

A revisionary treatment of four species of *Prasophyllum* R.Br. (Orchidaceae) loosely related to *P. correctum* D.L.Jones

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Abstract

The taxonomy of a small group of species loosely related to *Prasophyllum correctum* (Orchidaceae) is resolved. Four species are recognised in the group - *P. correctum* D.L.Jones, *P. bagoensis* D.L.Jones and two species newly described here (*P. crebriflorum* D.L.Jones and *P. incorrectum* D.L.Jones). The taxonomic significance of the latter new species was resolved by an independent group of researchers (Orthia *et al.*) using a molecular technique, the results of this study being reported in an accompanying paper in this issue. Subsequent re-examination of morphological characters supports these findings.

Keywords: *Prasophyllum*, new species, *P. correctum*, *P. bagoensis*, *P. crebriflorum*, *P. incorrectum*, Victoria, Tasmania, Australia.

Introduction

Prasophyllum R.Br. is a complex genus of Australian and New Zealand Orchidaceae which presents difficulties in identification for taxonomists, ecologists and orchid enthusiasts, mainly because of general similarity between many taxa and the difficulty of defining unique characters which can be used as a ready means of identification.

Prasophyllum is the subject of continuing studies which have resulted in the description of new species (Bates 1989b, 1990; Jones 1991, 1994a, 1994b, 1996b, 1997), a review of Tasmanian species (Jones 1998) and the resolution of various complexes (Bates 1989a; Jones 1996a; Jones & Clements 1996). In this paper the taxonomy of four species loosely related to *P. correctum* D.L.Jones is clarified. Two of these taxa are described as new.

Characteristics of the taxa

All four taxa in this group share the following morphological characters: widely gaping flowers with the lateral sepals and petals being well separated from the dorsal sepal; widely spreading, upswept, narrow petals; an erect labellum which is often strongly recurved in the distal half; and, a column, which is fully exposed, or nearly so, when the flower is viewed from the side. *Prasophyllum retroflexum* D.L.Jones and *P. morganii* also share some of these characters and could be considered as part of this group but can be readily distinguished by their densely crowded flowers and retroflexed petals; additionally *P. morganii* has papillae on the labellum and lateral sepals.

Taxonomic history

A species of *Prasophyllum*, originally described as *P. chasmogamum* R.Bates & D.L.Jones (Jones 1991), was later redescribed as *P. correctum* D.L.Jones (Jones 1994a), when it was realised that the wrong specimen had been inadvertently used as the type. In the following year specimens collected from the Campbell Town Golf Course in Tasmania by Hans and Annie Wapstra were identified by the author as *P. correctum* and later included as this species in a review of the genus for Tasmania (Jones 1998). A second species, *P. bagoensis*,

with apparent affinities to *P. correctum*, was described from material collected in the Bago State Forest in south-eastern New South Wales (Jones 2000). In December 1999 a single specimen, provisionally identified by me as having similarities with *P. correctum*, was collected by Mark Wapstra and Brooke Craven from montane tussock grassland in northern Tasmania and further collections were secured by Hans and Annie Wapstra in the following year. Most recently the taxon from Campbell Town identified by me as *P. correctum*, has been shown by a molecular study (Orthia *et al.* 2003) to be distinct at the molecular level; subsequent re-examination of morphological characters have confirmed these distinctions, and the taxon requires formal description.

Key to Species of the *Prasophyllum correctum* Group

- 1 Dorsal sepal retroflexed; distal petal margins crenulate; labellum straight or in a shallow sigmoid curve (montane areas, south-eastern NSW).....*P. bagoensis*
1. Dorsal sepal deflexed or recurved, not retroflexed; petal margins entire; labellum recurved near the middle2
- 2 Flowers mainly yellowish green; stigmatic plate much longer than the anther and column wings (lowland areas, eastern Vic.)*P. correctum*
2. Flowers mainly reddish brown; stigmatic plate of similar length to the anther and column wings3
- 3 Flowers densely crowded; apical tail about one-third of labellum length; callus smooth at the base, smooth or rugose distally (montane areas, Tasmania).....*P. crebriflorum*
3. Flowers not crowded; apical tail about one-half of labellum length; callus rugose throughout (lowland areas, Tasmania).....*P. incorrectum*

Taxonomy

1. *Prasophyllum bagoensis* D.L.Jones, *Orchadian* 13(4): 150-151 (2000). Type: New South Wales. Bago State Forest, 6 Jan. 2000, *P. Branwhite 129* (holo CANB!, iso NSW!).

