly irregular; apex truncate to emarginate. *Column* porrect from the end of the ovary c. 4 mm long, c. 3 mm wide; appendages narrowly oblong, c. 3.5 mm long, c. 1 mm wide, slightly falcate, pinkish, apex obtuse. *Anther* shorter than the stigmatic plate, ovate, c. 2.5 mm long, c. 2 mm wide, brownish purple. *Pollinarium* c. 3.3 mm long; viscidium ovate, c. 0.4 mm long; hamulus ligulate, c. 6 mm long; pollinia c. 2.5 mm long, yellow, sectile. *Stigma* quadrate, c. 1.6 mm long, c. 2 mm wide; rostellum higher than the appendages. *Capsules* obovoid, 7-8 mm long, 3.5-4.5 mm wide, suberect, green, shiny. **Fig. 6.15.**

Distribution and ecology: Endemic to Tasmania where known only from small populations between Campbell Town and Tunbridge. This is the lowest rainfall region in the state (c. 500 mm per annum). Grows in native grassland with occasional small shrubs, in well-drained, red-brown basaltic loam and stony loam. Altitude: c. 210 m. Flowering period: October and November.

Notes: *Prasophyllum tunbridgense* can be distinguished by the following combination of features; large (17-25 mm across) flowers; widely divergent oblanceolate petals with flared margins; an ovate-oblong labellum; short more or less oblong callus; and, proportionately long (c. 4 x 3 mm) column.

Prasophyllum tunbridgense is part of the *P. truncatum* complex. Plants apparently flower freely in the absence of fire.

Conservation status: Known only from small relict patches of grassland, with most of the habitat converted to agriculture; conserved in the Township Lagoon Nature Reserve; suggest 2EC by the criteria of Briggs & Leigh (1996).

Etymology: From the type locality at Tunbridge.

Specimens examined:

TASMANIA: Township Lagoon, 9 Nov. 1983, *Moscal 3886*, (HO 87791); "Wanstead" Midland Hghy, N. of Campell Town, 15 Nov. 1996, *North (ORG 455)* (CANB); Tunbridge Township Lagoon, 17 Nov. 1995, *Wapstra (Jones 14657a)* (CANB).

EXCLUDED SPECIES

The following species were included in Curtis (1979) but were withdrawn from the Census (Buchanan 1995) on my advice. Some notes on their status and distribution are warranted.

Prasophyllum album R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 33: 211, t. XA, f. 1-9 (1909).
TYPE: Recorded from Victor Harbour and Grunthal, 15 Nov. 1907, *R.S. Rogers* (lecto AD, *fide* Clements 1989).

Notes: Described from South Australian specimens but of uncertain application.

Prasophyllum frenchii F. Muell., *Victorian Naturalist* 6: 126 (1889).
TYPE: Near Dandenong Ranges, Nov. 1889, *C. French* (lecto MEL!, *fide* Clements 1989; isolecto K).

Notes: Occurs in Victoria and possibly South Australia.

Prasophyllum fuscum R. Br., *Prodr.* 318 (1810).
TYPE: Moist meadows towards Georges River, Oct. 1803, *R. Brown* (lecto specimen a BM!, *fide* Clements 1989; isolecto AD!, BM, MEL, P).

Notes: Endemic to New South Wales.

Prasophyllum gracile R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 33: 213, t. 12a (1909), *non* Lindl.(1840).
TYPE: Sandergrove, 1 Nov. 1908, *J. Tucker* (holo AD!).

Notes: A synonym of *P. constrictum* R.S. Rogers, which is endemic to South Australia.

Prasophyllum odoratum R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 33: 209, t. 9b, f. 1-9 (1909).
TYPE: Blackwood, South Australia, 13 Oct. 1908, *R.S. Rogers* (lecto AD!, *fide* Clements 1989).

Notes: Occurs in South Australia and possibly also Victoria and New South Wales.

Prasophyllum parviflorum (R.S. Rogers) Nicholls, *Victorian Naturalist* 57; 191, f. A-I (1941).
TYPE: Yarram-Port Albert, 21 Nov. 1928, *E. Devonshire ex A.J. Tadgell herb.R.S. Rogers* (lecto AD!, fide Clements 1989).

Notes: Endemic to Victoria.

Prasophyllum uroglossum Rupp, *Victorian Naturalist* 64: 3 (1947).
TYPE: New South Wales, at Burrawang, 17 Nov. 1946, *A.W. Dockrill* (holo NSW!; iso MEL!).

Notes: A synonym of *P. fuscum*.

Prasophyllum rogersii *Rupp, Proc. Linn. Soc. New South Wales* 53: 340 (1928).
TYPE: Barrington Tops, at about 5000 ft, Jan. 1928, *H.M.R. Rupp & J. Hopson* (holo NSW!; iso K, NSW).

Notes: Endemic to New South Wales. See also *P. perangustum* entry above.

Prasophyllum suttonii R.S. Rogers & B. Rees, *Proc. Roy. Soc. Victoria (new ser.)* 25: 112, t. 6, f. A-C (1912).
TYPE: Buffalo Plateau, Victoria, Dec. 1902, *Sutton* (holo MEL!).

Notes: Apparently endemic to Mt Buffalo, Victoria. See also the entry for *P. alpestre* D.L. Jones.

ACKNOWLEDGEMENTS

As for paper 1 in this series.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Barnard, F.G.A. & Sutton, C.S. (1903). Among the Alpine Flowers, *Victorian Naturalist* 20(1): 4-12.
- Briggs, J.D and Leigh, J.H. (1996). *Rare or Threatened Australian Plants*, Revised Edition, CSIRO and Australian Nature Conservation Agency.
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Clements, M.A. (1983). Notes on the Contents of John Lindley's Orchid Herbarium - 2, *The Orchadian* 7(10): 242-245.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*, (Government Printer, Hobart).
- Jones, D.L. (1996). Resolution of the *Prasophyllum alpinum* R.Br. (Orchidaceae) complex in mainland south-eastern Australia and New Zealand, *Muelleria* 9:51-62.
- Nicholls, W.H. (1969). *Orchids of Australia* (Thomas Nelson, Melbourne).

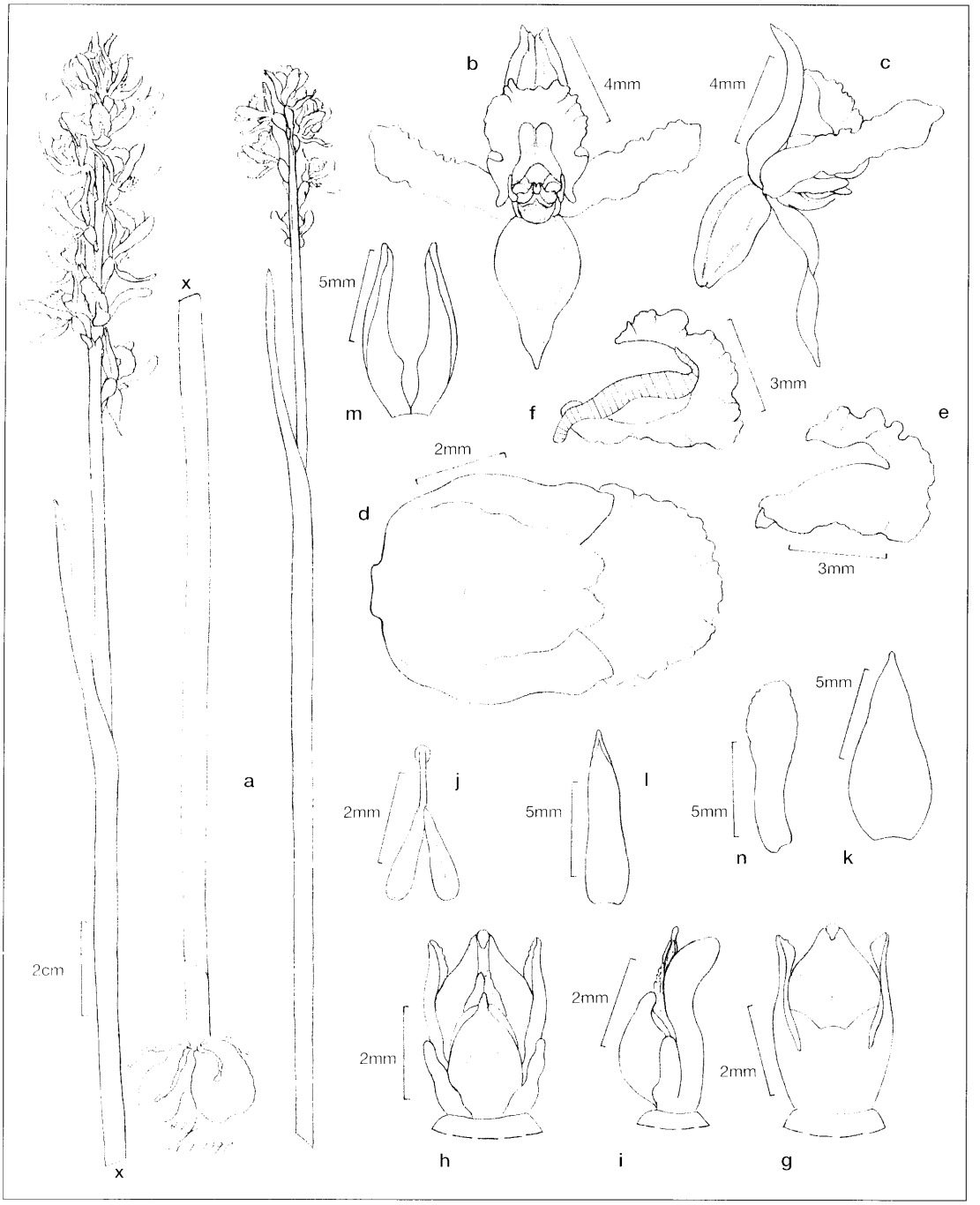


Fig. 6.1

Prasophyllum alpestre

near Perisher, New South Wales.

Broers.

a. plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h.column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. lateral sepals (free); n petal.

Drawing 29/1/1990 by D.L. Jones.©

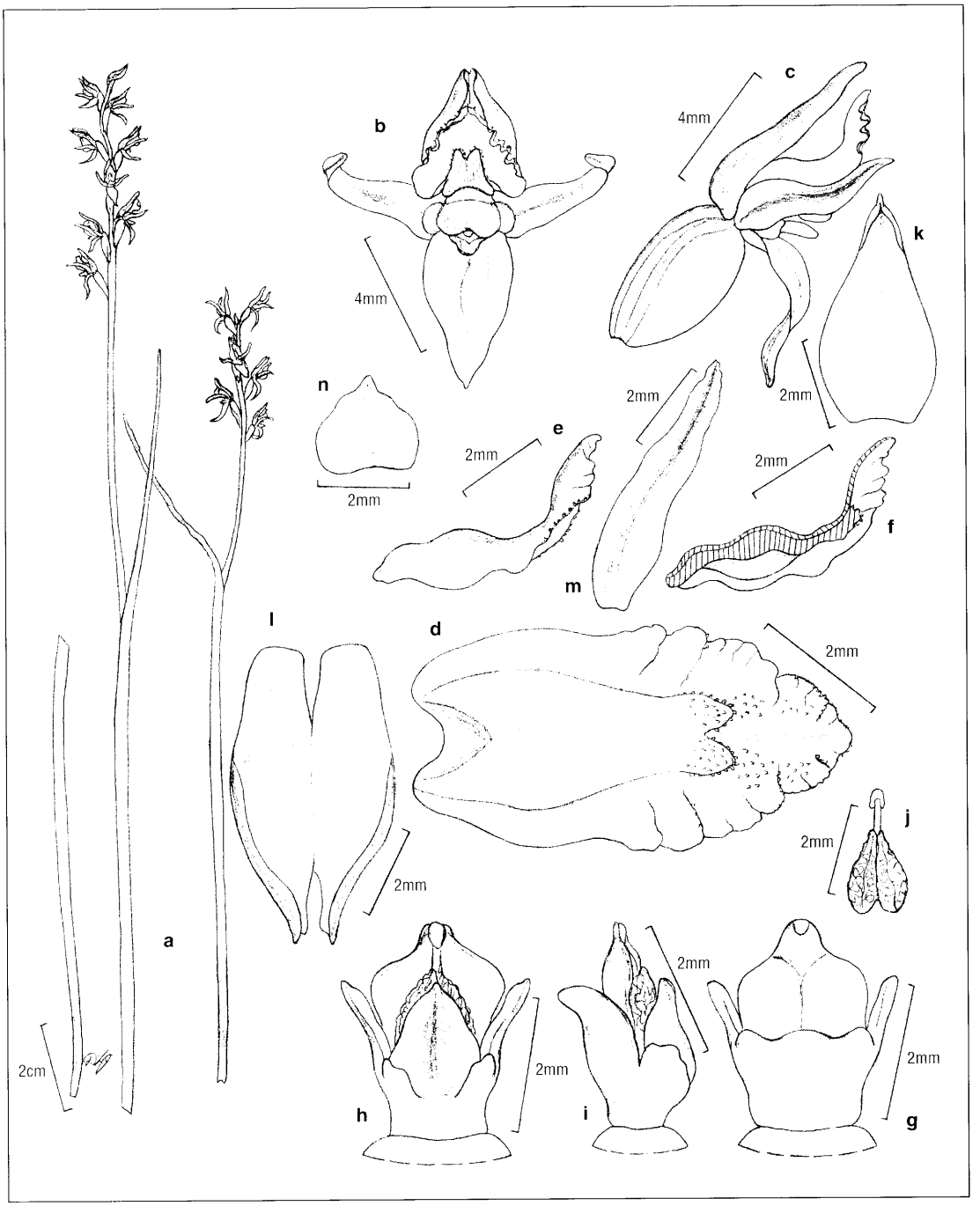


Fig. 6.2

Prasophyllum amoenum

Snug Plains, Tasmania.

J.E. Wapstra (ORG 515); from the type collection.

a. plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h.column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. synsepalum; m. petal; n. floral bract.

Drawing by D.L. Jones.©

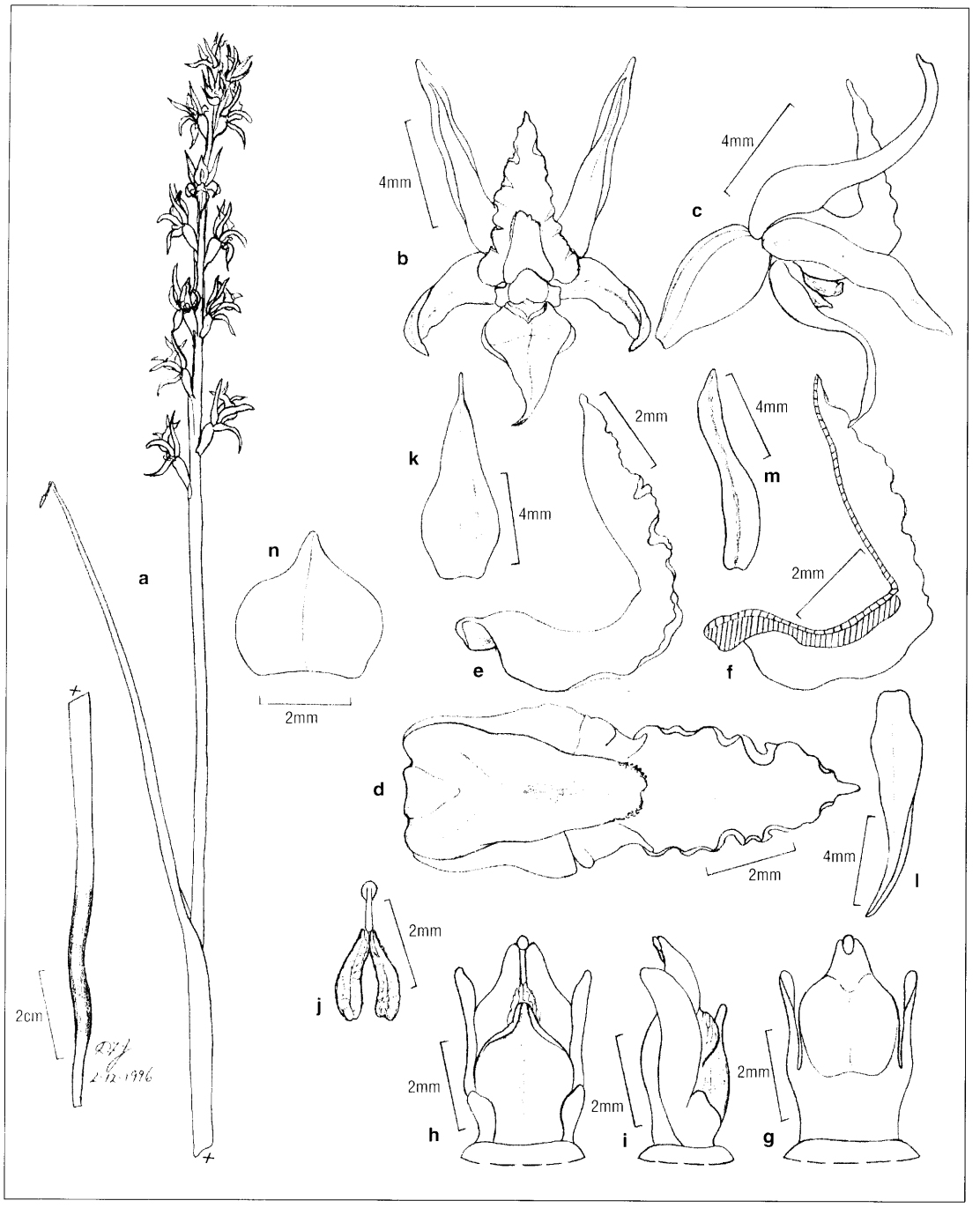


Fig. 6.3

Prasophyllum apoxychilum

Murdunna, Tasmania.

R. Minchin (ORG 495); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 2/12/1996 by D.L. Jones.©

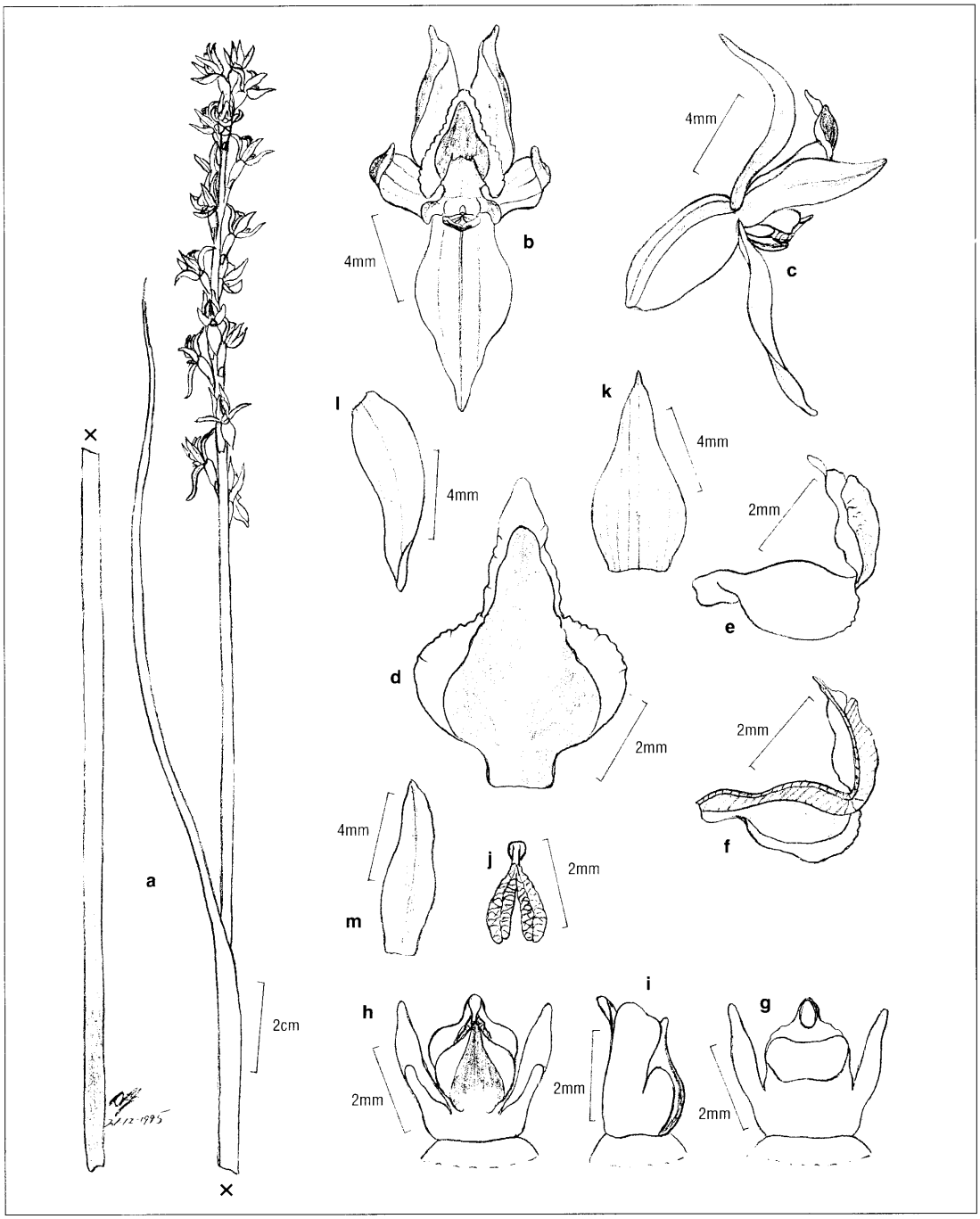


Fig. 6.4

Prasophyllum castaneum

Bruny Island, Tasmania.

J.E. Wapstra (D.L. Jones 14732); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal.

Drawing 21/12/1995 by D.L. Jones.©

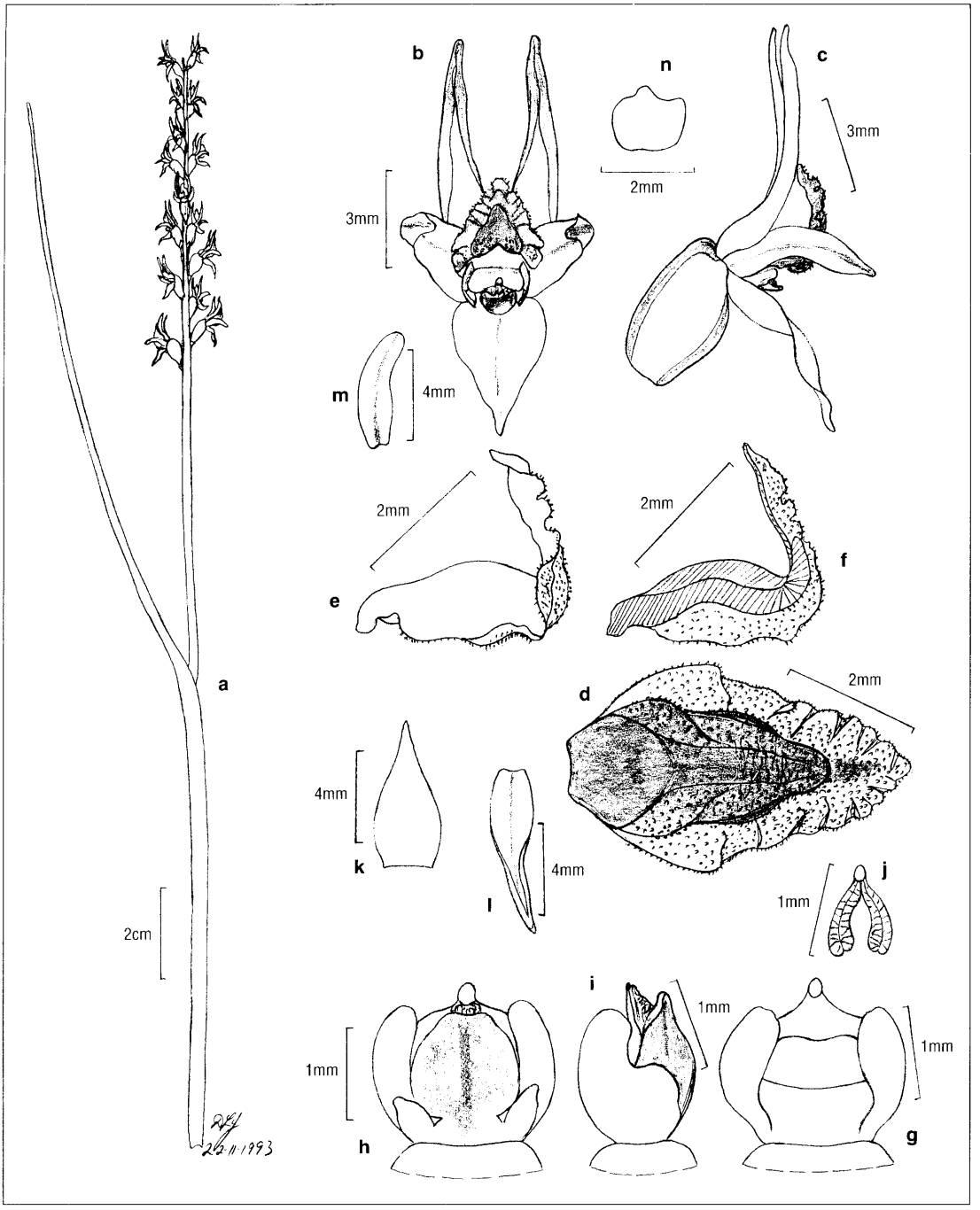


Fig. 6.5

Prasophyllum favonium

Rebecca Creek, Tasmania.

L. Rubenach (D.L. Jones 12693); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 22/11/1993 by D.L. Jones.©

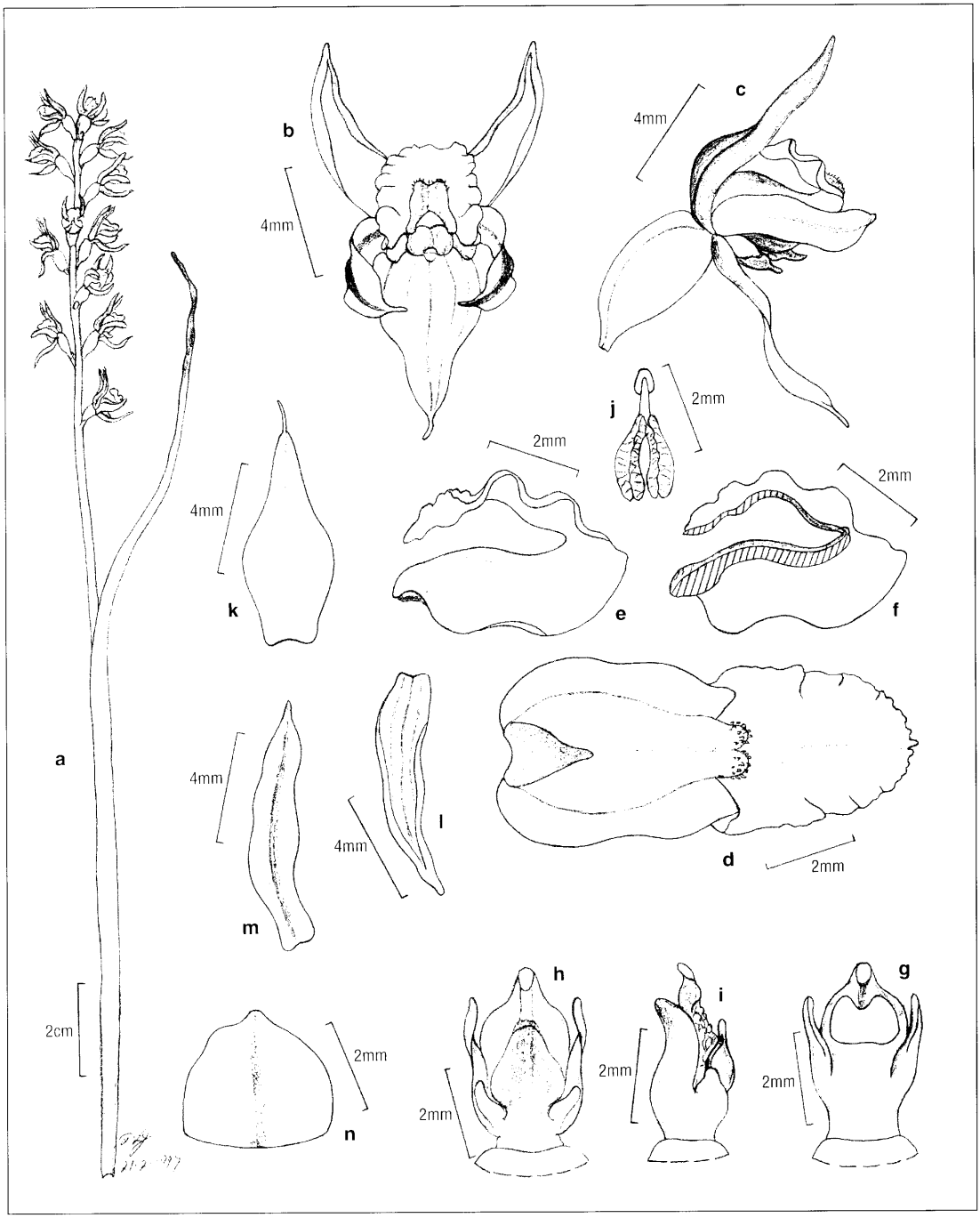


Fig. 6.6

Prasophyllum incurvum

Liawenee, Tasmania.

J.E. Wapstra (ORG 583); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 21/2/1997 by D.L. Jones.©

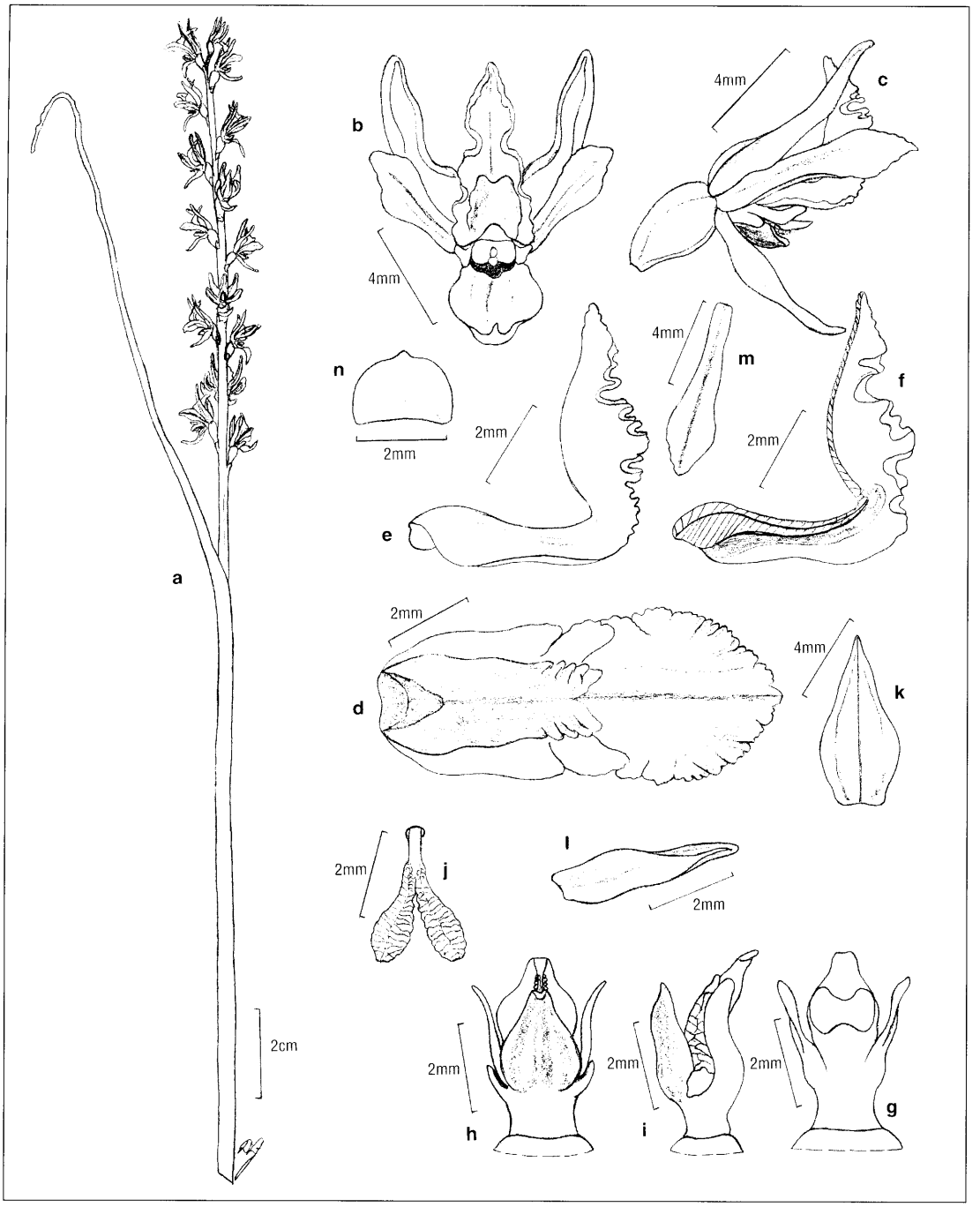


Fig. 6.7

Prasophyllum milfordense

Milford, Tasmania.

J.E. Wapstra (D.L. Jones 13708); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 21/11/1994 by D.L. Jones.©

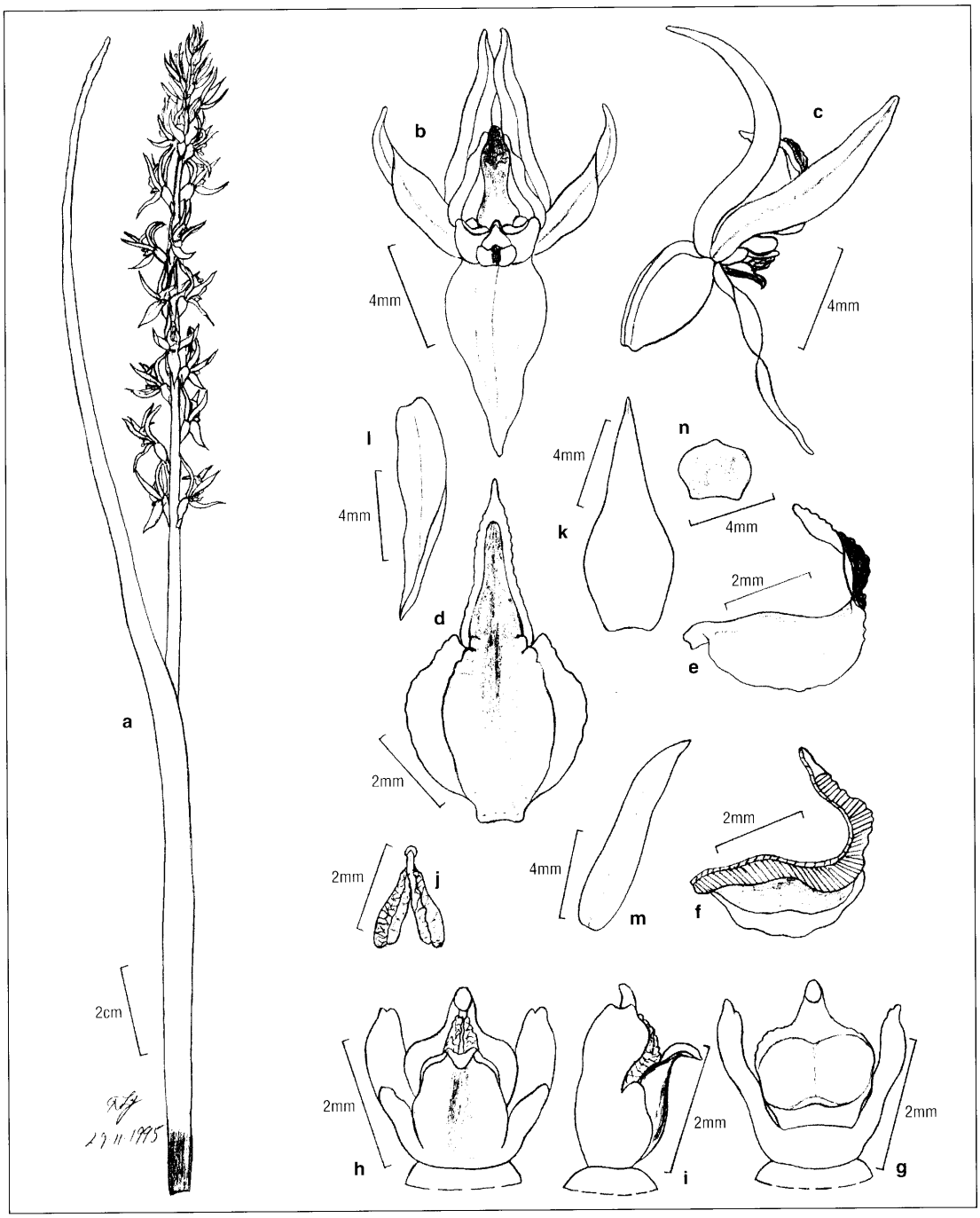


Fig. 6.8

Prasophyllum olidum

Campbell Town, Tasmania.

J.E.. Wapstra.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 29/11/1995 by D.L. Jones.©

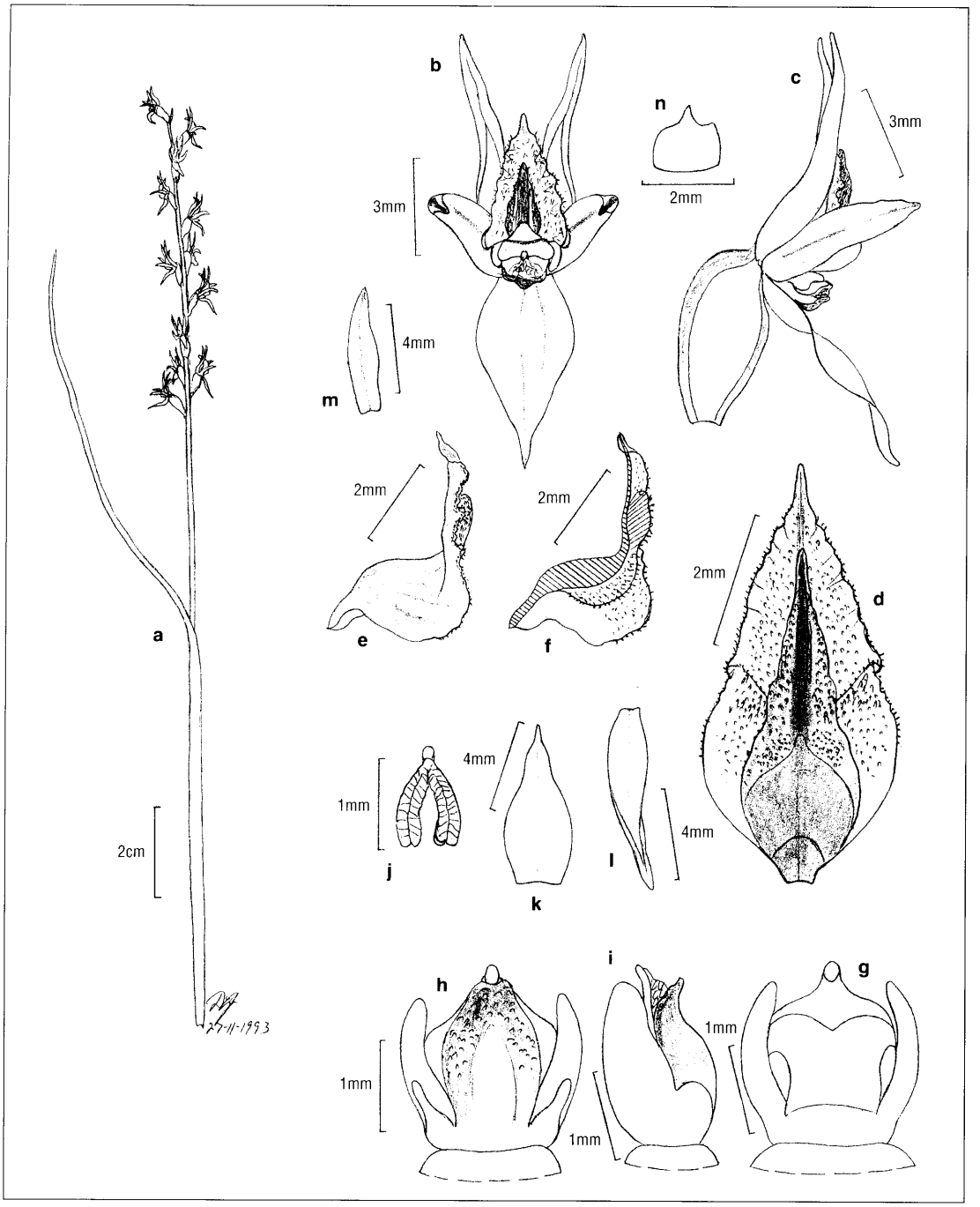


Fig. 6.9

Prasophyllum perangustum

Knocklofty, Tasmania.

D. Ziegeler (D.L. Jones 12614).

a. plant; b. flower from front; c. flower from side ; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 27/11/1993 by D.L. Jones.©

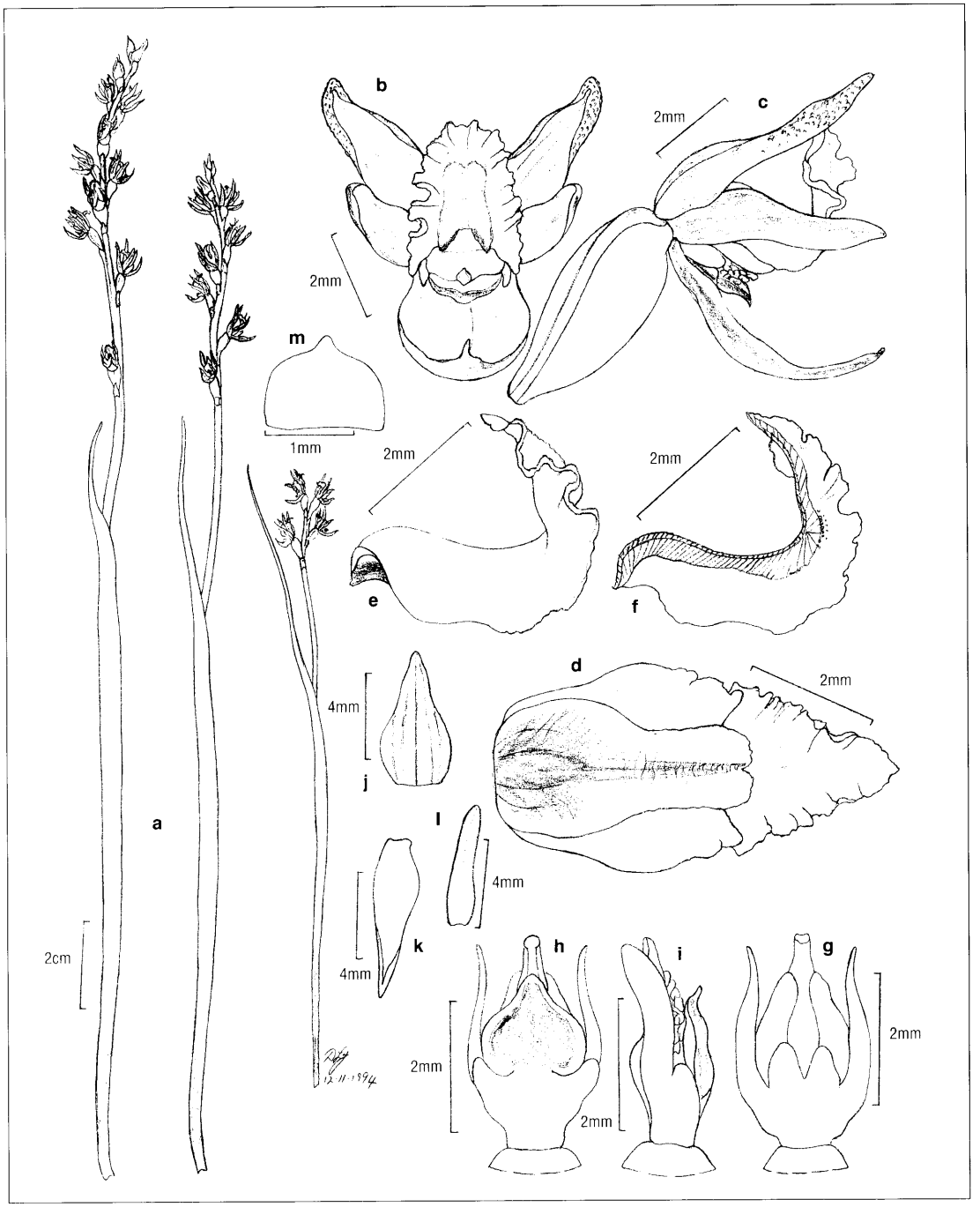


Fig. 6.10

Prasophyllum pulchellum

South Bruny Island, Tasmania.

D.L. Jones 13694; from the type collection.

a. plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. dorsal sepal; k. lateral sepal; l. petal; m. floral bract.

Drawing 12/11/1994 by D.L. Jones.©

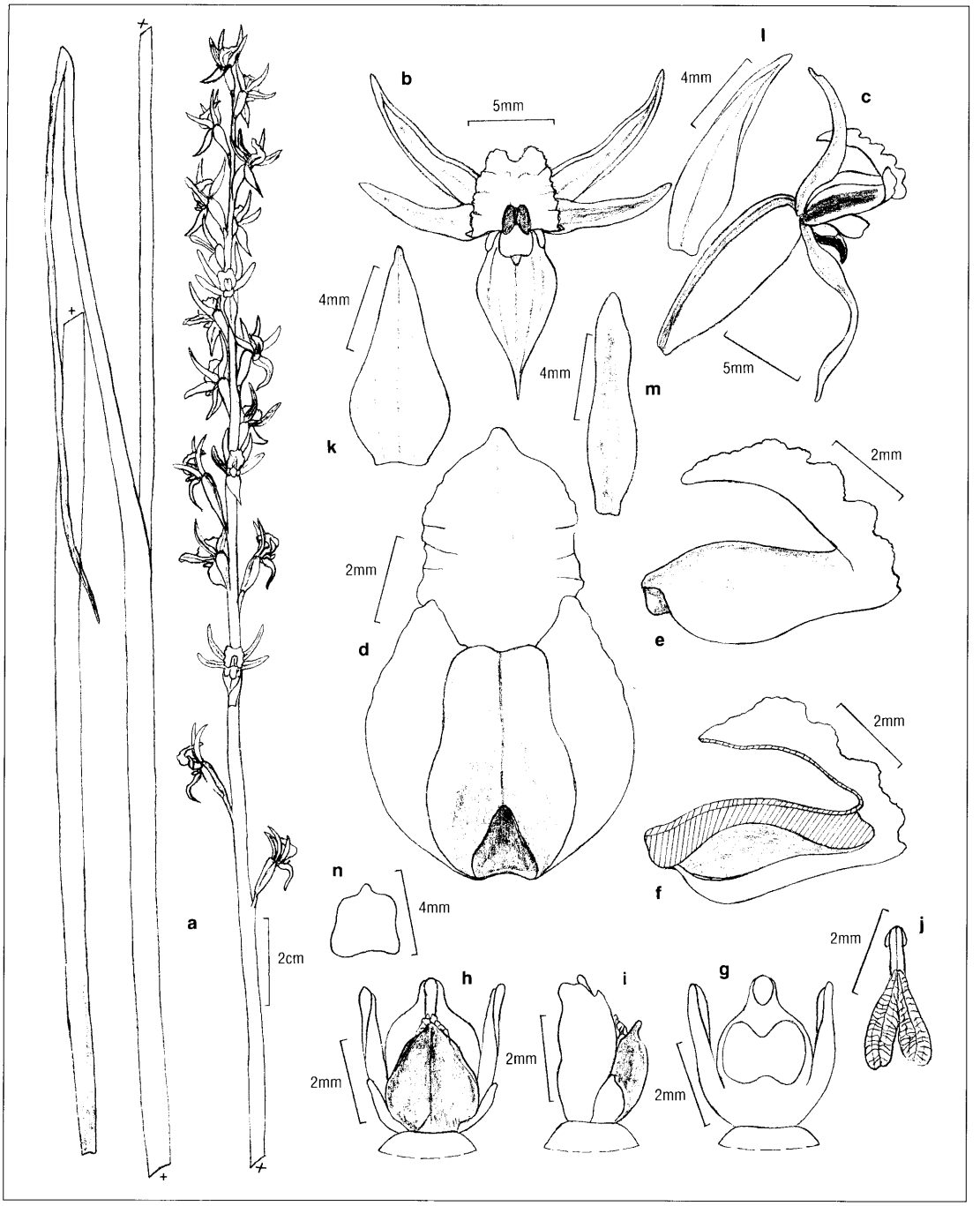


Fig. 6.11

Prasophyllum robustum

Latrobe, Tasmania.

P. Tonelli (D.L. Jones 14648).

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 17/11/1995 by D.L. Jones.©

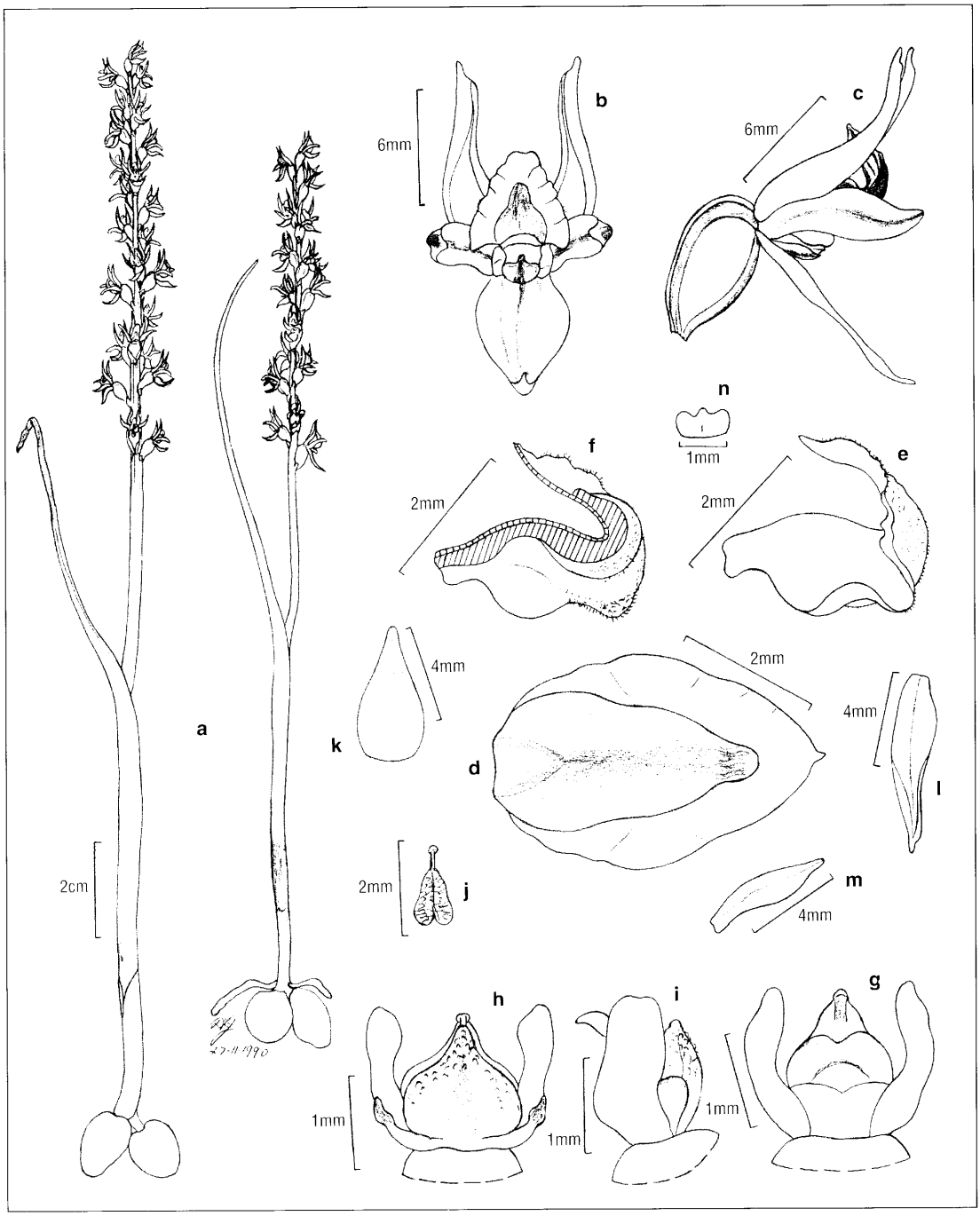


Fig. 6.12

Prasophyllum secutum

Anthony Beach, Tasmania.

D.L. Jones 7043.

a. plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 27/11/1990 by D.L. Jones.©

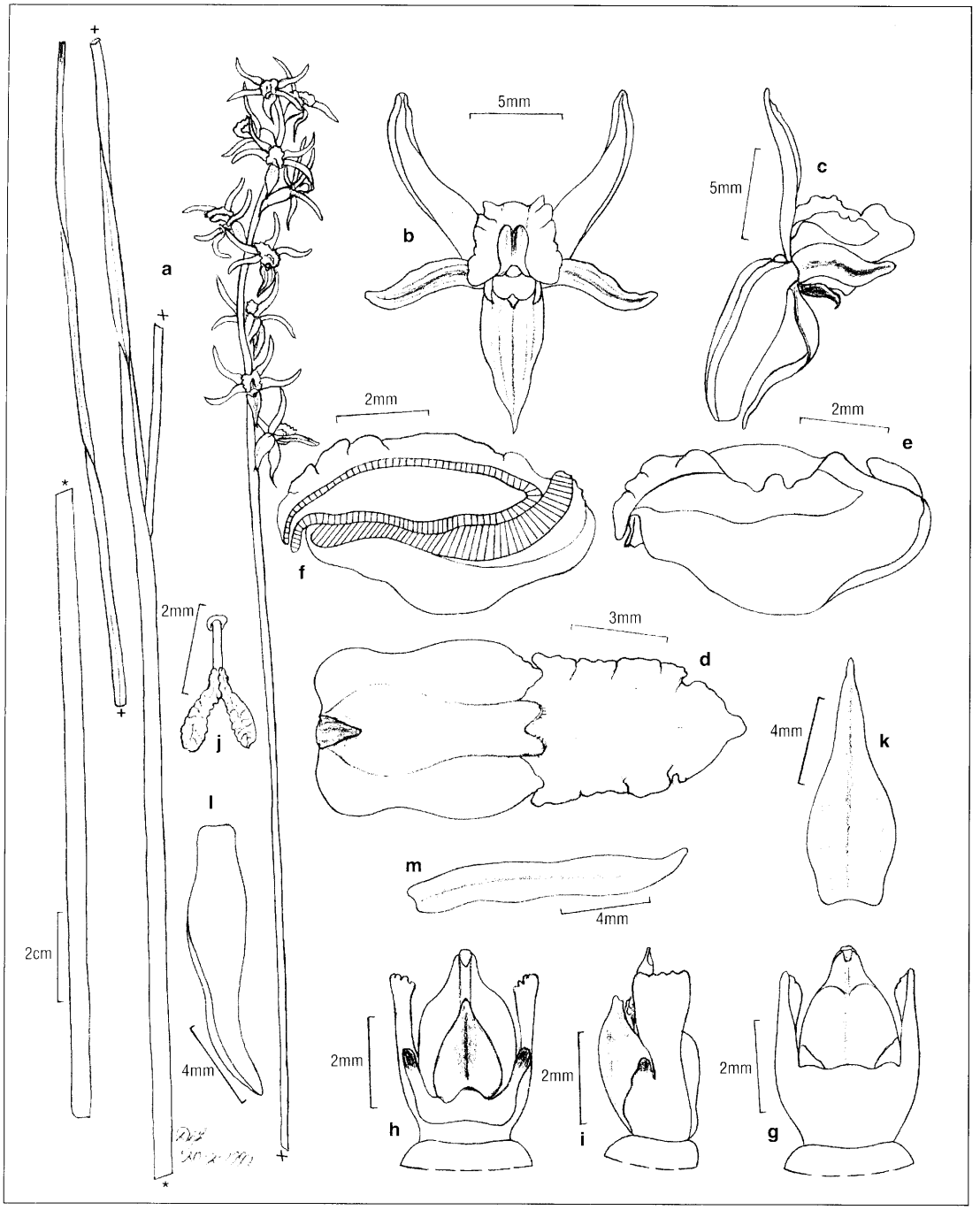


Fig. 6.13

Prasophyllum stellatum

Ben Lomond, Tasmania.

L. Rubenach (D.L. Jones 9083); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal.

Drawing 20/2/1992 by D.L. Jones.©

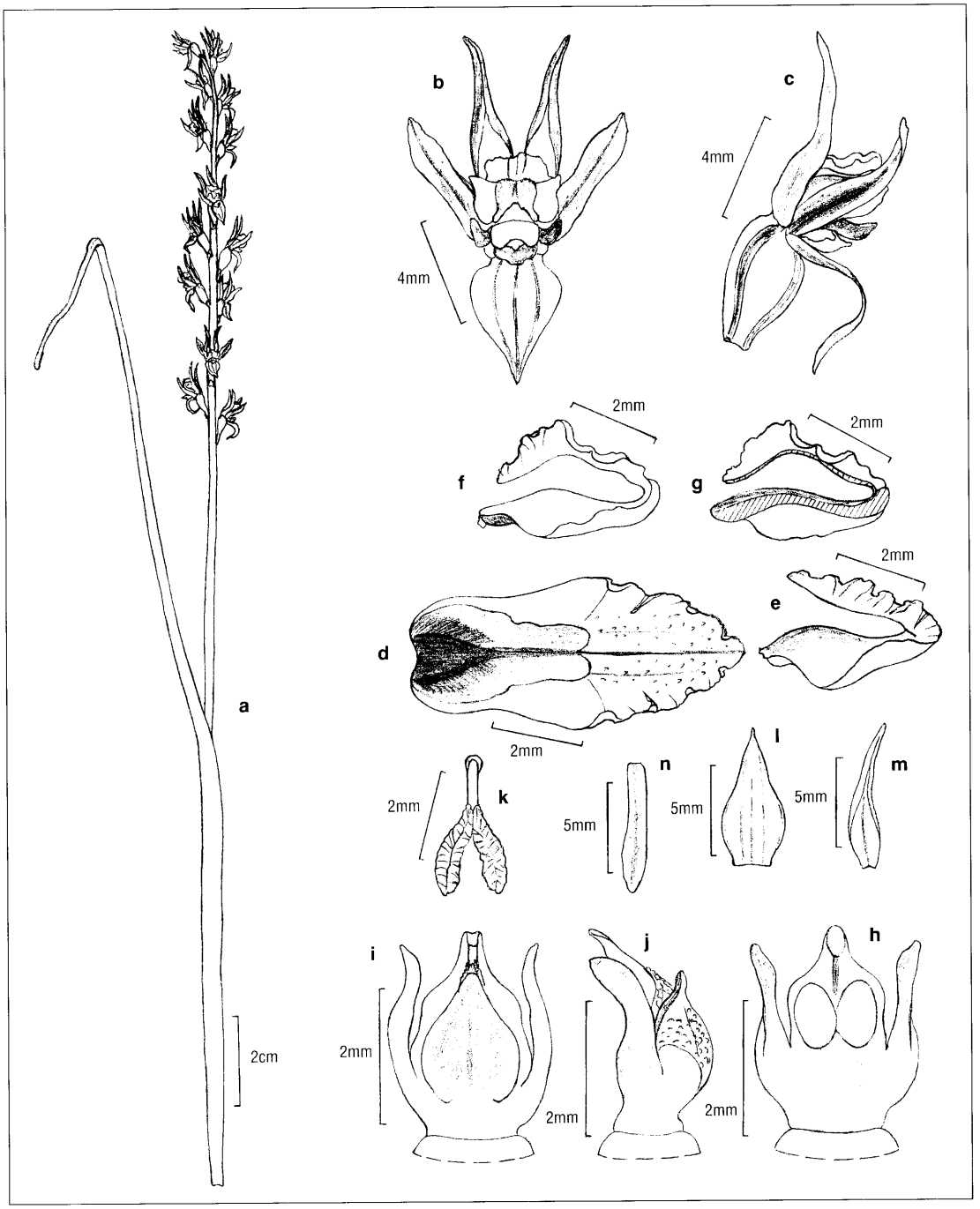


Fig. 6.14

Prasophyllum truncatum

Barbers Bottom, Tasmania.

J. Campbell 94164.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e, f. two labella from side; g. longitudinal section of labellum; h. column from front; i. column from rear; j. column from side; k. pollinarium; l. dorsal sepal; m. lateral sepal; n. petal.

Drawing 7/1/1994 by D.L. Jones.©

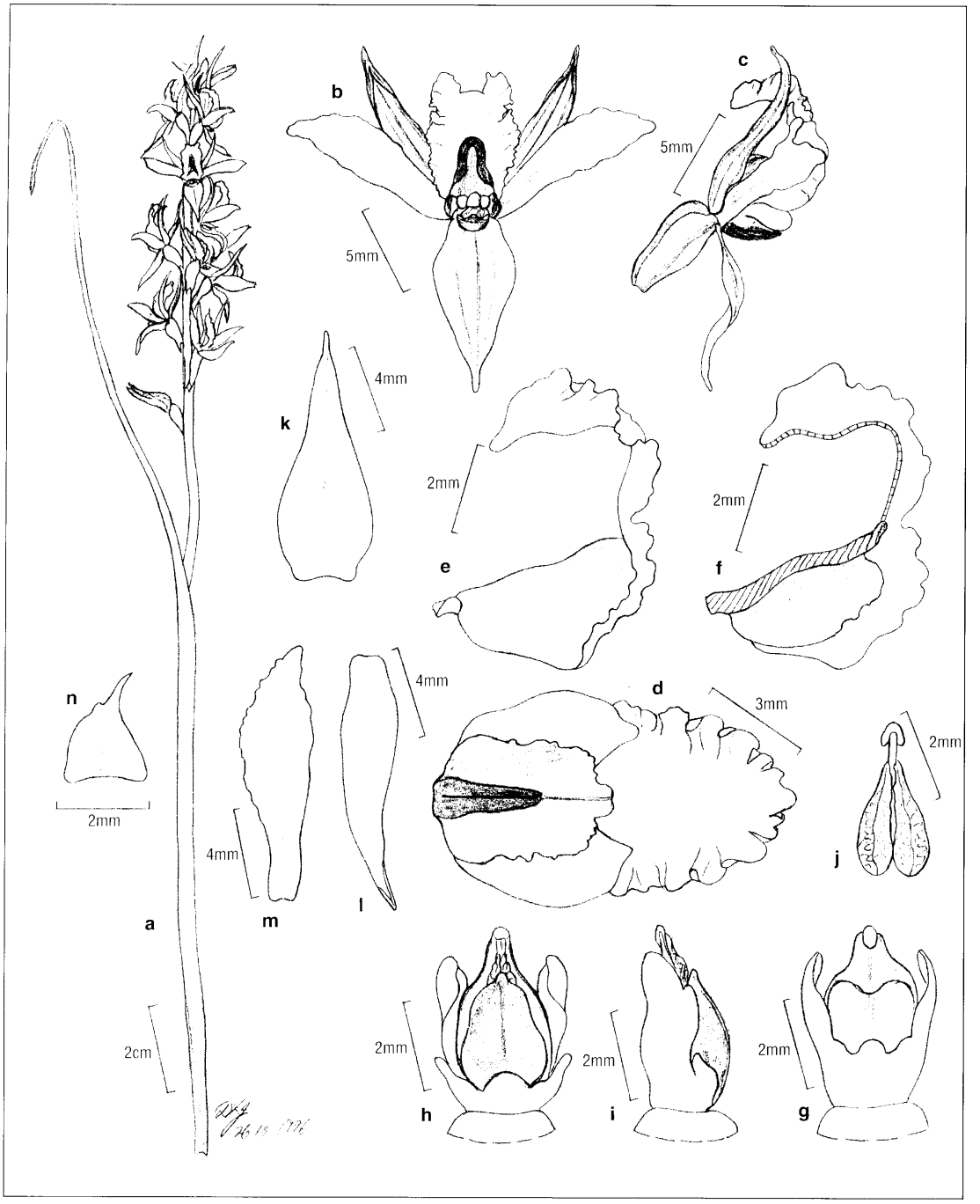


Fig. 6.15

Prasophyllum tunbridgense

Tunbridge, Tasmania.

J.E. Wapstra (ORG 324); from the type collection.

a. plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from rear; i. column from side; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

Drawing 26/10/1996 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 7:

A Taxonomic Review Of *Pterostylis* R.Br. In Tasmania

David L. Jones

Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

This paper contributes towards the clarification of *Pterostylis* in Tasmania. Nine species are described as new: *P. atriola* D.L. Jones, *P. melagramma* D.L. Jones, *P. pratensis* D.L. Jones, *P. rubenachii* D.L. Jones, *P. stenochila* D.L. Jones, *P. uliginosa* D.L. Jones, *P. wapstreorum* D.L. Jones, *P. williamsonii* D.L. Jones and *P. ziegeleri* D.L. Jones. The following poorly known or confused species are characterised: *P. dubia* R. Br., *P. furcata* Lindl., *P. scabrida* Lindl., and *P. squamata* R.Br. is fully described. *Pterostylis oreophila* Clemesha is found to be distinct from *P. dubia* R.Br. and is reinstated (for New South Wales and Victoria). *Pterostylis tunstallii* D.L. Jones & M.A. Clem. is recorded for Tasmania for the first time. A key to the species of *Pterostylis* in Tasmania is provided.

INTRODUCTION

The genus *Pterostylis* R. Br., is mainly Australian, with a strong development also in New Zealand, a small group in New Caledonia and a few scattered species in Melanesia. It is a complex group of small geophytes which grow in a wide range of mesic and semi-mesic habitats from lowland to subalpine regions. Vegetative reproduction is strongly developed in some groups within the genus and is absent from others. Most species are entomogamous and are pollinated by small microdipterans of the families Mycetophilidae and Culicidae; some autogamy also occurs.

There has been no detailed study of the genus throughout its range and a revision of the genus is in preparation. Numerous undescribed species, 24 of which have been recently named (Jones & Clements 1993, Jones 1994, Jones 1997, Jones, Molloy & Clements 1997), are known to occur in Australia and New Zealand. The only comprehensive treatment for Tasmania was that of Curtis (1979). This paper presents the results of a preliminary study into the genus in Tasmania.

Buchanan (1995) lists 26 species and one hybrid whereas Curtis (1979) described 25 species and a hybrid. This treatment recognises 35 species from Tasmania, including nine new species, and also addresses some of the confusion surrounding other taxa.

MATERIALS AND METHODS

As for paper 1 in this series.

TAXONOMIC TREATMENT

Pterostylis

Pterostylis R. Br., *Prodr.* 326 (1810) (*nom. cons.*).
Type species: *Pterostylis curta* R. Br. (*type cons.*).

Terrestrial *herbs*, sympodial. *Roots* filamentous. *Tubers* fleshy, replacement tubers formed at the end of short droppers, daughter tubers formed at the end of lateral stolonoid roots. *Leaves* basal in a rosette or cauline, sometimes reduced to sheathing structures, convolute, petiolate or sessile. *Inflorescence* racemose, one-several-flowered, terminal. *Flowers* resupinate. *Dorsal sepal* overlapping petal margins and adherent to form a galea, about as long as lateral sepals. *Lateral sepals* basally fused, distally free, either erect and embracing the galea or deflexed and subtending the labellum. *Petals* asymmetrical, shorter or rarely longer than the dorsal sepal. *Labellum* free, attached to the column foot by a short irritable ligulate claw; lamina entire or two-four-lobed, with or without a basal appendage, sometimes with a terminal knob. *Column* lacking free filament and style; column wings fused to the column basally, distally free, usually two-lobed. *Column foot* much shorter than the column. *Anther* erect to incumbent. *Pollinia* four, free, soft and mealy. *Stigma* lobed, situated medially or basally. *Rostellum* terminal.

A genus of c. 150 species distributed in Australia, New Zealand, Lord Howe Island, New Caledonia, New Guinea, New Britain, New Ireland and Ceram. Thirty-five species occur in Tasmania.

Key to *Pterostylis* in Tasmania.

1. Galea with two openings; labellum filiform, with a swollen apical knob and long, yellow hairs **2**
   Galea with a single opening, labellum not as above **3**

2. Plants mostly > 20 cm tall; leaves in a loose spiral rosette; flowers to 35 mm long; galea with a long apical point; labellum hairs moderately dense ..... **23. *P. plumosa***
   Plants mostly < 15 cm tall; leaves in a tight basal rosette; flowers to 25 mm long; galea with a short, blunt apical point; labellum densely hairy ..... **30. *P. tasmanica***

3. Lateral sepals erect or obliquely erect in front of the galea (rarely projecting forwards); labellum with a linear, decurved, penicillate basal appendage **4**
   Lateral sepals deflexed below the galea; labellum lacking a linear, decurved, penicillate basal appendage **26**

4. Flowers usually two or more, less than 12 mm long; galea opening towards the rhachis; rosette on flowering plants absent or present as a lateral growth **5**
   Flowers solitary (rarely two), more than 15 mm long; rosette on flowering plants absent or encircling the base of the scape **8**

5. Flowers white and green (rarely slight brown in galea) **6**
   Flowers white, green and brown **7**

6. Scape wiry; flowers not crowded; labellum tip visible through the sinus in the set position (flowering autumn and winter) ..... **20. *P. parviflora***
   Scape fleshy; flowers crowded; labellum tip not visible through the sinus in the set position (summer flowering) ..... **32. *P. uliginosa***

7. Scape fleshy; flowers mostly dark brown, crowded (spring and summer flowering) .. **2. *P. aphylla***
   Scape wiry; flowers white, green and light tan,not crowded, (autumn and winter flowering) ..... **4. *P. atriola***

8. Growth habit and leaves of sterile and fertile plants similar **9**
Growth habit and leaves of sterile and fertile plants markedly dissimilar **22**

9. Plants with a tight, stem-encircling basal rosette, stem bracts reduced and tightly sheathing **10**
Plants with a loose rosette, usually several leaves ascending the scape **16**

10. Dorsal sepal extending as a long, filiform point ..... **21. *P. pedoglossa***
Dorsal sepal acute, not extending as a filiform point **11**

11. Top of sinus flat when viewed from the front, labellum apex not visible through the sinus in the set position ..... **18. *P. nana***
Sinus deeply vee-ed when viewed from the front, labellum apex visible or protruding through the sinus in the set position **12**

12. Labellum apex notched **13**
Labellum apex entire **14**

13. Labellum apex broadly notched, rosette leaves four to six ..... **6. *P. concinna***
Labellum apex narrowly notched, rosette leaves two (or absent) ..... ***P.* X*'toveyana'***

14. Labellum apex twisted to one side ..... **8. *P. curta***
Labellum apex not twisted **15**

15. Flower nodding, labellum hispid, protruding conspicuously through the sinus ..... **19. *P. nutans***
Flower erect, labellum glabrous, not protruding through the sinus ..... **22. *P. pedunculata***

16. Flower nodding, labellum hispid ..... **19. *P. nutans***
Flower erect, labellum glabrous **17**

17. Sinus rich red-brown, markedly scabrid ..... **7. *P. cucullata***
Sinus green or green and white, glabrous or shortly scabrid **18**

18. Flower < 25 mm long; lateral sepals tightly embracing the galea,without a lateral gap ..... **13. *P. foliata***
Flower > 25 mm long; lateral sepals loosely embracing the galea leaving a prominent lateral gap **19**

19. Labellum dark bluish-green ..... **11. *P. dubia***
Labellum green and white, sometimes brownish towards the apex **20**

20. Flower 25-35 mm long; free points of lateral sepals just higher than the galea; scape scabrid ..... **27. *P. scabrida***
Flower 30-55 mm long, free points of lateral sepals extending high above the galea; scape smooth **21**

21. Sinus deeply notched; flowers to 45 mm long ..... **14. *P. furcata***
Sinus broadly and shallowly notched; flowers to 55 mm long ..... **12. *P. falcata***

22. Labellum apex narrowly notched ..... ***P.* X*'toveyana'***
Labellum apex entire **23**

23. Petals widely flared; labellum narrowly linear to filiform in distal half ..... **15. *P. grandiflora***
Petals not widely flared; labellum tapered throughout **24**

24. Flowers boldly striped; sinus vee-ed, not protruding when viewed from the side; tips of free points usually curved forwards ..... **1. *P. alata***

Flower colours suffused rather than boldly striped; sinus flat or notched centrally, bulging prominently when viewed from the side; tips of free points erect or divergent **25**

25. Flowers about 20 mm long; sinus bulging in a prominent platform; free points of lateral sepals often clavate; labellum tip not protruding through the sinus in the set position .....**3. *P. atrans***
Flowers about 25 mm long; sinus bulging but not platform-like; free points of lateral sepals filiform; labellum tip protruding prominently through the sinus in the set position .....**10. *P. decurva***

26. Lateral sepals flat or convex **27**
Lateral sepals pouched or concave **31**

27. Flowers red-brown; lateral sepals as broad as long, with a shallow concavity beneath the labellum; labellum with an erect basal tail-like structure.....**26. *P. sanguinea***
Flowers green; lateral sepals longer than wide, without a concavity beneath the labellum; labellum with a basal mound but no tail-like structure **28**

28. Labellum green or tawny, c. 2-3 times longer than wide **29**
Labellum dark brown, c. 1.5 times longer than wide **30**

29. Petal flanges not blocking off the base of the galea; labellum tawny with a prominent black central stripe .....**16. *P. melagramma***
Petal flanges blocking off the base of the galea; labellum green or brownish green.....**29. *P. stenochila***

30. Labellum of similar width throughout; apex deeply notched .....**31. *P. tunstallii***
Labellum broadest at the base; apex shallowly notched.....**34. *P. williamsonii***

31. Labellum with a prominent basal appendage; margins lacking setae **32**
Labellum without a basal appendage; margins with prominent white moniliform setae **36**

32. Labellum appendage with a prominent protruding beak **33**
Labellum appendage without a protruding beak **35**

33. Scape to 30 cm tall; beak of labellum appendage c. 1 mm long, sharply pointed .....**9. *P. cycnocephala***
Scape to 15 cm tall; beak of labellum appendage less than 0.5 mm long, blunt **34**

34. Rosette leaves broadest towards the base, to 20 x 10 mm; scape to 10 cm tall, very slender (coastal species) .....**35. *P. ziegeleri***
Rosette leaves broadest towards the apex, to 35 x 22 mm; scape to 15 cm tall, stout (subalpine species). .....**24. *P. pratensis***

35. Scape to 8 cm tall; flowers < 10 mm long, crowded .....**25. *P. rubenachii***
Scape more than 20 cm tall; flowers > 10 mm long, crowded or spaced **35**

36. Leaves thick and fleshy; scape thick; flowers crowded.....**33. *P. wapstreorum***
Leaves thin-textured; scape slender; flowers widely spaced .....**17. *P. mutica***

37. Flowers greenish; lateral sepals with long filiform points; labellum thin-textured, with two prominent erect basal setae .....**5. *P. commutata***
Flowers reddish-brown; lateral sepals with very short points; labellum thick and fleshy, lacking erect basal setae.....**28. *P. squamata***

1. ***Pterostylis alata*** (Labill.) Rchb. f., *Beitr. Syst. Pflanzenk.* 70 (1871);
Disperis alata Labill., *Nov. Holl. pl.* 2:59, t. 210 (1806);
Diplodium alata (Labill.) Sw., *Ges. Naturf. Freunde Berlin Mag.* 4: 84 (1810).
TYPE: Terra Diemen, 1792, *Labillardiere 33, 38* (syn FI, photo!).
Pterostylis praecox Lindl., *Gen. sp. orchid. pl.* 388 (1840).
TYPE: Tasmania, Circular Head, 1837, *R. Gunn 751* (holo K-L, photo!; iso HO!, P, W).

Illustration: None found.

Distribution and ecology: Endemic to Tasmania. Grows in open forest and coastal scrubs in sandy loam and clay loam. Altitude: c. 10-150 m. Flowering period: May to August. **Fig. 7.1**.

Notes: This species is characterised by dimorphic sterile and fertile plants; erect narrow heavily striped flower; free points of the lateral sepals held high above the galea with the tips often incurved; and, the labellum apex protruding prominently through the sinus in the set position.

The relationship with mainland populations is currently under study. The flowers of *Pterostylis alata* are more boldly striped than similar species on the mainland; have a deeply notched sinus and the labellum apex protrudes much more prominently.

Pterostylis alata hybridises with *P. concinna* where the two species grow sympatrically. The resultant progeny has been assigned to *P. xtoveyana* Ewart & Sharman (Curtis 1979), but this taxon was described from mainland specimens which have a different parentage.

Specimens examined:
TASMANIA: Cape Barren Island, July 1923, *Atkinson* (QVM); Lake Leake Hghy, near Block and Stable Ck, 2 June 1984, *Cameron* (QVM); Coningham, Gellibrand Camp Ground, 25 June 1989, *Cameron* (QVM); Cobbs Hill, 1 June 1951, *Cruikshank* (HO); Bluff, Circular Head, 10 July 1837, *Gunn* (QVM); Circular Head, 18 July 1838, *Gunn* (HO); Bellerive, May 1924, *Rodway* (HO 111228); Cape Barren Island, 1 Aug. 1970, *Whinray 444* (HO 26006).

2. ***Pterostylis aphylla*** Lindl., *Gen. sp. orchid. pl.* 392 (1840);
Pterostylis parviflora R. Br. var *aphylla* (Lindl.) Ewart & J.White, *Proc. Roy. Soc. Victoria* 24: 71 (1911).
TYPE: Tasmania, Circular Head, Dec. 1837, *R. Gunn 903* (holo K-L, photo!; iso E, W).

Illustration: None found.

Distribution and ecology: Endemic to Tasmania. Grows in heathy open forest, exposed heathland and buttongrass moorland in peaty sand and peat. Altitude: 5-800 m. Flowering period: October to March. **Fig. 7.2**.

Notes: This species is characterised by short habit; fleshy scape; dark brown flowers; scabrid dorsal sepal and lateral sepals; dark elliptic labellum; and, broadly elliptic stigma.

Specimens examined:
TASMANIA: Smithton, Nov. 1926, *Atkinson* (QVM); Coal R., 2 Dec. 1940, *Bailey* (HO 411680); 3 km NE. of Nye Bay, 25 Jan. 1986, *Buchanan 8180* (HO 405052); Coates Ck, Central Plateau, Jan. 1974, *Cameron* (QVM); Avoca, c. 4 km along Storys Ck Rd, 28 Feb. 1986, *Cameron* (QVM); between Rebecca Ck and Sardine Ck, West Coast, 5 Nov. 1988, *Campbell* (QVM); Coates Ck, Lyell Hghy, 17 Jan. 1991, *Campbell (Jones 7313)* (CANB); Duck Bay, 4 Nov. 1997, *Hyatt (ORG 448)* (CANB); road to Forest, 13 Dec. 1837, *Gunn* (QVM); Smithton-Gladstone, 26 Nov. 1939, *Perrin* (HO); Georges Bay, Nov. 1892, *collector unknown* (QVM).

3. ***Pterostylis atrans*** D.L. Jones, *Muelleria* 8(2); 185-186 (1994).
TYPE: Australian Capital Territory, Brindabella Ranges, c. 4.3 km along Bendora Dam Rd from Bulls Head, 22 Feb. 1992, *D.L.Jones 9092 & B.E.Jones* (holo CANB!; iso CANB!, HO!, MEL!, NSW!).
Pterostylis obtusa R. Br. *auct non* R.Br.; W.M. Curtis,*The Student's Flora of Tasmania* 4A: 22 (1979).

Illustration: Page 268, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in montane forest, wet

sclerophyll forest and moist areas of open forest, often among grass, in clay loams and sandy loams. Altitude: 200-1000 m. Flowering period: December to March.

Notes: This species was previously confused with *P. obtusa* R.Br., which does not occur in Tasmania. It is somewhat similar to *P. decurva* but can be distinguished by its smaller flowers (14-20 mm long), shorter free points on the lateral sepals, these having a thickened, knobbed apex, and a much shorter labellum, the tip of which is obscured or just visible above the sinus in the set position (protruding in *P. decurva*).

Pterostylis atrans is apparently uncommon in Tasmania or perhaps has been confused with *P. decurva*.

Specimens examined:
TASMANIA: Turners Marsh, Dec. 1934, *Atkinson* (QVM); Myrtle Bank, Lorenz Property, 18 Jan. 1986, *Cameron* (QVM); Mt Barrow Rd, 7 Jan. 1989, *Campbell* (QVM); Stewarts Bay, near Port Arthur, 1 Jan. 1931, *Gould* (HO); near Storys Ck, Feb. 1964, *Firth* (HO); Ben Nevis, 20 Jan. 1929, *Perrin* (HO); Fosters Gully, near New Norfolk, 2 Jan. 1971, *Reid* (HO); Mt Wellington, Jan. 1913, *Rodway* (HO); Snug Plains, 25 Jan. 1997, *Wapstra (ORG 537)* (CANB); Flinders Island, Darling Ra., Walkers Hill, 25 Dec. 1968, *Whinray* (HO, MEL).

4. *Pterostylis atriola* D.L. Jones, sp. nov., *P. parviflorae* R. Br. affinis, sed planta elatiore (ad 35 cm alta), floribus usque ad 10; petalis brunneis; sinu non convexo apice plano; et labello elliptico, in situ intento apice per sinum non visible, differt.

TYPUS: Tasmania, Snug Plains, 600 m, 3 Mar. 1997, *J.E. & A. Wapstra (ORG 607)* (holo CANB; iso HO, MEL).

Tuberous terrestrial *herb. Plants* 15-35 cm tall, not elongating in fruit. *Rosettes* one or two, basal, borne on lateral growths; *leaves* three to six, spreading; lamina ovate, 5-14 mm long, 4-9 mm wide, dark green; margins entire; apex subacute; petioles slender, 3-7 mm long, narrowly winged. *Scape* slender, wiry, one-ten-flowered. *Sterile bracts* three to five, ovate lanceolate, 10-16 mm long, 3-5 mm wide, closely sheathing, acuminate. *Floral bracts* similar, sheathing the pedicel and ovary base. *Flowers* well spaced, facing inwards, two-four open at once, 8.5-9.5 mm long, 2-2.5 mm wide, dark green and white with brown petals, sometimes brown on the tip of the dorsal sepal and the free points of the lateral sepals; galea slightly inflated at the base, erect before curving forwards in a semi-circle; segments all of a similar length, the distal parts of the dorsal sepal and petals scabrous. *Dorsal sepal* ovate-lanceolate when flattened, 10-15 mm long, 5-7 mm wide, inflated at the base then tapered to the apex, boldly striped, acute to apiculate, dorsal surface scabrous. *Lateral sepals* erect, closely embracing the galea; sinus step-like at the top, flat or gently sloping when viewed from the side, very shallowly notched medially when viewed from the front; frontal opening c. 1 mm wide; conjoined part 5.5-6.5 mm long, c. 2 mm wide, narrowed to c. 1.2 mm across at the base, prominently striped; free points c. 3 mm long, tapered, acuminate, curved forwards, the tips just higher than the galea. *Petals* linear-oblong, 7-10 mm long, c. 2 mm wide, strongly falcate, brown striped with white, subacute; flange c. 1 mm across, broadly deltate, obtuse. *Labellum* erect, not visible through the sinus in any position, straight or slightly curved forwards near the apex, reddish to red-brown and white; lamina linear-elliptical, 3-3.5 mm long, c. 1.5 mm wide, obtuse; basal appendage decurved, c. 1 mm long, broadest at the base; apex erect, trifid. *Callus* a raised central reddish ridge c. 0.3 mm across. *Column* 5-6 mm long, curved away from the ovary at c. 60§ at the base then erect, green. *Column wings* c. 1.5 mm long; basal lobe broadly deltate, c. 0.5 mm long, white, at an angle of c. 45§; apex broadly obtuse; inner margins adorned sparsely with short white cilia; mid-section c. 1 mm long, dark green; apical lobe narrowly linear, c. 0.7 mm long, acute. *Anther* c. 1 mm long, obtuse. *Pollinia* c. 1 mm long, narrowly linear, yellow, mealy. *Stigma* situated basally, broadly scutiform, c. 2 mm long, c. 1.6 mm wide, raised. *Capsules* narrowly obovoid, 10-13 mm long, 3-4 mm wide, erect, on pedicels to 5 mm long. **Fig. 7.3**.

Distribution and ecology: Endemic to Tasmania where known from four widely separated sites. The exact distribution is

uncertain due to confusion with related taxa. Grows in open forest and has been recorded from relatively cold habitats such as frost hollows and exposed ridges. Soils are stony loams which are often skeletal. Altitude: c. 100-600 m. Flowering period: January to April.

Notes: This species is characterised by tall scape; small narrow green and white flowers with brown petals; sinus flat when viewed from the side; very narrow frontal opening to the flower; scabrid dorsal sepal; attenuate free points which extend just above the galea; and, linear-elliptical, reddish labellum.

The friable nature of the pollen and basal siting of the stigma suggest autogamy, but this requires confirmation.

Conservation status: Poorly known; suggest 2K by criteria of Briggs and Leigh (1996).

Etymology: From the Latin *atriolum*, small room, hall or vestibule, in reference to the narrow sinus opening in the flower.

Specimens examined:
TASMANIA: Holwell Gorge, 26 Mar. 1997, *Campbell 97006* (CANB); Golconda, 26 Mar. 1997, *Campbell 97007* (CANB); Blowhole Valley, 12 Feb. 1992, *Yeates & Wapstra* (HO); Thompsons Marshes, 30 Jan. 1992, *Ziegeler 174* (CANB).

5. ***Pterostylis commutata*** D.L. Jones, *Muelleria* 8(2): 186-189 (1994).
TYPE: Tasmania, "Charlton", Ross district, 14 Jan. 1987, *L. Gilfedder* (holo HO 101722!).

Illustration: None found.

Distribution and ecology: Endemic to the midlands of Tasmania. Grows among low shrubs, herbs, grasses and rocks in red-brown loam. Altitude: c. 200 m. Flowering period: December to February. **Fig. 7.4**.

Notes: This species was confused with *P. biseta* Blackmore & Clemesha which does not occur in Tasmania. It is a multiflowered species which can be recognised by the translucent green, white and brown flowers; deflexed, elliptical lateral sepals with long, filamentous free points; and, a thin-textured, obovate-spathulate labellum with two prominent basal setae.

Specimens examined:
TASMANIA: Old Cemetery, Ross, 23 Dec. 1986, *Campbell* (QVM); Ross Cemetery, Jan. 1988, *Campbell* (QVM); Cemetery, Ross, Jan. 1985, *Fenshaw* (HO 89392).

6. ***Pterostylis concinna*** R. Br., *Prodr.* 326 (1810).
TYPE: Port Jackson, Bennelong Point, Sydney Cove, 18 Aug. 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto E, K, K-L, P, W).

Illustration: Page 277, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia (south-east). Grows in heathy open forest, coastal scrubs and heathland, usually in sands or sandy loam. Altitude: 0-200 m. Flowering period: June to October.

Notes: This species is characterised by a basal stem-encircling rosette of leaves; small flowers with brown or orange-brown tips in the galea; short divergent free points; and, a broadly notched labellum.

Tasmanian populations have a broader sinus and more broadly emarginate labellum than those of mainland populations.

Pterostylis concinna hybridises sporadically with *P. alata* where the two species grow sympatrically (see *P. alata* entry).

Specimens examined:
TASMANIA: Near Red Gate, Bellerive, 8 July 1931, *Atkinson* (HO); Golf Course at Pittwater, 23 Sept. 1984, *Moscal 8502* (HO 400774); Bellerive, 22 July 1893, *Rodway* (HO); *ibid*, July 1895, *Rodway* (HO); Big Dog Island, 24 Sept. 1992, *Spry* (CANB); Airport, Pittwater Rd, 8 Oct. 1992, *Wapstra (Jones 10260)*; Coles Bay, 12 Sept. 1989, *Williamson* (CANB).

7. *Pterostylis cucullata* R. Br., *Prodr.* 327 (1810).
TYPE: Tasmania. Port Dalrymple, *Paterson* (lecto specimen a, BM, *fide* Clements 1989, photo!)
Pterostylis mackibbinii F. Muell., *Victorian Naturalist* 9: 93 (1892).
TYPES: Near St Vincent's Gulf, 1848, *F. Mueller* (syn MEL!); Cardinia Ck, *C. French* (syn MEL!); on King's Island and Swan Island, Nov. 1888, *J. Mackibbin* (syn MEL!, isosyn K, NSW); near Brighton Bluff, Sept 1892, *S. Hart* (syn MEL!).

Illustration: Plate 4, Curtis (1979).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. In Tasmania this species is now extinct on the mainland and is restricted to Hunter Island and Three Hummock Island in Bass Strait. It has also been recorded from King Island but is probably extinct there due to mining activities. It predominately grows in coastal scrubs on stabilised dunes in sands and sandy loam. Altitude: c. 0-50 m. Flowering period: September and October.

Notes: This species is characterised by fleshy leaves in a loose stem-encircling rosette; large (30-40 mm long) flowers with bright reddish-brown colourations in the sinus and galea; strongly scabrid, deeply notched sinus; short free points; and, brown labellum not protruding through the sinus in the set position.

Specimens examined:
TASMANIA: Hunter Island, Dec. 1992, *Bayly-Stark* (QVM); Circular Head, 28 Oct. 1837, *Gunn* (NSW); George Town, 23 Oct. 1844, *Gunn* (HO 111902); King Island, Oct. 1892, *McKibbin* (K); Hunter Island, 1 Nov. 1971, *Pinner* (HO 111904); Collins Bonnet, Dec. 1901, *Rodway* (NSW); Sandhills, Circular Head, 28 Oct. 1837, *Smith* (QVM); Bluff under the Stone Quarry, Circular Head, 15 Nov. 1837, *Smith* (QVM); Three Hummock Is., 3 Nov. 1988, *Tonelli* (QVM).

8. *Pterostylis curta* R. Br., *Prodr.* 326 (1810).
TYPE: Port Jackson, 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, K-L, P, W).

Illustration: Page 279, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in moist areas of open forest, woodland, coastal scrubs and heathland. Altitude: 10-500 m. Flowering period: August to November.

Notes: This species is characterised by stem-encircling basal rosette of leaves; large (30-35 mm long) flower; abbreviated galea; bulging sinus; short backswept free points; and, labellum with a prominent apical twist.

Specimens examined:
TASMANIA: W. side of Mt Maria, Maria Island, 10 Oct. 1986, *Collier 1735* (HO 113876); Penquite, Launceston, 1 Oct. 1843, *Gunn* (HO); Coles Bay, 19 Sept. 1969, *Johnson* (HO 111886); Fingal, 26 Sept. 1988, *Rubenach* (HO 144113); North Bruny Island, 4 Sept. 1938, *Somerville* (HO 411709).

9. *Pterostylis cycnocephala* Fitzg., *Austral. orch.* 1(2): t. 7 (1876).
TYPE: Molong, *Ross* (lecto specimen a, BM, *fide* Clements 1989, photo!).

Illustration: Plate 336, Nicholls (1969).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in open forests, woodlands and grassland in shallow well-drained clay loams. Altitude: 0-200 m. Flowering period: September to December.

Notes: *Pterostylis cycnocephala* is characterised by elliptic to narrowly ovate (to 35 x 15 mm) rosette leaves; tall (to c. 30 cm) scape; closely sheathing, well-spaced stem leaves; long (to 9 mm), broad (c. 4.5 mm wide) flowers; broad petals; broad column; and, a long narrow pointed beak on the labellum appendage.

Studies have shown that *P. cycnocephala* consists of a complex of several taxa, at least three of which occur in Tasmania. Two collections flowering in January (HO 111498 & 111499) are worthy of closer examination. Two distinctive segregate species, *P. pratensis* and *P. ziegeleri*, are described as new in this paper.

Specimens examined:
TASMANIA: 1 km S. of Campbell Town, 2 Oct. 1982, *Buchanan 975* (HO 58920); Campbell Town, Oct. 1941, *Curtis* (HO 87745); Marlborough, 4 Jan. 1841, *Gunn* (HO 111498); Launceston, Oct.-Nov. 1841-3, *Gunn* (HO 87748); Hampshire Hills, 30 Jan. 1842, *Milligan 976* (HO 111499); Tea Tree Golf Course, 20 Sept. 1975, *Palmer & Rayner* (HO 78095); Badger Head Rd, West Tamar, 14 Oct. 1987, *Rubenach* (HO 108600);

10. *Pterostylis decurva* R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 47: 339-40, t. 27 (1923).
TYPE: Victoria, Ferntree Gully, 20 Nov. 1920, *E.E. Pescott & A.N. Burns* (lecto AD!, *fide* Clements 1989).