Illustrations: Top plates, page 148, *Orchadian* 13(4) (2000); plate 69, Rouse (2001).

Distribution and ecology: Currently known only from the Bago State Forest in south-eastern New South Wales where it grows in grassy forest in shallow clay loam and in herbfield in peaty soil. Altitude: c. 1000 m.

Phenology: This species flowers in December and January.

Recognition: Within the *P. correctum* group, *P. bagoensis* is recognised by its tawny green flowers which have a strongly retroflexed dorsal sepal; linear-oblong petals with the distal margins crenulate; and, a relatively short, obliquely erect labellum which bends in a shallow sigmoid curve and with a short, thick, smooth callus. In the column the stigmatic plate is of similar length to the column wings and anther. Fig. 1.

Notes: *Prasophyllum bagoensis* is similar to *P. correctum* but that species can be distinguished by its mainly yellowish-green flowers which have a deflexed, not retroflexed, dorsal sepal; linear petals with entire margins; a much larger, obliquely erect labellum which is recurved near the middle; labellum lamina with a long caudate apex which is about half of the total labellum length; the callus being rugose distally; and, the stigmatic plate on the column being much longer than either the anther or the column wings.

Conservation status: Apparently of restricted distribution but poorly known and not conserved. Jones (2000) suggested a conservation status category of 2KV according to the criteria of Briggs and Leigh (1996).

Other specimen examined: **NEW SOUTH WALES.** S end of Bago State Forest, 13 Dec. 2001, *D. Rouse 116* (CANB).

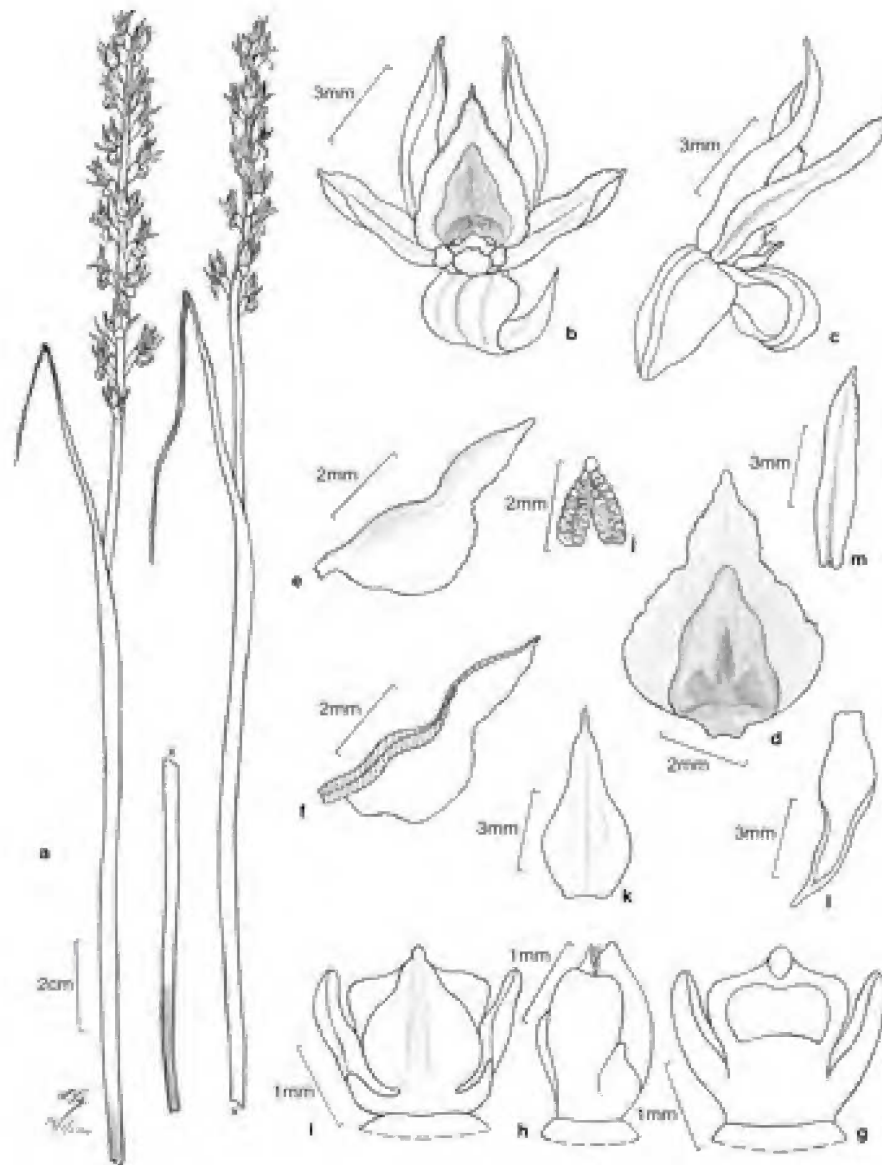


Figure 1. *Prasophyllum bagoensis*, Bago State Forest, NSW, *P. Branwhite 129* (drawn from the type collection): a. flowering plants; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from side; i. column from rear; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal.