Illustration: Page 281, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Commonly grows in moist areas of open forest and woodland; in Tasmania it also occurs in coastal heath and coastal tussock grassland. Soils include sands, sandy loam and clay loams. Altitude: 0-1200 m. Flowering period: November to March.

Notes: This species is characterised by dimorphic sterile and fertile plants; slender striped flower with a prominently decurved galea; long point on the dorsal sepal; long non-clavate free points; slightly bulging sinus; and, labellum protruding from the sinus in the set position.

Selected specimens: (15 seen) :
TASMANIA: Near Thumbs Picnic Shelter, SE. of Orford, 5 Feb. 1992, *Coates* (HO); Mt Mangana, South Bruny Island, 3 Mar. 1985, *Collier 409* (HO 115544); Silver Falls, Mt Wellington, 6 Feb. 1991, *Collier 5200* (HO 142605); Fazackerleys Ra., Forestier Pen., 8 Feb. 1989, *Moscal 17157* (HO 144555); Ben Lomond Natl Pk, 23 Mar. 1979, *Noble 28451* (HO 77415); c. 2 km NW. of Fingal, 8 Jan. 1989, *Rubenach* (HO 112877); back of Lagoon, Circular Head, 8 Dec. 1837, *Smith* (QVM).

11. *Pterostylis dubia* R. Br., *Prodr.* 328 (1810).
TYPE: Tasmania, Derwent, Apr. 1804, *R.Brown* (lecto BM!, *fide* Clements 1989).
Illustration: Plate 3, Curtis (1979).

Distribution and ecology: Endemic to Tasmania. Grows in wet sclerophyll forest and montane forest above about 500 m altitude. Flowering period: November to February.

Notes: This species is characterised by dark green and white flowers; narrow petals which do not flare widely towards the apex; shallowly bulging sinus with the free points mostly erect and hardly exceeding the galea; and, a narrowly lanceolate, dark blue-green labellum (11-14 mm long, c. 3 mm wide) which curves forward at the apex.

Pterostylis dubia has been recorded as extending to the mainland (Curtis 1979, Clements 1989, Backhouse & Jeanes 1995), but these records have arisen from confusion with *P. oreophila* Clemesha. The latter species can be distinguished by lighter green flowers; broadly flared petals; prominently bulging sinus with the free points recurved and hardly exceeding the galea; and, an elliptical to ovate-lanceolate, aqua-blue labellum (13-20 mm long, 4-5 mm wide) which is drawn out with the apex often recurved or coiled.

Pterostylis oreophila occurs in southern New South Wales, Australian Capital Territory and Victoria. Both species will be fully characterised in the forthcoming revision of the genus.

Pterostylis dubia hybridises with *P. scabrida* where the two species grow sympatrically.

Selected specimens: (19 seen) :
TASMANIA: Mt Wellington, Sept. 1923, *Atkinson* (QVM); Lenah Valley Tk, Mt Wellington, 10 Dec. 1989, *Cameron* (QVM); Mother Cummins Peak, 10 Dec. 1987, *Campbell* (QVM); Poatina Rd, 23 Dec. 1992, *Campbell* (CANB); Western Ck Tk, Western Tiers, 14 Jan. 1991, *Collier 5142* (HO 142547); Mt Rufus, Dec. 1917, *Rodway* (NSW); Mt Wellington, 14 Dec. 1993, *Wapstra (Jones 12741)* (CANB); Pipeline Tk, Ferntree, 22 Dec. 1993, *Ziegeler* (CANB); Lake Fenton, Mt Field National Park, 20 Jan. 1994, *Ziegeler (Jones 12809)* (CANB).

12. *Pterostylis falcata* R.S. Rogers, *Proc. Roy. Soc. Victoria* (new ser.) 28(1): 106, t. 9 (1915).
TYPE: Dandenong Ck, near Oakleigh, Victoria, Oct. 1911, *C.French* (lecto AD!, *fide* Clements 1989; isolecto MEL).

Illustration: Page 286, Backhouse & Jeanes (1995).

Distribution and ecology: Southern Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Typically *P. falcata* grows in moist to wet areas in open forest and wet sclerophyll forest, particularly near streams and swamps, usually in clay loams and peaty loams. Altitude: 10-1000 m. Flowering period: October to January.

Notes: Although very widespread on the mainland, *P. falcata* appears to be restricted and rare in Tasmania. Six collections from northern Tasmania are known. Most of the Tasmanian specimens are smaller flowered than is usual in this species and I suspect that many records of *P. falcata* from this state have arisen from confusion with *P. furcata*.

Pterostylis falcata is readily distinguished by large (6-8 cm long) flowers with an attenuate galea that is usually held horizontally; long labellum; and, long free points on the lateral sepals.

Clements (1989) included *P. falcata* as a synonym of *P. furcata* but this is erroneous.

Specimens examined:
TASMANIA; Exeter, 18 Dec. 1948, *Burrows* (HO 112167); *ibid*, Dec. 1951, *Burrows* (NSW 23712); *ibid*, 31 Jan. 1972, *Burrows* (HO 112042); Ben Lomond, Mt Barrow, Jan. 1929, *Perrin* (NSW); foothills of Mt Barrow, Jan. 1922, *Rupp* (NSW); Mt Barrow, Jan. 1922, *Rupp* (NSW).

13. *Pterostylis foliata* Hook. f., Fl. nov.-zel. 1: 249 (1853).
TYPE: New Zealand, Northern Island, Marshy places, east coast and Ruahine Mountains, *W.Colenso 1906* (lecto specimen a, k, *fide* Clements 1989, photo!).
Pterostylis gracilis Nicholls, *Victorian Naturalist* 43: 324-6 (1927).
TYPE: Wilsons Promontory, Sept. 1926, *R.S. Rogers & E. Coleman* (lecto MEL!, *fide* Clements (1989).
Pterostylis vereenae R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 38: 360-1, f. 18 (1914).
TYPE: Cherry Gardens, Sept., *V. Jacobs* (holo AD, not found).

Illustration: Page 288, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania, South Australia and New Zealand. Grows in wet sclerophyll forest, tall open forest, heathy woodlands and coastal scrubs in sands, terra rossa, sandy loams and clay loams. Altitude: 50-1000 m. Flowering period: September to January.

Notes: This species is characterised by fleshy leaves arranged loosely up the scape; relatively small (20-25 mm long), erect, narrow, dark green, white and brown flower; lateral sepals tightly embracing the galea; short free points; deeply vee-ed sinus; and, labellum protruding prominently from the sinus in the set position.

Selected specimens: (25 seen):
TASMANIA: Devonport, Nov. 1926, *Atkinson* (QVM); Lady Barron Falls, Dec. 1940, *Atkinson* (QVM); Roses Tier, 1 Jan. 1950, *Atkinson* (QVM); Lilydale Rd, 26 Oct. 1946, *Burrows* (QVM); heathland inland from West Point, near Marrawah, 7 Sept. 1984, *Cameron* (QVM); Yates Ck, King Island, 24 Oct. 1987 *Campbell* (QVM); near Mt Mangana, Bruny Island, 31 Oct. 1987, *Campbell* (QVM); Waterfall Bay, Tasman Pen., 27 Oct. 1985, *Collier 918* (HO 116775); Mt Hobbs, 14 Dec. 1986, *Collier 2032* (HO 121363).

14. *Pterostylis furcata* Lindl., *Gen. sp. orchid. pl.* 390 (1840).
TYPE: In wet places a few miles from Launceston, *R.Gunn 602* (holo K-L, photo!; iso K, photo!).

Illustration: None found.

Distribution and ecology: Endemic to Tasmania. Grows in wet sclerophyll forest, montane forests and montane grassland in moist loam. Altitude: 500-900 m. Flowering period: November to January. **Fig. 7.5**.

Notes: The identity of this species has caused much confusion. Nicholls (1949, 1950) discussed this species in detail in relation to fresh specimens received from two collections in Tasmania. Neither of these is a good match for the type, but may well represent extreme variation of the species. Clements (1989) included *P. falcata* R.S. Rogers as a synonym of *P. furcata* but this is erroneous. *Pterostylis furcata* can be distinguished by flowers 25-45 mm long; galea obliquely erect to erect; deeply notched sinus; and, erect free points (10-23 mm long) of the lateral sepals.

Pterostylis monticola D.L.Jones, which does not occur in Tasmania, has some similarities but can be immediately distinguished by its scabrid scape (smooth in *P. furcata*) and broad sinus.

Specimens examined:
TASMANIA: Patersonia side of Mt Arthur, no date, *Burrows* (QVM); Interlaken Rd, 22 Jan. 1989, *Campbell 1989-3* (QVM); *ibid*, 31 Jan. 1991, *Campbell* (CANB); *ibid*, 16 Dec. 1992, *Campbell 92497* (CANB); *ibid*, 30 Jan. 1996, *Campbell 96001* (CANB); Formosa, 6 km S. of Clair, 7 Jan. 1844, *Gunn 906* (HO 114604); West Coast, no date, *Rodway* (HO 111321); NW. side of Woods Lake, 31 Jan. 1991, *Campbell* (CANB); *ibid*, 23 Dec. 1992, *Campbell 92490* (CANB); *ibid*, 8 Jan. 1993, *Campbell 93009* (CANB); *ibid*, 17 Dec. *collector unknown* (QVM).

15. *Pterostylis grandiflora* R. Br., *Prodr*. 327 (1810).
TYPE: Port Jackson, 1804, *F. Bauer* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, P, W).

Illustration: Page 289, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Victoria and Tasmania. Grows in open forest and coastal scrub in sands, sandy loam and clay loam. Altitude: 0-100 m. Flowering period: April to August.

Notes: This species is characterised by dimorphic sterile and fertile plants; large (30-35 mm long) flower with broadly flared brown petals; long erect free points; and, a labellum tapered suddenly in the distal half to a narrow linear section.

Specimens examined:
TASMANIA: Launceston, June 1951, *Burns* (HO 111390); Back Ck, Australian Slate Mine, near Lefroy, 21 April 1974, *Cameron* (QVM); Bicheno, 3 June 1984, *Cameron* (QVM); Monarch Hill, near Lefroy, 30 June 1984, *Cameron* (QVM); Golden Ridge, 1 June 1986, *Collier 1482* (HO 119296); St Helens, June 1945, *Curtis* (HO 111389); near Coles Bay water storage, 24 May 1987, *Rubenach* (HO 105422); St Helens, June 1940, *Smith* (HO); Georges Bay, 1892, *collector unknown* (QVM).

16. *Pterostylis melagramma* D.L. Jones, sp. nov.,
P. longifoliae R. Br. affinis, sed apicibus sepalorum dorsalis et lateralorum brunneis ad aurantiis, et labello oblongo trichomatibus ad basin labelli praecipue limitatis, differt.

TYPUS: Tasmania, King Island, Pegarah, 4 Nov. 1991, *D.L. Jones 8461* (holo CANB, iso AD, BRI, CANB, HO, MEL, NSW)

Illustration: Page 293, Backhouse & Jeanes (1995) - as *P. longifolia.*

Tuberous terrestrial *herb.* Sterile and fertile plants dimorphic. *Sterile plants* consisting of a rosette only; *rosette* on a slender stalk 3-10 cm tall; *leaves* three to six, narrowly lanceolate to narrowly ovate-lanceolate, rarely ovate, 10-50 mm long, 4-8 mm wide, dark green above, smooth and paler beneath; petioles very short or absent; margins entire or wrinkled; apex acute. *Flowering plants* 15-80 cm tall. Scape slender, one-20-flowered. *Cauline leaves* five to seven, sessile, sheathing at the base; lamina narrowly lanceolate to narrowly ovate-lanceolate, 25-80 mm long, 5-10 mm wide, spreading to obliquely erect, dark green above, paler beneath; margins flat; apex subacute to acuminate. *Floral bracts* obovate, 8-25 mm long, 4-7 mm wide; apex acuminate. *Pedicels* slender, 4-8 mm long, straight. *Ovary* narrowly obovoid, 6-8 mm long, dark green, smooth to slightly warty. *Flowers* 12-15 mm long, translucent green with indistinct darker green stripes, shiny, porrect to slightly erect; galea irregularly curved throughout, decurved suddenly near the apex; petals without flanges which block off the base of the galea. *Dorsal sepal* more or less ovate-oblong, 13-17 mm

long, 10-12 mm wide, inflated in the proximal half then tapered to apex; apical point c. 1 mm long, decurved, often brown. *Lateral sepals* narrowly elliptic, 10-13 mm long, 6-8 mm wide, deflexed, recurved just below the middle then curved forwards slightly near the apex; inner surface minutely papillate; sinus narrow; lobes widely divergent; free points 4-5 mm apart; distal margins inrolled, often brown. *Petals* narrowly oblong-oblanceolate, 12-14 mm long, 3-3.5 mm wide; central ridge prominent, dark green; proximal posterior flange c. 1 mm across, poorly developed, obtuse; distal posterior flange hardly developed; anterior flange c. 2.5 mm wide, transparent; outer margins entire. *Labellum* hinged on a basal ligulate strap c. 1.5 mm long, c. 1 mm wide; lamina oblong, often shallowly constricted medially, 5.5-6.5 mm long, c. 3 mm wide, tawny, brownish, or yellowish; basal mound and central callus dark brown to black; ventral surface covered with beaded siliceous cells, numerous acicular cells to 0.5 mm long to the anterior and posterior of the mound; basal mound c. 1.5 mm high, prominent, erect, obtuse; lateral lobes well developed, 4-4.5 mm long, strongly ridged in the distal half; mid-lobe c. 1 mm long; apex strongly upcurved, notched for 0.3 mm; lobes divergent. *Column* 12-16 mm long, curved near the base then nearly straight, green. *Column wings* more or less rectangular, c. 3.5 mm long, c. 3 mm wide; anterior margins incurved; upper margins with flat linear entire or forked barrier cilia; lower margins with filiform tangled cilia; upper lobe linear-oblong, c. 0.5 mm long, obtuse. *Anther* c. 1.4 mm long, shortly rostrate. *Pollinia* linear-oblong, c. 1.8 mm long, yellow, mealy. *Stigma* narrowly-elliptic, c. 6 mm long, c. 2 mm wide, elongated; apex broadly notched; distal margins shallowly crenate. *Capsules* obovoid, 6-8 mm long, 3-4 mm wide, green, often sparsely verrucose.
Fig. 7.6.

Distribution and ecology: Southern New South Wales, Victoria, Tasmania and South Australia. Grows in wet sclerophyll forests, moist areas of open forest and coastal scrubs in sandy loams, shallow clay loams and loams. Altitude: 10-1000 m. Flowering Period: June to November.

Notes: This species, part of the *P. longifolia* complex, is characterised by robust habit (plants to 80 cm tall); numerous (up to 20) flowers; elliptical sepals; petals without basal flanges; labellum oblong, shallowly constricted near the middle, tawny, brownish or yellowish with a prominent dark brown or black central stripe.

In this species the tips of the dorsal sepal and lateral sepals are frequently suffused with brown or orange-brown.

Conservation Status: Widespread, common and well conserved.

Etymology: Derived from the Greek *melas, melanos*, dark, black, *gramme*, line; in reference to the dark central stripe on the labellum.

Selected specimens : (c. 40 examined):
NEW SOUTH WALES: Carabost State Forest, 2 Sept. 1990, *Logan (Jones 6393)* (CANB).
VICTORIA: Knocker Tk, Omeo, 14 Nov. 1989, *Branwhite* (CANB); Yarram, 16 Oct. 1989, *Foster* (CANB); Lang Lang, 9 Aug. 1991, *Glare* (CANB); Diamond Ck, 28 July 1987, *Richards* (CANB); Bats Ridges, 1 Sept. 1987, *Woolcock* (CANB);
TASMANIA: Smithton, 21 Aug. 1992, *Porteus* (CANB); Big Dog Island, 24 Sept. 1992, *Spry (Jones 10128)* (CANB); Coles Bay, 6 sept. 1993, *Williamson* (CANB).
SOUTH AUSTRALIA: River Wirra, 31 Aug. 1987, *Bates 10177* (CANB); Para Wirra Recreation Pk, 21 Aug. 1988, *Bates 15061* (CANB).

17. *Pterostylis mutica* R. Br., *Prodr.* 328 (1810). TYPE: Port Jackson, raceground, Sept.-Oct. 1803, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM).

Illustration: Page 297, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Victoria, South Australia and possibly Tasmania. Grows in open forests, woodlands, mallee shrubland and grassland in shallow, well-drained clay loams. Altitude: 10-200 m. Flowering period: September to December.

Notes: Studies have shown that *P. mutica* consists of a complex of several taxa, at least

two of which occur in Tasmania. The study of this group in Tasmania has been limited by inadequate collections and it is uncertain if *P. mutica sens. strict*. occurs in the state. The collection detailed below is of a slender species with widely spaced flowers similar to *P. mutica* and needs follow up field work.

Two distinctive segregate species (*P. rubenachii* and *P. wapstreorum*) are described as new in this paper.

Specimen examined: TASMANIA. Knocklofty-Mt Stuart, 22 Oct. 1951, *Scott* (HO 87743).

18. *Pterostylis nana* R. Br., *Prodr*. 327 (1810).
TYPE: Port Dalrymple, *W. Paterson* (lecto specimen a, BM, *fide* Clements 1989, photo!).

Distribution and ecology: Southern Victoria and Tasmania. Grows in open forest, heathy forest, coastal scrub and heathland in sands, sandy loam and clay loam. Altitude: c. 0-200 m. Flowering period: August to October.

Notes: This species is characterised by basal rosette of stem-encircling leaves; flower small (15-20 mm long), narrow erect with a very high square sinus; long free points; small central ligule-like growth on the internal upper margin of the sinus; and, short labellum not visible through the sinus in any position.

Specimens from Mt. Killiecrankie (J.S. Whinray 2444; HO 51885) on Flinders Island are atypical in being very short and sturdy with larger flowers than those from other parts of Flinders Island and on the Tasmanian mainland. This variation warrants further study.

Selected specimens: (15 seen):
TASMANIA: Cape Barren Island, Nov. 1923, *Atkinson* (QVM); Flinders Island, Nov. 1946, *Atkinson* (QVM); Bridport, 5 Aug. 1984, *Cameron* (QVM); West Point, Marrawah, 7 Sept. 1984, *Cameron* (QVM); Brown Ck, Dazzler Ra., 21 Sept. 1986, *Collier 1601* (HO 119469); Cape Hauy, 4 Oct. 1986, *Collier 1696* (HO 119500); 4 km E. of Weymouth, 26 Aug. 1989, *Collier 4054* (HO 120474); Woolnorth, 16 Oct. 1837, *Gunn* (HO); Georgetown, 28 Oct. 1843, *Gunn* (HO); Cape Barren Island, 14 Aug. 1970, *Whinray* (HO 26009).

19. *Pterostylis nutans* R. Br., *Prodr*. 326 (1810).
TYPE: Port Jackson, North Rocks, July 1804, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, P, W).
Pterostylis mathewsii Cheesem., *Trans. & Proc. New Zealand Inst.* 47: 46 (1915).
TYPE: North Island, Mongonui County, crest of ridge leading to Pukemiro Hill, near Kaitaia, *H.B. Mathews* (holo K, photo!).

Illustration: Page 299, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Victoria, Tasmania, South Australia and New Zealand. Grows in a wide range of habitats, particularly moist areas in open forest, woodland and coastal scrubs in sandy loam and clay loam. Altitude: 0-1000 m. Flowering period: July to December.

Notes: This species is characterised by basal rosette of stem-encircling leaves; cernuous translucent green flower; free points projecting just over the galea; and, strongly recurved hispid labellum which projects prominently through the sinus in the set position.

Selected specimens: (57 seen):
TASMANIA: Cascades, 6 July 1931, *Atkinson* (HO); King Island, Grassy, 7 Nov. 1965, *Cameron* (HO 26894); Henry Somerset Reserve, Latrobe, 21 Sept. 1986, *Collier 1626* (HO 119474); 2 km E. of Weymouth, 26 Aug. 1981, *Collier 4060* (HO 120481); Cray Ck, 17 Oct. 1983, *Moscal 3607* (HO 69535); Rosetta, Hobart, 20 Sept. 1958, *Thompson* (HO 97789); Flinders Island, verge of Walkers Hill Rd, 23 Aug. 1968, *Whinray 291* (HO 26144).

20. *Pterostylis parviflora* R. Br., *Prodr*. 327 (1810).
TYPE: Port Jackson, between Sydney and Parramatta near Aiten's Bridge, Apr. 1805, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, W).

Illustration: Page 300, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Victoria and Tasmania. Grows in open forest, heathy woodlands, coastal scrub, heathland and shallow soil over rock plates. Altitude: 0-200 m. Flowering period: March to May. **Fig. 7.7**.

Notes: This species is characterised by dimorphic sterile and fertile plants; slender non-fleshy scape; flowers inward-facing, one to eight, very small (7-10 mm long), narrow, green and white (rarely some light brown in the galea); very short free points which are often curved forwards; notched sinus; and, short labellum the tip of which is visible through the galea in the set position.

A complex of undescribed taxa surrounds *P. parviflora sens. strict.* At least three of these taxa occur in Tasmania, two of which are described as new in this paper (see also *P. aphylla*, *P. atriola* and *P. uliginosa*).

Specimens examined:
TASMANIA: Eaglehawk Neck, July 1922, *Atkinson* (QVM); Snug, 6 April 1931, *Atkinson* (HO 411693); Lindisfarne, Apr. 1924, *Atkinson* (QVM); Coles Bay, 1 May 1983, *Cameron* (QVM); Grants Lagoon, Binalong Bay, 23 Apr. 1984, *Cameron* (QVM); Pearly Brook, 7 May 1989, *Campbell* (QVM); Epping Forest Reserve, 10 July 1992, *Moscal 23910* (HO 400462).

21. *Pterostylis pedoglossa* Fitzg., *Austral. Orch.* 1(3), t. 5 (1877).
TYPE: Long Bay, Sydney, June 1873, *R.D. Fitzgerald* (lecto Fitzgerald's plate!, *fide* Clements 1989).

Illustration: Page 302, Backhouse & Jeanes (1995).

Distribution and ecology: Southern Queensland, New South Wales, Victoria and Tasmania. Grows in heathy forests, coastal scrubs and heathland in sands, sandy loams and peaty sands. Altitude: 0-300 m. Flowering period: March to June.

Notes: This species is characterised by basal rosette of stem-encircling leaves; slender scape; flower small narrow green and white; long filamentous point on the dorsal sepal; long free points on the lateral sepals; high sinus; and, short labellum not visible through the sinus in any position.

Specimens examined:
TASMANIA: Cherry Tree Hill, Tasman Hghy, 18 km SE. of Bicheno, 18 Mar. 1990, *Collier 4625* (HO 142907); Murdunna, 29 Apr. 1956, *Curtis* (HO 111531); Friendly Beach Rd, 4 Mar. 1968, *Curtis* (HO 111532); Coles Bay, 4 Apr. 1993, *Jones 11461* (CANB); Forestier Pen., Apr. 1924, *Rodway* (HO 111539); Eaglehawk Neck, Sept. 1927, *Rodway* (HO 111536).

22. *Pterostylis pedunculata* R. Br., *Prodr.* 327 (1810).
TYPE: Tasmania, Port Dalrymple, June, *Paterson* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM).
Pterostylis semirubra F. Muell., *Fragm.* 8: 249 (1874).
TYPE: In truncis arboris filicum prope Apollo Bay, *C. Walter* (holo MEL!).

Illustration: Page 303, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in wet sclerophyll forest, fern gullies, moist areas of open forest and woodland and coastal scrubs in sandy loams, clay loams and loams. Altitude: 0-1000 m. Flowering period: July to December.

Notes: This species is characterised by basal rosette of stem-encircling leaves; flower small (15-20 mm long), translucent white, towards the apex heavily suffused red-brown to blackish; wide lateral gap between the petals and lateral sepals; deeply notched sinus; widely divergent free points; and, a short ovate-elliptical labellum.

Specimens examined:
TASMANIA: W. of Middle Patriarch, Flinders Island, 18 Oct. 1985, *Collier 765* (HO 116600); South Cape Bay, 1 Oct. 1988, *Collier 3445* (HO 118469); Green Tier Ck, 8 km S. of Tooms Lake, 14 Oct. 1989, *Collier 4314* (HO 119655); Summer Camp Gully, 15 km NE. of Whitemark, Flinders Island, 27 Oct. 1990, *Collier 4902* (HO

128027); Black Charlies Opening, 13 km NNW. of Sorell, 11 Sept. 1988, *Moscal 16436* (HO 408838); Fingal, 26 Sept. 1988, *Rubenach* (HO 144112).

23. *Pterostylis plumosa* L. Cady, *Austral. Pl.* 5(39): 138, f. B-D (1969).
TYPE: New South Wales, Road to Abercrombie Caves, Oct. 1961, *W. Brinsley* (holo NSW!).

Illustration: Plate 182, Bishop (1996).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, mallee shrubland and coastal scrubs in sands, sandy loams and clay loams. Altitude: 50-300 m. Flowering period: September to November.

Notes: This species is characterised by tall (15-35 cm) habit; leaves large (15-35 x 8-15 mm), in a loose rosette; flower large (30-35 mm long), with a long apical point on the galea; and, moderately dense plumose labellum. The flowers are insect pollinated.

Pterostylis plumosa is relatively widespread in Tasmania. Some confusion between this species and *P. tasmanica* can be expected until the differences become familiar to field operatives (see also *P. tasmanica* entry).

Selected specimens: (18 seen):
TASMANIA: Lindisfarne, Oct. 1922, *Atkinson* (QVM); Friendly Beaches, 5 Oct. 1984, *Cameron* (QVM); Road to Fortescue Bay, 5 Nov. 1984, *Cameron* (QVM); Esk Hghy, c. 5 km E. of Conara, 14 Nov. 1986, *Campbell* (QVM); Epping Forest, on Barton Rd, 6 Nov. 1987, *Campbell* (QVM); Pottery Rd, Lenah Valley, 15 Nov. 1990, *Palmer* (CANB); Coles Bay, 27 Oct. 1992, *Williamson* (CANB).

24. Pterostylis pratensis D.L. Jones, sp. nov.,
P. cycnocephalae R.D. Fitzg. affinis, sed foliis rosulae late obovatis ad paene orbicularibus; floribus confertis, albis, vittis atro-viridibus; petalis anguste oblongo-lanceolatis; et appendicis labelli rostro brevissimo, late obtuso, differt.
TYPUS: Tasmania, Liawenee Moor, Lake Highway, Great Lake, 5 Dec. 1997, *J.E. & A. Wapstra (ORG 1059)* (holo CANB; iso HO)

Tuberous terrestrial *herb*. *Leaves* four to eight, ground-hugging, sessile, in a basal stem-encircling rosette; *lamina* obovate to broadly obovate or nearly orbicular, 25-35 mm long, 14-22 mm wide, smooth, green; margins entire; apex bluntly apiculate. *Scape* 7-15 cm tall, 2-3 mm across, two-twelve-flowered. *Sterile bracts* two to six, well-developed, often overlapping, narrowly ovate-lanceolate, 8-20 mm long, 3-5 mm wide, loosely sheathing, acute. *Fertile bracts* similar but smaller, closely sheathing. *Pedicels* c. 3 mm long, straight, slender. *Ovaries* oblong-obovoid, 3-4 mm long, c. 2 mm wide. *Flowers* crowded, 7-8.5 mm long, c. 4.5 mm wide, porrect, white with darker green veins. *Dorsal sepal* hardly gibbous at the base, shallowly curved for most of its length then abruptly decurved near the apex, as long as or slightly longer than the petals. *Lateral sepals* when flattened c. 5 mm long, c. 7 mm wide, decurved, pouched, dorsally gibbous; points apiculate, c. 3 mm apart. *Petals* more or less asymmetrically narrowly oblong-lanceolate, 6-7 mm long, c. 2.6 mm wide; dorsal margin strongly thickened, dark green, with a prominent supra-medial dorsal gibbosity; lamina pale green with darker veins; ventral margin entire. *Labellum* irritable, on a ligulate claw c. 1 mm long, c. 1 mm wide, whitish green with a dark green appendage; lamina oblong, 2.4-2.8 mm long, c. 2.4 mm wide, membranous; apex slightly emarginate; appendage basal, more or less narrowly oblong, c. 1.3 mm long, c. 1 mm wide, c. 0.9 mm thick, recurved; distal margins dark green, thickened; central ridge projecting as a short (c. 0.5 mm long), broadly obtuse, dark green beak; callus a broadly tapered, thickened, slightly darker medial ridge. *Column* 7-7.5 mm long, obliquely erect, shallowly curved or nearly straight, green with darker distal areas. *Column wings* more or less rectangular, c. 2 mm long, c. 1.3 mm wide; basal lobe broadly deltate; inner margins sparsely ciliate; upper margins with layers of beaded siliceous cells; barrier cilia c. 0.2 mm long, clavate. *Anther* c. 0.9 mm long, obtuse. *Pollinia* obovate-clavate, c. 1 mm long, yellow, mealy. *Stigma* situated above centre, just below the column wings, scutiform, c. 2.5 mm long, c. 1.3 mm wide, raised. *Capsules* not seen. **Fig. 7.8.**

Distribution and ecology: Endemic to central Tasmania. Grows in subalpine grassland dominated by *Poa labillardieri* Steud. with scattered shrubs of *Olearia algida* N.A. Wakef. and *Hakea microcarpa* R. Br. Soils are brown loams. Altitude: c. 850-1060 m. Flowering period: Late November to January.

Notes: This species is characterised by montane to subalpine habitat; broadly obovate to nearly orbicular rosette leaves; crowded white flowers with darker green stripes; narrowly oblong-lanceolate petals; and, very short, broadly obtuse beak on the labellum appendage.

Pterostylis pratensis is similar to *P. cycnocephala* but that species is much taller (to c. 30 cm) with larger (to 35 x 15 mm) rosette leaves; broader petals; much broader column; and, a longer narrowly pointed beak on the labellum appendage.

Conservation status: Poorly known but locally abundant and conserved.

Etymology: From the Latin *pratensis*, growing in meadows, in reference to the highland habitat of this species.

Specimens examined:
TASMANIA. Liawenee Moor, 10 Jan. 1997, *North* (CANB); St Patricks Plains, 5 Dec. 1997, *Wapstra (ORG 1060)* (CANB); Barren Plains Rd, near Shannon Lagoon, 5 Dec. 1997, *Wapstra (ORG 1061)* (CANB).

25. ***Pterostylis rubenachii*** D.L. Jones, sp. nov.,
P. muticae R. Br. affinis, sed habitu pumilo; floribus dense confertis; sepalibus lateralibus profunde saccatis; petalis asymmetrice ovatis; et labelli appendice recurva, porca mediana per totam longitudinem labelli extensa supra porcas marginales elevata.

TYPUS: Tasmania, Western Plains, 4 Nov. 1837, *R.C. Gunn* (holo HO 111503; iso HO)

Tuberous terrestrial *herb*. *Leaves* sessile, ground-hugging, four to six, in a basal stem-encircling rosette; lamina oblong-ovate to narrowly elliptic, smooth, dark green, tapered to each end; margins entire; apex apiculate. *Scape* 3-8 cm tall, 2-3 mm across, two-seven-flowered. *Sterile bracts* two or three, ovate-lanceolate, 8-16 mm long, 5-6 mm wide, loosely sheathing, acute to apiculate. *Fertile bracts* similar, closely sheathing. *Pedicels* c. 2 mm long, straight, slender. *Ovaries* linear-oblong, 2.5-3 mm long, c. 2 mm wide. *Flowers* densely crowded, 8.5-9.5 mm long, c. 5 mm wide, porrect, green with darker green veins. *Dorsal sepal* hardly gibbous at the base, shallowly curved for most of its length then abruptly decurved near the apex, about as long as or slightly shorter than the petals. *Lateral sepals* when flattened c. 6 mm long, c. 5 mm wide, obliquely decurved to decurved, deeply pouched, dorsally gibbous, the points very shortly apiculate, c. 1 mm apart. *Petals* more or less asymmetrically ovate, 6-7 mm long, c. 4 mm wide; dorsal margin strongly thickened, dark green, with a prominent dorsal gibbosity just less than halfway along; lamina light green with three darker veins; ventral margin irregularly and shortly toothed. *Labellum* irritable, on a ligulate claw c. 1.3 mm long, c. 1 mm wide, whitish green with a dark green appendage; lamina ovate-oblong, 2.5-2.8 mm long, c. 2.2 mm wide, membranous; apex emarginate; appendage basal, more or less oblong, c. 1.1 mm long, c. 1 mm wide, c. 0.7 mm thick, shallowly recurved; margins dark green, thickened; central ridge narrow, raised above the margins, dark green; callus of a thickened, darker medial ridge. *Column* 8-8.5 mm long, obliquely erect, shallowly curved, green with darker areas on the wings. *Column wings* more or less rectangular, c. 2.5 mm long, c. 1.5 mm wide; basal lobe deltate, projecting; inner margins sparsely ciliate; upper margins with beaded siliceous cells; barrier cilia c. 0.2 mm long, clavate. *Anther* c. 0.8 mm long, obtuse. *Pollinia* obovate, c. 1 mm long, yellow, mealy. *Stigma* central, narrowly scutiform, c. 3.5 mm long, c. 1 mm wide, raised. *Capsules* not seen. **Fig. 7.9.**

Distribution and ecology: Endemic to western Tasmania. Grows in low heath in moist to wet grey sandy loam. Altitude: c. 10-30 m. Flowering period: October and November.

Notes: This species is characterised by dwarf habit; thin-textured leaves; densely crowded, very fleshy flowers; deeply pouched lateral sepals; asymmetrically ovate petals; and, a broad recurved labellum appendage not much

narrower than the lamina and with the central ridge extending full length and raised above the marginal ridges.

Pterostylis rubenachii is similar to *P. mutica* but that species is much taller (to 35 cm), with widely spaced flowers and the central ridge on the labellum ends below the apex and projects as a very short, blunt beak. It also has affinities with *P. wapstreorum* but that species is much more robust with thick-textured fleshy leaves and a narrower labellum appendage.

Conservation status: Becoming very rare due to alienation of habitat; suggest 2EK by the criteria of Briggs & Leigh (1996).

Etymology: Named after Les Rubenach, keen bushwalker, competent photographer and orchid specialist who has been one of the very few people to collect this species.

Specimens examined:
TASMANIA: South of Arthur River, 4 Nov. 1994, *Rubenach (Jones 13668)* (CANB); Tiger Ck, 12 Nov. 1997, *Wapstra (ORG 1010)* (CANB); Bottle Ck, 12 Nov. 1997, *Wapstra (ORG 1011)* (CANB).

26. *Pterostylis sanguinea* D.L. Jones & M.A. Clem., *Austral. Orch. Res.* 1: 126 (1989).
TYPE: South Australia, Belair Recreation Reserve, 70 acre Flora Reserve, behind Pines Oval, 9 July 1986, *M.A.Clements 4097 & A.S.Cameron* (holo CANB!; iso AD!, K!).
Pterostylis vittata auct non Lindl.; W.M.Curtis, *The Student's Flora of Tasmania* 4A: 28 (1979).

Illustration: Page 310, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in open forests, coastal scrubs and heathland in sandy loam or clay loam. Altitude: 0-100 m. Flowering period: May to September.

Notes: This species was previously confused with *P. vittata* Lindl. which is endemic to Western Australia. *Pterostylis sanguinea* is easily recognised by dimorphic sterile and fertile plants; large dark reddish brown flowers; broadly elliptical deflexed lateral sepals; and labellum with an unusual short erect basal tail-like structure.

In Tasmania the species was thought to be restricted to Bass Strait islands, but there has been a recent collection from the mainland (Collier 5357).

Selected specimens: (25 seen):
TASMANIA: Cape Barren Island, June 1923, *Atkinson* (QVM); Road to Petal Point, 19 Sept. 1992, *Collier 5357* (HO 410796); Deal Island, Kent Group, 1884, *Johnstone* (MEL); Clarke Island, 1893, *Maclaine* (MEL); Martha Lavinia Lake, King Island, 14 July 1968, *McGarvie* (MEL); Cape Barren Island, 9 June 1970, *Whinray 405* (HO, MEL); Badger Island, 29 July 1973, *Whinray 1108* (MEL); Flinders Island, Tanners Bay, 18 June 1968, *Whinray 2052* (MEL).

27. *Pterostylis scabrida* Lindl., *Gen. sp. orchid. pl.* 389 (1840).
TYPE: Tasmania, Black River, Circular Head, Nov. 1837, *R. Gunn 906* (holo K-L (photo!); iso K (photo!).
Pterostylis vereenae auct non R.S. Rogers (1914); W.H. Nicholls, *Orchids of Australia,* 82 (1969).
Pterostylis alpina auct non R.S. Rogers (1915); W.M. Curtis, *The Student's Flora of Tasmania* 4A: 19 (1979).

Illustration: Plate 305, Nicholls (1969) - as *P. vereenae*.

Distribution and ecology: Endemic to Tasmania. Grows in a wide range of moist habitats including wet sclerophyll forest, montane forests, beech forests and rainforest. Altitude: 50-1000 m. Flowering period: October to February. **Fig. 7.10**.

Notes: This species has been commonly confused with *P. alpina*, which does not occur in Tasmania, and to a lesser extent *P. foliata* (as *P. vereenae*). *P. scabrida* can be distinguished from *P. alpina* by the shallowly curved sinus when viewed from the side and the free points of the sepals being erect above the galea. The scape is scabrid but in some specimens the peduncle is smooth.

At high altitudes, *P. scabrida* may hybridise with *P. dubia* where the two species grow sympatrically, resulting in confusing variants.

Further study is warranted into the variation exhibited by *P. scabrida.*

Specimens examined:
TASMANIA: Dunning Rivulet, 18 Feb. 1986, *Buchanan 8251* (HO 405172); Mt Maurice, 17 Dec. 1992, *Campbell 92482* (CANB); Interlaken Rd, 23 Dec. 1992, *Campbell 92498* (CANB); Mother Cummins, 8 Jan.1993, *Campbell 93015* (CANB); Storys Ck, 4 Dec. 1994, *Campbell 94170* (CANB); Hellyer Gorge, 2 Nov. 1990, *Jones 6905 & Broers* (CANB); SW. of Smithton, 14 Oct. 1992, *Porteus (Jones 10278)* (CANB); Black River, 6 Dec. 1837, *Smith* (QVM); Woods Lake, 17 Dec. 1993, *Smith & Williamson* (CANB); Van Morey Rd, Margate, 13 Nov. 1993, *Wapstra (Jones 12602)* (CANB).

28. *Pterostylis squamata* R. Br., *Prodr.* 327 (1810).
Pterostylis rufa R. Br. var. *squamata* (R. Br.) Fitzg., in C. Moore and E. Betche, *Handb. Fl. Pl. New South Wales* 401 (1893).
TYPE: Tasmania, Table Mtn, 1805, *R. Brown* (lecto specimen a, BM!, *fide* Clements 1989).
Pterostylis rufa subsp. *rufa auct non* R. Br.; W.M. Curtis, *The Student's Flora of Tasmania* 4A: 27 (1979).

Illustration: Page 309, Backhouse & Jeanes (1995) - as *P.* aff. *rufa*.

Tuberous terrestrial *herb*. *Leaves* six to 12, in a basal stem-encircling rosette, usually senescent at anthesis; *lamina* ovate to elliptical, 12-30 mm long, 7-12 mm wide, dull green to grey green, subsessile; margins entire; apex subacute. *Scape* 10-30 cm tall, slender, 1-10-flowered. *Sterile bracts* 3-6, ovate to ovate-lanceolate, 7-18 mm long, 5-7 mm wide, closely sheathing, occasionally imbricate, acute. *Floral bracts* ovate, 5-16 mm long, 3-5 mm wide, closely sheathing, involute, acute. *Pedicels* 4-7 mm long, slender, obliquely erect, curved. Ovaries linear-obovoid, 4-6 mm long, 2.5-3 mm wide, brownish. *Flowers* porrect, 10-14 mm long, reddish to reddish brown, with translucent markings in the dorsal sepal, dull to shiny; galea gibbous at the base, shallowly curved in the middle, abruptly decurved in the distal third; petal flanges not touching. *Dorsal sepal* 10-13 mm long, cucullate, obliquely erect, abruptly decurved in the distal third; apical point 1-3 mm long, rostrate. *Lateral sepals* deflexed, wholly reddish brown or with translucent markings towards the base; fused part 4-5 mm long, 7-9 mm wide, c. 2.5 mm across at the base, shallowly concave; margins incurved, ciliate; sinus narrow; lobes divergent; free points involute, 5-7 mm long, widely divergent, 6-9 mm apart at the tips. *Petals* lanceolate, 8-10 mm long, 3-4 mm wide, reddish brown with two darker lines; dorsal ridge shortly ciliate; proximal flange poorly developed. *Labellum* highly irritable on a claw c. 2.5 mm long; lamina oblong, 4-4.5 mm long, c. 2.5 mm wide, reddish brown, slightly constricted in the proximal third, thickest towards the base; basal lobe obliquely recurved, raised, densely ciliate; margins with five to seven pairs of white spreading setae to 2 mm long and a few fine cilia towards the apex; apex shortly emarginate; underside with a narrow central channel extending from the basal lobe nearly to the apex. *Column* 8-11 mm long, curved. *Column wings* more or less rectangular, 3-3.5 mm long, c. 2 mm wide; dorsal margins siliceous; ventral margins ciliate. *Stigma* narrowly elliptical to scutiform, 5-5.5 mm long, 1.5-2.5 mm wide; upper margins shallowly lobed. *Anther* c. 2 mm long, obtuse. *Pollinia* oblong-clavate, c. 2 mm long, yellow, mealy. *Capsules* obovoid, 7-11 mm long, 3-4 mm wide, erect, reddish brown. **Fig. 7.11.**

Distribution and ecology: Southern New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in open forest and woodland with a sparse to dense understorey, often in proximity to rock outcrops. The species occurs at low altitudes and also extends to montane habitats. Soils include clay loams, shales and gravelly loams. Altitude: 10-1000 m. Flowering period: October to March.

Notes: *Pterostylis squamata* can be distinguished from other species of the rufa group by the following combination of features; relatively small (10-14 mm long), reddish to reddish brown, porrect, moderately crowded flowers; pedicels 4-7 mm long; and, a relatively broad oblong labellum (to 4.5 x 2.5 mm).

Pterostylis squamata is very similar to *P. rufa* R. Br. but that species has widely spaced nodding flowers, longer pedicels (to 16 mm) and ovaries (to 9 mm) and a proportionately narrower labellum (to 4.5 x 2 mm). *Pterostylis rufa* is restricted to New South Wales and southern Queensland.

The status of *P. squamata* has been uncertain almost since it was described. Much of the confusion has arisen because the

specimens in the type collection are immature and undue emphasis has been placed on the sterile bracts, which on the type specimens are extremely well developed and imbricate. I suspect this development is due to an exceptionally good season enhanced by lack of elongation of the scape due to the specimen's immaturity.

Conservation status: Widely distributed, often locally common and well conserved in National Parks and other reserves.

Specimens examined:
TASMANIA: Coles Bay, 22 Dec. 1985, *Cameron* (QVM); Esk Hghy, 5.4 km from Conara, 17 Jan. 1986, *Cameron* (QVM); railway underpass, 5 km from Avoca, 4 Jan. 1987, *Campbell* (QVM); Coles Bay, Jan. 1985, *Hamdorf* (HO 89426); near Waterworks, Hobart, Mar. 1907, *Rodway* (HO 87750); Triabunna, 22 Jan. 1969, *Vaughan* (HO 304385); 'Beaufront', Ross, 10 Jan. 1996, *Wapstra (Jones 14765)* (CANB); Bicheno, Jan. 1959, *Wall* (HO 87752); Georges Bay, St Helens, Dec. 1892, *collector unknown* (QVM); Grass Tree Hill, 15 Jan. 1952, *collector unknown* (HO 304386); Coles Bay, 3 Apr. 1967, *collector unknown* (HO 304387).

29. *Pterostylis stenochila* D.L. Jones, sp. nov.
affinis *P. longifoliae* R. Br. a qua sepalis lateralibus ellipticus, et labello angusto lineari ad linearioboyato, smaragdino; et *P. smaragdynae* D.L. Jones et M.A. Clem. affinis, sed floribus minoribus vivide viridibus nitentibus, sepalis lateralibus anguste elliptico-oblongis, et labello anguste oblongo smaragdino, differt.

TYPUS: Tasmania, Brooks Bay, 22 Aug. 1992, *Wapstra (Jones 9918)* (holo CANB, iso CANB, HO).

Tuberous terrestrial *herb*. Sterile and fertile plants dimorphic. *Sterile plants* consisting of a rosette only; *rosette* on a slender stalk 3-5 cm tall; *leaves* three to five, widely spreading; *lamina* lanceolate to ovate-lanceolate, 20-40 mm long, 6-8 mm wide, dark green above, smooth and paler beneath, sessile or on very short petioles; margins entire or wrinkled; apex acute. *Flowering plants* 12-30 cm tall, one-seven-flowered. *Cauline leaves* five or six, sheathing at the base, lanceolate to ovate-lanceolate, 15-50 mm long, 5-9 mm wide, sessile, spreading to obliquely erect, dark green above, paler beneath; margins flat; apex subacute to acuminate. *Floral bracts* ovate to obovate, 10-15 mm long, 4-6 mm wide, acuminate. *Pedicels* slender, 5-9 mm long, straight. *Ovary* narrowly obovoid, 6-9 mm long, dark green, smooth to slightly warty. *Flowers* 12-15 mm long, transparent green with darker green stripes, shiny, porrect to slightly nodding; galea irregularly curved throughout, decurved suddenly near the apex; petals with prominent flanges which block off the base of the galea. *Dorsal sepal* more or less ovate-oblong, 13-17 mm long, 10-12 mm wide, inflated in the proximal half then tapered to the apex; apical point c. 1 mm long, decurved, green. *Lateral sepals* narrowly elliptic to oblong-elliptic, 10-13 mm long, 4.5-5.5 mm wide, deflexed, recurved just below the middle then curved forwards slightly near the apex; inner surface minutely papillate; sinus narrow; lobes widely divergent; free points 4-5 mm apart, involute, green. *Petals* narrowly oblong-oblanceolate, 12-14 mm long, 3-3.5 mm wide; central ridge prominent, dark green; proximal posterior flange c. 2 mm across, well developed, obtuse; distal posterior flange hardly developed; anterior flange c. 2.5 mm wide, transparent; outer margins entire. *Labellum* hinged on a basal ligulate strap c. 1.5 mm long, c. 1 mm wide; lamina narrowly linear-oblong to narrowly linear-obovate, constricted medially, 6-7 mm long, c. 2.5 mm wide, brownish green to bright green, covered with beaded siliceous cells, numerous acicular cells to 0.5 mm long to the anterior and posterior of the mound; basal mound and central callus dark emerald green; mid-lobe paler; basal mound c. 2 mm thick, prominent, erect; apex obtuse to truncate; lateral lobes well developed, 5-5.5 mm long, strongly ridged in the distal half; mid-lobe c. 1.5 mm long, apex strongly upcurved, notched for 0.3 mm; lobes divergent. *Column* 14-16 mm long, curved near the base then nearly straight, green. *Column wings* more or less rectangular, c. 5 mm long, c. 3 mm wide; anterior margins incurved; upper margins with flat linear entire or forked barrier cilia; lower margins with filiform tangled cilia; upper lobe linear-oblong, c. 0.6 mm long, obtuse. *Anther* c. 1.4 mm long, shortly rostrate. *Pollinia* linear-oblong, c. 2 mm long, yellow, mealy. *Stigma* narrowly-elliptic, c. 6 mm long, c. 2 mm wide, elongated; apex broadly notched; distal

margins shallowly crenate. *Capsules* obovoid, 6-8 mm long, 3-4 mm wide, green. **Fig. 7.12.**

Distribution and ecology: Endemic to Tasmania. Grows in open forest and coastal scrub in sandy loams and shallow clay loam. Altitude: 0-300 m. Flowering period: June to September.