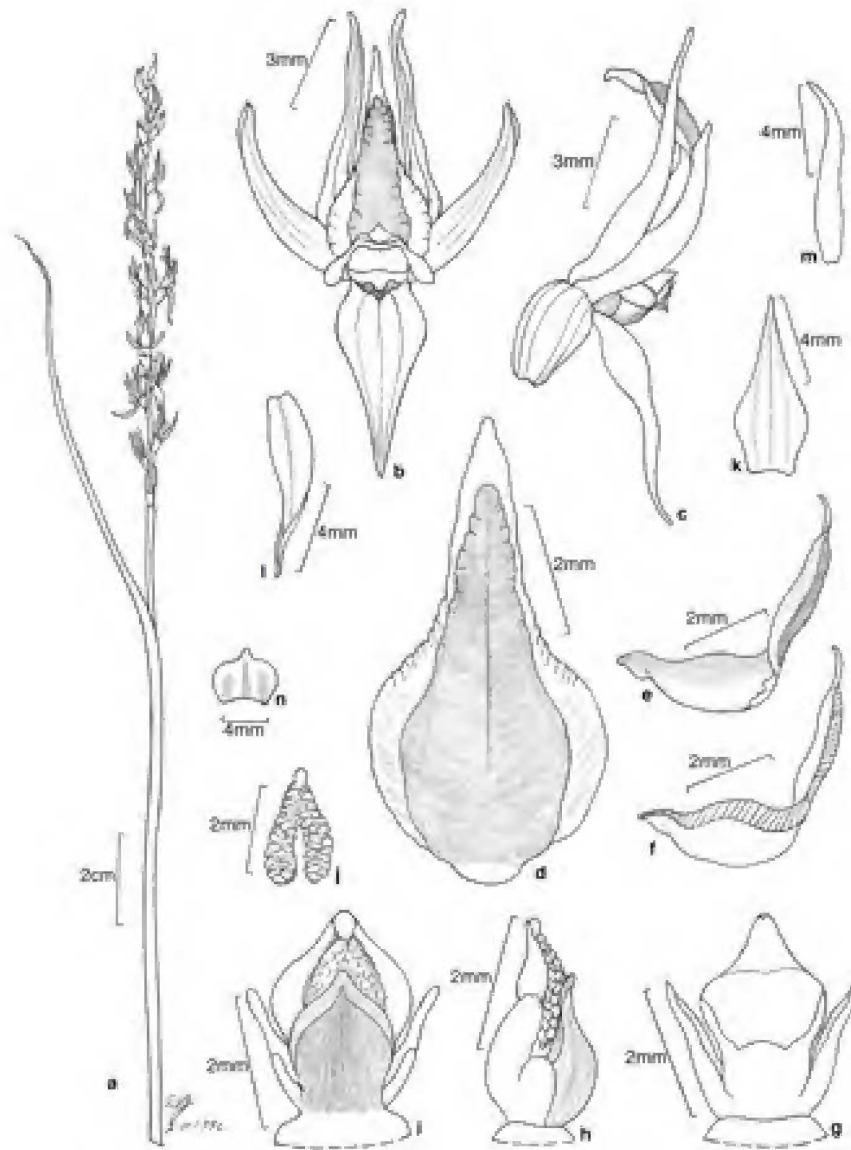


Figure 2. *Prasophyllum correctum*, near Munro, Vic., D.L.Jones 10689: a. flowering plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from side; i. column from rear; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. fertile bract.

2. *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!).

Illustrations: Page 235, Backhouse and Jeanes (1995); plate 114, Bishop (1996); plate 68, Rouse (2001).

Distribution and ecology: Eastern Victoria, near Munro and Lindenow South. Grows in grassland dominated by *Themeda triandra* and in grassy woodland with *Eucalyptus tereticornis* Sm. as the dominant tree (Coates *et al.* 1999). The soil is a brown clay loam. Altitude: 20-50 m.

Phenology: The species flowers in October and November.

Notes: Within the *P. correctum* group this species can be recognised by its mainly yellowish-green flowers; labellum with a long caudate apex which is about half of the total labellum length; the callus being rugose distally; and, the stigmatic plate on the column being much longer than either the anther or the column wings. It also has more noticeably fragrant flowers than any other member of the group, the largest flowers of the four taxa and very slender spikes. Fig. 2.

The taxon originally described as *P. chasmogamum* (Jones 1991) and treated incorrectly as a synonym of *P. pyriforme* (Jones 1994a), will be included in a revisionary treatment of the *P. rostratum* Lindl. complex, which is in preparation.

Conservation status: This species is listed as threatened under the Victorian Flora and Fauna Guarantee Act 1988. Less than 150 plants remain in two populations (Coates *et al.* 1999). Suggest 2E according to the criteria of Briggs and Leigh (1996).

Specimens examined: **VICTORIA**. None found; all specimens quoted in Jones 1994a are *P. chasmogamum*.

3. *Prasophyllum crebriflorum* D.L.Jones, sp. nov. Affinis *P. correcto* D.L.Jones, sed floribus congestis, rufescentibus; labello parvum insuper medio recurvato, apice caudato tertia parte brevior; et callo laevigato, differt.

Type: Australia. Tasmania: Surrey Hills Freehold (North Forests Burnie), Westwing Plain (precise locality withheld), 670 m, 14 Dec. 2000, J.E. & A. Wapstra (ORG 3269) (holo CANB, iso HO, MEL).

Slender tuberous terrestrial *herb* growing singly or in loose groups. *Tubers* not seen. *Leaf* erect, 12-26 cm long, 2-5 mm wide, terete, dark green, base 2-3 mm diam., reddish to purple; free lamina suberect, 6-10 cm long, usually withered at anthesis. *Inflorescence* a moderately dense to dense spike 6-20 cm long. *Floral bracts* transversely ovate, 2-2.3 mm long, c. 3 mm wide, closely embracing the ovary; apex apiculate. *Ovaries* at about 40° to the rachis, obovoid, 5-6 mm long, c. 3 mm wide, bright green, shiny. *Flowers* 6-c.25, 10-12 mm across, reddish brown, opening very widely, sessile. *Dorsal sepal* narrowly ovate-lanceolate, 6.5-8 mm long, 2.5-3 mm wide, sharply deflexed, with 3 indistinct darker veins; apex often recurved, subacute to apiculate. *Lateral sepals* free throughout, linear-lanceolate, 6.5-8 mm long, 1.8-2.2 mm wide, falcate, erect or shallowly recurved, parallel or slightly divergent; base not gibbous; distal margins involute; apex entire or bidentate. *Petals* upswept, widely spreading, linear, 5.5-7 mm long, 0.8-1.2 mm wide; margins entire; apex obtuse to attenuate. *Labellum* very shortly stalked, obliquely erect, usually in a shallow curve but at a sharper angle in old flowers, distal half recurved, the tip erect or recurved; basal claw almost vestigial, c. 0.3 mm long, c. 1.3 mm wide; lamina ovate-lanceolate in outline when flattened, 5-6 mm long, 3-3.5 mm wide, with broad basal margins, constricted in the distal third to half; base not gibbous; proximal margins entire; distal margins slightly irregular. *Callus* extending nearly to the labellum apex, ovate-oblong, 4-5.2 mm long, 2-2.5 mm wide in the proximal third, raised, fleshy, greenish brown, shallowly channelled centrally, constricted sharply in the distal half and extending as a narrow, raised, smooth or rugose caudate section; margins entire or slightly irregular. *Column* prorect from the end of the ovary, c. 2.8 mm

long, c. 3 mm wide, partially exposed by the wide expansion of the tepals; appendages oblong-obovate, c. 2 mm long, c. 0.5 mm wide, straight, pale green, slightly incurved, apex obliquely truncate, shorter than the stigmatic plate. *Anther* ovate, c. 2 mm long, c. 1.8 mm wide, brownish to purplish. *Pollinarium* c. 2.6 mm long; viscidium ovate, c. 0.3 mm long, white; hamulus c. 0.2 mm long; pollinia c. 2 mm long, yellow, sectile. *Stigma* quadrate, c. 2 mm long, c. 2 mm wide, the rostellum higher than the appendages. *Capsules* obovoid, 6-7 mm long, 3-4 mm wide, shiny, pale green. Fig. 3.

Distribution and ecology: Currently known only from Westwing Plain which is south-east of Hellyer Gorge in northern Tasmania. It grows in tussock grassland (*Poa labillardierei* Steud.) with scattered patches of *Hakea microcarpa* R. Br. Some of the orchids were growing in fairly dense patches of *Poa*, but most were in a naturally open area with bare ground and *Herpolirion novae-zelandiae* Hook. f. and *Trachymene humilis* (Hook. f.) Benth. (J.E. Wapstra pers. comm.). The soil is a brown clay loam. Altitude: 660-670 m.

Phenology: This species flowers in late November and December.

Recognition: Within the *P. correctum* group, *P. crebriflorum* is recognised by its crowded, widely opening reddish-brown flowers, the labellum recurved just above the middle, the apical tail-like part of the labellum comprising about one-third of the length of the labellum and the callus being smooth. In appearance it is most similar to *P. incorrectum* but that species, which flowers earlier, has flowers more widely spaced in the spike, the apical tail-like part of the labellum comprising about one-half of the total length of the labellum, and the callus thin and rugose towards the apex. The lowland habitat of *P. correctum* contrasts with the montane habitat of *P. crebriflorum*.

Notes: *Prasophyllum crebriflorum*, which was first collected by Mark Wapstra and Brooke Craven in 1999, is a slender species with crowded, reddish-brown, widely opening flowers; erect, non-gibbous lateral sepals; widely spreading, upswept, linear-oblong petals; an obliquely erect labellum which bends in a shallow curve and with an elongated callus constricted in the distal two-thirds and extended as a narrow, raised, caudate section.

Conservation status: Known from only two almost adjacent grasslands which occur among pine plantations and not located on five other similar grasslands in the area (J.E. Wapstra pers. comm.); not conserved and occurring on private land owned by a timber company; the species remains poorly known. I suggest a conservation status category of 2KE according to the criteria of Briggs and Leigh (1996).

Etymology: From the Latin *creber*, close, crowded and *flos*, flower, in reference to the crowded flowers.

Other Specimens examined: **TASMANIA**. Surrey Hills Freehold (North Forests Burnie), Westwing Plain, 15 Dec. 1999, M. Wapstra & B. Craven (ORG 2888) (CANB); Surrey Hills Freehold (North Forests Burnie), Racecourse Plain, 14 Dec. 2000, J.E. & A. Wapstra (ORG 3268) (CANB); *ibid*, 4 Jan 2001, J.E. & A. Wapstra (ORG 3293) (CANB).