Notes: This species, part of the *P. longifolia* complex, is characterised by elliptical sepals; basal petal flanges which block off the internal base of the galea; long, narrowly linear-oblong to narrowly linear-obovate labellum constricted near the middle; and, usually the labellum with a prominent emerald green central stripe.

Conservation Status: Suggest 2R by the criteria of Briggs & Leigh (1996).

Etymology: Derived from the Greek *stenos*, narrow, *cheilos*, lip; in reference to the narrow labellum.

Specimens examined: TASMANIA: Coles Bay, 5 Aug. 1988, *Williamson* (CANB); ibid, 10 Aug. 1988, *Williamson (Jones 2717)* (CANB); *ibid*, 25 July 1991, *Williamson (Jones 7530)* (CANB); South Arm, 4 Aug. 1992, *Ziegeler (Jones 9755)* (CANB); Brown Mtn, 11 Aug. 1992, *Ziegeler* (CANB); Kingston, 11 Aug. 1992, *Ziegeler* (CANB); Georges Bay, July 1893, *unknown* (QVM).

30. *Pterostylis tasmanica* D.L. Jones, *Muelleria* 8(2): 190-191 (1994).
TYPE: Tasmania, Rebecca Ck, N. of Temma, 5 Nov. 1990, *D.L. Jones 7030 & C.H. Broers* (holo CANB!; iso HO, MEL).

Illustration: Page 313, Backhouse & Jeanes (1995).

Distribution and ecology: Southern New South Wales, Victoria, Tasmania and New Zealand. Grows in coastal scrubs and heathland in sands and sandy loams. Altitude: 0-100 m. Flowering period: October to December.

Notes: Similar to *P. plumosa* but with a short (8-14 cm tall) habit; small (10-24 x 3-7 mm) leaves in a tight basal rosette; smaller (18-25 mm long) flowers with a short blunt apical point on the galea; and, a more densely plumose labellum. This species is autogamous and the ovary swells conspicuously early in anthesis.

Selected specimens: (20 seen):
TASMANIA: Oyster Cove, Nov. 1923, *Atkinson* (QVM); N. slope of Mt Bleak, Bruny Island, 8 Nov. 1984, *Buchanan 4202* (HO 407800); Bridport, 22 Oct. 1979, *Cameron* (QVM); Greens Beach, 4 Nov. 1986, *Campbell* (QVM) ; Sisters Beach, 3 Nov. 1990, *Jones 6928 & Broers* (CANB); Rebecca Ck, 5 Nov. 1990, *Jones 7030 & Broers* (CANB); Blackmans Bay, 9 Nov. 1994, *Jones 13678* (CANB); South Bruny Island, 10 Nov. 1994, *Jones 13695* (CANB); Lime Bay Nature Reserve, 21 Oct. 1993, *Wapstra (Jones 12484)* (CANB).

31. *Pterostylis tunstallii* D.L. Jones & M.A. Clem., *Austral.Orch.Res.* 1: 128 (1989).
TYPE: Nowra-Braidwood Rd, 200 m N. of Tomerong intersection, June 1987, *R.G. Tunstall 201* (holo CANB!, iso NSW!).

Illustration: Page 317, Backhouse & Jeanes (1995).

Distribution and ecology: South-eastern New South Wales, Victoria and Tasmania (Bass Strait Islands). Grows in coastal forests and coastal scrub in sandy loam or clay loam. Altitude: c. 0-50 m. Flowering period: July to September. **Fig. 7.13**.

Notes: Specimens have been located among the Bass Strait collections of J.S. Whinray at CANB and in his own herbarium. It can be distinguished from *P. longifolia* by smaller flowers; lateral sepals usually reflexing against the ovary; and, an oblong dark brown labellum. *P. williamsonii* is similar but has an ovate-oblong labellum which is prominently thickened at the base, a larger basal mound and a shallowly incised apical notch. The correct collection number for the type citation of this species is *R.G. Tunstall 201*, (not *R.G. Tunstall 202* as was originally quoted).

Specimen examined: TASMANIA: Vansittart Island, Furneaux Group, 22 Aug. 1973, *Whinray 537* (CANB); Swan Island, 7 Sept. 1979, *Whinray* (herb. Whinray).

32. *Pterostylis uliginosa* D.L. Jones, sp. nov.,

P. parviflorae R. Br. affinis, sed foliis rosulae majoribus (ad 30 x 9 mm); scapo carnoso; floribus confertis autogamis; et labello latiore (ad c. 4 mm lato) obovato, differt.

TYPUS: New South Wales, beside Appin-Bulli Rd, 7 Jan. 1993, *D.L. Jones 11120* (holo CANB; iso AD, BRI, HO, MEL, NSW).

Terrestrial tuberous *herb. Plants* 10-15 cm tall, elongating to c. 25 cm when in fruit, one to seven-flowered (usually two or three). *Rosettes* one to three, basal, borne on lateral growths; *leaves* three to eight, spreading; *lamina* ovate to elliptical-ovate, 5-16 mm long, 4-9 mm wide, dark green and shiny above, paler beneath; margins entire; apex subacute; *petioles* 5-12 mm long, narrowly winged. *Scape* fleshy, narrowed towards the base; flowers moderately crowded, usually facing inwards, one to three open at once. *Sterile bracts* three or four, ovate-lanceolate, 8-10 mm long, 3-4 mm wide, closely sheathing, acuminate. *Floral bracts* similar. *Flowers* 6-7.5 mm long, c. 2.5 mm wide, bright green and white, striped, shiny, darker green towards the apex; *galea* slightly inflated, curved near the base then erect before curving forwards in a semi-circle; segments all of similar length, connate throughout except at the apex. *Dorsal sepal* ovate-triangular when flattened, 6-7 mm long, 3-4 mm wide, inflated at the base then gradually tapered, prominently striped, obtuse to subacute. *Lateral sepals* erect, closely embracing the galea; *sinus* protruding in a moderate bulge when viewed from the side, broadly notched medially when viewed from the front; margins sloping obliquely upwards; frontal opening c. 2.5 mm wide; *conjoined part* 4-5 mm long, c. 3 mm wide, narrowed to c. 1 mm across at the base, finely striped; upper margins dark green, involute, suddenly tapered into the free points; *free points* c. 2 mm long, tapered, erect or curved forwards, not reaching the top of galea. *Petals* obliquely lanceolate, 8-10 mm long, 1.8-2.2 mm wide, strongly falcate, green striped with white, subobtuse, entire or the distal margin irregularly toothed; *flange* c. 1 mm across, obtuse or irregular. *Labellum* erect, not visible through the sinus in any position, slightly curved forwards near the apex, dark green and white; *lamina* obovate, 3-4 mm long, c. 1.5 mm wide; apex broadly obtuse; *basal appendage* 1-1.5 mm long, decurved, broadest at the base, sharply incurved towards the apex, trifid. *Callus* of a raised central dark green ridge c. 0.6 mm across. *Column* c. 6 mm long, curved away from the ovary at about 50° at the base then slightly bent forwards, green. *Column wings* c. 1.5 mm long, more or less rectangular; basal lobe deltate, c. 0.8 mm long, white, at an angle of c. 50°; apex obtuse; inner margins incurved, adorned sparsely with short, white cilia; mid-section c. 0.8 mm long, dark green; apical lobe linear, c. 0.7 mm long, obtuse to subacute. *Anther* c. 1 mm long, obtuse. *Pollinia* linear, c. 1.3 mm long, pale yellow, mealy, incoherent. *Stigma* situated in the basal third of the column, ovate-cordate to broadly scutiform, c. 1.5 mm long, c. 1.5 mm wide, raised. *Capsules* ovoid to obovoid, 7-9 mm long, c. 3 mm wide, erect, on pedicels to 10 mm long. **Fig. 7.14.**

Distribution and ecology: Widely, but disjunctly, distributed from northern New South Wales to western Victoria, Tasmania and South Australia. Grows in wet sites amid low shrubs, rushes and sedges, usually where free water is present; such sites include seepage areas, swamps, marshes and in the mounds of sphagnum bogs. Soils range from peaty sands and sandy loams to heavy, black peaty loam. Altitude: 5-500 m. Flowering period: November to March.

Notes: This species is characterised by the wet habitat; late spring-summer flowering habit; fleshy scape being narrow at the base and wider distally; long swollen ovaries at anthesis; small autogamous green and white flowers; broad obovate labellum; broad stigma which is situated basally on the column; and, scape elongating in fruit.

Pterostylis uliginosa has been misidentified as *P. aphylla* (Weber & Bates 1986) but is probably more closely related to *P. parviflora*. It can be readily distinguished from *P. aphylla* by its much smaller green and white flowers. These flowers are similar in size, shape and colouration to those of *P. parviflora*, but differ in that they are autogamous, have longer swollen ovaries at anthesis, a broader labellum, a much broader stigma which is situated near the base of the column and the scape elongates

markedly prior to seed dispersal. Its rosette leaves are also much brighter green and shiny.

The habit of the scape elongating between early anthesis and seed shedding is most interesting and may be unique within the *P. parviflora* group.

Autogamy occurs within this species by the friable pollinia breaking up and fragments dropping onto the basally situated broad stigma.

Because of the late spring-summer flowering period and dense habitat where it grows, this species is readily overlooked and seldom collected.

Conservation status: Widespread and conserved.

Etymology: From the Latin *uliginosus*, growing in marshes; in reference to the swampy or marshy habitats where this species grows.

Specimens examined:
NEW SOUTH WALES: Hastings Valley Way, W. of Wauchope, 27 Dec. 1983, *Barton* (CANB); Batemans Bay, 17 Nov. 1987, *Bates 12289* (AD 98753108); Tourist Rd, Robertson, 2 Mar. 1986, *Clements 4008* (CANB); Manning Lookout, 3 Mar. 1989, *Jones* (CANB); Bulli-Appin Rd (in fruit), 2 July 1992, *Jones 9559* (CANB); Colliery Rd, North Cliff (in fruit), 2 July 1992, *Jones 9561* (CANB);
VICTORIA: E. of Bruthen, 26 Oct. 1984, *Beauglehole 78772 & Turner* (MEL 670949).
TASMANIA: Callitris Ck, Freycinet Peninsula, 28 Dec. 1987, Buchanan 10629 (HO 123536); Leprena Track, 8 Jan. 1993, *J.E. & A. Wapstra* (CANB);
SOUTH AUSTRALIA: Myponga, 30 Dec. 1904, *Ashby* (AD 97722082); Yundi via Mt Compass, 3 Feb. 1976, *Bates* (AD 97604647); Nangkita, 10 Apr. 1966, *Hunt* (AD 98622071).

33. *Pterostylis wapstreorum* D.L.Jones, sp. nov.,
P. muticae R. Br. affinis, sed foliis rosulae crassis carnosis; scapo crasso; floribus dense confertis; sepalibus lateralibus profunde saccatis; petalis anguste ovatis; et labelli appendice recurva, porca mediana supra porcas marginales elevata.

TYPUS: Tasmania, Pontville Army Rifle Range, 3 Nov. 1996, *J.E. & A. Wapstra (ORG 394)* (holo CANB; iso AD, CANB, HO, MEL, NSW)

Tuberous terrestrial *herb*. *Leaves* four to seven, ground-hugging, sessile, in a basal stem-encircling rosette; *lamina* oblong-ovate or oblong-elliptic to almost sagittate, 15-27 mm long, 8-20 mm wide, smooth, dark green, thick-textured, fleshy, tapered to each end; margins entire; apex broadly obtuse. *Scape* 8-22 cm tall, 4-5 mm across, five-15-flowered. *Sterile bracts* four to six, ovate-lanceolate, 12-25 mm long, 5-9 mm wide, loosely sheathing, acuminate to apiculate. *Fertile bracts* similar, closely sheathing. *Pedicels* c. 6 mm long, straight, slender. *Ovaries* linear-oblong, 4-6 mm long, c. 2.5 mm wide. *Flowers* densely crowded, 9.5-10.5 mm long, c. 5 mm wide, porrect, green with darker green veins. *Dorsal sepal* hardly gibbous at the base, shallowly curved for most of its length (often incurved medially) then abruptly decurved near the apex, slightly longer than the petals. *Lateral sepals* when flattened c. 8 mm long, c.11 mm wide, decurved, deeply pouched, dorsally gibbous; points apiculate, c. 1 mm apart. *Petals* more or less asymmetrically narrow-ovate, 7-8 mm long, c. 4.5 mm wide; dorsal margin strongly thickened, dark green, with a prominent medial dorsal gibbosity; lamina light green with darker veins; ventral margin irregularly and shortly toothed. *Labellum* irritable, on a ligulate claw c. 1.5 mm long, c. 1.2 mm wide, whitish green with a dark green appendage; lamina elliptic-oblong, 2.7-3 mm long, c. 2.3 mm wide, membranous; apex emarginate; appendage basal, more or less oblong, c. 1.5 mm long, c. 1.1 mm wide, c. 1 mm thick, slightly recurved; margins dark green, thickened; central ridge narrow, raised above the margins, dark green; callus of a thickened darker medial ridge. *Column* 8-8.5 mm long, obliquely erect, shallowly curved, green with darker areas on the wings. *Column wings* more or less rectangular, c. 2.5 mm long, c. 1.5 mm wide; basal lobe deltate; inner margins sparsely ciliate; upper margins with a layer of beaded siliceous cells; barrier cilia c. 0.3 mm long, clavate. *Anther* c. 1 mm long, obtuse. *Pollinia* obovate-clavate, c. 1 mm long, yellow, mealy. *Stigma* central, scutiform, c. 3.5 mm long, c. 1.5 mm wide, raised. *Capsules* obovoid, 6-8 mm long, 4-5 mm wide, green to brown, on pedicels to 15 mm long. **Fig. 7.15.**

Distribution and ecology: Endemic to Tasmania. Grows in grassland in well-drained loams. Altitude: c. 50 m. Flowering period: October to December.

Notes: This species is characterised by thick fleshy rosette leaves; thick scape; densely crowded flowers; deeply pouched lateral sepals; narrowly ovate petals; and, recurved labellum appendage with the central ridge raised above the marginal ridges.

Pterostylis wapstreorum is similar to *P. mutica* but that species has thin-textured leaves, is much taller (to c. 35 cm), with widely spaced flowers and the central ridge on the labellum ends below the apex and projects as a very short, blunt beak. It also has affinities with *P. rubenachii* but that species is much less robust and with thin-textured leaves.

Conservation status: Apparently rare due to alienation of habitat; suggest 2RK by criteria of Briggs & Leigh (1996).

Etymology: Named after Johannes (Hans) and Annie Wapstra, dedicated orchid enthusiasts who have been of major asssistance to my study of the Orchidaceae of Tasmania.

Specimens examined:
TASMANIA. Penstock, Dec. 1929, *Giblin* (HO 105755); Glen Leith, New Norfolk, 24 Oct. 1840, *Gunn* (HO 111474); Cambridge, 5 Oct. 1890, *Rodway* (HO 111502); Lewisham, 1925, *Rodway* (HO 111501); Mt Nelson, 7 Nov. 1955, *Venkata Rao* (HO 87744);

34. *Pterostylis williamsonii* D.L. Jones, sp. nov.
affinis *P. longifoliae* R. Br. a qua floribus politissimis seminutantibus longipedicellatis, et labello aeque atroporphyreo trichomatibus perpaucis; et *P. tunstallii* D.L. Jones et M.A. Clem. affinis, sed labello sursum valde angustato, atro-brunneo, lobis basalibus latis, differt.

TYPUS: Tasmania, Coles Bay, 25 July 1991, *Ron & Kath Williamson (Jones 7532)* (holo CANB; iso CANB, HO).

Tuberous terrestrial *herb*. Sterile and fertile plants dimorphic. *Sterile plants* consisting of a rosette only; *rosette* on a slender stalk 1-3 cm long; *leaves* four to six, spreading; *lamina* ovate to ovate-lanceolate, 3-35 mm long, 3-8 mm wide, dark green. *Flowering plants* 9-30 cm tall, one-nine-flowered. *Cauline leaves* five or six, linear-lanceolate, 40-70 mm long, 4-7 mm wide, obliquely erect to spreading, dark green above, paler beneath; base sheathing; margins flat or slightly recurved; apex acute. *Floral bracts* ovate-lanceolate, 6-40 mm long, 4-7 mm wide, acute. *Pedicels* slender, c. 12-15 mm long, curved. Ovaries narrowly obovoid, 6-8 mm long, green, smooth. *Flowers* 10-14 mm long, transparent with prominent green stripes, shiny, facing downwards; galea gibbous at the base, decurved suddenly to the obliquely decurved apex; petals parallel; basal flanges not obstructing the entrance to the galea. *Dorsal sepal* more or less ovate-oblong, 11-16 mm long, 8-10 mm wide, slightly inflated in proximinal half then tapered to the apex; apical point c. 1 mm long, obtuse, brown. *Lateral sepals* deflexed, more or less ovate-oblong, 9-12 mm long, 5-7 mm wide, slightly recurved near the apex; inner surface minutely papillate; sinus narrow; lobes divergent; free points c. 4 mm long, involute; tips c. 4-5 mm apart, orange-brown. *Petals* more or less oblong, 10-12 mm long, c. 2.5 mm wide; central ridge prominent; proximal posterior flange absent; distal posterior flange c. 0.5 mm wide; anterior flange c. 2 mm wide, transparent; margin entire or minutely scabrid. Labellum irritable, hinged at the base; lamina ovate-oblong, 4-5 mm long, 2.6-3 mm wide, covered with beaded siliceous cells, dark chocolate brown; basal mound and central callus black; apex tawny; basal mound c. 2.5 mm thick, prominent, sloping backwards; apex obtuse to truncate; lateral lobes c. 4 mm long, not promminent, slightly spreading in distal half, a few short acicular cells on the proximal margins; mid-lobe c. 1.5 mm long, light yellowish-brown, slightly upcurved, notched for c. 0.3 mm; lobes divergent. *Column* 8-10 mm long, curved, green. *Column wings* rectangular, c 3 mm long, c. 2 mm wide; anterior margin incurved; barrier cilia numerous, to 1 mm long; upper lobe reduced to a vestigal bump. *Anther* c. 1 mm long, obtuse. *Pollinia* linear-oblong, c. 1.4 mm long, yellow, mealy. *Stigma* narrow-cordate, c. 4 mm long, c. 2 mm wide, curved; distal margins crenate. *Capsules* obovoid, 7-9 mm long, 3-4 mm wide. **Fig. 7.16.**

Distribution and ecology: Endemic to Tasmania. Grows in open forest among low shrubs and bracken in sandy loam, gravelly loam and clay loam. Altitude: 5-250 m. Flowering Period: June to September.

Notes: This species is characterised by small (10-14 mm long), partly deflexed, very shiny flowers; ovate-oblong dark reddish brown labellum (to 5 mm x 3 mm) prominently thickened at the base; very few labellum trichomes; and, broadly emarginate apex.

P. williamsonii is part of the *P. longifolia* complex and is very similar to *P. tunstallii*. The latter species has an oblong labellum which is hardly swollen at the base, a smaller basal mound and more deeply incised apical notch.

A population of *P. williamsonii* at South Arm has a high proportion of plants with honey-brown flowers. Some plants are wholly this colour, including the scape and leaves (J.E. Wapstra pers. comm.).

Conservation Status: Widely distributed and conserved.

Etymology: Named after Ron Williamson, keen Tasmanian orchid enthusiast who first brought the species to my attention.

Specimens examined:
TASMANIA: S. side of Gog Range, 30 Sept. 1991, *Barker* (QVM); Pittwater, 20 Sept. 1931, *Long 629* (HO 400035); Dalgarth Park, Asbestos Range, 6 Aug. 1995, *Tonelli* (*Clements 8327*) (CANB); Coles Bay, 22 July 1987, *Williamson* (CANB); South Arm, 5 Aug. 1992, *Ziegeler* (*Jones 9756*) (CANB); Big Dog Island, 23 Sept. 1992, *Ziegeler* (CANB); South Arm Rd, 11 Aug. 1992, *Ziegeler 231* (CANB); Mt Nelson, 11 Aug. 1992, *Ziegeler* (CANB).

35. *Pterostylis ziegeleri* D.L. Jones, sp. nov., *P. cycnocephalae* R.D. Fitzg. affinis, sed habitu brevi (5-10 cm alto); scapo gracili; floribus sparsis parvis (c. 7 mm longis), angustis (c. 3.5 mm latis) ; petalis anguste ovato-lanceolatis; et appendicis labelli rostro brevissimo angusto truncato.

TYPUS: Tasmania, Cape Portland, 2 Oct. 1983, *A. Moscal 3057* (holo HO 70174; iso HO) Tuberous terrestrial *herb*. *Leaves* four to seven, ground-hugging, sessile, in a basal stem-encircling rosette; *lamina* oblong-ovate or narrowly ovate-lanceolate, 12-20 mm long, 5-10 mm wide, smooth, green, tapered to each end; margins entire; apex obtuse. *Scape* 5-10 cm tall, 2-3 mm across, three-eight-flowered. *Sterile bracts* three to six, well-developed, often overlapping, narrowly ovate-lanceolate, 8-15 mm long, 3-4 mm wide, loosely sheathing, acute. *Fertile bracts* similar, closely sheathing. *Pedicels* c. 4 mm long, straight, slender. *Ovaries* linear-oblong, 4-6 mm long, c. 2 mm wide. *Flowers* densely crowded, 5-7 mm long, c. 3.5 mm wide, porrect, pale green with darker green veins. *Dorsal sepal* hardly gibbous at the base, shallowly curved for most of its length then abruptly decurved near the apex, as long as or slightly longer than the petals. *Lateral sepals* when flattened c. 5 mm long, c. 5.5 mm wide, decurved, pouched, dorsally gibbous; points apiculate, c. 0.5 mm apart. *Petals* more or less asymmetrically narrowly ovate-lanceolate, 5.5-6.5 mm long, c. 3 mm wide; dorsal margin strongly thickened, dark green, with a prominent medial dorsal gibbosity; lamina pale green with darker veins; ventral margin entire. *Labellum* irritable, on a ligulate claw c. 1 mm long, c. 1 mm wide, whitish green with a dark green appendage; lamina elliptic, 2.3-2.5 mm long, c. 2 mm wide, membranous; apex slightly emarginate; appendage basal, more or less linear, c. 2 mm long, c. 0.6 mm wide, c. 0.6 mm thick, recurved; distal margins dark green, thickened; central ridge projecting as a short (c. 0.3 mm long), truncate or pointed dark green beak; callus of a broadly tapered thickened, darker medial ridge. *Column* 6.5-7 mm long, obliquely erect, shallowly curved or nearly straight, green with darker distal areas. *Column wings* more or less rectangular, c. 2 mm long, c. 1 mm wide; basal lobe narrowly deltate; inner margins sparsely ciliate; upper margins with a layer of beaded siliceous cells; barrier cilia c. 0.2 mm long, clavate. *Anther* c. 0.8 mm long, obtuse. *Pollinia* obovate-clavate, c. 0.8 mm long, yellow, mealy. *Stigma* situated above centre just below the column wings, scutiform, c. 2.5 mm long, c. 1 mm wide, raised. *Capsules* obovoid, 5-7 mm long, 3-4 mm wide, green, on pedicels to 8 mm long. **Fig. 7.17**.

Distribution and ecology: Endemic to northern Tasmania. Grows on the slopes of low stabilised dunes in dense tall tussock grassland. Soils are grey to white sands and sandy loams. Altitude: c. 0-20 m. Flowering period: September to October.

Notes: This species is characterised by short (5-10 cm tall) habit; small (to 20 x 10 mm) rosette leaves; slender scape with prominent often overlapping stem bracts; well-spaced small (c.5-7 mm long) and narrow (c. 3.5 mm across) flowers; narrowly ovate-lanceolate petals; and, very short narrow truncate or pointed beak on the labellum appendage.

Pterostylis ziegeleri is similar to *P. cycnocephala* but that species is much taller (to c. 30 cm) with larger (to 35 x 15 mm) rosette leaves; longer (to 9 mm) and broader (c. 4.5 mm wide) flowers; broader petals; much broader column; and, a longer broader pointed beak on the labellum appendage. It also has similarities with *P. pratensis*, which grows in subalpine areas, but that species has much larger obovate to nearly orbicular leaves, stouter scape and larger flowers.

Conservation status: Rare due to alienation of habitat and predation by feral Brown Garden Snails (*Helix aspersa*); suggest 2RK by the criteria of Briggs & Leigh (1996).

Etymology: Named after David Ziegeler, naturalist and orchid enthusiast who prepared the initial manuscript of the Orchid Atlas of Tasmania which provided impetus for my study on Tasmanian orchids.

Specimens examined:
TASMANIA. Cape Portland, 9 Nov. 1990, *Jones 7124 & Broers* (CANB); Lanoma Point, 6 Oct. 1983, *Moscal 3179* (HO 69545); Cape Portland, 8 Oct. 1983, *Moscal 3300* (HO 69766).

EXCLUDED TAXA

Pterostylis alpina R.S. Rogers, *Proc. Roy. Soc. Victoria* (new ser.) 28: 1089, t.9 (1940).
TYPE: Victoria, Fernshaw, 27 Sept. 1912, *C.French* (lecto AD!, *fide* Clements 1989).
Pterostylis alpina auct non R.S. Rogers; W.M. Curtis, *The Student's Flora of Tasmania* 4A: 19 (1979).

Notes: Occurs in southern New South Wales and Victoria. Has been recorded from Tasmania (Curtis 1979, Clements 1989, Backhouse & Jeanes 1995), but the records are erroneous and have arisen from confusion with *P. scabrida*. *Pterostylis alpina* can be distinguished by the sinus protruding in an abrupt curve when viewed from the side and the free points of the sepals being backswept and reflexed behind the galea.

Pterostylis* x*ingens (Rupp) D.L. Jones, *The Orchadian* 5; 54 (1976);
P. acuminata R.Br. var. *ingens* Rupp, *Proc. Linn. Soc. New South Wales* 53: 558 (1928).
TYPE: Victoria, Healesville, 1926, *A.J.Tadgell ex W.H.Nicholls* (holo NSW!).
P. x*ingens*, *auct non* (Rupp) D.L. Jones; W.M.Curtis, *The Student's Flora of Tasmania* 4A: 12 (1979).

Notes: Occurs in New South Wales and Victoria. This taxon, a natural hybrid between *P. falcata* and *P. nutans*, was erroneously recorded from Tasmania (Curtis 1979) based on a misidentification of *P. foliata*. The hybrid may occur in Tasmania but there are no substantiating specimens in any herbaria.

Pterostylis longifolia R. Br., *Prodr.* 327 (1810).
TYPE: Port Jackson, North Brush, June 1804, *G.Caley* (lecto specimen a, BM, *fide* Clements 1989, photo!).

Notes: Endemic to New South Wales. *Pterostylis longifolia* has been circumscribed very broadly by recent authors but my studies have shown it is a complex of many taxa. *Pterostylis longifolia sens. strict.* does not extend to Tasmania. Three related species have been described (Clements 1989, Jones & Clements 1993), and one of these, *P. tunstallii* D.L.Jones & M.A.Clem. extends to the Furneaux Group of islands. Three other species

(*P. melagramma*, *P. stenochila* and *P. williamsonii*) from mainland Tasmania, are described as new in this paper.

Pterostylis obtusa R. Br., Prodr. 327 (1810).
TYPE: Port Jackson, 1804, *R. Brown* (lecto specimen a, BM, *fide* Clements 1989, photo!; isolecto BM, E, P).
Pterostylis obtusa auct non R. Br.; W.M. Curtis, *The Student's Flora of Tasmania* 4A: 22 (1979).

Notes: Endemic to central areas of New South Wales. The records of this species from Tasmania (for example Curtis 1979) are applicable to *P. atrans*.

Pterostylis x***toveyana*** Ewart & Sharman, *Proc. Roy. Soc. Victoria* (new ser.) 28(2): 235 (1916).
TYPE: Victoria, Mentone, 1907, 1909, 1913, 1914, 1915, *J.R. Tovey* (syn MEL!).

Notes: This taxon is a natural hybrid between Victorian specimens of *P. alata sens. lat.* and *P. concinna*. Studies have shown that *P. alata sens. strict.* is endemic to Tasmania and although introgression occurs in Tasmania between this and *P. concinna*, the progeny are strictly not identical to mainland specimens. They are however very similar and for convenience this taxon has been retained in the key to *Pterostylis*.

ACKNOWLEDGEMENTS

As for paper 1 in this series.

REFERENCES

- Backhouse, G. & Jeanes, J. (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Bishop, A. (1996). *Field Guide to the Orchids of New South Wales and Victoria* (University of New South Wales Press, Sydney).
- Briggs, J.D and Leigh, J.H. (1996). *Rare or Threatened Australian Plants*, Revised Edition, CSIRO and Australian Nature Conservation Agency.
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*, (Government Printer, Hobart).
- Jones, D.L. (1994). New Species of Orchidaceae from South-eastern Australia, *Muelleria* 8(2): 177-192.
- Jones, D.L. (1997). Six New Species of *Pterostylis* R. Br. (Orchidaceae) from Australia, *The Orchadian* 12(6): 244-258.
- Jones, D.L. & Clements, M.A. (1993). New Species of *Pterostylis* R.Br. (Orchidaceae) from Victoria and New South Wales, *Muelleria* 8(1): 73-83.
- Jones, D.L., Molloy, B.P.J. & Clements, M.A. (1997). Six New Species of *Pterostylis* R. Br. (Orchidaceae) from New Zealand, *The Orchadian* 12(6): 266-281.
- Nicholls, W.H. (1949). *Pterostylis furcata*, an elusive orchid. *Victorian Naturalist* 65: 255-8.
- Nicholls, W.H. (1950). *Pterostylis furcata*, an additional note. *Victorian Naturalist* 66: 239-40.
- Nicholls, W.H. (1969). *Orchids of Australia*. (Thomas Nelson, Melbourne).
- Weber, J.Z. & Bates, R. (1986), in J.P. Jessop & H.R. Toelken (Eds), Flora of South Australia, 4th edition. (South Australian Printing Division, Adelaide).

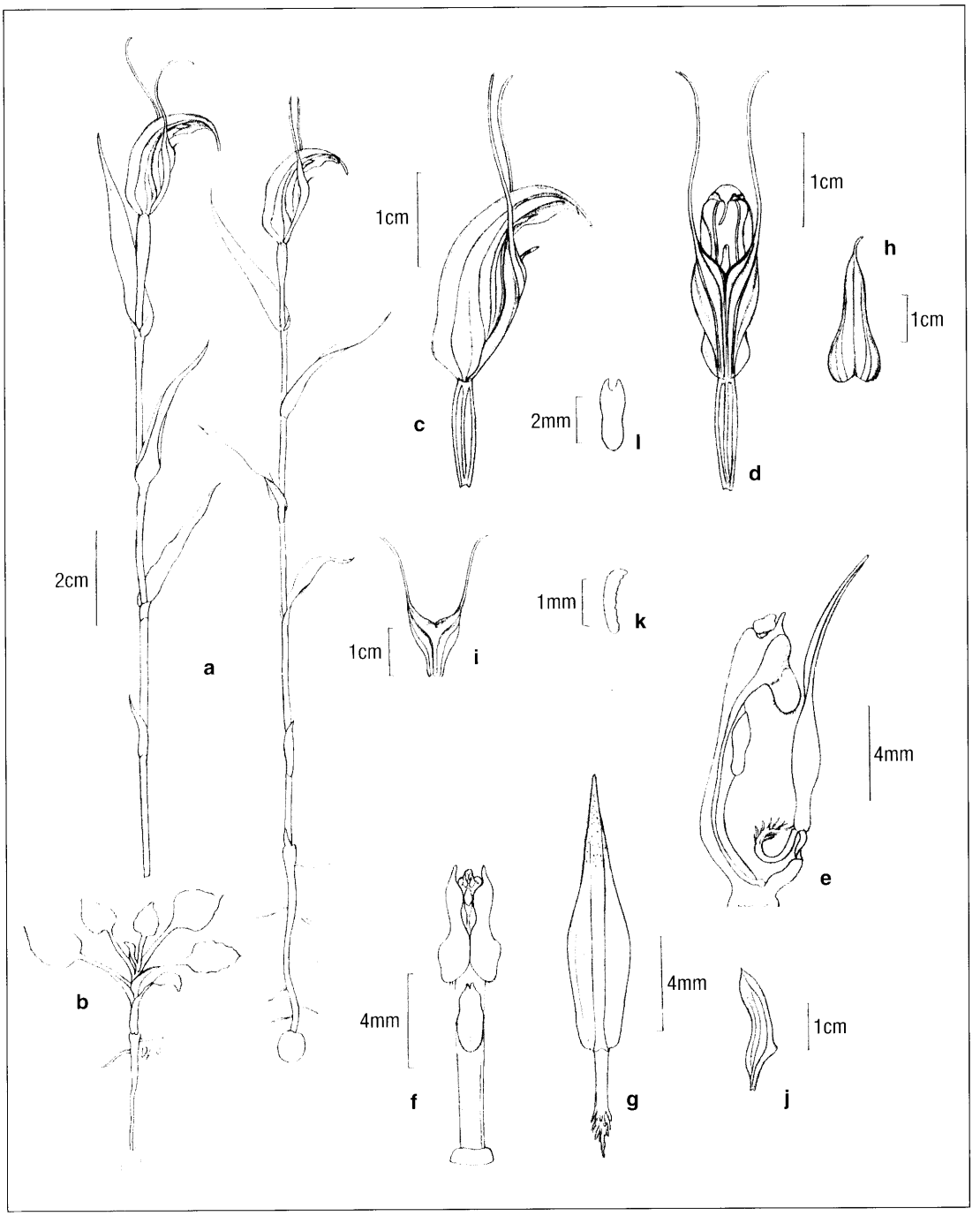


Fig. 7.1

Pterostylis alata

Sandy Bay, Tasmania.

P. Palmer.

a. flowering plants; b. rosette; c. flower from side; d. flower from front; e. column and labellum from side; f. column from front; g. labellum from above, flattened out; h. dorsal sepal; i. lateral sepals; j. petal; k. pollinium; l. stigma.

Drawing 1/6/1988 by D.L. Jones.©

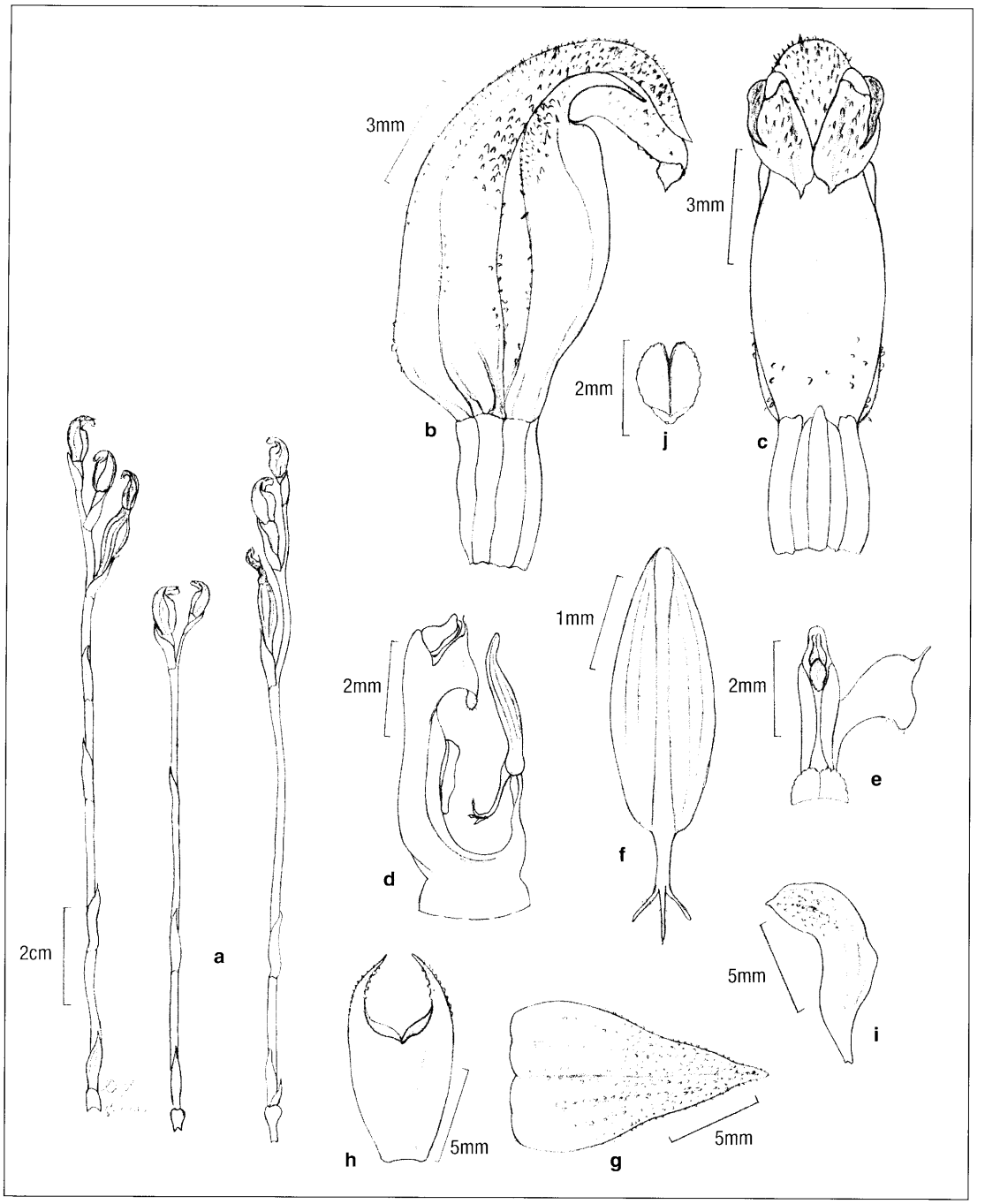


Fig. 7.2

Pterostylis aphylla

Coates Creek, Tasmania.

J. Campbell.

a. flowering plants; b. flower from side; c. flower from front;
d. column and labellum from side; e. top of column and one column wing;
f. labellum from above; g. dorsal sepal; h. lateral sepals; i. petal; j. stigma.

Drawing 16/1/1991 by D.L. Jones.©

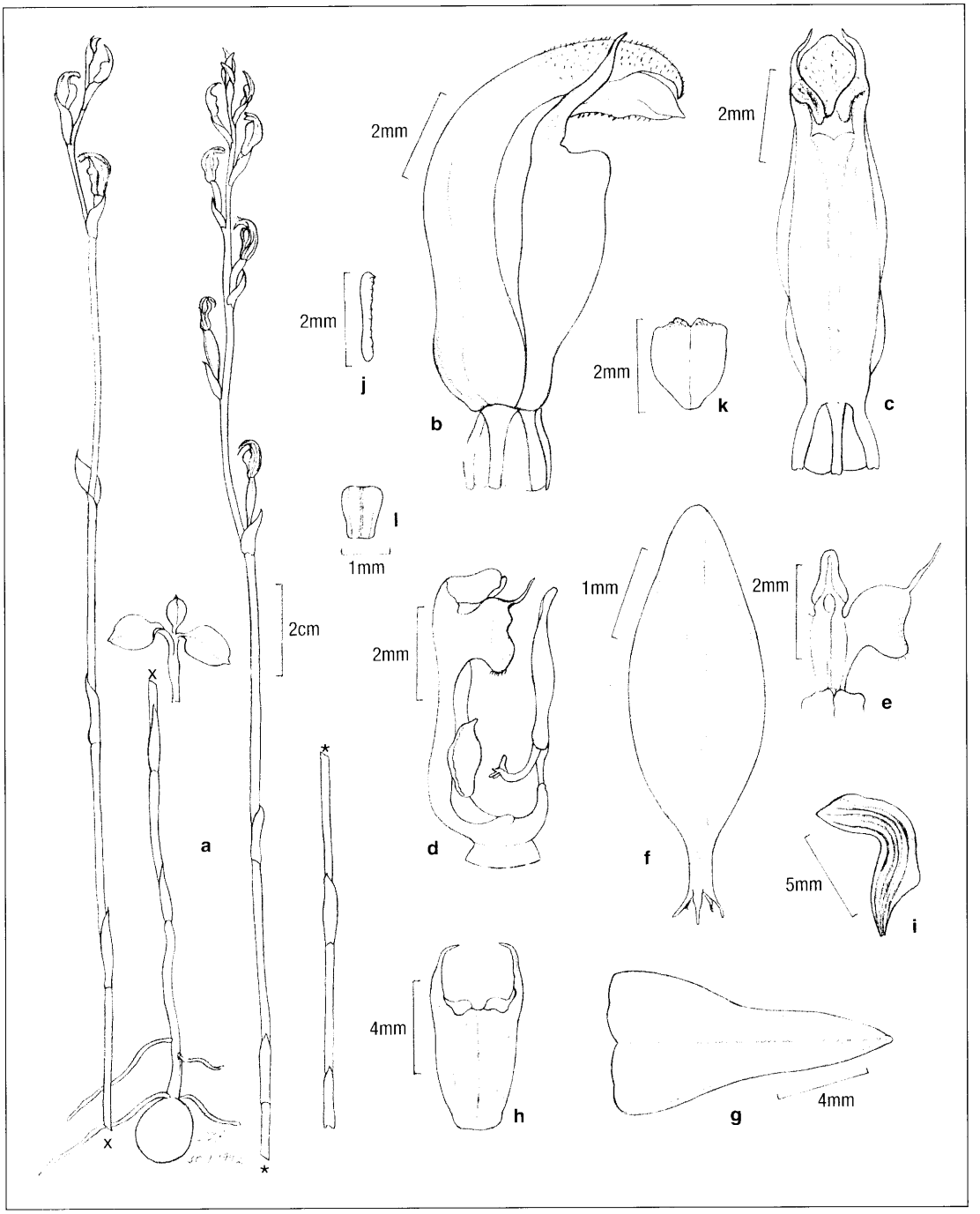


Fig. 7.3

Pterostylis atriola

Thompsons Marshes, Tasmania.

D. Ziegeler 174.

a. flowering plants and rosette from side; b. flower from side; c. flower from front; d. column and labellum from side; e. top of column and one column wing; f. labellum from above; g. dorsal sepal; h. lateral sepals; i. petal; j. pollinium; k. stigma; l. labellum strap.

Drawing 30/1/1992 by D.L. Jones.©

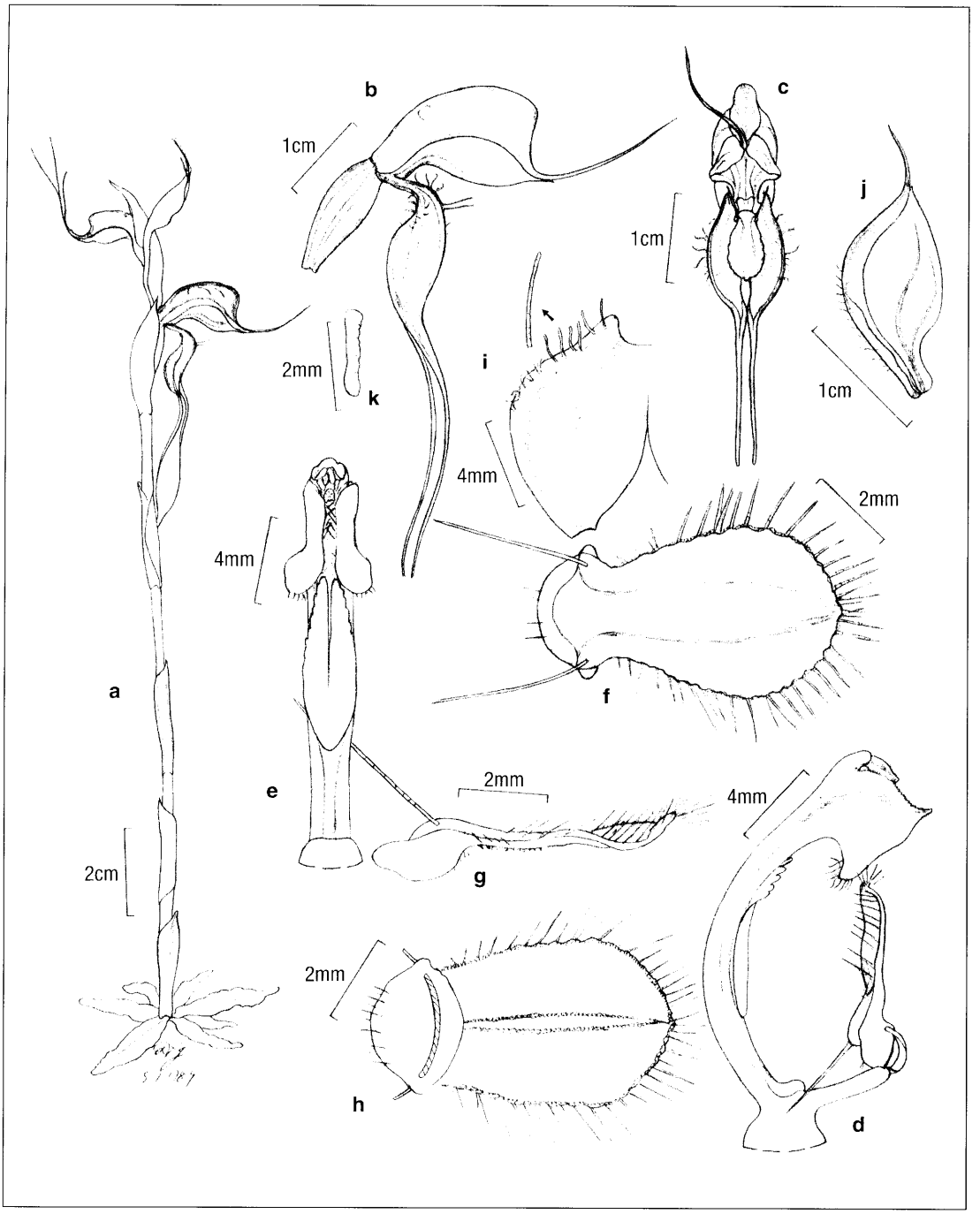


Fig. 7.4

Pterostylis commutata

Ross, Tasmania.