4. *Prasophyllum incorrectum* D.L.Jones, sp. nov. Affinis *P. correcto* D.L.Jones, sed floribus rufescentibus; callo crassiore; lamina stigmatica longitudine anthera et alis columnae similari, differt.

Type: Tasmania. Campbell Town Golf Course, 5 Nov. 1998, D.L.Jones 16179 & M.A.Garratt (holo CANB; iso HO, MEL).

Illustration: Page 189, Jones *et al.* (1999) - as *P. correctum*.

Slender tuberous terrestrial *herb* growing singly or in loose groups, occasionally in tufts. *Tubers* ovoid, 0.8-1.2 cm long, 0.6-1 cm wide. *Leaf* erect, 12-30 cm long, 3-5 mm wide, terete, dark green, base 3-5 mm diam., red to purple; free lamina suberect, 8-15 cm long, usually withered at anthesis. *Inflorescence* a sparse to moderately dense spike 5-10 cm long. *Floral bracts* ovate, 3-4 mm long, c. 2 mm wide, closely embracing the ovary, apex

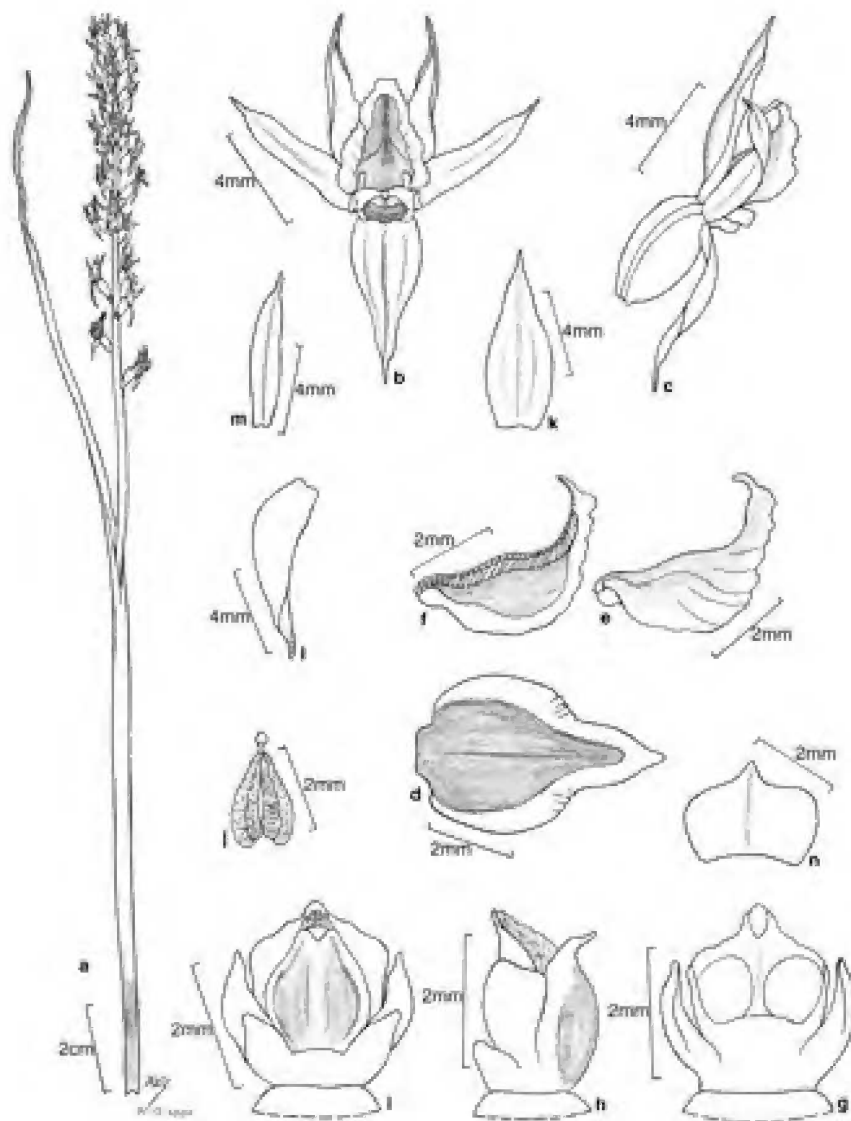


Figure 3. *Prasophyllum crebriflorum*, Surrey Hills Freehold, Tas., ORG 3268: a. flowering plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from side; i. column from rear; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

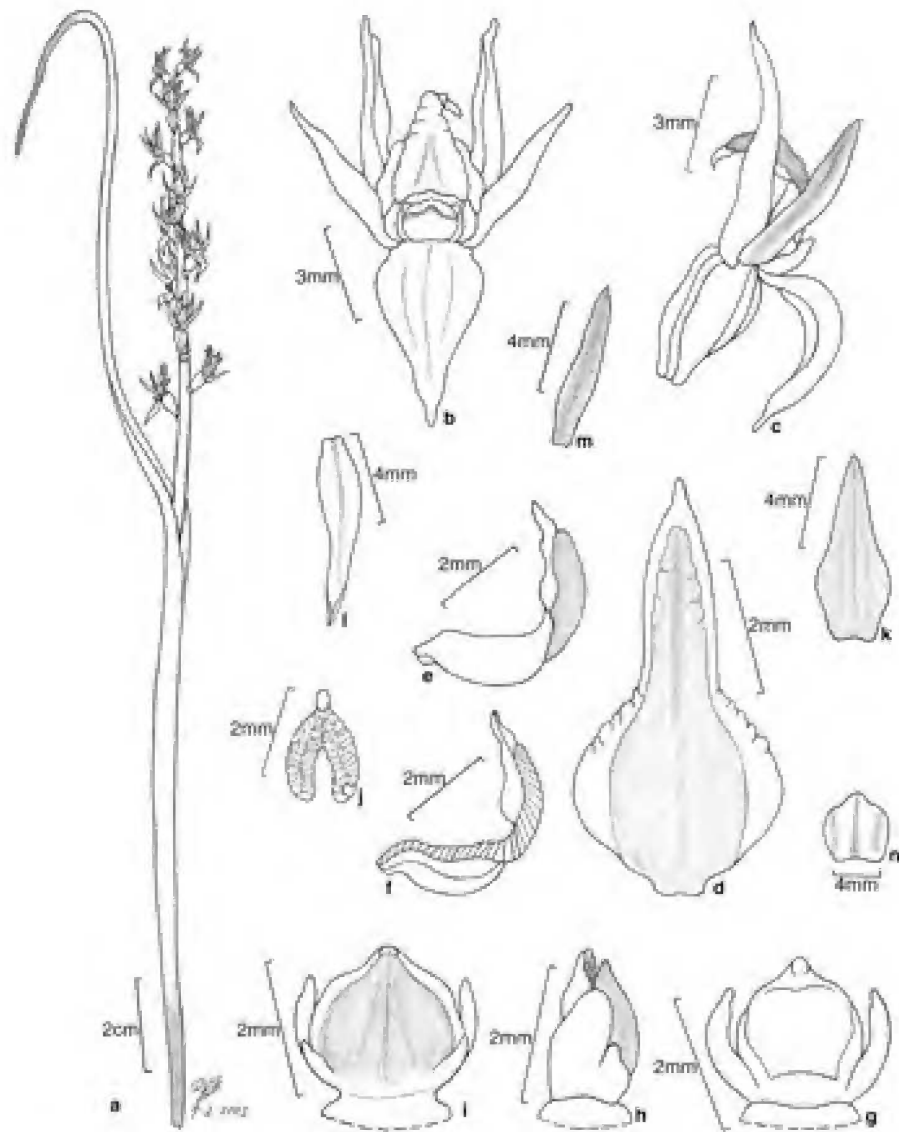


Figure 4. *Prasophyllum incorrectum*, Campbell Town Golf Course, Tas., H. & A. Wapstra (Jones 14539): a. flowering plant; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. longitudinal section of labellum; g. column from front; h. column from side; i. column from rear; j. pollinarium; k. dorsal sepal; l. lateral sepal; m. petal; n. floral bract.