H. Ronken.

a. flowering plant; b. flower from side; c. flower from front, tips of lateral sepals removed; d. column and labellum from side; e. column from front; f. labellum from above; g. labellum from side; h. labellum from below; i. part of lateral sepals from rear; j. petal; k. pollinarium.

Drawing 5/1/1987 by D.L. Jones.©

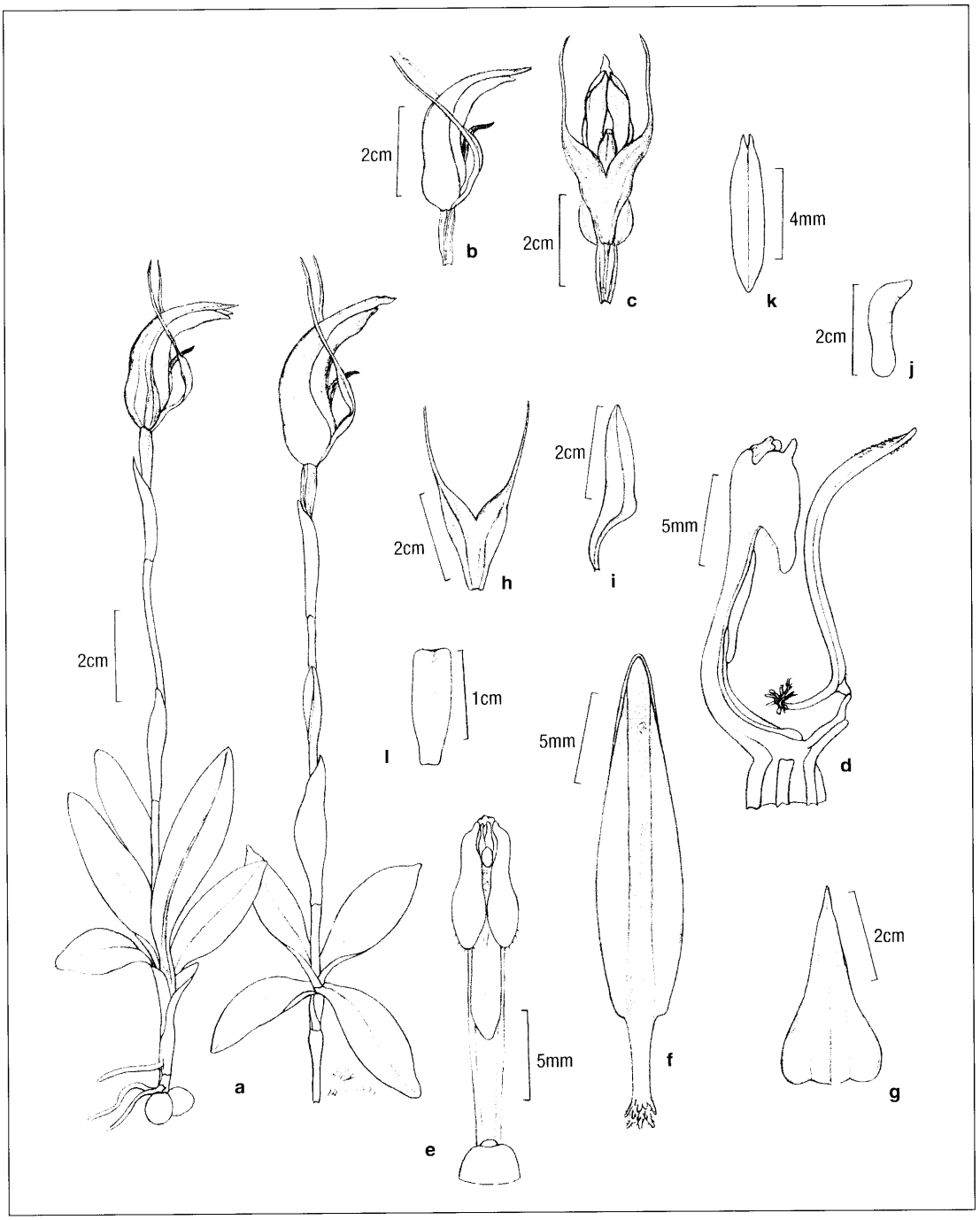


Fig. 7.5

Pterostylis furcata

Woods Lake, Tasmania.

L. Rubenach.

a. flowering plants; b. flower from side; c. flower from front; d. column and labellum from side; e. column from front; f. labellum from above, flattened out; g. dorsal sepal; h. lateral sepals; i. petal; j. pollinium; k. stigma; l. labellum strap.

Drawing 14/1/1991 by D.L. Jones.©

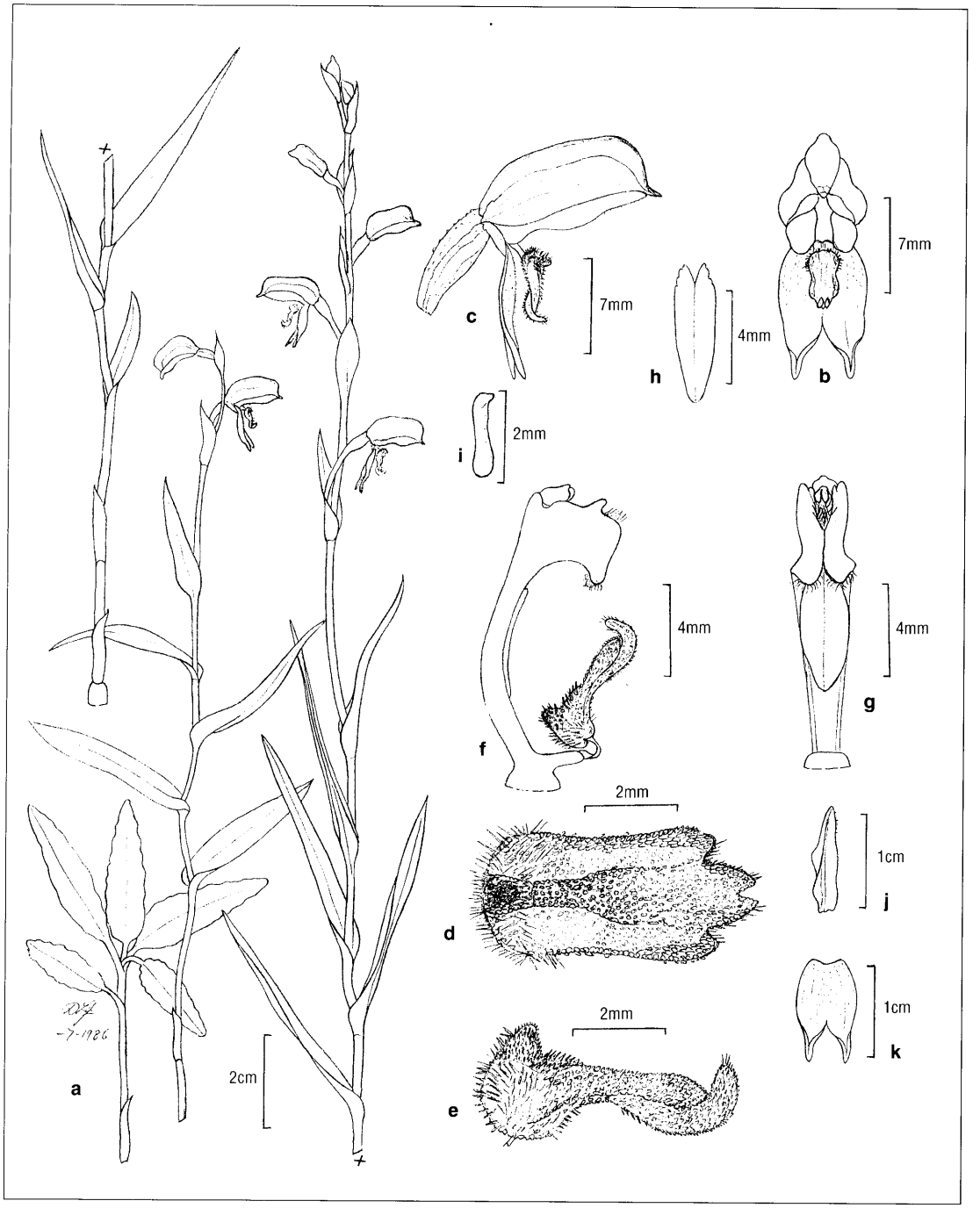


Fig. 7.6

Pterostylis melagramma

Diamond Creek, Victoria.

H.M.E. Richards 128.

a. flowering plants and rosette; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. column and labellum from side; g. column from front; h. stigma; i. pollinium; j. petal; k. lateral sepals.

Drawing 7/1986 by D.L. Jones.©

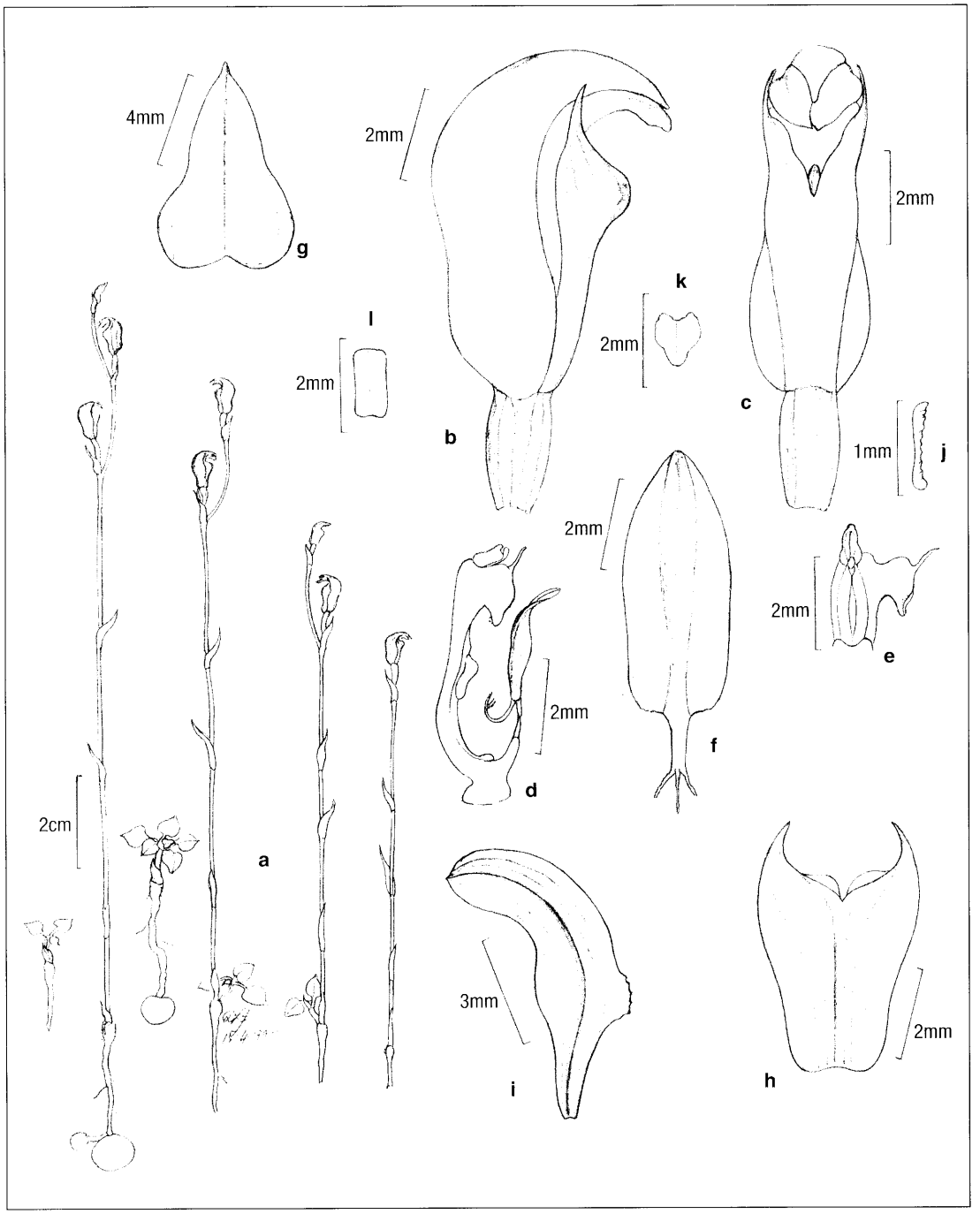


Fig. 7.7

Pterostylis parviflora

Manning Lookout, New South Wales.

D.L. Jones.

a. flowering plants and rosette; b. flower from side; c. flower from front;
d. column and labellum from side; e. top of column and column wing; f. labellum from above;
g. dorsal sepal; h. lateral sepals; i. petal; j. pollinium; k. stigma; l. labellum strap.

Drawing 15/4/1990 by D.L. Jones.©

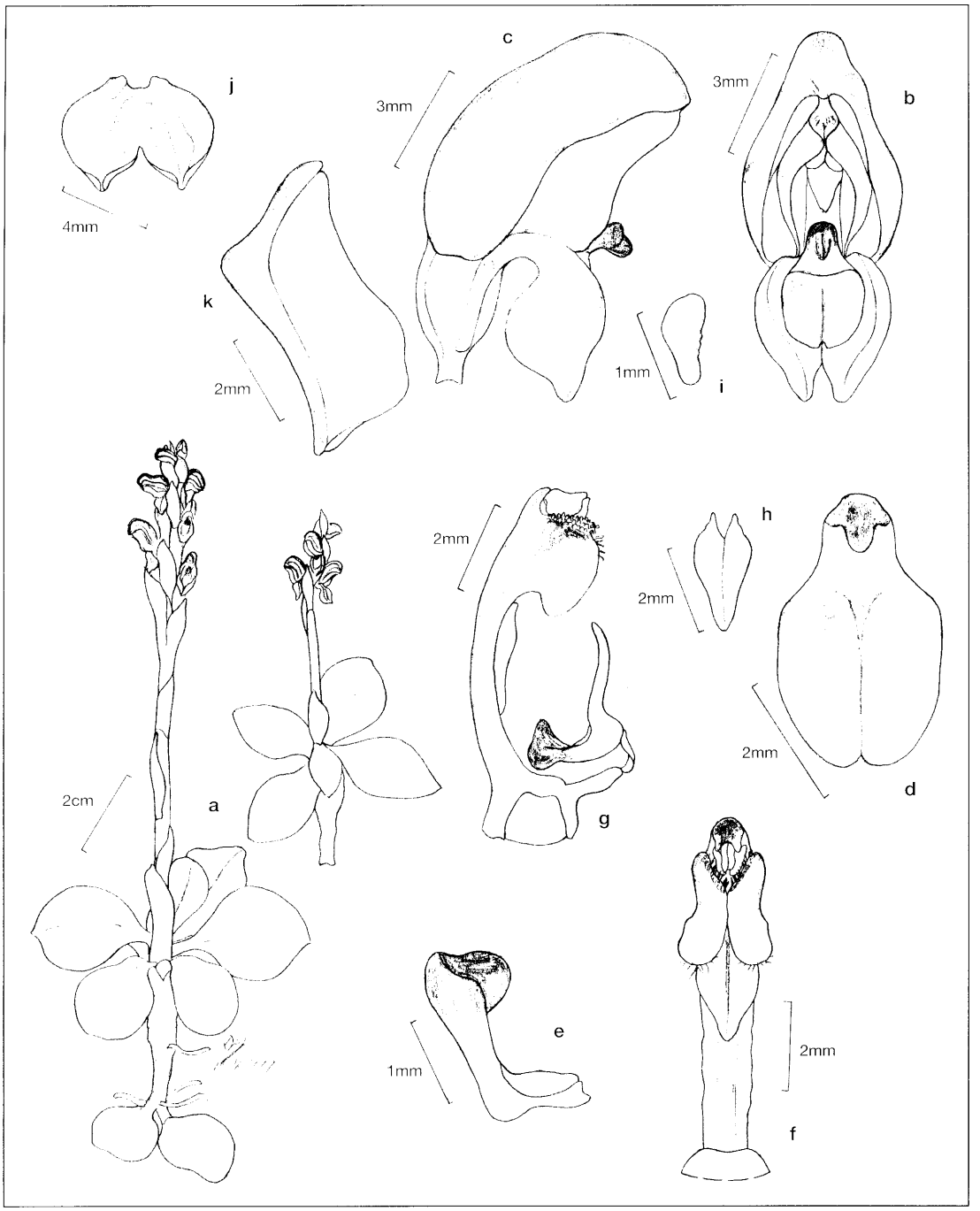


Fig. 7.8

Pterostylis pratensis

Liawenee Moor, Tasmania.

J.E. & A. Wapstra (ORG 1059).

a. plants; b. flower from front; c. flower from side; d. labellum from above;
e. labellum appendage from side; f. column from front; g. column and labellum from side;
h. stigma; i. pollinium; j. lateral sepals; k. petal.

Drawing 10/12/1997 by D.L. Jones.©

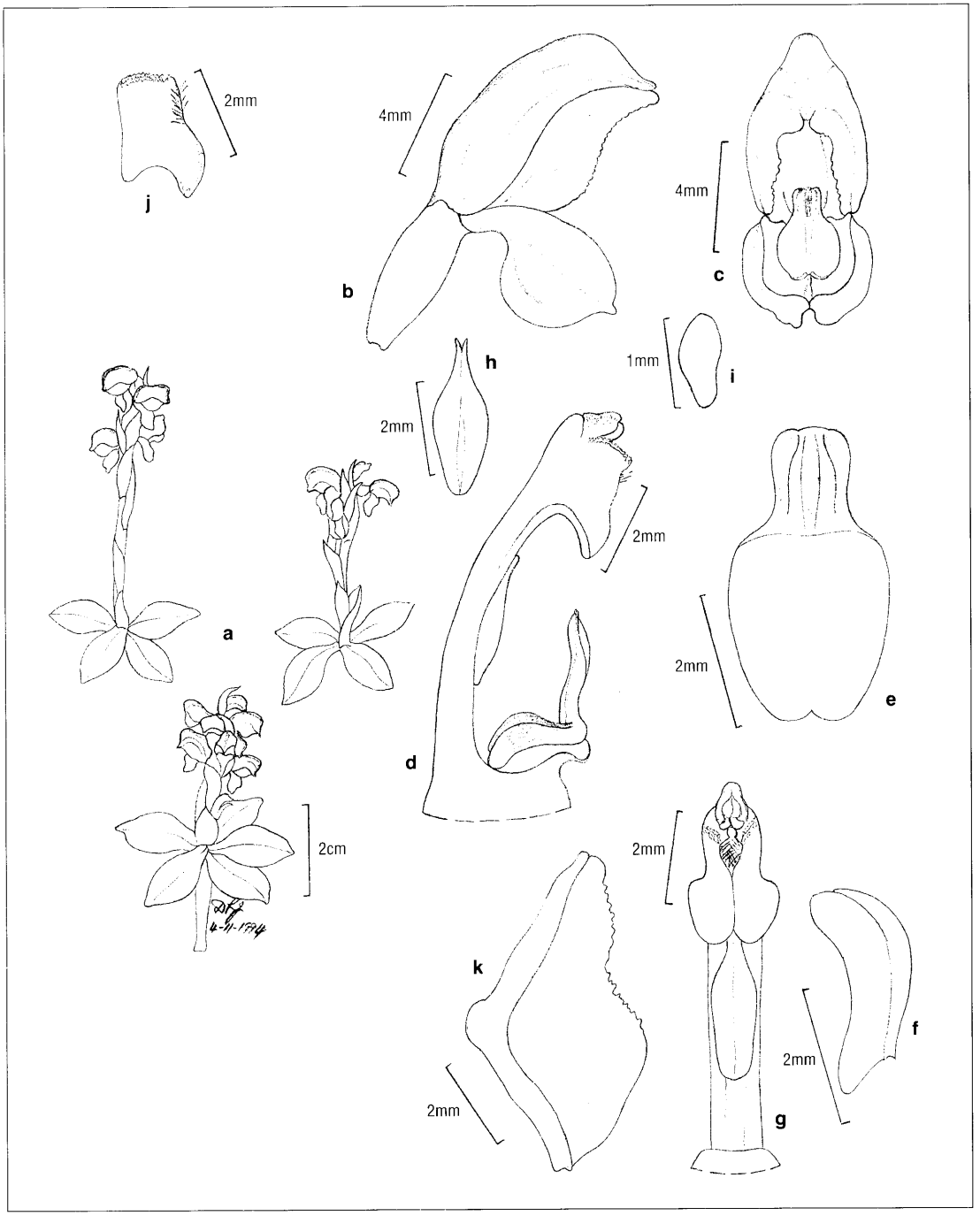


Fig. 7.9

Pterostylis rubenachii

South of Arthur River, Tasmania.

L. Rubenach.

a. flowering plants; b. flower from side; c. flower from front; d. column and labellum from side; e. labellum from above, flattened out; f. labellum appendage from side; g. column from front; h. stigma; i. pollinium; j. column wing, interior view.

Drawing 4/11/1994 by D.L. Jones.©

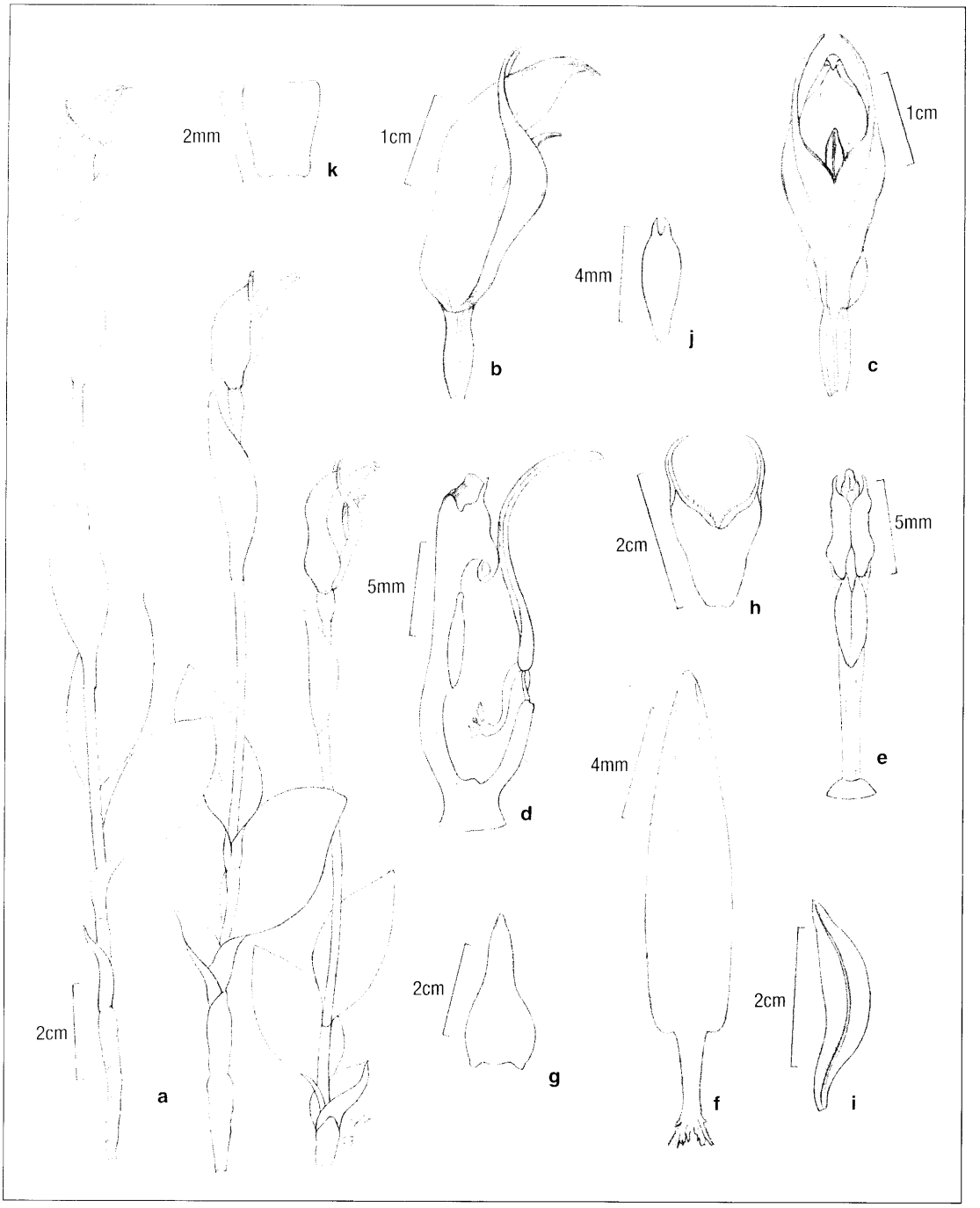


Fig. 7.10

Pterostylis scabrida

Storys Creek, Tasmania.

J. Campbell 92325.

a. flowering plants; b. flower from side; c. flower from front; d. column and labellum from side; e. column from front; f. labellum from above, flattened out; g. dorsal sepal; h. lateral sepals; i. petal; j. stigma; k. labellum strap.

Drawing 23/12/1992 by D.L. Jones.©

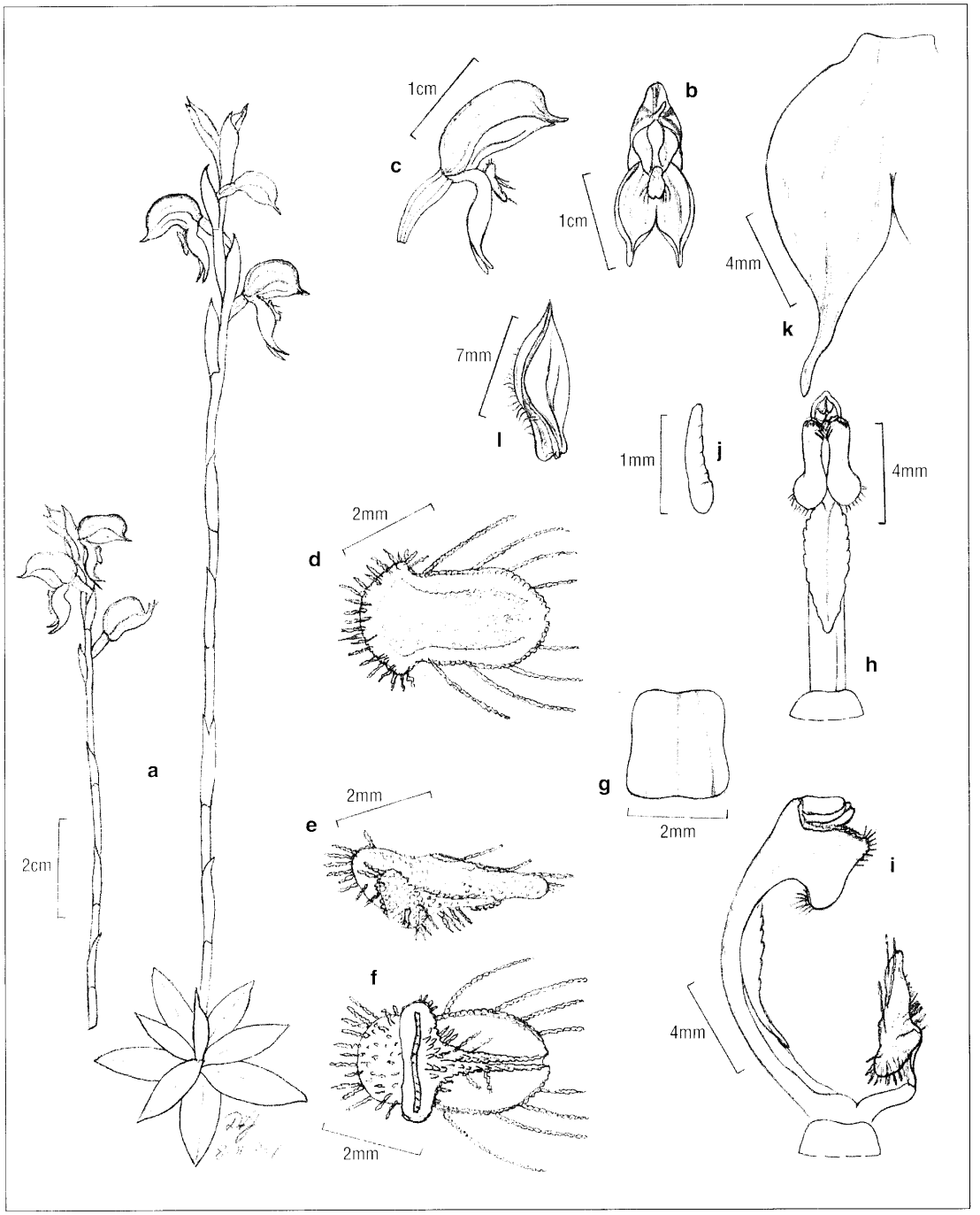


Fig. 7.11

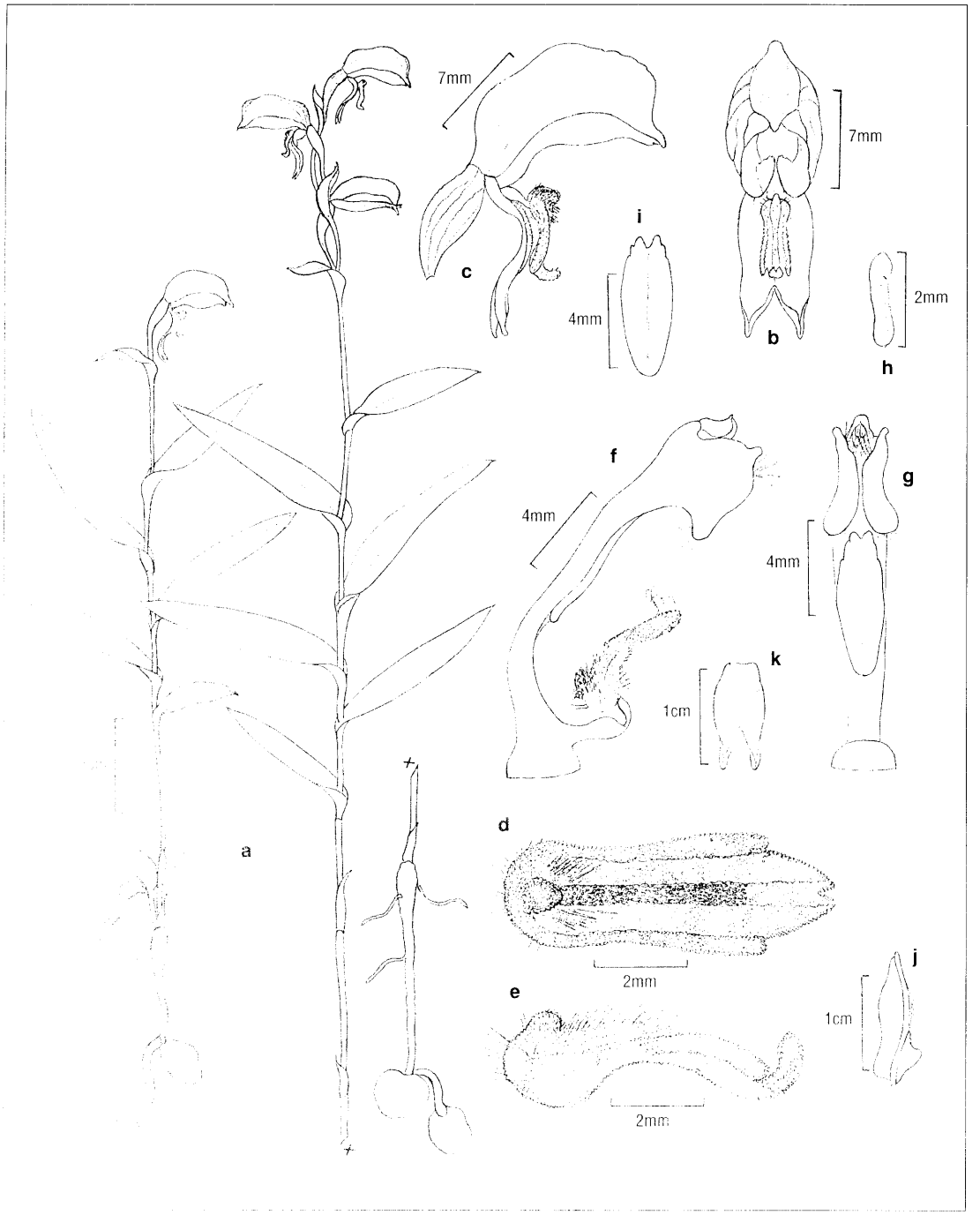
Pterostylis squamata

Coles Bay, Tasmania.

R. Williamson.

a. flowering plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. labellum from below; g. labellum strap; h. column from front; i. column and labellum from side; j. pollinium; k. portion of lateral sepals from rear; l. petal.

Drawing 8/11/1987 by D.L. Jones.©



Pterostylis stenochila

Coles Bay, Tasmania.

R. Williamson.

a. flowering plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. column and labellum from side; g. column from front; h. pollinium; i. stigma; j. petal; k. lateral sepals.

Drawing 8/1988 by D.L. Jones.©

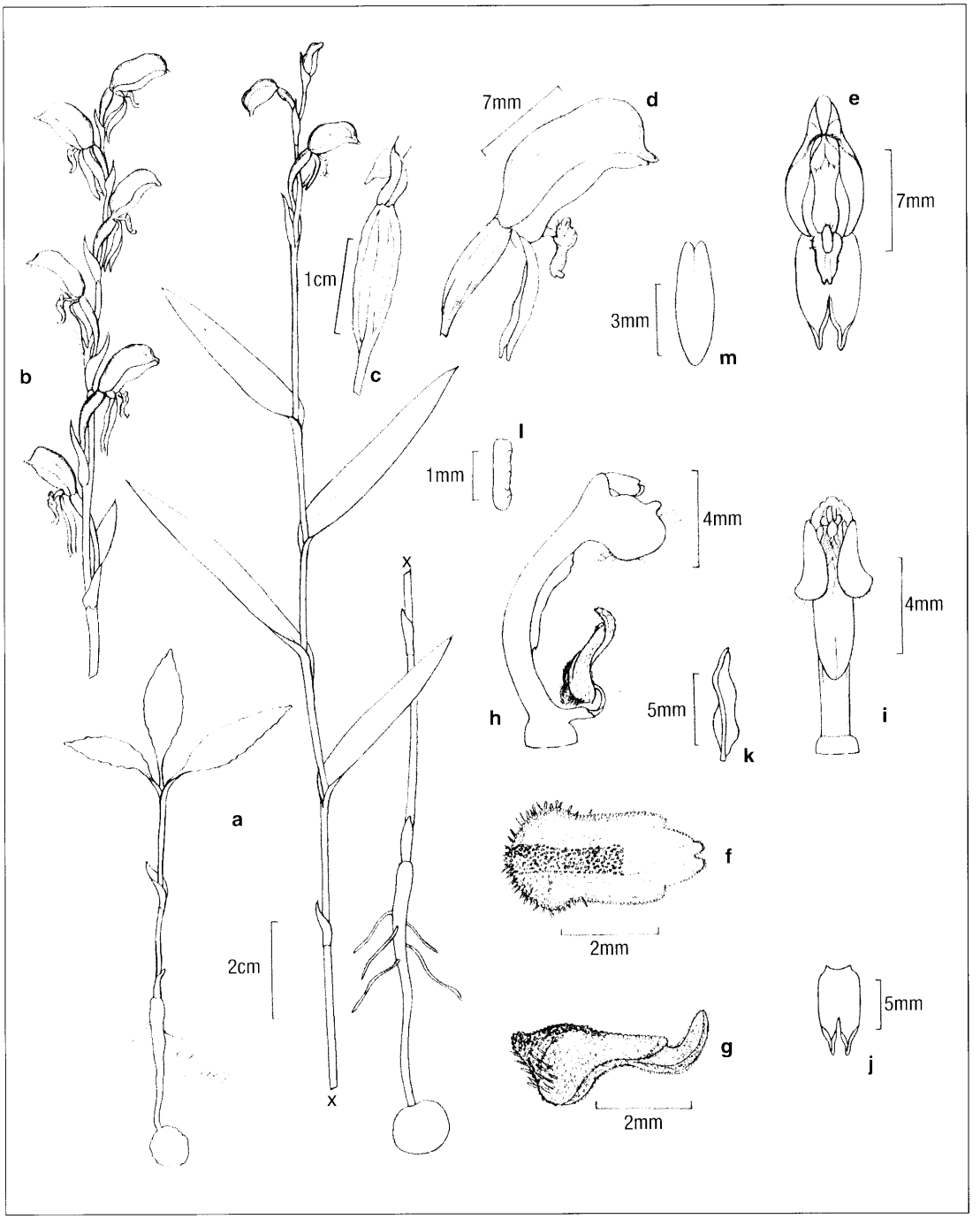


Fig. 7.13

Pterostylis tunstallii

Manning Lookout & Tomerong, New South Wales.

R. Tunstall.

a. flowering plant and rosette from Manning Lookout; b. inflorescence from Tomerong; c. capsule; d. flower from side; e. flower from front; f. labellum from above; g. labellum from side; h. column and labellum from side; i. column from front; j. lateral sepals; k. petal; l. pollinium; m. stigma

Drawing 5/1987 by D.L. Jones.©

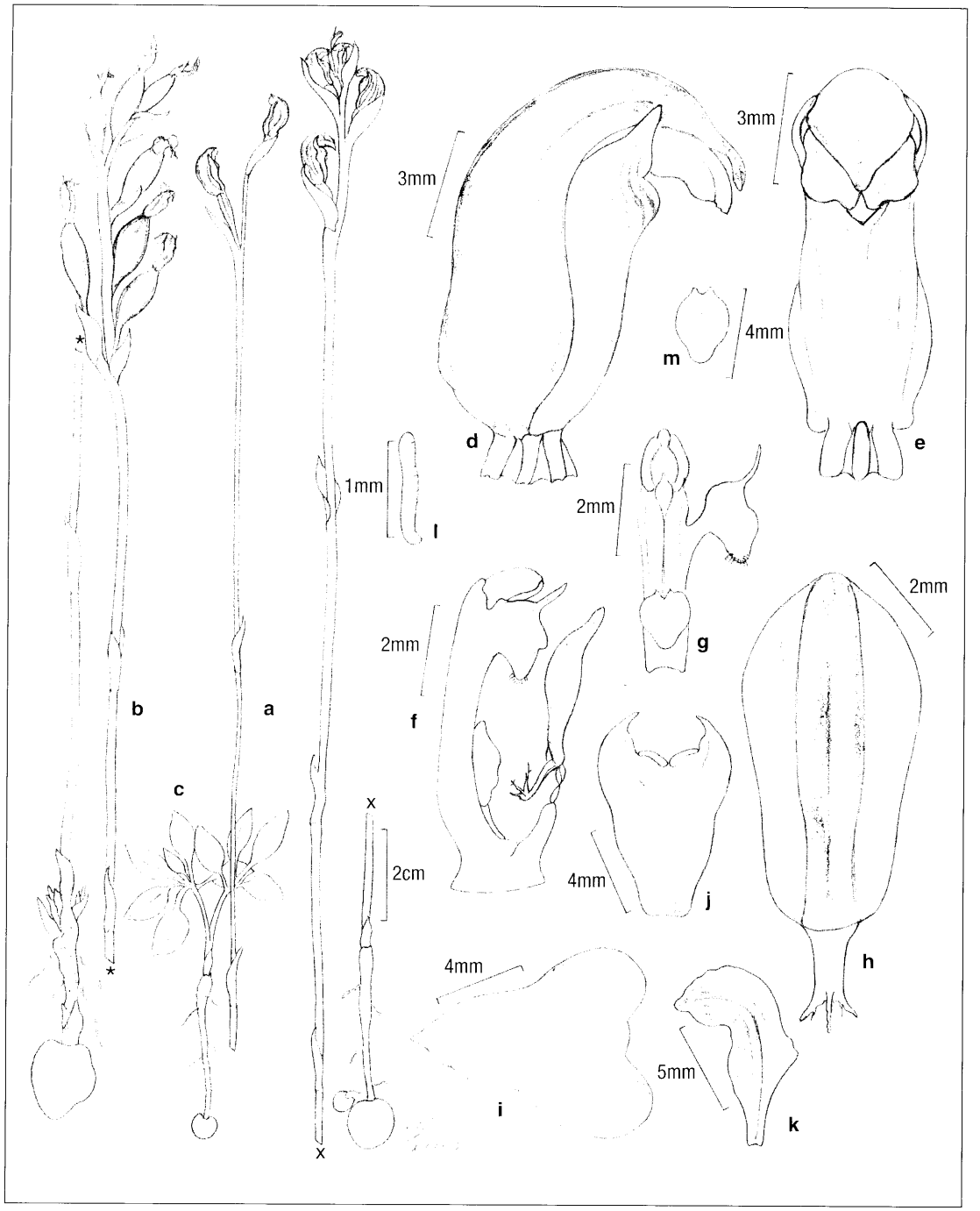


Fig. 7.14

Pterostylis uliginosa

Appin Road - near Appin, New South Wales.

D.L. Jones 9559.

a. flowering plant; b. fruiting plant; c. rosette; d. flower from side; e. flower from front; f. column and labellum from side; g. top of column and column wing from front; h. labellum from above; i. dorsal sepal; j. lateral sepals; k. petal; l. pollinium; m. stigma.

Drawing 2/1/1993 by D.L. Jones.©

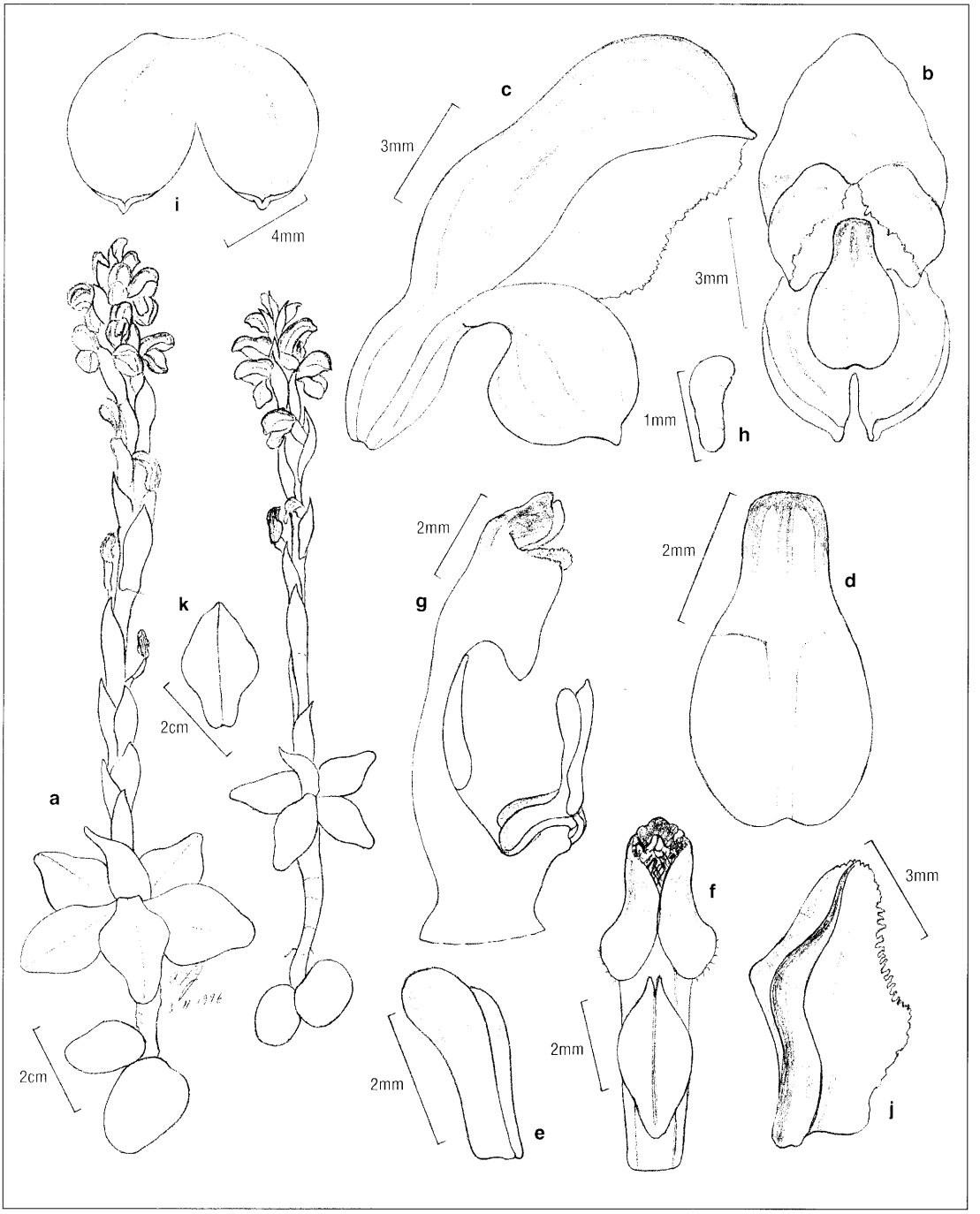


Fig. 7.15

Pterostylis wapstreorum

Pontville, Tasmania.

J.E. Wapstra (ORG 394)., from the type collection.

a. flowering plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum appendage from side; f. column from front; g. column and labellum from side; h. pollinium; i. lateral sepals.

Drawing 3/11/1996 by D.L. Jones.©

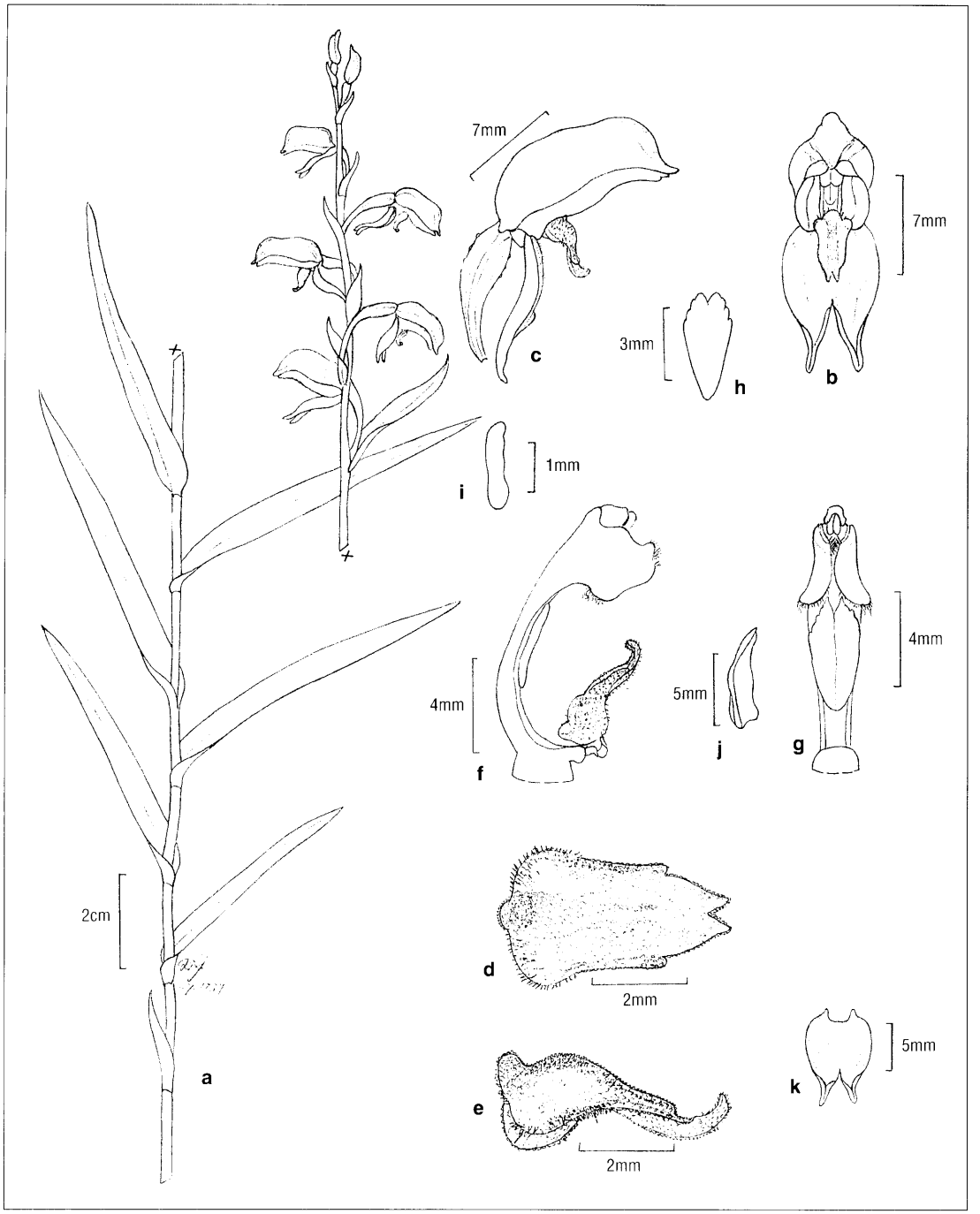


Fig. 7.16

Pterostylis williamsonii

Coles Bay, Tasmania.

R. Williamson.

a. flowering plant; b. flower from front; c. flower from side; d. labellum from above; e. labellum from side; f. column and labellum from side; g. column from front; h. stigma; i. pollinium; j. petal; k. lateral sepals.

Drawing 7/1987 by D.L. Jones.©

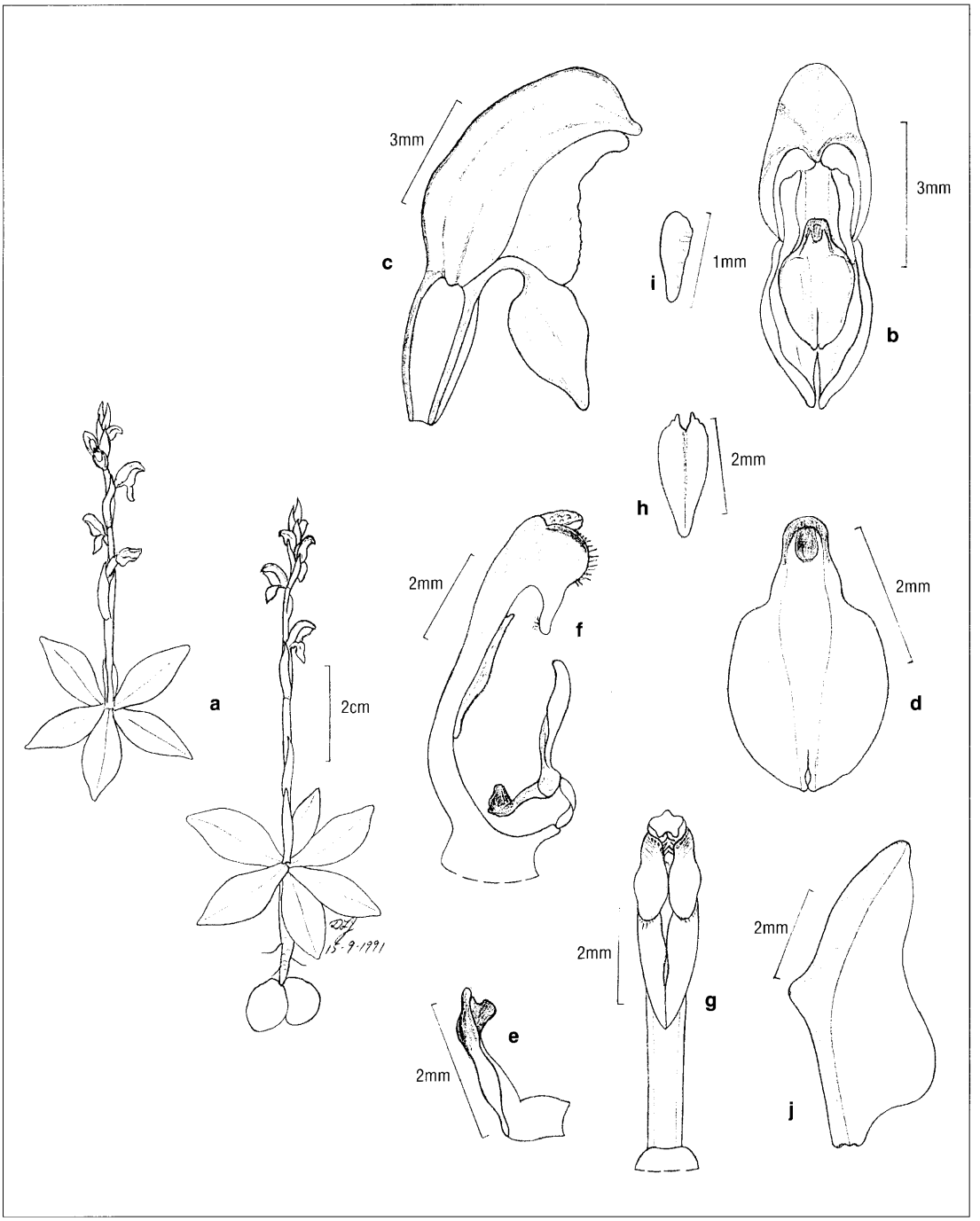


Fig. 7.17

Pterostylis ziegeleri

Cape Portland, Tasmania.

D.L. Jones 7124.

a. flowering plants; b. flower from front; c. flower from side; d. labellum from above; e. labellum appendage from side; f. column and labellum from side; g. column from front; h. stigma; i. pollinium; j. petal.

Drawing 15/9/1991 by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 8:

A Taxonomic Review Of *Thelymitra* J.R. & G. Forst. In Tasmania

David L. Jones & Mark A. Clements
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

Thelymitra is reviewed for Tasmania. *Thelymitra erosa* D.L. Jones & M.A. Clem., *T. improcera* D.L. Jones & M.A. Clem., *T. longiloba* D.L. Jones & M.A. Clem., *T. polychroma* D.L. Jones & M.A. Clem., *T. simulata* D.L. Jones & M.A. Clem., *T. spadicea* D.L. Jones & M.A. Clem. and *T. sparsa* D.L. Jones & M.A. Clem. are described as new and the new status and name, *T. imbricata* D.L. Jones & M.A. Clem., is given to *T. nuda* var. *grandiflora* Lindl. *Thelymitra versicolor* Lindl. is reinstated, *T. juncifolia* Lindl. is characterised and *T. malvina* M.A. Clem., D.L. Jones & Molloy is newly recorded for Tasmania.

INTRODUCTION

The genus *Thelymitra* J.R. & G. Forst. in Australia consists of about 44 described species and several named hybrid taxa (Clements 1989). From our field studies and specimens received from collaborators in various parts of Australia, it is apparent that many other taxa await formal recognition. *Thelymitra* was being studied by J.Z. Weber of the Adelaide Herbarium but his work was cut short by his untimely death.

Thelymitra is a complex genus consisting of many well-defined species and a number of others where extensive variation can be observed within and between populations. Some populations with large, colourful, fragrant, entomophilous flowers may intermix and intergrade with other populations or individuals which have smaller, less-colourful, non-fragrant, facultatively autogamous flowers (see also pollination biology below), resulting in identification difficulty and confusion. In such taxa, variation in some features may be extensive, including plant habit (particularly physical size of leaves, scape and flowers), floral colouration and intensity of the colours and post-anther lobe features including size, degree of inflation, colouration and ornamentation. As a result the taxonomy of *Thelymitra* is confused throughout its range and the genus badly needs revision. As with some other terrestrial orchid genera, dried herbarium specimens are of limited value and any study in *Thelymitra* should involve fresh material supplemented by spirit-preserved flowers and colour photographs.

POLLINATION BIOLOGY

The breeding system of *Thelymitra* is complex and an understanding of the processes involved is useful in resolving the taxonomy of the genus.

Species of *Thelymitra* are commonly known as sun orchids because the perianth segments of most species expand on hot sunny days, closing again at night. Our observations in the field and on cultivated plants show that the higher the diurnal temperature the more rapidly the flowers open and the wider the resulting expansion of the perianth segments. In some species these even recurve away from the column on very hot days. On days of high humidity the perianth segments expand more readily and at lower temperatures than on drier days. Response to temperature varies with the taxon and some species are very reluctant to open their flowers fully even in hot weather, whereas others may expand readily even on relatively cool days.

Thelymitra flowers are different from most other orchids in that the labellum lacks any ornamentation

or calli and it is not greatly differentiated in shape and size from the petals. As a result the flowers approach radial symmetry which is unusual in the Orchidaceae. The role of pollen vector attraction belongs to the column rather than the labellum. This structure has a well-developed mitra formed by the fusion of the two lateral staminodes and the filament of the fertile stamen (Burns-Balogh & Bernhardt 1985). This mitra surrounds the anther and stigma and may form an expanded apical hood or it may extend as a rim-like collar. Either structure may be colourful and ornamented with calli, ridges or papillae. Also present are protruding column arms that support clusters of trichomes or are themselves toothed or sculptured. Auxiliary lobes may also be present in some species between the column arms and the mitra rim.

The basic pollination syndrome in *Thelymitra* involves deceit and floral mimesis (Bernhardt & Burns-Balogh 1986, Dafni & Calder 1987). Some species are totally entomophilous relying completely on cross-pollination, whereas others are facultatively or obligatorily autogamous (Fitzgerald 1875-1895, Cheeseman 1881, Bates 1978, Cropper and Calder 1990).

The pollinarium of *Thelymitra* consists of two pairs of white pollinia attached directly to an elliptical or ovoid viscidium. In the strictly entomophilous, cross-pollinating species, the pollen grains are tightly packed and the pollinia retain their integrity and attachment to the viscidium unless exposed to air. By contrast, in the autogamous species the pollen grains are loosely packed and the pollinia break down and become incoherent prior to or during early anthesis. The pollinia also frequently separate from the viscidium so that the whole pollinarium cannot be extracted as a single unit. Any pollen which comes into contact with stigmatic fluid germinates and can bring about auto-fertilisation. In such autogamous species the perianth segments may not expand at all, even in hot weather. This is especially true of species or variants from montane regions where cool, cloudy conditions are frequent during the period of anthesis.

As to be expected, sporadic hybridisation can occur between entomophilous, cross-pollinating species of *Thelymitra*, but it can also occur between those autogamous taxa in which the perianth expands in hot weather. Usually this latter hybridisation is a result of female *Lassioglossum* (Halictidae) bees transferring fragments of pollinia to the stigma of another species while foraging for pollen (D.L. Jones, pers. obs.).

THE TASMANIAN SITUATION

Many collections of *Thelymitra*, including undescribed taxa, have been obtained from Tasmanian localities during the period of this study, and these supplement the extensive collections of the genus at CANB. From this material, and from an earlier study of the type collections (Clements & Cribb 1984, Clements 1989), we have been able to make headway on the taxonomy of the genus in Tasmania and the results of this study are presented here. New species are described, poorly known species highlighted, doubtful records are confirmed for the state and excluded taxa are detailed at the end of the paper.

Buchanan (1995) lists 22 species and one variety of *Thelymitra*, 20 of which are described in Curtis (1979). This current treatment recognises 25 described species and two named natural hybrids in Tasmania.

MATERIALS AND METHODS

As for paper 1 in this series.

Thelymitra

Thelymitra J.R. & G. Forst., *Char. Gen. pl.* 97, t. 49 (1776).
Type species: *Thelymitra longifolia* J.R. & G. Forst.

Terrestrial *herbs*, sympodial. *Roots* filamentous. *Tubers* fleshy, replacement tubers formed at the end of short droppers, sometimes extra daughter tubers formed in the same manner, rarely daughter tubers formed at the end of lateral stolonoid roots. *Leaf* single, basal, usually erect, terete or canaliculate, convolute, sessile. *Inflorescence* racemose, one-several-flowered, terminal. *Flowers* resupinate, the perianth parts spreading in response to sunshine, opening freely or tardily or cleistogamous. *Sepals* free, usually all similar. *Petals* free, similar to sepals or different. *Labellum* free, unadorned, attached by its base to the anterior column base, usually similar in shape and size to the sepals and petals, sometimes broader or narrower. *Column* lacking free filament and style, short and stubby; column wings fused and surrounding the column to form a mitra; basal anterior part of mitra forming an unadorned rim or ridge in front of the stigma base; dorsal apical part of mitra complex, usually tripartite with a central post-anther lobe and two lateral arms, sometimes extra auxiliary lobes or lobules flank the post-anther lobe on the anterior side; post-anther lobe prominent or reduced, in one group elongate, tubular and cucullate, variously cleft, lobed or toothed apically, often differently coloured from the rest of the column, in another group much reduced and dorsally adorned with digitate calli; lateral arms with or without hair tufts. *Column foot* absent. *Anther* basifixed, erect and parallel to the axis of the column or porrect, rostrate or not. *Pollinarium* present; pollinia two, white, soft, mealy, attached directly to a terminal viscidium; pollen grains in monads or tetrads. *Stigma* entire, quadrate, supported on a basal stalk. *Rostellum* ventral, in a terminal slot on the stigma.

A genus of c. 50 species distributed in Australia, New Zealand, New Caledonia, New Guinea, Indonesia and the Philippines. Twenty-seven taxa occur in Tasmania.

Key to Thelymitra in Tasmania

1 Column lateral arms with hair tufts **2**
Column lateral arms lacking hair tufts **22**

2 Column post-anther lobe extending above the level of insertion of the lateral arms as an erect lobe **8**
Column post-anther lobe much abbreviated and hardly extending above the level of insertion of the lateral arms **3**

3 Perianth segments usually spotted **4**
Perianth segments never spotted **6**

4 Columnar calli numerous in a dense band on the top of the rim . . . . . **14. *T. ixioides***
Columnar calli few, usually in a narrow dorsal band **5**

5 Hair tufts sparse; columnar calli short (montane species flowering Dec.-Jan.) . . . . . **25. *T. sparsa***
Hair tufts moderately dense; columnar calli long and digitate (lowland species flowering Oct.-Dec.) . . . . . **15. *T. juncifolia***

6 Hair tufts white or mauve **7**
Hair tufts yellow . . . . . **6. *T. circumsepta***

7 Auxiliary column lobes short, about as long as the post-anther lobe, usually irregularly toothed or lobed . . . . . **12. *T. improcera***
Auxiliary column lobes much longer than the post-anther lobe, usually smooth **16. *T. longiloba***

8 Column post-anther lobe tubular or resembling an extended rim; flowers usually spotted **9**
Column post-anther lobe narrowly or broadly hooded; flowers never spotted **13**

9 Flowers pink ..... **13. *T.* ×*irregularis***
Flowers usually blue **10**

10 Flowers obliquely erect, post-anther lobe broad and swollen; hairtufts cream **21. *T. polychroma***
Flowers porrect, post-anther lobe not swollen; hairtufts white **11**

11 Column post-anther lobe mostly yellow ..... **26. *T.* ×*truncata***
Column post-anther lobe mostly brown **12**

12 Dorsal surface of column ruminate (montane to subalpine plants) ..... **23. *T. simulata***
Dorsal surface of column smooth (lowland plants) ..... **24. *T. spadicea***

13. Column post-anther lobe elongated and narrow **14**
Column post-anther lobe squat and broadly expanded **15**

14 Column with 2 prominent auxiliary lobes ..... **4. *T. azurea***
Column without any auxiliary lobes ..... **3. *T. aristata***

15 Hair tufts yellow; column coated with a glistening bloom ..... **18. *T. mucida***
Hair tufts cream, white, pink or mauve; column lacking any glistening bloom **16**

16 Column post-anther lobe broad and inflated **17**
Column post-anther lobe not inflated **18**

17 Plants robust; perianth segments broad ..... **11. *T. imbricata***
Plants slender; perianth segments narrow ..... **27. *T. versicolor***

18 Flowers usually <20 mm across, mostly opening tardily **19**
Flowers usually >25 mm across, mostly opening freely **21**

19 Column apex bright yellow; post-anther lobe deeply cleft ..... **10. *T. holmesii***
Column apex cream, light yellow or brownish; post anther lobe notched or shallowly cleft ..**20**

20 Flowers blue to purple; hair tufts erect and column-embracing ..... **2. *T. arenaria***
Flowers pale blue; hair tufts erect but not column-embracing ..... **20. *T. pauciflora***

21 Flowers greenish outside; column post-anther lobe slightly elongated; hair tufts usually mauve ..... **17. *T. malvina***
Flowers blue outside; column post-anther lobe not elongate; hair tufts usually white **19. *T. nuda***

22 Flowers yellow **23**
Flowers pink or blue **24**

23 Column arms extending above the anther as red-brown, ear-like appendages **1. *T. antennifera***
Column arms reduced to vestigial knobs ..... **9. *T. flexuosa***

24 Flowers pink **25**
Flowers blue **26**

25 Flowers usually <20 mm across; column lateral arms long and narrow ..... **5. *T. carnea***
Flowers usually >20 mm across; column lateral arms short and broad ..... **22. *T. rubra***

26 Column arms spirally twisted, usually held above the anther ..... **7. *T. cyanea***
Column arms not spirally twisted, usually obliquely erect in front of the anther ..... **8. *T. erosa***

1. ***Thelymitra antennifera*** (Lindl.) Hook. f., *Fl. Tasman.* 2: 4, t.101A (1858);
Macdonaldia antennifera Lindl. in *Edwards's, Bot Reg. 1-23: Swan Riv. Append.* I (1840).
TYPE: Swan River, 1839, *J. Drummond* (lecto K-L!, isolecto BM!, *fide* George 1971).

Illustration: Page 329, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania, South Australia and Western Australia. Grows in a wide range of habitats including open forest, heathy forests, coastal scrubs, heathland and mallee shrubland. Soils may be moist or well drained sands, sandy loams, clay loams and gravelly loams. Altitude: 0-100 m. Flowering period: August to October.

Biology: This species is entomophilous (Dafni & Calder 1987).

Notes: This species is characterised by the terete leaf; wiry flexuose scape; freely opening yellow flowers; and dark brown ear-like column appendages held erect above the column.

Specimens examined:
TASMANIA: Bakers Beach, 1 Oct. 1987, *Campbell* (QVM); Lulworth, Oct. 1995, *Campbell 95011* (CANB); Blizzards Landing, 1 Oct. 1986, *Churchill* (QVM).

2. ***Thelymitra arenaria*** Lindl., *Gen. sp. orchid. pl.* 519-20 (1840).
TYPE: Tasmania, Circular Head, Nov. 1837, *R. Gunn 937* (lecto specimen 6b K-L!, *fide* Clements 1989).

Illustration: None found.

Distribution and ecology: A poorly known species which is apparently endemic to Tasmania. The type was collected in the north of the state and Lindley records it as growing in sandy soil. The very slender nature of the type specimens suggests that the species may grow in dense vegetation such as among sedges or in swamps. Flowering period: November.

Biology: The breeding system of this species is unknown.

Notes: Lindley records this species as "a slender plant 1.5-2 feet high. Flowers middle sized. Leaf linear, racemes 2-6-flowered, hood emarginate, glabrous, lateral flaps petiolate, with matted hairs, flowers purple, spreading."

Typification: The type specimens are tall and slender with narrow leaves to 3 or 4 mm diam., and flowers about 20 mm across. All four specimens have open flowers and this together with Lindley's comments suggests that the perianth segments may spread freely. The column has a hooded post-anther lobe and white hair tufts.

We can find few herbarium collections that match this species which has obviously been overlooked and probably confused with one of the many variants assigned to *T. pauciflora*. The type specimens however are distinct and the species needs to be looked for, especially in northern coastal localities.

Specimens examined:
TASMANIA: Skamps Property, near Launceston, 5 Dec. 1992, *Campbell 92428* (CANB); Scamander, 11 Nov. 1995, *Campbell 95032* (CANB).

3. ***Thelymitra aristata*** Lindl., *Gen. sp. orchid. pl.* 521 (1840).
TYPE: Tasmania, Wilcorne River near Woolnorth, Nov. 1837, *R. Gunn 939* (lecto K-L!, *fide* Clements 1989).

Illustration: Page 330, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, heathy forest, coastal scrubs and heathland in sands, sandy loam, gravelly loam, clay loam and peaty loam, sometimes in low-lying areas. Altitude: 0-300 m. Flowering period: September to November.

Biology: This species is entomophilous.

Notes: This species is characterised by robust habit; large, channelled, ribbed leaf; large freely opening blue flowers; and, elongated narrow column post-anther lobe with an irregularly toothed yellow apex.

Selected specimens: (25 seen):
TASMANIA: Waverley Park, 6 Nov. 1988, *Collier 3712* (HO 143117); Wet Cave Beach, 5 Nov. 1990, *Jones 6947 & Broers* (CANB 9016415); 8 km S of Arthur R., 5 Nov. 1990, *Jones 7022 & Broers* (CANB 9614119); just E of Lulworth, 8 Nov. 1990, *Jones 7107 & Broers* (CANB 9614204); Lindisfarne, 3 Nov. 1934,*Little* (HO 411697); Tasman Peninsula, 3 Dec. 1983, *Moscal 4658* (HO 401941); Daisy R., 18 Dec. 1983, *Moscal 4972* (HO 404384).

4. *Thelymitra azurea* R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 38: 342, t. 17 (1917).
TYPE: South Australia, Found blooming in great numbers between Mount Compass and Victor Harbour, 19 Nov. 1916, *R.S. Rogers* (holo AD!; iso AD!, MEL!, NSW).
Thelymitra canaliculata auct. non R. Br.; W.M.Curtis,The Student's Flora of Tasmania 4A: 46 (1979).

Illustration: Page 331, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in coastal scrubs, heathland, low-lying areas and around the margins of swamps. Altitude: 10-250 m. Flowering period: October to December.

Biology: This species is entomophilous.

Notes: Although recorded in both Curtis (1979) and Buchanan (1995), it should be noted that this species is extremely rare in Tasmania. It has prominently swollen buds and azure-blue flowers. The sepals often have a dark outer surface and the column has three prominent yellow-tipped apical lobes.

Tasmanian specimens have lighter blue flowers than mainland specimens and the main part of the post-anther lobe is broader, flattened and less rod-like.

Specimens examined:
TASMANIA: Eaglehawk Neck, 5 Nov. 1984, *Cameron* (CANB, photo!); Taranna, Tasman Peninsula, 5 Nov. 1996, *Minchin (ORG 385)* (CANB); *ibid*, 24 Oct. 1997, *Wapstra (ORG 962)* (CANB).

5. *Thelymitra carnea* R. Br., *Prodr.* 314 (1810).
TYPE: Port Jackson, moist meadows towards Georges River and near Parramatta, Oct.-Nov. 1803, *R. Brown* (lecto specimen a!, BM, *fide* Clements 1989; isolecto BM!, E!, P!).

Illustration: Page 333, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania, and South Australia. Grows in open forests, heathy forests, woodland, coastal scrubs and heathland in dry to moist sandy loam and clay loam. Altitude: 0-800 m. Flowering period: October and November.

Biology: This species is facultatively autogamous and is often also cleistogamous.

Notes: This species is characterised by terete leaf; slender flexuose reddish brown scape; small tardily opening pink flowers; narrow post-anther lobe; and, narrow column arms with nearly entire margins.

Specimens examined:
TASMANIA: Carr Villa Flora Reserve, 1 Nov. 1993, *Campbell 93132* (CANB); Somerset, 6 Nov. 1984, *Clements 3575b* (CANB); Rocky Cape, 30 Sept. 1988, *Clements 4689* (CANB); Coles Bay, 11 Nov. 1990, *Jones 7176 & Broers* (CANB 9016442); Sea Elephant Rd, King Island, 5 Nov. 1991, *Jones 8481* (CANB); Freycinet Nat. Park, 28 Oct. 1992, *Jones 10533* (CANB); Howrah Hills, 5 Nov. 1995, *Ziegeler (Jones 14610)* (CANB).

6. *Thelymitra circumsepta* Fitzg., *Austral. Orch.* 1(4), t.1 (1878).
TYPE: Swampy edges round the summit of Mount Tomah, Dec., *R.D. Fitzgerald* (lecto Fitzgerald's plate!, *fide* Clements 1989).
Thelymitra retecta Rupp, *Victorian Naturalist* 60: 176 (1944).
TYPE: Gravelly beach, on the Tamar River below Launceston, Dec. 1943, *N. Burrows* (holo NSW!).
Thelymitra formosa auct., non Colenso; L.B. Moore, *New Zealand J. Bot.* 6: 477-478 (1969).

Illustration: Page 335, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and New Zealand. Grows in swampy areas of open forest and well-drained soils along stream banks and in high-rainfall tall forests. Altitude: 100-700 m. Flowering period: December to February.

Biology: This species is facultatively autogamous.

Notes: This species is characterised by late-flowering habit; tardily opening blue flowers 20-25 mm across; abbreviated column post-anther lobe; large obliquely erect auxiliary lobes which are usually deeply fringed or lobed; and yellow hair tufts.

Specimens examined:
NEW SOUTH WALES: Wentworth Falls, 7 Dec. 1990, *Jones 7283* (CANB); Penrose State Forest, 1 Dec. 1991, *Jones 8600* (CANB); Point Lookout, 11 Jan. 1993, *Tunstall (Jones 11154)* (CANB);
VICTORIA: Browntown Tk, Weeaproinah, 27 Dec. 1991, *Barnett (Jones 8690)* (CANB);
TASMANIA: Flinders Island, 2 Dec. 1992, *Spry* (CANB); Snug Falls, 20 Jan. 1993, *Wapstra* (CANB); Coles Bay Rd, 20 Jan. 1993, *Wapstra* (CANB); Jefferys Tk, 28 Jan. 1993, *Wapstra* (CANB); Snug Plains, 13 Jan. 1997, *Wapstra (ORG 518)* (CANB); Mathinna Plains, 29 Jan. 1997, *Wapstra (ORG 556)* (CANB).

7. *Thelymitra cyanea* (Lindl.) Benth., *Fl. Austral.* 6: 323 (1873);
Macdonaldia cyanea Lindl. in *Edwards's Bot. Reg.* 1-23: *Swan Riv. Append.* I (1840);
Thelymitra venosa R. Br. var. *cyanea* (Lindl.) Hatch, *Trans. & Proc. Roy. Soc. New Zealand* 79: 391 (1952).
TYPE: Tasmania, Circular Head, Dec. 1837, *R. Gunn 938* (lecto specimen 12a K-L!, *fide* Clements 1989; isolecto BM!, FI!, K!, P!).
Thelymitra venosa auct., non R. Br.; W.M. Curtis, The Student's Flora of Tasmania 4A: 48 (1979).

Illustration: Page 336, Backhouse & Jeanes (1995).

Distribution and ecology: Occurs in New South Wales, Australian Capital Territory, Victoria, Tasmania, South Australia and New Zealand. Grows in moist to wet areas of heathland, heathy forests, buttongrass moorland and subalpine fens and moors. Soils are dark sandy loams, peaty sands, peats and the species also grows in living sphagnum moss. Altitude: 10-1800 m. Flowering period: November to March.

Biology: This species is facultatively autogamous (Jones 1971).

Notes: This species is characterised by distinctly veined perianth segments; labellum broader than the other perianth segments; and, spirally twisted, yellow column appendages.

Typification: The lectotype was chosen from amongst the three syntypes because it matched the protologue, consisted of good specimens, contained a flower in a packet and illustrations of column from side and rear. It was assumed that it represented a single collection as distinct from the other syntypes.

Selected specimens: (21 seen):
TASMANIA: Badger Hill, Railton, 21 Nov. 1992, *Campbell 92307* (CANB); Arthur R. Rd, 2 Dec. 1992, *Campbell 92381* (CANB); Oxberry Rd, 12 Dec. 1992, *Campbell 92471* (CANB); Chain of Lagoons, 19 Nov. 1992, *Jones 10746* (CANB); Safety Cove, 3 Dec. 1983, *Moscal 4560* (HO 404149); near Cassiterite Ck, 10 Dec. 1983, *Moscal 4753* (HO 408802); Pine Cove Ck, 8 Jan. 1984, *Moscal 5377* (HO 403722); Blackmans Bay, 12 Dec. 1995, *Wapstra (Jones 14728)* (CANB); Snug Tiers, 13 Jan. 1997, *Wapstra (ORG 516)* (CANB).

8. *Thelymitra erosa* D.L. Jones & M.A. Clem., *sp. nov.*,
T. pulchellae Hook. f. affinis, sed labello petalis forma statura simili; columnae pagina dorsali bullis parvis rotundatis ornata; et columnae brachiis longis (1.5-2 mm) angustis marginibus irregulariter et vadose erosis, differt.

TYPUS: Tasmania, Burwood Drive area, Blackmans Bay, 17 Nov. 1994, *J.E. & A. Wapstra (ORG 57)* (holo CANB 9707725; iso AD, HO, MEL, NSW).

T. cyanea auct., non (Lindl.) Benth.; L. Rodway, *The Tasmanian Flora* 189 (1903).

Illustration: Page 358, Backhouse & Jeanes (1995) - as *T.* sp. aff. *pulchella*.

Glabrous terrestrial *herb*. *Tubers* ovoid to oblong-ovoid, 12-20 mm long, 8-12 mm wide, fleshy. *Leaf* linear to linear-lanceolate, 10-20 cm long, 8-12 mm wide, erect, dark green, canaliculate, fleshy, ribbed dorsally, apex acute. *Scape* 15-50 cm tall, slender to moderately stout, green or brownish, 1-6-flowered. *Sterile bracts* 2 or 3, narrowly lanceolate, 20-60 mm long, 5-8 mm wide, closely sheathing, acute to acuminate. *Fertile bracts* lanceolate, 6-15 mm long, 4-6 mm wide, closely sheathing, acuminate. *Pedicels* 5-10 mm long, slender. *Ovary* obovoid, 6-9 mm long, 3-5 mm wide. *Flowers* 20-28 mm across, dark blue to purplish blue, opening freely only in hot weather. *Perianth segments* often with darker veins, sometimes these discontinuous or absent. *Dorsal sepal* ovate-lanceolate to elliptical-lanceolate, 9-14 mm long, 5-7 mm wide, apex acute to apiculate. *Lateral sepals* asymmetrically ovate-lanceolate 9-14 mm long, 4-6 mm wide, apex acuminate. *Petals* ovate, 8-13 mm long, 6-8 mm wide, apex acute to apiculate. *Labellum* obovate, 8-13 mm long, 6.5-8.5 mm wide, apex apiculate. *Column* porrect from the end of the ovary, 5-6 mm long, 2.5-2.8 mm wide, pale blue to blue with a brown or bluish apical collar, apex yellow; post-anther lobe short, the dorsal surface with few to several round bumps; auxiliary lobes absent; lateral arms 1.5-2 mm long, porrect to obliquely erect, white or yellow, the margins irregularly erose. *Anther* ovate, c. 3.2 mm long, c. 3 mm wide. *Pollinarium* c. 2.8 mm long; viscidium elliptic, c. 0.6 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2.6 mm long, c. 2.5 mm wide, margins irregular. *Capsules* obovoid, 8-12 mm long, 6-8 mm wide, erect, ribbed.
Fig 8.1, a-c.

Distribution and ecology: ?New South Wales, Victoria and Tasmania. Grows in heathland and heathy forest in moist areas, soaks and low-lying swampy sites, often along the margins of tracks and on road embankments. Soils are dark sandy loams and peaty loams. Altitude: 0-600 m. Flowering period: Late October to December.

Biology: This species is facultatively autogamous.

Notes: This species is characterised by moderately large bright blue to purplish blue flowers which open freely in hot weather; perianth segments that are often striped; labellum of similar size and shape to the petals; small round knobs ornamenting the dorsal surface of the column; and, long (1.5-2 mm) narrow column arms with irregularly and shallowly erose margins.

In Tasmania, *T. erosa* shows considerable variation in striping of the perianth segments, with some specimens having plain segments, others partially striped whereas most are strongly striped.

Thelymitra erosa has been confused with *T. pulchella* Hook. f. which was described from New Zealand material. An examination of the type specimens of *T. pulchella* shows clearly that this species has striped flowers, a greatly enlarged labellum (similar to that of *T. cyanea* and *T. venosa*) and relatively short (0.5-1 mm) column arms with deeply fringed or lobed margins. This matches a taxon which is common in New Zealand but has not been found in Australia.

Specimens from highland areas of south-eastern Australia (not Tasmania) have been assigned to *T. pulchella* (for example Clements 1989, Harden 1993, Weber & Entwisle 1994), but they are very similar to *T. erosa* and may prove to belong with that species. Certainly they are closer to it than to *T. pulchella sens. strict.*

A study of New Zealand specimens and photographs purported to be of *T. pulchella* shows that at least three distinct entities shelter under that name in New Zealand. Some, if not all, may have been described, since the names *T. concinna* Colenso, *T. fimbriata* Colenso, *T. pachyphylla* Cheesem and *T. caesia* Petrie have been treated as synonyms of *T. pulchella* (Moore & Edgar 1970).

Conservation status: Widespread in Tasmania; suggest 3KC by criteria of Briggs & Leigh (1996).

Etymology: From the Latin *erosus*, having an irregularly toothed or apparently gnawed margin, in reference to the column arms.

Selected specimens: (20 seen) :
TASMANIA: Pipers River Rd, 4 Dec. 1992, *Campbell 92405* (CANB); Sisters Hills, 15 Nov. 1992, *Campbell 92268* (CANB); Bruny Island, 1992, *Campbell 92271* (CANB); Myrtle Bank, 10 Dec. 1995, *Campbell 95045* (CANB); Kelso Rd, 8 Dec. 1992, *Campbell 92435* (CANB); S. outskirts of Bicheno, 11 Nov. 1990, *Jones 7152* (CANB); Surges Bay, 13 Nov. 1993, *Wapstra (Jones 12610)*; Maranoa Heights, Kingston, 3 Nov. 1996, *Wapstra (ORG 395)* (CANB).

9. *Thelymitra flexuosa* Endl., *Nov. stirp. dec.* 3: 23-24 (1839).
TYPE: "Crescit in Novae-hollandiae austro-occidentalis colonia King George Sound (*Hügel*)", [1830-37], *K.Hügel* (holo W!; iso LD).
Macdonaldia concolor Lindl. in *Edwards's Bot. Reg. 1-23: Swan Riv. Append.* I (1840).
TYPE: King George Sound, *A. Collie* (holo K-L!, iso BM!, K!).
Macdonaldia smithiana Gunn ex Lindl. in *Edwards's Bot. Reg. 1-23: Swan Riv. Append.* I (1840);
Thelymitra smithiana (Gunn ex Lindl.) J.D. Hook., *Fl. Tasman.* 2: 4 (1856).
TYPE: Tasmania, Circular Head, Nov. 1837, *R. Gunn 945* (holo K-L!; iso K!, L!, P!, W!).

Illustration: Page 339, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania, South Australia and Western Australia. Grows in moist to wet sands, sandy loam, peaty loam and clay loam in open forest, heathy forest, coastal scrubs and heathland. Altitude: 0-200 m. Flowering period: October and November.

Biology: This species is autogamous and frequently also cleistogamous.

Notes: This species is characterised by terete leaf; slender reddish flexuose stem; small tardily opening yellow flowers; vestigial, knob-like column arms; and, large, swollen, yellow papillate anther.

Typification: The type sheet of *Macdonaldia concolor* contains a single specimen and a sketch of the top of the column. That of *Macdonaldia smithiana* contains five specimens, a sketch of a flower and a holotype label signed by A.S, George on 22 Jan. 1968.

Specimens examined:
TASMANIA: Timbertops Ridge, 7 Dec. 1983, *Buchanan 1934* (HO 412165); Lulworth, 25 Oct. 1995, *Campbell 95012* (CANB); Rocky Cape, 26 Oct. 1989, *Clements 5449* (CANB); near Patriarch Inlet, Flinders Island, 26 Oct. 1990, *Collier 4882* (HO 127084); E. of Lulworth, 8 Nov. 1990, *Jones 7104* (CANB); Sea Elephant Rd, King Island, 5 Nov. 1991, *Jones 8477* (CANB); Cloudy Bay, Bruny Island, 10 Nov. 1994, *Jones 13691* (CANB); Bruny Island, 22 Oct. 1993, *Wapstra* (CANB).

10. *Thelymitra holmesii* Nicholls, *Victorian Naturalist* 49: 263, f. (1933); *Thelymitra pauciflora* R. Br. var. *holmesii* (Nicholls) Nicholls, *Victorian Naturalist* 60: 56 (1943).
TYPE: Victoria, Gorae, via Portland, Dec. 1932, *M. Holmes* (holo MEL!; iso AD!).

Illustration: Page 340, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania and South Australia. Grows in moist areas of grassland, open forest and heathland in clay loam and peaty loam. Also around swamp margins. Altitude: 0-200 m. Flowering period: November and December.

Biology: This species is facultatively autogamous.

Notes: This species is characterised by late-flowering habit; moderately small, freely opening dark blue flowers; bright yellow, deeply cleft post-anther lobe; and, cream or yellow hair tufts.

Specimens examined:
TASMANIA: Anthony Beach, 15 Nov. 1992, *Campbell 92257* (CANB); Cockle Ck, 1 Dec. 1992, *Campbell 92369* (CANB); North Darling Ra., 20 Nov. 1992, *Jones 10819* (CANB); West Darling Ra., 20 Nov. 1992, *Jones 10823* (CANB).

11. *Thelymitra imbricata* D.L. Jones & M.A. Clem., *nom. et stat. nov.*
Basionym: *Thelymitra nuda* R. Br. var. *grandiflora* Lindl., *Gen. sp. orchid. pl.* 520 (1840).

TYPE: Tasmania, Circular Head, Nov. 1837, *R. Gunn 940* (lecto specimen 20b, K-L!, *fide* Clements 1989; isolecto BM!, FI!, P!).
Thelymitra megcalyptra auct., non Fitzg.; W.M. Curtis, *The Student's Flora of Tasmania* 4A: 43 (1979).

Illustration: None found.

Distribution and ecology: Endemic to Tasmania. Grows in open forest, coastal scrubs, grassland and heathland in sands and sandy loams. Altitude: 0-200 m. Flowering period: October and November.

Biology: The breeding system of this species is unknown.

Notes: This species is characterised by stout scapes; dark blue flowers about 30 mm across; broad, imbricate perianth segments; and, inflated column post-anther lobe.

Thelymitra imbricata has been confused with *T. megcalyptra* (e.g. Curtis 1979) but the two are distinct (see also excluded taxa below). *Thelymitra imbricata* has smaller darker flowers than *T. megcalyptra* and a much less swollen post-anther lobe. It is also similar to *T. nuda* but that species has slender scapes, pale blue or pink flowers 20-25 mm across and narrow perianth segments which hardly overlap.

Lindley (1840), when describing *T. nuda* var. *grandiflora*, noted "The flowers of *beta* [*T. nuda* var *grandiflora*] are considerably larger than *alpha* [*T. nuda*] and the stem stouter and shorter". These features are patently obvious in the specimens of the type collections of *T. nuda* var. *grandiflora* and are markedly different from the type specimens of *T. nuda*.

Conservation status: Poorly known overall but not known to be conserved; suggest 3K according to Briggs & Leigh (1996).

Specimens examined:
TASMANIA: Campbell Town Golf Course, 21 Nov. 1995, *Wapstra (Jones 14685* (CANB); Mt Brown, Tasman Peninsula, 20 Dec. 1995, *Wapstra (Jones 14738*) (CANB).

12. *Thelymitra improcera* D.L. Jones & M.A. Clem., *sp. nov.*,
T. mediae R. Br. affinis, sed habitu brevi, gracili; floribus 1-6, moderate parvis, pallide caeruleis, non confertis; columna gracile, lobo post antherum abbreviato; columnae lobis auxiliaribus erosis ad laciniatus; et columnae brachiis oblique rectis, caespitibus pilorum elongatis penicillatis, differt.
TYPUS: Tasmania, Sea Elephant Rd, King Island, 5 Nov. 1991, *D.L. Jones 8476* (holo CANB).

Illustration: Plate 12, fig. b & c, and probably also j, k & l, Nicholls (1969) - as *T. media*.

Glabrous terrestrial *herb*. *Tubers* ovoid to oblong-ovoid, 10-20 mm long, 8-10 mm wide, fleshy. *Leaf* linear to linear-lanceolate, 10-20 cm long, 8-12 mm wide, erect, canaliculate, fleshy, ribbed dorsally, apex acute. *Scape* 15-25 cm tall, slender, green or brownish green, 1-6-flowered. *Sterile bracts* 2 or 3, narrowly lanceolate, 30-70 mm long, 5-11 mm wide, closely sheathing, acute to acuminate. *Fertile bracts* lanceolate, 5-20 mm long, 4-6 mm wide, closely sheathing, acuminate. *Pedicels* 3-6 mm long, slender. *Ovary* narrowly obovoid, 6-9 mm long, 3-4 mm wide. *Flowers* 20-25 mm across, pale blue, unspotted, opening moderately freely only in hot weather. *Dorsal sepal* ovate-elliptical, 12-15 mm long, 5.5-6.5 mm wide, acuminate. *Lateral sepals* ovate-lanceolate, 12-15 mm long, 6-7.5 mm wide, acuminate. *Petals* broadly ovate-elliptical, 11-13 mm long, 6.5-8 mm wide, acute to acuminate. *Labellum* obovate, 11-13 mm long, 6-7 mm wide, apex obtuse to acute. *Column* porrect from the end of the ovary, 5-6 mm long, 2.5-3 mm wide, cream or bluish with a dark apical collar, apex yellowish; post-anther lobe short, the dorsal surface with a few irregular bumps; auxiliary lobes short, erect, yellow-tipped, the apical margins deeply erose to laciniate; lateral arms obliquely erect, with an elongated, brush-like terminal tuft of white hairs, the individual trichomes c. 1 mm long. *Anther* ovate, c. 3 mm long, c. 2.8 mm wide. *Pollinarium* c. 2.5 mm long; viscidium elliptic, c. 0.4 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2.5 mm long, c. 2 mm wide, margins irregular. *Capsules* obovoid, 8-12 mm long, 6-8 mm wide, erect, ribbed.

Distribution and ecology: Southern Victoria and King Island, Tasmania. Grows in coastal and near-coastal sites mainly in heathland and heathy forest in low-lying moist areas. Soils are sandy loams and peaty loams. Altitude: 0-50 m. Flowering period: October to December.

Biology: This species is facultatively autogamous.

Notes: This species is characterised by short habit; 1-6 moderately small, pale blue, uncrowded flowers; slender column with an abbreviated post-anther lobe; erose to laciniate auxiliary column lobes; and, obliquely erect column arms with elongate, somewhat brush-like hair tufts.

Thelymitra media, with which *T. improcera* has been confused, is more robust with plants to one metre tall, thick fleshy leaves to 30 cm x 20 mm, up to 30 crowded blue flowers to 30 mm across and a short column with a broad dark collar, porrect column arms and short auxiliary lobes.

Conservation status: Poorly known overall; suggest 2KC by criteria of Briggs & Leigh (1996).

Etymology: From the Latin *improcerus*, short, undersized, in reference to the short plants and smaller flowers when compared with *T. media*.

Specimen examined:
TASMANIA: Naracoopa, King Island, 12 Nov. 1993, *Campbell 93150* (CANB);

13. *Thelymitra* X*irregularis* Nicholls, *Victorian Naturalist* 63: 126-127, f. A-C (1946).
TYPE: Victoria, Wonthaggi, Nov. 1934, *E.H. Homann* (holo MEL!).

Notes: A natural hybrid purported to be between *T. ixioides sens. lat.* and *T. carnea*, however, on mainland Australia, hybrid progeny with a very similar appearance to *T.* X*irregularis* also result from natural crosses between *T. ixioides* and *T. rubra*. The progeny of both crosses have pink flowers and columns with intermediate features between the parents.

Specimens examined:
TASMANIA: Sisters Beach, 3 Nov. 1990, *Jones 6945* (CANB); Wet Cave Beach, 3 Nov. 1990, *Jones 6948* (CANB); near Naracoopa, King Island, 5 Nov. 1991, *Jones 8469* (CANB); Blackmans Bay, 14 Nov. 1997, *Wapstra* (CANB).

14. *Thelymitra ixioides* Sw., *Ksvenska Vet. Akad. Handl.* 21: 253, t. III, f. L (1800).
TYPE: Port Jackson, New South Wales, *J. White* (lecto SUNIV!, *fide* Clements & Cribb 1985 and Clements 1989; isolecto LINN!, LIV!).

Illustrations: Plate 5 (not fig. b), Nicholls (1969); Page 342, Backhouse & Jeanes (1995).

Distribution and ecology: In the narrow sense: New South Wales, Victoria and Tasmania. Grows in a wide range of lowland forested and heathy habitats. Altitude: 0-300 m. Flowering period: September to November.

Biology: Breeding system variable with the taxon from facultatively autogamous to entomophilous.

Notes: In the narrow sense *T. ixioides* is a robust species with leaves to 25 cm x 15 mm, scapes to 80 cm tall and numerous (to 20), large (to 45 mm across), freely opening, insect-pollinated, fragrant, blue or pink flowers which usually have dark spots on the dorsal sepal and petals. The column is broad and the apical rim of the post-anther lobe is densely covered with short digitate calli which are often yellow but may be dark.

Tasmanian specimens allocated to this species require further study. Curtis (1979, page 45) records robust specimens which may be *T. ixioides* or possibly a hybrid.

Thelymitra ixioides has been a botanical dumping ground for a suite of taxa which have a spotted perianth. Certainly it is a variable taxon (for example see plate 7, Nicholls 1969), however many specimens encountered in montane and southern parts of mainland Australia, Tasmania and New Zealand do not match typical *T. ixioides* as they have smaller facultatively autogamous flowers and different columnar calli. In most modern treatments these variants are simply included in *T. ixioides* because of the shared characters of spotted perianth and digitate columnar calli.

In this treatment of Tasmanian taxa we tentatively place the large-flowered specimens with *T. ixioides sens. st.* and recognise *T. juncifolia* as a relatively widespread species which has been generally overlooked. This does not account for all the variation encountered in Tasmania and it is apparent that further studies are required.

We agree with McAlpine (1978) and Bates & Weber (1990) that *T.* x*truncata* is a natural hybrid resulting from a cross between small-flowered member(s) of the *T. ixioides* complex and member(s) of the *T. pauciflora / nuda* complex, but this taxon is rare in Tasmania. Curtis (1979) also records *T.* x*merraniae* Nicholls from Tasmania and we also regard this taxon to be of hybrid origin.

Typification: The lectotype of *T. ixioides* consists of a single inflorescence with seven flowers. It was selected from two sheets labelled with this name in Swartz's hand from the herbarium in Uppsala, Sweden, because it matches the main body of the diagnostic illustration for the species. The choice of a lectotype was necessary because another species, belonging to the *T. pauciflora / nuda* complex, is present in both the illustration and on the second sheet. The status and identity of this second species will be dealt with elsewhere.

Specimens examined:
TASMANIA: Near Lanoma Point, Freycinet Pen., 12 Nov. 1990, *Jones 7188* (CANB); Maranoa Heights, 31 Oct 1997, *Wapstra (ORG 988)* (CANB).

15. *Thelymitra juncifolia* Lindl., *Gen. sp. orchid. pl.* 522 (1840).
TYPE: Tasmania, Circular Head, Nov. 1837, *R. Gunn 936* (lecto K-L!, specimen with five capsules on right hand side of sheet is here designated as lectotype; Clements (1989) choice of specimen 32a K-L is rejected - see below: isolecto BM!, FI!, NSW!).
T. ixioides var *subdifformis auct. non* Nicholls; G. Backhouse & J. Jeanes, *The Orchids of Victoria*, 343 (1995).

Illustration: Page 343, Backhouse & Jeanes (1995) - as *T. ixioides* var. *subdifformis*.

Glabrous terrestrial herb. Tubers ovoid to oblong-ovoid, 15-25 cm long, 8-12 mm wide, fleshy. Leaf linear to linear-lanceolate, 10-20 cm long, 5-12 mm wide, erect, canaliculate, fleshy, ribbed dorsally, base reddish, apex acute. Scape 18-30 cm tall, slender to stout, green or brownish, 1-5-flowered. Sterile bracts 2 or 3, lanceolate, 1.5-5.5 cm long, 5-8 mm wide, closely sheathing, acute to acuminate. Fertile bracts lanceolate, 10-30 mm long, 4-6 mm wide, closely sheathing, acuminate. Pedicel 5-30 mm long, slender. Ovary narrowly obovoid, 6-9 mm long, 3-4 mm wide. Flowers 25-35 mm across, pale greyish blue to blue, the petals with coarse dark spots. Dorsal sepal ovate to ovate-lanceolate, 10-13 mm long, 5-7 mm wide, apex apiculate. Lateral sepals asymmetrically ovate-lanceolate 10-13 mm long, 4.5-6 mm wide, apex subobtuse. Petals oblong-elliptical to ovate-elliptical, 11-13 mm long, 4-6 mm wide, apex apiculate. Labellum narrowly ovate-lanceolate to obovate lanceolate, 11-13 mm long, 4-6 mm wide, apex apiculate. Column porrect from the end of the ovary, 4.5-6 mm long, 2.8-3.3 mm wide, bluish white, apex orange or yellow, with a darker reddish subapical collar; post-anther lobe short, the dorsal surface with a central patch of relatively long, erect, crowded, irregular, digitate calli; auxiliary lobes erect or projecting forwards, relatively broad, yellow-tipped, the apical margins irregularly erose; lateral arms obliquely erect, with a relatively sparse terminal tuft of white hairs, the individual trichomes 1-1.5 mm long. Capsules obovoid, 8-11 mm long, 6-8 mm wide, erect, ribbed.

Distribution and ecology: Victoria, Tasmania and possibly South Australia. Grows in heathland, coastal scrub and open forest with a dense shrubby understorey. Often grows on the fringes of small open areas and colonizes track verges and road embankments. Altitude: 0-200 m. Flowering period: October to December.

Biology: This species is facultatively autogamous.

Notes: *Thelymitra juncifolia*, part of the *T. ixioides* complex, can be distinguished by moderately large pale greyish blue to blue flowers; large spots on the dorsal sepal and petals; relatively long digitate calli confined to a

narrow area on the dorsal surface of the column mid-lobe (the whole rim is densely covered with calli in *T. ixioides*); and, relatively sparse hair tufts (dense in *T. ixioides).*

Despite a very confused taxonomic history, the identity of this species is unequivocal. Bentham (1873), treated it as a synonym of *T. ixioides* and was probably influenced in this by the sketch of a column which is found on the bottom of Lindley's type sheet and Gunn's reference to a spotted perianth (see below). Since Bentham's time the species has been variously linked with the *T. ixioides* complex. Clements (1982) treated it as an earlier name for *T. truncata* and this line was followed by Jones (1988) and Weber & Entwisle (1994), whereas Bates & Weber (1990) suggested that the name applied to self-pollinating variants of *T. ixioides*. Other authors have treated it as a poorly known species of doubtful taxonomic status (Backhouse & Jeanes 1995), or have ignored it completely (Curtis 1979).

A sketch of the dorsal view of the expanded column of *T. juncifolia* is present on the bottom of the type sheet in the Lindley herbarium. Although diagrammatic, this shows a column with a reduced mid-lobe with irregular margins, broad auxiliary lobes with irregular to erose apices and hair tufts. Softened columns of the lectotype and the BM isolectotype clearly shows the true identity of *T. juncifolia* as being a relatively widespread and well-marked taxon within the *T. ixioides* complex.

Thelymitra juncifolia has been confused with *T. ixioides* var. *subdifformis* Nicholls (for example Backhouse & Jeanes 1995), but we consider these taxa to be different. The latter, which occurs in south-western Victoria and possibly adjacent areas of South Australia, can be distinguished by winter flowering habit, large (to 45 mm across) flowers, relatively narrow perianth segments, and, bicoloured flowers (green sepals and blue petals).

Thelymitra juncifolia is a distinctive member of the small-flowered taxa which currently shelter under the mantle of *T. ixioides sens. lat.* Further studies are required to determine the status of other apparently unnamed taxa within this group, particularly those from mainland Australia and New Zealand.

Typification: The type sheet of *T. juncifolia* contains two collections both labelled "Circular Head, R. Gunn 936". On the left hand side of the sheet are three flowering specimens dated November 1837, and immediately beneath them is a packet containing a flower; on the right hand side of the sheet, dated December 1837, are two specimens in advanced fruit. On the bottom left-hand side of the sheet is a sketch by Lindley of a column from the rear showing details of the post-anther lobe, auxiliary lobes and hair tufts. Clements reconstituted a flower from each collection and made detailed sketches, the originals of which are held at CANB. He also chose the left hand group of flowering specimens as the lectotype as it appeared that all elements on the LHS of the sheet (specimens, flower in packet and illustration) referred to the one collection (Clements 1989).

The collections on the type sheet are either of two different taxa or were made at different times since one is flowering and the other is close to shedding seed. Clements' sketches show that the flowering specimens, chosen by him as the lectotype, are *T. circumsepta* and the other collection is of a species with a column similar to *T. ixioides*. Clements' choice of a lectotype is in conflict with the protologue in two places; "*purpureis variegatis*" which presumably refers to a spotted perianth since Lindley notes at the bottom of the description "Flowers spotted with dark marks, according to Mr Gunn" and "*centrali granuloso*" which refers to the digitate calli on the dorsal surface of the column, this feature being shown in Lindley's sketch of the column. These ornaments are present in members of the *T. ixioides* group but do not occur in *T. circumsepta*. Based on this evidence the lectotype chosen by Clements is rejected and a second lectotypification is necessary to fix the application of Lindley's name to that described in the protologue.

The isolectotype at BM contains two specimens both in advanced fruit. A flower, reconstituted by Jones, clearly shows large dark spots on the petals and a column identical to that of the new lectotype. This specimen is in excellent condition and its identity is unequivocal.

Conservation status: Widespread, common and well conserved.

Selected specimens: (25 seen):
VICTORIA: Montys Track, S. of Carlisle R., 28 Nov. 1992, *Jones 10844* (CANB); s. of Carlisle R., 30 Nov. 1992, *Jones 10883* (CANB); Rifle Ra., Port Campbell, 12 Nov. 1995, *Rowney (Jones 14633)* (CANB);
TASMANIA: Sisters Hills, 15 Nov. 1992, *Campbell 92265* (CANB); Barbers Bottom, 3 Dec. 1992, *Campbell 92389* (CANB); *ibid*, 3 Dec. 1992, *Campbell 92395* (CANB); c. 1 km S. of Railton, 1 Nov. 1990, *Jones* 6894 (CANB); Railton, Oakden Hill, 7 Nov. 1984, *Moscal 8754* (HO 402736); Bullock Hill, E of Grove, 22 Nov. 1991, *Moscal 21963* (HO 142372); Knocklofty, 27 Oct. 1939, *Olsen 4253* (HO 411696); Maranoa Heights, 3 Nov. 1996, *Rubenach (ORG 404)* (CANB); Eaglehawk Neck, 5 Nov. 1992, *Ziegeler (Jones 10674)* (CANB); Southport Lagoon, 24 Nov. 1994, *Ziegeler (Jones 13735)* (CANB).

16 *Thelymitra longiloba* D.L. Jones & M.A. Clem., *sp. nov.*,
T. mediae R. Br. affinis, sed habitu gracili; folio angusto; floribus 1-6, moderate parvis, tempestati calida lente aperientibus; columna gracili, lobo post antheram abbreviato, callis paucis gracilibus digitatis ornato; columnae lobis auxiliaribus longis, rectis laevibus vel parum erosis; et columnae brachiis oblique rectis caespitibus pilorum comparate dispersorum, differt.

TYPUS: Tasmania, Arthur River Road, at turn-off to lighthouse, 8 Nov. 1997, *J.E. & A. Wapstra (ORG 1021)* (holo CANB; iso HO).

Thelymitra media R. Br. var. *carneo-lutea* Nicholls, *Victorian Naturalist* 60: 56-58, f. A-D (1943).
TYPE: Victoria, swampy land at Tynong North,Oct.-Nov.1941, *J. Leppitt* (holo MEL!).

Illustration: Page 349, Backhouse & Jeanes (1995) - as *T. media* var. *carneo-lutea* Nicholls.

Glabrous terrestrial *herb*. *Tubers* ovoid to oblong-ovoid, 10-20 mm long, 8-10 mm wide, fleshy. *Leaf* linear to linear-lanceolate, 10-25 cm long, 5-10 mm wide, erect, canaliculate, fleshy, ribbed dorsally, apex acute. *Scape* 10-40 cm tall, slender, green or brownish, 1-6-flowered. *Sterile bracts* 2 or 3, narrowly lanceolate, 10-50 mm long, 5-8 mm wide, closely sheathing, acute to acuminate. *Fertile bracts* lanceolate, 10-30 mm long, 4-6 mm wide, closely sheathing, acuminate. *Pedicels* 5-20 mm long, slender. *Ovary* narrowly obovoid, 6-9 mm long, 3-4 mm wide. *Flowers* 18-25 mm across, pale blue to dark blue sometimes pink, unspotted, opening tardily only in hot weather. *Dorsal sepal* oblong-lanceolate, 8-12 mm long, 4-5 mm wide, apex acute to apiculate. *Lateral sepals* asymmetrically narrow-ovate-lanceolate 8-12 mm long, 4.5-5.5 mm wide, apex acute. *Petals* oblong-ovate, 8-12 mm long, 4.5-5.5 mm wide, apex acute to apiculate. *Labellum* narrowly oblong-lanceolate, 11-13 mm long, 4-6 mm wide, apex apiculate. *Column* porrect from the end of the ovary, 5-6 mm long, 2-2.5 mm wide, pinkish or bluish with a dark apical collar, apex yellow; post-anther lobe short, the dorsal surface with few to several short erect digitate calli; auxiliary lobes long and erect, yellow-tipped, the apical margins entire or slightly erose; lateral arms obliquely erect, with a relatively sparse terminal tuft of white hairs, the individual trichomes c. 1 mm long. *Anther* ovate, c. 2.5 mm long, c. 2.4 mm wide. *Pollinarium* c. 2 mm long; viscidium elliptic, c. 0.4 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2 mm long, c. 1.3 mm wide, margins irregular. *Capsules* obovoid, 8-12 mm long, 6-8 mm wide, erect, ribbed.
Fig. 8.1, d-g.

Distribution and ecology: Queensland, New South Wales, southern Victoria and northern and western Tasmania. Grows in coastal and near-coastal sites including coastal headlands, heathland and heathy forest in both well-drained sites and in low-lying swampy areas that may be inundated for part of the year. Soils are sands, sandy loams, clay loams and peaty loams. Altitude: 0-50 m. Flowering period: October to December.

Biology: This species is facultatively autogamous and sometimes also cleistogamous.

Notes: This species is characterised by slender habit; narrow leaf; 1-6 moderately small flowers which open tardily in hot weather; slender column with an abbreviated post-anther lobe adorned with a few slender digitate calli; long erect smooth or slightly erose auxiliary lobes;

and, obliquely erect column arms with relatively sparse hair tufts.

Nicholls (1943) believed this taxon to be related to *T. media* R. Br. and he described it at varietal rank as *T. media* var *carneo-lutea*. This description was based on pink-flowered specimens collected at Tynong North, Victoria. In our experience the flowers of this taxon are usually blue and hence we have chosen to redescribe it using a new type rather than elevate Nicholls inappropriate epithet to specific rank.

The recognition of this species from Queensland is based on a recording in the Flora of South-eastern Queensland (Stanley & Ross 1989) and a photograph in the collection of the National Parks at Girraween. The photograph, an excellent close-up portrayal of a column, was taken by the late Percy Grant in the Wyberba area.

Conservation status: Poorly known overall; suggest 3KC by criteria of Briggs & Leigh (1996).

Etymology: From the Latin *longus*, long, *lobus*, lobe, in reference to the long auxiliary lobes on the column.

Specimens examined:
QUEENSLAND: Wyberba, no date, *Grant* (photo CANB);
NEW SOUTH WALES. just S. of Little Ck, Nadgee Nature Reserve, 21 Oct. 1996, *Jones 14939, Garratt & FitzGerald* (CANB).
VICTORIA: East Wingan, 2 Nov. 1992, *Jeanes (Jones 10589 & 10590)* (CANB);
TASMANIA: Oxberry Rd, near Launceston, 12 Dec. 1992, *Campbell 92464* (CANB); cult. ex Marrawah, 25 Oct. 1997, *Jones 15612* (CANB).

17 ***Thelymitra malvina*** M.A. Clem., D.L. Jones & Molloy, *Austral. Orch. Res.* 1: 141 (1989).
TYPE: Victoria, just S. of Wilkin, c. 21 km NNW. of Dartmoore, 28 Oct. 1985, *G.W. Carr 10423* (holo MEL!, spirit specimen).

Illustration: Page 347, Backhouse & Jeanes (1995).

Distribution and ecology: Queensland, New South Wales, Victoria and Tasmania. Grows in open forest with a heathy understorey and coastal scrubs. Often occurs in sands and sandy loam, less commonly in clay loam. Altitude: 10-200 m. Flowering period: October and November.

Biology: This species is facultatively autogamous.

Notes: Newly recorded for Tasmania. Previously confused with *T. nuda* but distinguished by a smooth, narrow, yellow post-anther lobe on the column and pink to mauve hair tufts.

The flowers are fragrant and may close by midday after opening very early in the day (Backhouse & Jeanes 1995).

Specimens examined:
TASMANIA: Yarra Ck, King Island, 12 Nov. 1993, *Campbell 93140* (CANB); Coles Bay, 11 Nov. 1990, *Jones 7177 & Broers* (CANB); *ibid*, 3 Nov. 1992, *Jones 10599* (CANB); Reedy Lagoon Rd, Flinders Island, 28 Oct. 1992, *Spry* (CANB).

18 ***Thelymitra mucida*** Fitzg., *Gard. Chron. (new ser.)* 17: 495 (1882).
TYPE: Wilsons Inlet, Western Australia, Sept., *R.D. Fitzgerald* (lecto BM!, *fide* George 1971; isolecto NSW!).

Illustration: Page 353, Backhouse & Jeanes (1995).

Distribution and ecology: Victoria, Tasmania, South Australia and Western Australia. Grows in moist to wet low-lying areas and along swamp margins in dense coastal forests, grasslands and heathlands. Soils are usually peaty loams. Altitude: 0-50 m. Flowering period: October and November.

Notes: This species is characterised by moderately small, tardily opening blue flowers with faint but prominent stripes on the perianth segments; deeply cleft post-anther lobe covered with sticky whitish powder; and, yellow hair tufts.

Biology: This species is facultatively autogamous.

Specimens examined:
TASMANIA: Reddins Ck, 20 Nov. 1992, *Jones 10826* (CANB).

19. *Thelymitra nuda* R. Br., *Prodr.* 314 (1810).
TYPE: In pratis dipritis prope Western Arm Port Dalrymple, 5 Jan. 1804, *R. Brown* (lecto specimen a, BM!, *fide* Clements 1989; isolecto BM!, E!, FI!, P!).

Illustration: Page 354, Backhouse & Jeanes (1995).

Distribution and ecology: In the broad sense; Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in open forest and woodland from lowland to montane regions. Altitude: c. 50-800 m. Flowering period: November to January.

Notes: The breeding system of this species is unknown. Most specimens attributed to this species are facultatively autogamous.

Notes: A complex of taxa from Australia which requires detailed study. The type of *T. nuda* is from northern Tasmania. The type specimens are slender and have linear to narrowly linear-lanceolate leaves and two to six flowers which are 20-25 mm across. The column has a slender post-anther lobe and hair tufts which are distinctly brush-like. Gunn, who must have been very familiar with this species notes, "Stem 1-1.5 feet high. Flowers pale blue with a pink shade or of a fine bright pink" [note recorded by Lindley (1840)]. These observations and details gleaned from the types are not consistent with the species as interpreted by most modern flora writers (e.g. Willis 1970, Hardin 1993, Walsh & Entwisle 1994) and orchid specialists (e.g. Rupp 1943, Jones 1988, Bates & Weber 1990, Backhouse & Jeanes 1995).

Specimens examined:
TASMANIA: South Bruny Island, 24 Nov. 1993, *Wapstra* (CANB).

20. *Thelymitra pauciflora* R. Br., *Prodr.* 314 (1810).
TYPE: Port Jackson, between Sydney and Parramatta, moist meadows, Sept.-Oct. 1803, *R. Brown* (lecto specimen a, BM!, *fide* Clements 1989; isolecto BM!, P!).

Illustration: Page 356, Backhouse & Jeanes (1995).

Distribution and ecology: In the broad sense; Queensland, New South Wales, Australian Capital Territory, Victoria, Tasmania and South Australia. Grows in a very wide range of habitats and soil types. Altitude: 0-800 m. Flowering period: September to November.

Biology: This species is facultatively autogamous and frequently also cleistogamous.

Notes: This species is characterised by slender habit; small blue, pink or white flowers which open tardily; tubular, apically notched post-anther lobe which is not inflated; and, mop-like white hair tufts.

Typification: The type sheet contains eight specimens each with one to three flowers and two labels showing different origins, which is why specimen 'a' was designated as the lectotype.

Specimens examined:
TASMANIA: Tam O'Shanter Rd turn-off from Lulworth Rd, 8 Nov. 1990, *Jones 7118 & Broers* (CANB 9614215); Cape Portland, 9 Nov. 1990, *Jones 7120 & Broers* (CANB 9613217); Moorina Cemetery, 9 Nov. 1990, *Jones 7133 & Broers* (CANB 9614230).

21. *Thelymitra polychroma* D.L. Jones & M.A. Clem., *sp. nov.*,
T. truncatae R.S. Rogers affinis, sed habitu gracili; folio angusto; floribus 1-4, parvis, rectis, tempestati frigidula, libenter aperientibus; petalis venis atratis et maculis paucis; columna polychroma, rosea, caerulea, brunnea et flava, caespitibus pilorum cremeorum; lobo post antheram tumido, tubulari, pagina dorsali rugosa, apice vadose lobato; et columnae brachiis brevibus oblique rectis caespitibus pilorum densorum, differt.

TYPUS: Tasmania, Heemskirk Road, N. of Rebbecca Ck, 7 Nov. 1997, *J.E. & A. Wapstra (ORG 1026)* (holo CANB; iso HO).

Illustration: None found.

Glabrous terrestrial *herb*. *Tubers* not seen. *Leaf* narrowly linear to linear, 10-20 cm long, 4-8 mm wide, erect, canaliculate, fleshy, ribbed dorsally; base reddish; apex acute. *Scape* 10-25 cm tall,

slender, green, 1-4-flowered. *Sterile bracts* 2 or 3, narrowly lanceolate, 10-40 mm long, 4-8 mm wide, closely sheathing, acute to acuminate. *Fertile bracts* lanceolate, 10-30 mm long, 3-5 mm wide, closely sheathing, acuminate. *Pedicels* 3-6 mm long, slender. *Ovary* narrowly oblong-obovoid, 6-9 mm long, 2-3 mm wide. *Flowers* upward-facing, 15-20 mm across, blue suffused with mauve, with a few small spots on the petals and darker veins, opening freely in cool weather. *Dorsal sepal* elliptical-obovate, 7-11 mm long, 5-5.5 mm wide; apex apiculate. *Lateral sepals* asymmetrical, oblanceolate, 7-11 mm long, 5-5.5 mm wide; apex apiculate. *Petals* broadly elliptical-obovate, 7-10 mm long, 5-5.5 mm wide; apex apiculate. *Labellum* oblong-obovate, 6-9 mm long, 5-5.2 mm wide, apex apiculate. *Column* porrect from the end of the ovary, 5-5.5 mm long, 2.2-2.6 mm wide, pink or purple; base shiny pink; margins near column arms blue; dorsal part near the apex brown with a darker subtending collar; apex yellow; post-anther lobe swollen, elongate, obliquely erect, more or less tubular; dorsal surface wrinkled; apex irregularly and shallowly lobed; auxiliary lobes absent; lateral arms short, obliquely erect, with a dense terminal tuft of cream hairs, the individual trichomes c. 1 mm long. *Anther* ovate, c. 3 mm long, c. 2.8 mm wide. *Pollinarium* c. 2 mm long; viscidium elliptic, c. 0.5 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2.8 mm long, c. 2.5 mm wide. *Capsules* not seen.
Fig. 8.1, h-j.

Distribution and ecology: Apparently endemic to western Tasmania. Grows in coastal and near-coastal sites on heathland in dark peaty loam. The type collection was made on heathland that was burnt three years previously. Altitude: 0-50 m. Flowering period: November and possibly December.

Biology: The breeding system of this species is unknown.

Notes: This species is characterised by slender habit; narrow leaf; 1-4 moderately small flowers which open freely in cool weather; dark-veined perianth and few small spots on the petals; colourful column in shades of pink, mauve, blue, brown and yellow with cream hair tufts; swollen tubular post-anther lobe with a wrinkled dorsal surface and shallowly lobed apex; and, short obliquely erect column arms with dense cream hair tufts.

The column of this species bears some resemblance to that of *T.* x*truncata* but is much more colourful and with a broader, almost swollen post-anther lobe. The bright yellow post-anther lobe of *T.* x*truncata* is narrower and more distinctly tubular. *Thelymitra polychroma* is not of hybrid origin and is locally common where it occurs. The plants have a very distinctive appearance and are easily recognisable from a distance by their colour and upward-facing flowers (J.E. & A. Wapstra pers. comm.).

Conservation status: Known only from the type locality; suggest 1K by criteria of Briggs & Leigh (1996).

Etymology: From the Greek *polychromus*, many-coloured, in reference to the variety of colours on the column.

Specimen examined: None found.

22. *Thelymitra rubra* Fitzg., *Gard. Chron.* (*new ser.*) 17: 495 (1882);
Thelymitra carnea R. Br. var. *rubra* (Fitzg.) J. Weber & R. Bates, *Fl. S. Austral.* (ed. 3) 1: 455 (1978).
TYPE: Mount Lofty, South Australia, 25 Oct., *R.D. Fitzgerald* (holo BM!).
Thelymitra urnalis Fitzg., *Gard. Chron.* (*new ser.*) 17: 495 (1882).
TYPE: Mount Lofty, South Australia, 25 Oct., *R.D. Fitzgerald* (holo BM!).
Thelymitra elizabethiae F. Muell., *Victorian Naturalist* 7: 116 (1890).
TYPE: Towards the Yarra near Camberwell, Nov. 1890, *J. MacKibbin* (holo MEL!).
Thelymitra rubra Fitzg. var. *magnanthera* Rupp, *Proc. Linn. Soc. New South Wales* 68: 9-10 (1943).
TYPE: New South Wales, Janalli near Como, Aug. 1942, *M. Moodie & H.M.R. Rupp* (holo NSW!).

Illustration: Page 359, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forests, woodland, heathy forest,

coastal scrub and heathland in well-drained to moist sandy loam, gravelly loam, peaty loam and shallow clay loam. Altitude: 0-800 m. Flowering period: September to November.

Biology: This species is facultatively autogamous.

Notes: This species is characterised by slender flexuose reddish scape; moderately large freely opening pink flowers; and broad post-anther lobe and broad toothed column arms.

In many Tasmanian specimens the column arms have a few long yellow strands or lobes which resemble hairs.

Selected specimens: (25 seen):
TASMANIA: Epping Forest, 25 Oct. 1987, *Collier 2994* (HO 409329); 20 km NNW. of Lady Barron, Flinders Island, 26 Oct. 1990, *Collier 4868* (HO 127026); near Patriarch Inlet, Flinders Island, 26 Oct. 1990, *Collier 4880* (HO 127082); St Marys Cemetery, 10 Nov. 1990, *Jones 7146 & Broers* (CANB 9614213); S. outskirts of Bicheno, 11 Nov. 1990, *Jones 7154 & Broers* (CANB 9614251); Leslie Hill, 20 Nov. 1991, *Moscal 21959* (HO 142368).

23. Thelymitra simulata D.L.Jones & M.A. Clem., *sp. nov.*,
T. truncatae R.S. Rogers affinis, sed habitatione montana vel subalpina; columnae lobo post antheram tubulari, pagina dorsali ruminata, ora apicali angusta flava, et collo subapicali lato atro-brunneo-purpureo; et columnae caespitibus pilorum penicillatis densis rectis, differt.

TYPUS: Tasmania, Ben Ridge Road, Paradise Plains, 820 m., 13 Dec. 1997, *J.E. & A. Wapstra (ORG 1077)* (holo CANB; iso HO).

Thelymitra decora auct., non Cheeseman; M.A. Clements, Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 139 (1989).

Illustration: Page 337, Backhouse & Jeanes (1995) - as *T. decora*.

Glabrous terrestrial *herb*. *Tubers* oblong-ovoid, 10-20 mm long, 6-10 mm wide, fleshy. *Leaf* linear-lanceolate, 10-15 cm long, 4-8 mm wide, erect, canaliculate, fleshy, carinate, ribbed dorsally, base reddish, apex acute. *Scape* 15-35 cm tall, slender, brownish, pruinose, 1-6-flowered. *Sterile bracts* 2 or 3, lanceolate, 2.5-5 cm long, 3-7 mm wide, pruinose, closely sheathing, acute to acuminate. *Fertile bracts* oblanceolate, 6-15 mm long, 2-4 mm wide, closely sheathing, acuminate. *Pedicels* 5-10 mm long, slender. *Ovary* narrowly obovoid, 6-9 mm long, 3-4 mm wide. *Flowers* 20-25 mm across, blue, the petals and dorsal sepal with numerous small dark spots, opening tardily in hot weather. *Dorsal sepal* broadly oblong-obovate, 10-13 mm long, 7-8 mm wide, apex subacute. *Lateral sepals* asymmetrically ovate-lanceolate 10-13 mm long, 5.5-6.5 mm wide, apex acute. *Petals* ovate-elliptical, 10-13 mm long, 6-7 mm wide, apex subacute. *Labellum* obovate, 9-12 mm long, 5-6 mm wide, apex subacute to obtuse. *Column* porrect from the end of the ovary, 6-7 mm long, 3-4 mm wide, bluish white, apex yellow, with a broad dark brownish-purple subapical collar; post-anther tubular, rim-like, the dorsal surface ruminate, apex shallowly crenate; auxiliary lobes absent; lateral arms obliquely erect, with a terminal mop-like tuft of white hairs, the individual trichomes c. 1 mm long. *Anther* ovate, c. 2.8 mm long, c. 2.5 mm wide. *Pollinarium* c. 2 mm long; viscidium elliptic, c. 0.5 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2.4 mm long, c. 2.3 mm wide. *Capsules* obovoid, 10-14 mm long, 5-7 mm wide, erect, ribbed.
Fig. 8.2, a-c.

Distribution and ecology: New South Wales, Australian Capital Territory, Victoria and Tasmania. Grows in montane and subalpine areas in woodland and open forest dominated by *Eucalyptus pauciflora* Sieber ex Sprengel and subalpine herbfield and grassland. Soils are stony loam and well-structured brown loam. Altitude: 800-1480 m. Flowering period: December to January.

Biology: This species is facultatively autogamous and frequently also cleistogamous.

Notes: This species is characterised by montane to subalpine habitat; dark spots on the dorsal sepal and petals; tubular column post-anther lobe with a ruminate dorsal surface, a narrow yellow apical rim and a broad dark brownish-purple subapical collar; and, dense erect mop-like hair tufts.

Backhouse & Jeanes (1995) followed Clements (1989) in treating this species as *T. decora* Cheeseman and suggest that it is probably of hybrid origin from crossing between members of the *T. ixioides* and the *T. nuda / pauciflora* complex. Studies by us in the Snowy Mountains, New South Wales and by J.E. & A. Wapstra in Tasmania show that this species is not of hybrid origin as it grows in substantial numbers either by itself or with one other species (a member of the *T. megcalyptra* complex in the Snowy Mountains; *T.* aff *ixioides* in Tasmania). Its frequency, lack of putative parents and its apparent stability do not support the notion of hybridity.

Although it has been placed with *T. decora* (Clements 1989), this Australian species lacks a name and is here described. *Thelymitra decora* is in fact a synonym of *T. nervosa* Colenso and is endemic to New Zealand (Molloy, Clements & Jones in prep.).

Conservation status: Widespread, locally common and conserved.

Etymology: From the Latin *simulatus*, to imitate or copy, in reference to the similarity of this species to *T.* x*truncata*.

Specimens examined:
NEW SOUTH WALES: Tantangara Dam Rd, 13 Dec. 1997, *Jones 15648* (CANB);
AUSTRALIAN CAPITAL TERRITORY: Mt Franklin, 30 Dec. 1989, *Jones 5596* (CANB);
TASMANIA: Ben Ridge Rd, Paradise Plains, 9 Dec. 1997, *M. Wapstra (ORG 1069)* (CANB).

24. *Thelymitra spadicea* D.L. Jones & M.A. Clem., *sp. nov.*,
T. truncatae R.S. Rogers, affinis, sed habitu gracili; folio angusto; floribus 1-4, moderate parvis, tempestati calida libenter aperientibus; petalis maculis paucis parvis; columna brevi, lobo post antheram elongato, tubulari, pro parte maxima brunneo, apice pallido; et columnae brachiis brevibus, porrectis, caespitibus pilorum densorum, differt.

TYPUS: Tasmania, Anthony Beach, Stanley, 9 Nov. 1997, *J.E. & A. Wapstra (ORG 1032)* (holo CANB; iso HO).

Illustration: None found.

Glabrous terrestrial *herb*. *Tubers* narrowly oblong-obovoid, 10-16 mm long, 5-8 mm wide, fleshy. *Leaf* narrowly linear to linear, 10-22 cm long, 4-8 mm wide, erect, canaliculate, fleshy, ribbed dorsally; base reddish; apex acute. *Scape* 10-25 cm tall, slender, green, 1-4-flowered. *Sterile bracts* 2 or 3, narrowly lanceolate, 10-40 mm long, 4-8 mm wide, closely sheathing, acute to acuminate. *Fertile bracts* lanceolate, 10-30 mm long, 3-5 mm wide, closely sheathing, acuminate. *Pedicels* 3-6 mm long, slender. *Ovary* narrowly oblong-obovoid, 6-9 mm long, 2-3 mm wide. *Flowers* 16-22 mm across, blue with a few small spots on the petals and labellum, opening reasonably freely in hot weather. *Dorsal sepal* broadly elliptical-obovate, 7-11 mm long, 5-6 mm wide; apex apiculate. *Lateral sepals* asymmetrical, broadly elliptical-obovate, 7-11 mm long, 4.5-5.5 mm wide; apex apiculate. *Petals* broadly elliptical-obovate, 7-11 mm long, 5.5-6 mm wide; apex apiculate. *Labellum* broadly obovate, 8-12 mm long, 5.5-6.5 mm wide; apex apiculate. *Column* porrect from the end of the ovary, 4-4.5 mm long, 2.2-2.5 mm wide, whitish or bluish; dorsal part near the apex brown with a blue subtending collar; apex light yellow; post-anther lobe elongate, more or less tubular; dorsal surface smooth; apex irregularly and shallowly lobed; accessory lobes absent; lateral arms short, porrect, with a dense terminal tuft of white hairs, the individual trichomes c. 1 mm long. *Anther* ovate, c. 2 mm wide, c. 1.6 mm wide. *Pollinarium* c. 1.5 mm long; viscidium elliptic, c. 0.5 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2 mm long, c. 1.3 mm wide. *Capsules* obovoid, 7-10 mm long, 6-8 mm wide, erect, ribbed. **Fig. 8.2, d-f.**

Distribution and ecology: Apparently endemic to northern and western Tasmania. Grows in coastal and near-coastal sites including coastal headlands, heathland and heathy forest in somewhat moist sandy loams and peaty loams. Altitude: 0-50 m. Flowering period: November and possibly December.

Biology: This species is facultatively autogamous.

Notes: This species is characterised by slender habit; narrow leaf; 1-4 moderately small flowers which open reasonably freely in hot weather; few small spots on the petals and labellum; short column with an elongated tubular post-anther lobe which is mostly brown with a pale apex; and, short porrect column arms with dense hair tufts.

The column of this species bears a close resemblance to that of *T.* x*truncata* which is purported to be a sporadic natural hybrid between member(s) of the *T. ixioides* and *T. pauciflora* complexes (Weber & Bates 1990, Backhouse & Jeanes 1995). *Thelymitra* x*truncata* however can be recognised by a bright yellow post-anther lobe which is finely toothed at the apex and with low ridges or tubercles on the dorsal surface. *Thelymitra spadicea* is not of hybrid origin and is locally common where it occurs (J.E. Wapstra pers. comm.).

Conservation status: Poorly known overall; suggest 2K by criteria of Briggs & Leigh (1996).

Etymology: From the Latin *spadicea*, brown like a date, in reference to the dominant colour of the post-anther lobe.

Specimens examined:
TASMANIA: Sundown Tk, near Rebecca Ck, 7 Nov. 1997, *Wapstra (ORG 1024)* (CANB); Arthur River Road, at turn-off to lighthouse, 8 Nov. 1997, *Wapstra (ORG 1022)* (CANB).

25. *Thelymitra sparsa* D.L. Jones & M.A. Clem., *sp. nov.*,
T. ixioidi Sw. affinis, sed florescentia serotina; habitu gracilissimo; folio angusto; floribus 1-6, moderate grandibus, tempestati calida libenter aperientibus; columna brevi, lobo post antheram, abbreviato, callis paucis gracilibus digitatis ornato; columnae lobis auxiliaribus brevibus, rectis, angustis; et columnae brachiis porrectis caespitibus pilorum sparsissimorum, differt.

TYPUS: Tasmania, Snug Plains, 13 Jan. 1997, *J.E. & A. Wapstra (ORG 520)* (holo CANB; iso HO).

Illustration: None found.
Glabrous terrestrial *herb*. *Tubers* not seen. *Leaf* linear to linear-lanceolate, 6-25 cm long, 2-5 mm wide, erect, canaliculate, fleshy, ribbed dorsally, apex acute. *Scape* 10-25 cm tall, slender, green or brownish, 1-6-flowered. *Sterile bracts* 2 or 3, narrowly lanceolate, 15-50 mm long, 5-8 mm wide, closely sheathing, acute to acuminate. *Fertile bracts* lanceolate, 10-30 mm long, 4-6 mm wide, closely sheathing, acuminate. *Pedicels* 5-10 mm long, slender. *Ovary* narrowly obovoid, 6-9 mm long, 3-4 mm wide. *Flowers* 25-30 mm across, blue, with a few dark spots on the dorsal sepal and petals, the exterior surface of the sepals with a thickened greenish band, opening freely only in hot weather. *Dorsal sepal* ovate-lanceolate to oblong-lanceolate, 11-15 mm long, 4-6 mm wide, apex apiculate. *Lateral sepals* asymmetrical, ovate-lanceolate to oblong-lanceolate, 11-15 mm long, 4.5-5.5 mm wide, apex apiculate. *Petals* oblong-ovate, 10-14 mm long, 4.5-5.5 mm wide, apex obtuse to apiculate. *Labellum* narrowly elliptical-lanceolate, 9-13 mm long, 4-6 mm wide, apex apiculate. *Column* porrect from the end of the ovary, 4.5-5 mm long, 2.3-2.6 mm wide, bluish with a dark blue and brown apex and a protruding yellow central lobe; post-anther lobe short, the dorsal surface with few to several short erect digitate calli; auxiliary lobes short and erect, yellow-tipped, the apical margins shallowly lobed; lateral arms porrect, with an extremely sparse terminal tuft of white hairs, often as few as five trichomes, the individual trichomes c. 1 mm long. *Anther* ovate, c. 2.5 mm long, c. 2 mm wide. *Pollinarium* c. 2 mm long; viscidium elliptic, c. 0.5 mm long; pollinia white, mealy. *Stigma* ovate-quadrate, c. 2.4 mm long, c. 1.5 mm wide. *Capsules* obovoid, 8-12 mm long, 6-8 mm wide, erect, ribbed. **Fig. 8.2, g-i.**

Distribution and ecology: South-eastern Tasmania where known only from Snug Plains and the Wellington Range. Grows in low scrub mixed with areas dominated by rushes and sedges or grasses. Soils are stony clay loams developed on dolerite. Altitude: 600 - 700 m. Flowering period: December and January.

Biology: This species is facultatively autogamous and perhaps also occasionally cleistogamous.

Notes: This montane species is characterised by late-flowering period; very slender habit; narrow leaf; 1-6 moderately large spotted

flowers which open freely only in hot weather; short column with an abbreviated post-anther lobe adorned with a few to several slender digitate calli; short, erect, narrow auxiliary lobes; and, porrect column arms with very sparse hair tufts.

Conservation status: Poorly known; suggest 2K by criteria of Briggs & Leigh (1996).

Etymology: From the Latin *sparsus*, sparse, in reference to the very sparse hair tufts on the column.

Specimen examined:
TASMANIA: Jefferys Track, Wellington Ra., 15 Jan. 1997, *Wapstra (ORG 531)* (CANB).

26. *Thelymitra* x*truncata* R.S. Rogers., *Trans. & Proc. Roy. Soc. South Australia* 38: 343, t.17 (1917);
Thelymitra ixioides Sw. var. *truncata* (R.S. Rogers) Nicholls, *Victorian Naturalist* 60: 55 (1943).
TYPE: South Australia, Myponga, 29 Oct. 1917, *R.S. Rogers* (holo AD!).
Thelymitra decora auct., non Cheeseman; Weber & Bates in Black, *Flora of South Australia*, ed. 3: 456 (1978).

Illustration: Page 360, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria, Tasmania and South Australia. Grows in open forest, heathy open forest and heathland, sometimes in moist soils. Soils include sands, sandy loam, stony loam and clay loam.

Notes: This taxon, which was described from material collected at Myponga, South Australia, is a putative natural hybrid between member(s) of the *T. pauciflora* and *T. ixioides* complexes (McAlpine 1978, Weber & Bates 1990). When describing the taxon, Rogers (1917) recorded it as being very rare. It is characterised by few-flowered inflorescence; small tardily opening blue flowers which have a few spots on the petals and labellum; short, tubular, bright yellow column post-anther lobe with a truncate finely toothed apex; and, a few tubercles or ridges on the dorsal surface of the column.

This hybrid appears to be very rare in Tasmania and two new species described in this paper, viz. *T. simulata* & *T. spadicea*, were more than likely confused with it.

Specimens examined:
TASMANIA: Waterworks, 20 Nov. 1991, *Collier 5325* (HO 411282); Bruny Island, 20 Nov. 1992, *Jones 10794* (CANB); overlooking Cloudy Bay, Bruny Island, 10 Nov. 1994, *Jones 13689* (CANB); South Arm, 2 Nov. 1996, *Wapstra (ORG 398)* (CANB).

27. *Thelymitra versicolor* Lindl., Gen. sp. Orchid. Pl. 520 (1840).
TYPE: Tasmania, Circular Head, Dec. 1837, *R. Gunn 943* (holo K-L!).

Distribution and ecology: Endemic to Tasmania. A poorly known and overlooked species. Known only from the type collection but probably occurs widely in northern coastal areas. Flowering period: December.

Biology: The breeding system of this species is unknown.

Notes: This species is characterised by short (15-20 cm) scapes; narrow leaf; two to four flowers about 30 mm across; relatively narrow perianth segments; and, a distinctly enlarged post-anther lobe.

Clements (1989) reduced this species to a synonym of *T. nuda*. Lindley was in no doubt as to the distinctiveness of this species and his view is supported by the four well-pressed specimens which constitute the type. Lindley's diagnosis was "linear leaves, few-flowered raceme, flowers spreading, hood lobes pedicellate, hairy, intermediate bilobed, margins inflexed". He also noted "A smaller plant than *T. nuda*, with very narrow leaves, and a stem not more than a span high". Presumably Lindley chose the epithet "versicolor" because the species can have either pink or blue flowers.

This species needs to be looked for in northern areas.

EXCLUDED TAXA

Thelymitra canaliculata R.Br., *Prodr.* 314 (1810). TYPE: Found at a swamp in Princess Royals Harbour, King Georges Sound, South West of New Holland, Dec. 1801, *F. Bauer* (lecto specimen a, BM!, *fide* Clements 1989; isolecto BM!, E!, icon BM!).
Illustration: Page 257, Hoffman & Brown (1992).

Notes: Endemic to south-western Western Australia. Differs from *T. azurea* by its column having three flat folded lobes (rod-like in *T. azurea*).

Thelymitra* x*chasmogama R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 51: 4 (1927).
TYPE: South Australia, Golden Grove, 23 Oct. 1921,*R.S. & J. Rogers 4781* (holo AD!).

Illustration: Page 334, Backhouse & Jeanes (1995).

Notes: A natural hybrid between *T. luteocilium* Fitzg. (which does not occur in Tasmania) and *T. nuda*. Occurs in Victoria and South Australia.

Thelymitra luteocilium Fitzg., *Gard. Chron.* (new ser.) 17: 495 (1882).
TYPE: Mount Lofty, South Australia, Oct., *R.D. Fitzgerald* (holo BM!).

Illustration: Page 344, Backhouse & Jeanes (1995).

Notes: Occurs in Victoria and South Australia. Tasmanian records for the species appear to be based on unusual specimens of *T. rubra* which have a few yellow cilia on the column arms.

Thelymitra* x*macmillanii F. Muell., *Fragm.* 5: 93 (1865).
TYPE: Port Phillip Bay, near Mount Eliza and Mount Martha, 1865, *T. McMillan* (holo MEL!).

Illustration: Page 346, Backhouse & Jeanes (1995).

Notes: A natural hybrid between *T. antennifera* and either *T. megcalyptra* or *T. nuda*. No Tasmanian collections occur in herbaria, however there is no reason why this or similar hybrids should not occur in the state, at least involving variants of the *T. nuda* complex as one parent.

Thelymitra media R. Br., *Prodr.* 314 (1810).
TYPE: Port Jackson, Parramatta, Nov. 1803, *R. Brown* (lecto specimen a, BM!, *fide* Clements 1989; isolecto BM!).
Illustration: Page 350, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria and New Zealand. Grows in open forest, coastal scrubs and heathland. Altitude: 5-800 m. Flowering period: October to December.

Notes: Recorded from Tasmania (Curtis 1979) but specimens from this state are referable to *T. improcera and T. longiloba*. New Zealand specimens, previously confused with *T. aemula* Cheeseman are this species. A number of specimens identified as *T. media* in Tasmania are actually *T. circumsepta*, indicating some confusion by collectors.

Thelymitra megcalyptra Fitzg., *Austral. orch.* 1(5): t.2 (1879).
Thelymitra aristata Lindl. var. *megcalyptra* (Fitzg.) Nicholls in J.M. Black, *Fl. S. Austral.* ed. 2, 1:215 (1943).
TYPE: New South Wales, Deniliquin, Oct, *R.D. Fitzgerald* (lecto BM!, *fide* Clements 1989).

Illustration: Page 351, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria and South Australia. Grows in open forest, woodland, grassland and mallee shrublands, in sandy loam, gravelly loam and clay loam. Altitude: 10-300 m. Flowering period: September and October.

Notes: This species is recorded from Tasmania by Curtis (1979), but specimens from that state are different (see *T. imbricata*). *Thelymitra megcalyptra* is a robust species of inland regions of mainland Australia and has a large thick leaf and large (to 45 mm across) flowers, broad perianth segments which overlap at the base and a prominently enlarged or inflated post-anther lobe.

Thelymitra* x*merraniae Nicholls, *Victorian Naturalist* 46: 139-141, t. (1929);
T. ixioides Sw. forma *merraniae* (Nicholls) Nicholls, *Orchids Austral*. 1, t. 7 (1951).
TYPE: Victoria, Moggs Ck, Airey's Inlet, 6 Nov. 1929, *M. Sutherland* (holo MEL!; iso NSW!).

Illustration: Page 352, Backhouse & Jeanes (1995).

Distribution and ecology: New South Wales, Victoria and South Australia. Recorded from Tasmania by Curtis (1979) but confirmatory specimens are lacking. Grows in heathland and heathy forests in moist to well-drained sandy loam and clay loam. Altitude: 0-100 m. Flowering period: October and November.

Notes: A rare taxon which is a putative natural hybrid either resulting from a primary cross between a small-flowered variant of *T. ixioides* and a member of the *T. pauciflora / nuda* group or as the result of a backcross between a similar hybrid (such as *T.* x*truncata*) and a *T. ixioides* variant (Nicholls 1943, McAlpine 1978). It is characterised by an elongated, rim-like post-anther lobe.

Thelymitra pulchella Hook. f., *Fl. Nov.-zel.* 1: 206 (1853).
TYPE: Northern and Middle Island, *W. Colenso* (lecto K!, *fide* Clements 1989).

Distribution and ecology: Endemic to New Zealand. Grows in a range of habitats including swamps, moist areas of montane forests and in moist to wet areas of subalpine herbfield in peaty loams. Flowering period: November to January.

Notes: A complex of more than one taxon currently under study in New Zealand. Several names have been applied to members of this complex and their application needs to be resolved.

Thelymitra venosa R. Br., *Prodr*. 314 (1810).
TYPE: Port Jackson, Marshes towards Botany Bay, Oct.-Nov. 1803, *R. Brown* (lecto specimen a BM!, *fide* Clements 1989; isolecto BM!).

Illustration: Plate 49, Bishop (1996).

Notes: Endemic to central areas of New South Wales. Frequently confused with *T. cyanea* which is a much more widespread, common and familiar species.

ACKNOWLEDGEMENTS

As for paper 1 in this series. We also acknowledge the directors of the following additional herbaria for help with access to collections of *Thelymitra*: E, FI, G, LINN, LIV, P, W, and Z. Lyn Craven and Andrew Lyne commented on the manuscript.

REFERENCES

- Backhouse, G. & Jeanes, J, (1995). *The Orchids of Victoria*. (Miegunyah Press, Carlton).
- Bates, R.J. (1978). Pollination of Orchids - 9. *Native Orchid Soc. S. Australia Newsletter* 2(8): 7-8.
- Bates, R. & Weber, J. (1990). *Orchids of South Australia*. (Government printer, South Australia).
- Bentham, G. (1873). *Flora Australiensis* vol. 6: 318 (L. Reeve & Co, London).
- Bernhardt, P. & Burns-Balogh, P. (1986). Floral Mimesis in *Thelymitra nuda* (Orchidaceae). *Pl. Syst. Evol*. 151: 187-202.
- Burns-Balogh, P. & Bernhardt, P. (1985). Evolutionary trends in the androecium of the Orchidaceae. *Pl. Syst. Evol*. 151: 40-66.
- Bishop, A. (1996). Field Guide to the Orchids of New South Wales and Victoria. (University of New South Wales Press, Sydney).

- Briggs, J.D and Leigh, J.H. (1996). *Rare or Threatened Australian Plants*, Revised Edition. (CSIRO and Australian Nature Conservation Agency).
- Buchanan, A.M. (1995). *A Census of the Vascular Plants of Tasmania*, Tasmanian Herbarium Occasional Publication No. 5.
- Cheeseman, T.F. (1881). On the fertilization of *Thelymitra*. *Trans. Proc. New Zealand Inst.* 13: 291-296.
- Clements, M.A. (1982). *Preliminary checklist of Australian Orchidaceae.* (National Botanic Gardens, Canberra).
- Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Australian Orchid Research* 1: 1-160.
- Clements, M.A. & Cribb, P. (1985). Australian Orchids in the J.E. Smith Herbarium. *Kew Bull.* 40(3): 649-655.
- Cropper, S.C. & Calder, D.M. (1990). The floral biology of *Thelymitra epipactoides* (Orchidaceae), and the implications of pollination by deceit on the survival of this rare orchid. *Pl. Syst. Evol.* 170: 11-27.
- Curtis, W.M. (1979). *The Student's Flora of Tasmania. Part 4A*. (Government Printer, Hobart).
- Dafni, A. & Calder, D.M. (1987). Pollination by deceit and floral mimesis in *Thelymitra antennifera* (Orchidaceae). *Pl. Syst. Evol.* 158: 11-22.
- Fitzgerald, R.D. (1875-1895). *Australian Orchids* vol. 1 & 2. (Government Printer, Sydney).
- George, A.S. (1971). A Checklist of the Orchids of Western Australia. *Nuytsia* 1(2): 166-196.
- Hardin, G. (ed.) (1993). *Flora of New South Wales*, vol. 4. (New South Wales University Press, Sydney).
- Hoffman, N. & Brown, A. (1992). *Orchids of South-west Australia*. (University of Western Australia Press).
- Jones, D.L. (1971). A study of the self-pollination of *Thelymitra venosa* R. Br. and some notes on its implications. *Victorian Naturalist* 88: 217-219.
- Jones, D.L. (1988). *Native Orchids of Australia*. (Reed Books, Frenchs Forest).
- Lindley, J. (1840). *The Genera and Species of Orchidaceous Plants.* (1963 reprint A. Asher & Coy, Amsterdam).
- McAlpine, D.K. (1978). On the status of *Thelymitra truncata* Rogers. *The Orchadian* 5(12): 179-181.
- Moore, L. & Edgar, E. (1970). *Flora of New Zealand, vol. 2* (Government Printer, Wellington).
- Nicholls, W.H. (1943). Our perplexing sun orchids. *Victorian Naturalist* 60: 55-58.
- Nicholls, W.H. (1969). *Orchids of Australia* (Thomas Nelson, Melbourne).
- Rupp, H.M.R. (1943). *The Orchids of New South Wales.* (Australian Medical Publishing Coy, Sydney).
- Stanley, T.D. & Ross, E.M. (1989). *Flora of South-eastern Queensland, vol. 3*: 391 (Queensland Department of Primary Industries, Brisbane).
- Weber, J.Z. & Entwisle, T.J. (1994) in Walsh, N.G. & Entwisle, T.J. (1994). *Flora of Victoria*, vol. 2, (Inkata Press, Melbourne).
- Willis, J.H. (1970). *A Handbook to Plants in Victoria.* Vol. 1 (2nd edition). (Melbourne University Press, Carlton).

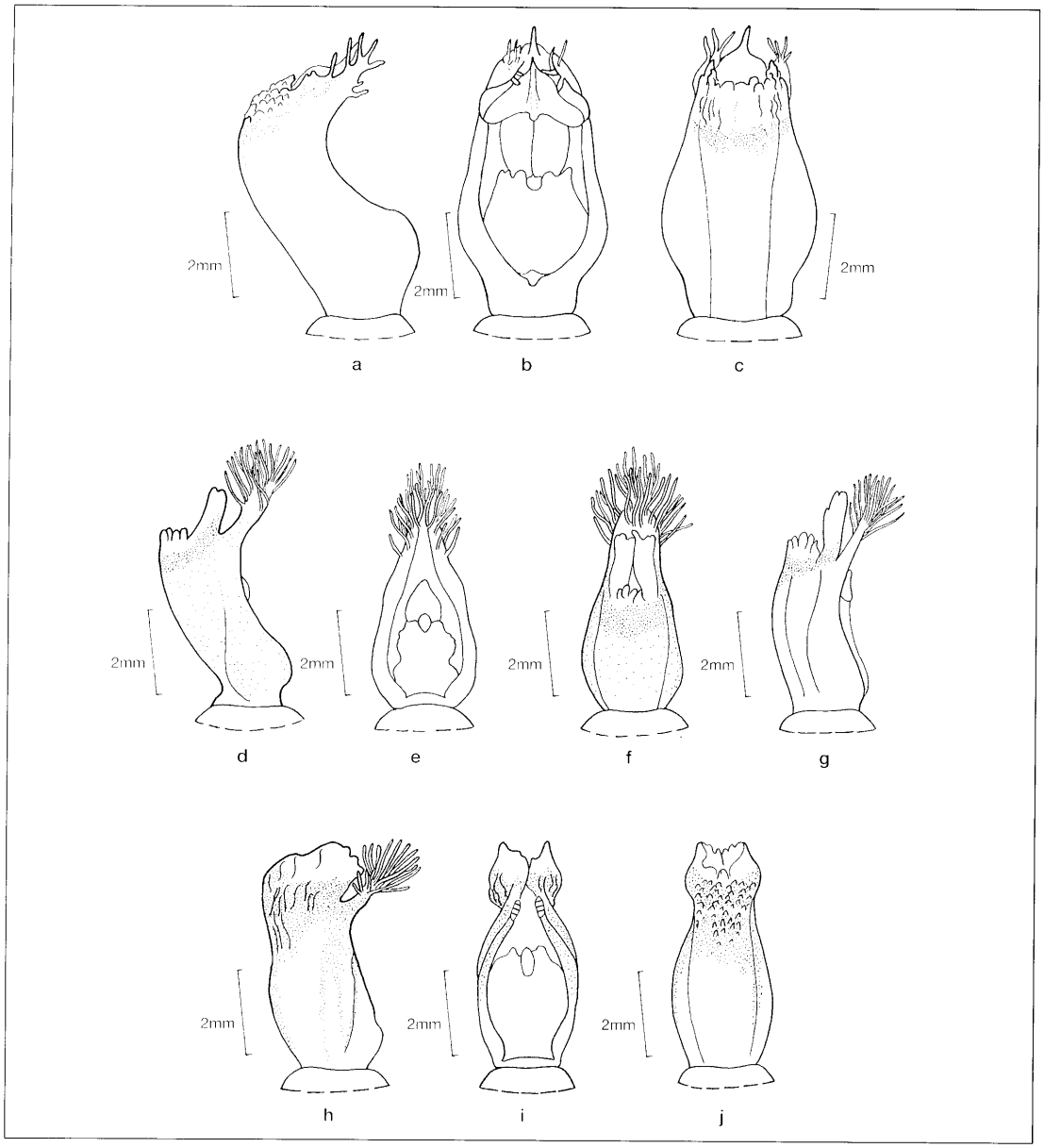


Fig. 8.1

Thelymitra erosa, Blackmans Bay, Tas., *J.E. & A. Wapstra (ORG 57)* - drawn from the type collection. a. column from side; b. column from front; c. column from rear.

Thelymitra longiloba, d-f from Nadgee Nature reserve, *Jones 1493*; g. from the type collection Arthur R. Rd, Tasmania, *J.E. & A. Wapstra (ORG 1021)*. d. column from side; e. column from front; f. column from rear; g. column from side.

Thelymitra polychroma, Heemskirk Rd, Tasmania, *J.E. & A. Wapstra (ORG 1026)* - drawn from the type. h. column from side; i. column from front, hair tufts removed; j. column from rear.

Drawing by D.L. Jones.©

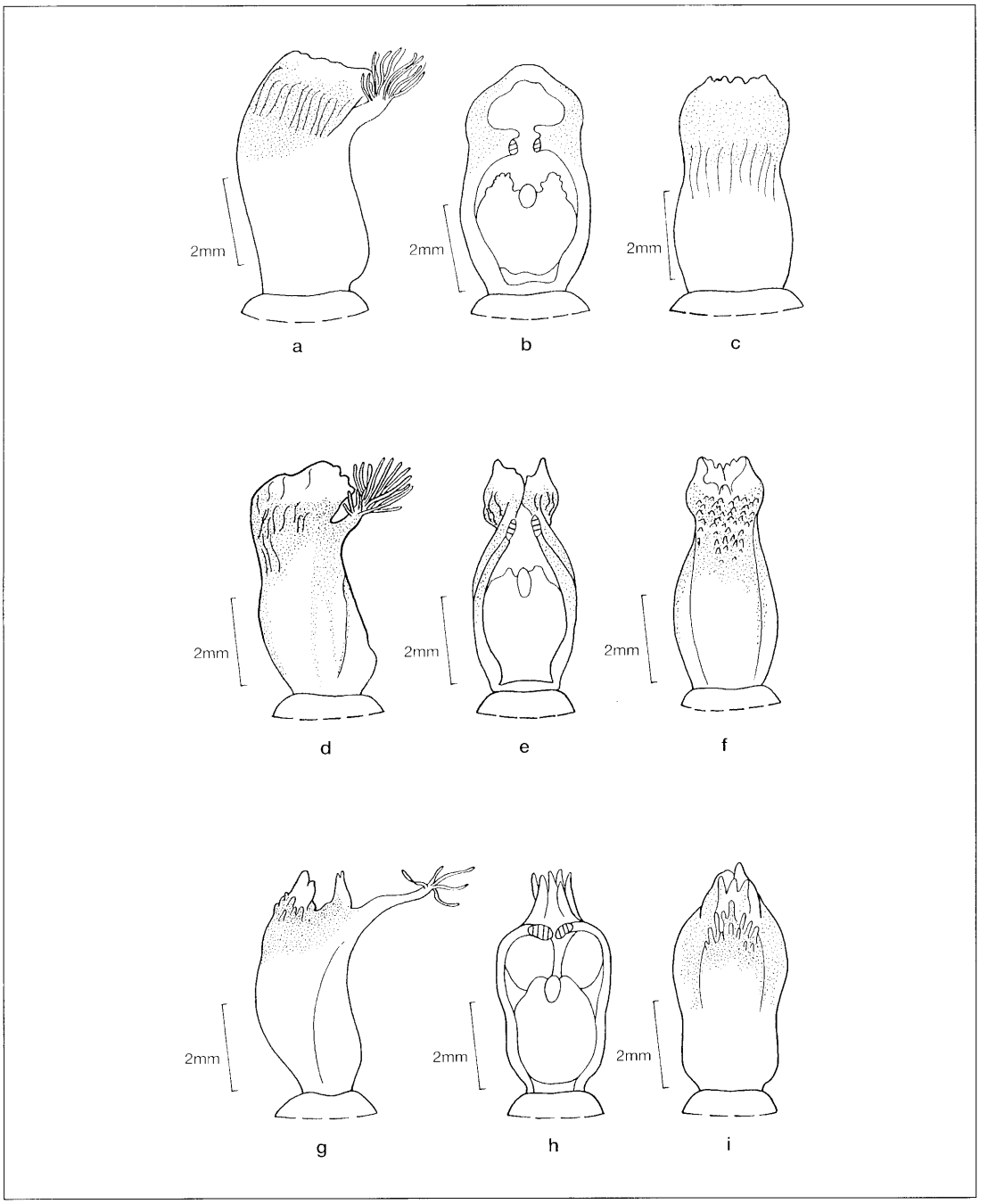


Fig. 8.2

Thelymitra simulata, Paradise plains, Tasmania, *J.E. & A. Wapstra (ORG 1077)* - drawn from the type. a. column from side; b. column from front, hair tufts removed; c. column from rear.
Thelymitra spadicea, Anthony Beach, Tasmania, *J.E. & A. Wapstra (ORG 1032)* - drawn from the type. d. column from side; e. column from front, hair tufts removed; f. column from rear.
Thelymitra sparsa, Snug Plains, Tasmania, *J.E. & A. Wapstra (ORG 520)* - drawn from the type. g. column from side; h. column from front, hair tufts removed; i. column from rear.
Drawing by D.L. Jones.©

CONTRIBUTIONS TO TASMANIAN ORCHIDOLOGY - 9:

A Checklist of Tasmanian Orchidaceae

David L. Jones
Centre for Plant Biodiversity Research, Australian National Herbarium,
GPO Box 1777, Canberra, Australian Capital Territory, Australia, 2601.

ABSTRACT

A checklist of the orchidaceae of Tasmania is presented. The Tasmanian flora contains 191 taxa (186 species, 2 subspecies, 3 named hybrids) of Orchidaceae in 29 genera.

Acianthus R. Br., *Prodr.* 321 (1810).
- ***A. caudatus*** R. Br., *Prodr.* 321 (1810).
- ***A. pusillus*** D.L. Jones, *Austral. Orch. Res.* 2: 7-8 (1991).

Arthrochilus F. Muell., *Fragm.* 1: 42 (1858).
- ***A. huntianus*** (F. Muell.) Blaxell, *Contr. N.S.W. Natl. Herb.* 4: 277 (1972), subsp. ***huntianus***.
- ***A. huntianus*** subsp. ***nothofagicola*** D.L. Jones, *Austral. Orch. Res.* 3: 3 (1998).

Burnettia Lindl., *Gen. sp. orchid. pl.* 517 (1840).
- ***B. cuneata*** Lindl., *Gen. sp. orchid. pl.* 518 (1840).

Caladenia R. Br., *Prodr.* 323 (1810).
- ***C. alata*** R. Br., *Prodr.* 324 (1810).
- ***C. alpina*** R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 51: 12 (1927).
- ***C. angustata*** Lindl., *Gen. sp. orchid. pl.* 420 (1840).
- ***C. anthracina*** D.L. Jones, *Austral. Orch. Res.* 3: 21 (1998).
- ***C. atrata*** D.L. Jones, *Muelleria* 8(2): 178-181 (1994).
- ***C. atrochila*** D.L. Jones, *Austral. Orch. Res.* 3: 23 (1998).
- ***C. aurantiaca*** (R.S. Rogers) Rupp, *Proc. Linn. Soc. New South Wales* 71: 280 (1947).
- ***C. australis*** G.W. Carr, *Indigenous Flora & Fauna Association Misc. Paper* No. 1: 2 (1991).
- ***C. brachyscapa*** G.W. Carr, *Muelleria* 6(6): 439-442 (1988).
- ***C. campbellii*** D.L. Jones, *Austral. Orch. Res.* 3: 25 (1998).
- ***C. cardiochila*** Tate, *Trans. & Proc. Roy. Soc. South Australia* 9: 60, t.2 (1887).
- ***C. carnea*** R. Br., *Prodr.* 324 (1810).
- ***C. caudata*** Nicholls, *Victorian Naturalist* 64: 231 (1948).
- ***C. clavigera*** A. Cunn. ex Lindl., *Gen. sp. orchid. pl.* 422 (1840).
- ***C. congesta*** R. Br., *Prodr.* 324 (1810).
- ***C. cracens*** D.L. Jones, *Muelleria* 9: 46-48 (1996).
- ***C. deformis*** R. Br., *Prodr.* 324 (1810).
- ***C. dienema*** D.L. Jones, *Austral. Orch. Res.* 3: 28 (1998).
- ***C. dilatata*** R. Br., *Prodr.* 325 (1810).
- ***C. echidnachila*** Nicholls, *Pap. & Proc. Roy. Soc. Tasmania* 1932: 13, t.6 (1933).
- ***C. filamentosa*** R. Br., *Prodr.* 324 (1810) var. ***filamentosa***.
- ***C. fuscata*** (Rchb. f.) M.A. Clem. & D.L. Jones, *Austral. Orch. Res.* 1: 25 (1989).
- ***C. gracilis*** R. Br., *Prodr.* 324 (1810).
- ***C. helvina*** D.L. Jones, *Austral. Orch. Res.* 2: 26, f.30 (1991).

C. latifolia R. Br., *Prodr.* 324 (1810).
C. lindleyana (Rchb. f.) M.A. Clem. & D.L. Jones, *Austral. Orch. Res.* 1: 27 (1989).
C. mentiens D.L. Jones, *Austral. Orch. Res.* 3: 35 (1998).
C. pallida Lindl., *Gen. sp. orchid. pl.* 421 (1840).
C. patersonii R. Br., *Prodr.* 324 (1810).
C. pusilla W.M. Curtis, *Student's Fl. Tas.* 4a: 133 (1979).
C. saggicola D.L. Jones, *Austral. Orch. Res.* 3: 39 (1998).
C. sylvicola D.L. Jones, *Austral. Orch. Res.* 3: 40 (1998).
C. tonellii D.L. Jones, *Austral. Orch. Res.* 3: 41 (1998).
C. transitoria D.L. Jones, *Austral. Orch. Res.* 3: 42 (1998).
C. vulgaris D.L. Jones, *Austral. Orch. Res.* 2: 34-35, f.41 (1991).

X ***Calassodia*** M.A. Clem., *Austral. Orch. Res.* 1: 33 (1989).
X***C. tutelata*** (R.S. Rogers) M.A. Clem., *Austral. Orch. Res.* 1: 33 (1989).

Caleana R. Br., *Prodr.* 329 (1810).
C. major R. Br., *Prodr.* 329 (1810).
C. minor R. Br., *Prodr.* 329 (1810).

Calochilus R. Br., *Prodr.* 320 (1810).
C. campestris R. Br., *Prodr.* 320 (1810).
C. herbaceus Lindl., *Gen. sp. orchid. pl.* 459 (1840).
C. paludosus R. Br., *Prodr.* 320 (1810).
C. robertsonii Benth., *Fl. Austral.* 6: 315 (1873).

Chiloglottis R. Br., Prodr. 322 (1810).
C. cornuta Hook. f., *Fl. antarct.* 1: 69 (1844).
C. grammata G.W. Carr, *Indigenous Flora & Fauna Association Misc. Paper* No.1: 21 (1991).
C. gunnii Lindl., *Gen. sp. orchid. pl.* 387 (1840).
C. reflexa (Labill.) Druce, *Rep. Bot. Exch. Cl. Brit. Isles* Suppl. 2: 614 (1917).
C. trapeziformis Fitzg., Austral. orch. 1(3): t. 9 (1877).
C. triceratops D.L. Jones, *Austral. Orch. Res.* 3: 66 (1998).
C. trilabra Fitzg., *J. Bot.* 21: 204 (1883).

Corybas Salisb., *Parad. Lond.* 2: t. 83 (1807).
C. aconitiflorus Salisb., *Parad. Lond.* 2: t. 83 (1807).
C. diemenicus (Lindl.) Rchb. f., *Beitr. Syst. Pflanzenk.* 42 (1871).
C. dienemus D.L. Jones, *Fl. Austral.* 50: 572 (1993).
C. fimbriatus (R. Br.) Rchb. f., *Beitr. Syst. Pflanzenk.* 42 (1871).
C. fordhamii (Rupp) Rupp, *Victorian Naturalist* 59: 61 (1942).
C. incurvus D.L. Jones & M.A. Clem., *Kew Bull.* 43(1): 135-137 (1988).
C. unguiculatus (R. Br.) Rchb. f., *Beitr. Syst. Pflanzenk.* 43 (1871).

Cryptostylis R. Br., *Prodr.* 317 (1810).
C. leptochila Benth., *Fl. Austral.* 6: 334 (1873).
C. subulata (Labill.) Rchb. f., *Beitr. Syst. Pflanzenk.* 15 (1871).

Cyrtostylis R. Br., *Prodr.* 322 (1810).
C. reniformis R. Br., *Prodr.* 322 (1810).
C. robusta D.L. Jones & M.A. Clem., *Lindleyana* 2(3): 157-160, f.11-15 (1987).

Dipodium R. Br., *Prodr.* 330 (1810).
D. roseum D.L. Jones & M.A. Clem., *Austral. Orch. Res.* 2: 51 (1991).

Diuris Smith, *Trans. Linn. Soc. London* 4: 222 (1798).
D. chryseopsis D.L. Jones, *Austral. Orch. Res.* 3: 74 (1998).
D. lanceolata Lindl., *Gen. sp. orchid. pl.* 508 (1840).
D. monticola D.L. Jones, *Austral. Orch. Res.* 3: 76 (1998).
D. orientis D.L. Jones, *Austral. Orch. Res.* 3: 77 (1998).
D. palustris Lindl., *Gen. sp. orchid. pl.* 507 (1840).
D. pardina Lindl., *Gen. sp. orchid. pl.* 507 (1840).
D. sulphurea R. Br., *Prodr.* 316 (1810).

Dockrillia Brieg. in Schltr., *Die Orchideen* 3(1): 745 (1981).
D. striolata (Rchb. f.) Rauschert, *Feddes Repert.* 94(7-8): 447 (1983) subsp. ***striolata***.
D. striolata subsp. ***chrysantha*** D.L. Jones, *Austral. Orch. Res.* 3: 9 (1998).

Eriochilus R. Br., *Prodr.* 323 (1810).
E. cucullatus (Labill.) Rchb. f., *Beitr. Syst. Pflanzenk.* 27 (1871).

Gastrodia R. Br., Prodr. 330 (1810).
G. procera G.W. Carr, *Indigenous Flora & Fauna Association Misc. Paper* No.1: 22 (1991).
G. sesamoides R. Br., *Prodr.* 330 (1810).

Genoplesium R. Br., *Prodr.* 319 (1810).
G. archeri (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989).
G. brachystachyum (Lindl.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989).
G. despectans (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 142 (1989).
G. firthii (L. Cady.) D.L. Jones, *Austral. Orch. Res.* 3: 89 (1998).
G. morrisii (Nicholls) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 143 (1989).
G. nudiscapum (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 143 (1989).
G. nudum (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 144 (1989).
G. pumilum (Hook. f.) D.L. Jones & M.A. Clem., *Lindleyana* 4(3): 144 (1989).
G. tasmanicum D.L. Jones, *Austral. Orch. Res.* 3: 90 (1998).

Glossodia R. Br., *Prodr.* 325 (1810).
G. major R. Br., *Prodr.* 326 (1810).

Leptoceras (R. Br.) Lindl. in Edwards's, *Bot. Reg.* 1-23, *Veg. Swan Riv. Append.* liii (1840).
L. menziesii (R. Br.) Lindl., *Gen. sp. orchid. pl.* 416 (1840).

Lyperanthus R. Br., *Prodr.* 325 (1810).
L. suaveolens R. Br., *Prodr.* 325 (1810).

Microtis R. Br., Prodr. 320 (1810).
M. arenaria Lindl. *Gen. sp. orchid. pl.* 306 (1840).
M. atrata Lindl. in Edwards's, *Bot. Reg.* 1-23, *Veg. Swan Riv. Append.* liv (1840).
M. orbicularis R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 31: 63 (1907).
M. parviflora R. Br., *Prodr.* 321 (1810).
M. rara R. Br., *Prodr.* 321 (1810).
M. unifolia (Forst. f.) Rchb. f., *Beitr. Syst. Pflanzenk.* 62 (1871).

Orthoceras R. Br., *Prodr*. 316 (1810).
O. strictum R. Br., *Prodr*. 317 (1810).

Prasophyllum R. Br., *Prodr*. 317 (1810).
P. alpestre D.L. Jones, *Austral. Orch. Res*. 3: 98 (1998).
P. alpinum R. Br., *Prodr*. 318 (1810).
P. amoenum D.L. Jones, *Austral. Orch. Res*. 3: 99 (1998).
P. apoxychilum D.L. Jones, *Austral. Orch. Res*. 3: 100 (1998).
P. australe R. Br., *Prodr*. 318 (1810).
P. brevilabre (Lindl.) Hook. f., *Fl. Tasm*. 2: 11, t. 110, f.A (1858).
P. castaneum D.L. Jones, *Austral. Orch. Res*. 3: 102 (1998).
P. concinnum Nicholls, *Victorian Naturalist* 64: 232 (1948).
P. correctum D.L. Jones, *Novon* 4: 106-108 (1994).
P. elatum R. Br., *Prodr*. 318 (1810).
P. favonium D.L. Jones, *Austral. Orch. Res*. 3: 104 (1998).
P. flavum R. Br., *Prodr*. 318 (1810).
P. incurvum D.L. Jones, *Austral. Orch. Res*. 3: 106 (1998).
P. lindleyanum Rchb. f., *Beitr. Syst. Pflanzenk*. 3: 58 (1871).
P. milfordense D.L. Jones, *Austral. Orch. Res*. 3: 107 (1998).
P. montanum R. Bates & D.L. Jones, *Austral. Orch. Res*. 2: 79-80 (1991).
P. olidum D.L. Jones, *Austral. Orch. Res*. 3: 108 (1998).
P. perangustum D.L. Jones, *Austral. Orch. Res*. 3: 109 (1998).
P. pulchellum D.L. Jones, *Austral. Orch. Res*. 3: 110 (1998).
P. pyriforme E. Coleman, *Victorian Naturalist* 49: 195, t. 14 (1932).
P. robustum (Nicholls) M.A. Clem. & D.L. Jones, *Austral. Orch. Res*. 1: 117 (1989).
P. rostratum Lindl., *Gen. sp. orchid. pl*. 516 (1840).
P. secutum D.L. Jones, *Austral. Orch. Res*. 3: 113 (1998).
P. sphacelataum D.L. Jones, *Muelleria* 9: 59-60, fig. 4 (1996).
P. stellatum D.L. Jones, *Austral. Orch. Res*. 3: 115 (1998).
P. tadgellianum R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 47: 338-339 (1923).
P. truncatum Lindl., *Gen. sp. orchid. pl*. 513 (1840).
P. tunbridgense D.L. Jones, *Austral. Orch. Res*. 3: 117 (1998).

Pterostylis R. Br., *Prodr*. 326 (1810).
P. alata (Labill.) Rchb. f., *Beitr. Syst. Pflanzenk*. 70 (1871).
P. aphylla Lindl., *Gen. sp. orchid. pl*. 392 (1840).
P. atrans D.L. Jones, *Muelleria* 8(2): 185-186 (1994).
P. atriola D.L. Jones, *Austral. Orch. Res*. 3: 140 (1998).
P. commutata D.L. Jones, *Muelleria* 8(2): 186-189 (1994).
P. concinna R. Br., *Prodr*. 326 (1810).
P. cucullata R. Br., *Prodr*. 327 (1810).
P. curta R. Br., *Prodr*. 326 (1810).
P. cycnocephala Fitzg., *Austral. orch*. 1(2): t. 7 (1876).
P. decurva R.S. Rogers, *Trans. & Proc. Roy. Soc. South Austral*. 47: 339 (1923).
P. dubia R. Br., *Prodr*. 328 (1810).
P. falcata R.S. Rogers, *Proc. Roy. Soc. Victoria* new ser. 28(1): 106, t.9 (1915).
P. foliata Hook. f., *Fl. nov.-zel*. 1: 249 (1853).
P. furcata Lindl., *Gen. sp. orchid. pl*. 390 (1840).
P. grandiflora R. Br., *Prodr*. 327 (1810).
P. melagramma D.L. Jones, *Austral. Orch. Res*. 3: 145 (1998).
P. mutica R. Br., *Prodr*. 328 (1810).
P. nana R. Br., *Prodr*. 327 (1810).
P. nutans R. Br., *Prodr*. 327 (1810).
P. parviflora R. Br., *Prodr*. 327 (1810).
P. pedoglossa Fitzg., *Austral. orch*. 1(3): t. 5 (1877).
P. pedunculata R. Br., *Prodr*. 327 (1810).
P. plumosa L. Cady, *Austral. Pl*. 5(39): 138, f.B-D (1969).

P. pratensis D.L. Jones, *Austral. Orch. Res*. 3: 149 (1998).
P. rubenachii D.L. Jones, *Austral. Orch. Res.* 3: 150 (1998).
P. sanguinea D.L. Jones & M.A. Clem., *Austral. Orch. Res*. 1: 126 (1989).
P. scabrida Lindl., *Gen. sp. orchid. pl.* 389 (1840).
P. squamata R. Br., *Prodr*. 327 (1810).
P. stenochila D.L. Jones, *Austral. Orch. Res*. 3: 153 (1998).
P. tasmanica D.L. Jones, *Muelleria* 8(2): 190-191 (1994).
P. tunstallii D.L. Jones & M.A. Clem., *Austral. Orch. Res.* 1: 128 (1989).
P. uliginosa D.L. Jones, *Austral. Orch. Res.* 3: 155 (1998).
P. wapstreorum D.L. Jones, *Austral. Orch. Res.* 3: 156 (1998).
P. williamsonii D.L. Jones, *Austral. Orch. Res*. 3: 157 (1998).
P. ziegeleri D.L. Jones, *Austral. Orch. Res.* 3: 158 (1998).

Pyrorchis D.L. Jones & M.A. Clem., *Phytologia* 77(6): 447-451 (1994).
P. nigricans (R. Br.) D.L. Jones & M.A. Clem., *Phytologia* 77(6): 449 (1994).

Sarcochilus R. Br., *Prodr*. 332 (1810).
S. australis (Lindl.) Rchb. f. in Walp., *Ann. bot. syst.* 6: 501 (1861).

Spiranthes Rich., *Orchideis Eur. Annot.* 20, 28, 36 (1817).
S. australis (R. Br.) Lindl., *Bot. Reg*. 10, subt. 823 (1824).

Thelymitra Forst. & Forst. f., *Char. gen. pl.* 97, t.49 (1776).
T. antennifera (Lindl.) Hook. f., *Fl. Tasman.* 2: 4, t.101A (1858).
T. arenaria Lindl., *Gen. sp. orchid. pl.* 519 (1840).
T. aristata Lindl., *Gen. sp. orchid. pl*. 521 (1840).
T. azurea R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 38: 342, t.17 (1917).
T. carnea R. Br., *Prodr*. 314 (1810).
T. circumsepta Fitzg., *Austral. orch.* 1(4): t.1 (1878).
T. cyanea (Lindl.) Benth., *Fl. Austral.* 6: 323 (1873).
T. erosa D.L. Jones & M.A. Clem., *Austral. Orch. Res*. 3: 184 (1998).
T. flexuosa Endl., *Nov. stirp. dec.* 3: 23 (1839).
T. holmesii Nicholls, *Victorian Naturalist* 49: 263, f.N (1933).
T. imbricata D.L. Jones & M.A. Clem., *Austral. Orch. Res*. 3: 186 (1998).
T. improcera D.L. Jones & M.A. Clem., *Austral. Orch. Res*. 3: 187 (1998).
T. x***irregularis*** Nicholls, *Victorian Naturalist* 63: 126-127, f. A-C (1946).
T. ixioides Sw., Ksvenska *Vet. Akad. Handl*. 21: 253, t.3, f.L (1800).
T. juncifolia Lindl., *Gen. sp. orchid. pl. 522* (1840).
T. longiloba D.L. Jones & M.A. Clem., *Austral. Orch. Res*. 3: 191 (1998).
T. malvina M.A. Clem., D.L. Jones & Molloy, *Austral. Orch. Res.* 1: 141 (1989).
T. mucida Fitzg., *Gard. Chron.* (new ser.) 17: 495 (1882).
T. nuda R. Br., *Prodr*. 314 (1810).
T. pauciflora R. Br., *Prodr.* 314 (1810).
T. polychroma D.L. Jones & M.A. Clem., *Austral. Orch. Res*. 3: 193 (1998).
T. rubra Fitzg., *Gard. Chron*. (new ser) 17: 495 (1882).
T. simulata D.L. Jones & M.A. Clem., *Austral. Orch. Res.* 3: 195 (1998).
T. spadicea D.L. Jones & M.A. Clem., *Austral. Orch. Res.* 3: 196 (1998).
T. sparsa D.L. Jones & M.A. Clem., *Austral. Orch. Res.* 3: 197 (1998).
T. x***truncata*** R.S. Rogers, *Trans. & Proc. Roy. Soc. South Australia* 38: 343, t.17 (1917).
T. versicolor Lindl., *Gen. sp. Orchid. Pl*. 520 (1840).

Townsonia Cheesem., *Man. New Zel. Fl.* 691 (1906).
T. viridis (Hook. f.) Schltr., *Feddes Repert.* 9: 250 (1911).

1 M.A. Clements

Arthrochilus huntianus* subsp. *huntianus
Snowy Mountains, New South Wales.
D.L. Jones. NB: Photo on side.

2 M.A. Clements

Arthrochilus huntianus* subsp. *nothofagicola
Gordon River Road, Tasmania.
D. Ziegeler. NB: Photo on side.

3 M.A. Clements

Caladenia alata
Pelverata Falls Track, Tasmania.
D.L. Jones 13642.

4 H. & A. Wapstra

Caladenia anthracina
Campbell Town, Tasmania.
H. & A. Wapstra.

5 M.A. Clements

Caladenia atrata
Police Point, Tasmania.
D.L. Jones 13636.

6 M.A. Clements

Caladenia campbellii
Sisters Hills, Tasmania.
D.L. Jones 13569.

7 M.A. Clements

Caladenia carnea
Douglas Aspley National Park, Tasmania.
D. Ziegeler.

8 M.A. Clements

Caladenia caudata
Boronia Hill, Tasmania.
D.L. Jones 10254.

9 M.A. Clements

Caladenia cracens
Hobart, Tasmania.
D.L. Jones 10604.

10 M.A. Clements

Caladenia dienema
Rebecca Creek, Tasmania.
D.L. Jones 13550.

11 M.A. Clements

Caladenia dilatata
Boronia Hill, Tasmania.
D.L. Jones.

12 M.A. Clements

Caladenia echidnachila
Boronia Hill, Tasmania.
D.L. Jones 12054.

13 J. Johnson

Caladenia echidnachila

Coles Bay, Tasmania. *J. Johnson*

Note tepalline apical extension on the labellum.

14 M.A. Clements

Caladenia fuscata

Lime Bay, Tasmania.

D.L. Jones 10300.

15 M.A. Clements

Caladenia helvina

Lake Leake Road, Tasmania.

D.L. Jones.

16 M.A. Clements

Caladenia patersonii

Blackwood Creek, Tasmania.

R. Williamson.

17 D.L. Jones

Caladenia saggicola
Milford, Tasmania.
D.L. Jones 13469

18 M.A. Clements

Caladenia sylvicola
Hobart, Tasmania.
D. Ziegeler.

19 J. Johnson

Caladenia transitoria
Mt. Montgomery, Tasmania.
J. Johnson.

20 H. & A. Wapstra

Chiloglottis grammata
Bothwell, Tasmania.
H. & A. Wapstra.

21 H. & A. Wapstra

Chiloglottis gunnii
Bothwell, Tasmania.
H. & A. Wapstra.

22 H. & A. Wapstra

Chiloglottis triceratops
Mt. Wellington, Tasmania.
H. & A. Wapstra.

23 M.A. Clements

Corybas diemenicus
Clifton Beach, Tasmania.
D.L. Jones. (ORG 750)

24 H. & A. Wapstra

Diuris chryseopsis
Campbell Town, Tasmania.
H. & A. Wapstra.

25 M.A. Clements

Diuris monticola

Guthega, New South Wales.

M.A. Clements.

26 J. Johnson

Diuris orientis

Rocky Cape, Tasmania.

J. Johnson.

27 J. Fanning

Dockrillia striolata* subsp. *striolata

Genoa Peak, Victoria. *D.L. Jones.*

Flower from rear NB: Photo on side.

28 J. Johnson

Dockrillia striolata* subsp. *chrysantha

Bicheno, Tasmania.

J. Johnson.

29 J. Johnson

Genoplesium archeri

Rocky Cape, Tasmania. *J. Johnson.*

Entomogamous form.

30 M.A. Clements

Genoplesium archeri

Arthur River, Tasmania. *J. Campbell.*

Autogamous form.

31 M.A. Clements

Genoplesium brachystachyum

Rocky Cape, Tasmania. *D.L. Jones 13740.*

32 M.A. Clements

Genoplesium tasmanicum

Blackmans Bay, Tasmania. *H. & A. Wapstra.*

33 M.A. Clements

Prasophyllum amoenum

Snug Plains, Tasmania.

H. & A. Wapstra.

34 M.A. Clements

Prasophyllum concinnum

Blackmans Bay, Tasmania.

H. & A. Wapstra.

35 M.A. Clements

Prasophyllum incurvum

Liawanee, Tasmania.

H. & A. Wapstra.

36 H. & A. Wapstra

Prasophyllum milfordense

Milford, Tasmania.

H. & A. Wapstra.

37 M.A. Clements

Prasophyllum montanum
Brindabella Ranges, A.C.T.
D.L. Jones 11360.

38 M.A. Clements

Prasophyllum olidum
Campbell Town, Tasmania.
H. & A. Wapstra.

39 M.A. Clements

Prasophyllum pulchellum
Bruny Island, Tasmania.
D.L. Jones 13694.

40 M.A. Clements

Prasophyllum robustum
Latrobe, Tasmania.
P. Tonelli.

41 M.A. Clements

Prasophyllum rostratum
Sisters Hills, Tasmania.
D.L. Jones.

42 M.A. Clements

Prasophyllum stellatum
Storys Creek, Tasmania.
L. Rubenach.

43 M.A. Clements

Prasophyllum truncatum
Bruny Island, Tasmania.
D.L. Jones 13782.

44 H. & A. Wapstra

Prasophyllum tunbridgense
Tunbridge, Tasmania.
H. & A. Wapstra.

45 J. Johnson

Pterostylis alata
Rocky Cape, Tasmania.
J. Johnson.

46 J. Johnson

Pterostylis aphylla
Rocky Cape, Tasmania.
J. Johnson.

47 M.A. Clements

Pterostylis atriola
Snug Plains, Tasmania.
H. & A. Wapstra.

48 D.L. Jones

Pterostylis commutata
Ross, Tasmania.
H. Ronken.

49 D.L. Jones

Pterostylis furcata

Interlaken Road, Tasmania.

J. Campbell.

50 D.L. Jones

Pterostylis melagramma

Diamond Creek, Victoria.

H. Richards.

51 D.L. Jones

Pterostylis plumosa

Epping Forest, Tasmania.

D.L. Jones.

52 J. Johnson

Pterostylis scabrida

Hellyer Gorge, Tasmania.

J. Johnson.

53 M.A. Clements

Pterostylis stenochila
Blackmans Bay, Tasmania.
H. & A. Wapstra.

54 D.L. Jones

Pterostylis tasmanica
Badger Head, Tasmania.
H. Ronken.

55 M.A. Clements

Pterostylis tunstallii
Tomerong, New South Wales.
D.L. Jones.

56 M.A. Clements

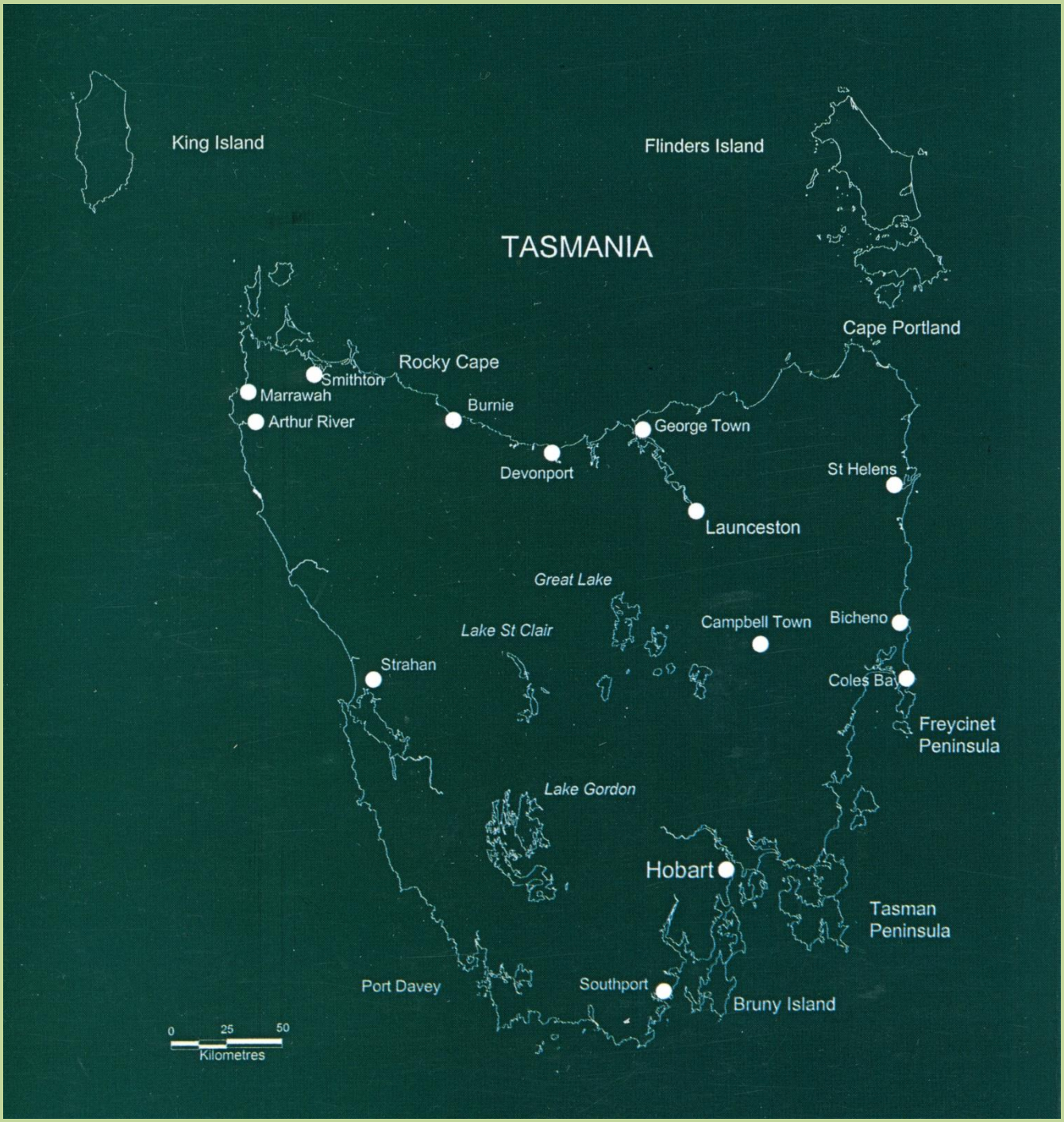
Pterostylis uliginosa
near Appin, New South Wales.
D.L. Jones 11120.

57 M.A. Clements
Pterostylis wapstreorum
Pontville, Tasmania.
H. &. A. Wapstra.

58 M.A. Clements
Pterostylis williamsonii
Mt. Nelson, Tasmania.
H. &. A. Wapstra.

59 M.A. Clements
Pterostylis ziegeleri
Cape Portland, Tasmania.
D.L. Jones 7124.

60 M.A. Clements
Thelymitra ixioides ***sens. strict.***
near Sydney, New South Wales.
D.L. Jones 9849.


King Island
Flinders Island
TASMANIA
Cape Portland
Rocky Cape
Smithton
Marrawah
Arthur River
Burnie
George Town
Devonport
St Helens
Launceston
Great Lake
Lake St Clair
Campbell Town
Bicheno
Strahan
Coles Bay
Freycinet Peninsula
Lake Gordon
Hobart
Tasman Peninsula
Port Davey
Southport
Bruny Island
0 25 50
Kilometres