apiculate. *Ovaries* at about 30° to the rachis, obovoid, 3-4 mm long, c. 2 mm wide, bright green, shiny, (rarely dark red). *Flowers* 10-20, 7-9 mm across, predominantly yellowish green and light reddish brown, (rarely dark red), opening widely, fragrant, sessile. *Dorsal sepal* linear-ovate, 7-9 mm long, c. 3 mm wide, deflexed, with 3 darker veins, apex subacute to acuminate. *Lateral sepals* connate throughout, partially united or free from the base, linear-lanceolate, 7-9 mm long, 1.5-2 mm wide, erect or recurved, base not gibbous, distal margins involute, apex entire. *Petals* incurved to widely spreading, linear to linear-lanceolate, 7-9 mm long, 1-1.2 mm wide, upswept, green with brown striae, apex subacute. *Labellum* very shortly stalked, obliquely erect, distal half recurved, the tip often projecting through the lateral sepals; basal claw almost vestigial, c. 0.4 mm long, c. 1 mm wide; lamina broadly ovate-lanceolate in outline when flattened, 6-8 mm long, 3.5-4 mm wide, yellowish green (rarely reddish), proximal half almost orbicular, shallowly constricted just above the middle, tapered in the distal half, base not gibbous, proximal margins flat, entire, distal margins entire or slightly crenulate. *Callus* elliptical-lanceolate, 5-6 mm long, 2-2.5 mm wide, raised, fleshy, green (rarely red), channelled centrally, margins entire or crenate, narrowed beyond the bend and extending nearly to the labellum apex. *Column* prorect from the end of the ovary, c. 3 mm long, c. 3 mm wide, fully exposed by the wide expansion of the tepals; appendages linear-oblong, c. 2.3 mm long, c. 0.7 mm wide, pale green (rarely red), divergent, apex truncate or emarginate, about as long as the stigmatic plate. *Anther* ovate, c. 2 mm long, c. 1.6 mm wide, dark red brown. *Pollinarium* c. 2 mm long; viscidium ovate, c. 0.25 mm long, white; hamulus c. 0.2 mm long; pollinia c. 1.6 mm long, yellow, sectile. *Stigma* quadrate, c. 1.5 mm long, c. 1.5 mm wide, the rostellum about as high as the appendages. *Capsules* obovoid, 4-5 mm long, c. 3 mm wide, shiny, green (rarely red). *Fig. 4.*

Distribution and ecology: Endemic to Campbell Town, Tasmania, growing in relatively damp native grassland dominated by *Themeda triandra* and grassy woodland with eucalypts and banksias, in grey sandy loam. Altitude: c. 200 m.

Phenology: This species flowers in October and November.

Recognition: Within the *P. correctum* group, *P. incorrectum* can be recognised by its reddish-brown flowers, the apical tail-like part of the labellum comprising about one-third of the total labellum length and the callus being thick and rugose towards the apex. It is morphologically most similar to *P. correctum* which has mainly yellowish-green, fragrant flowers in a very slender spike, and the stigmatic plate is much longer than either the anther or the column wings. Geographically it occurs closest to *P. crebriflorum* which grows in a montane area, flowers later, has densely crowded flowers and the callus is thinner and smooth throughout.

Notes: Plant habit and floral morphology of the Tasmanian specimens are very similar to collections of *P. correctum* from Victoria (Jones 1998), however the results of a molecular study using RAPD's show conclusively that the Tasmanian and Victorian populations belong to different taxa (Orthia *et al.* 2003).

Morphologically both taxa are very similar and difficult to separate, however after careful re-examination of material from Victoria and Tasmania, the following characters which can be used to separate the two taxa are evident. *Prasophyllum incorrectum* has slightly smaller flowers than *P. correctum* and a thicker labellum callus, however the most distinctive features lie in the column. In *P. correctum* the stigmatic plate is much longer than the anther and the column wings curve outwards, whereas in *P. incorrectum* the anther and stigmatic plate are of similar length and the column wings curve inwards. Flower colour is perhaps the most obvious feature which is easily identifiable. Plants from Victoria have mainly yellowish-green flowers with some brown striations (Backhouse & Jeanes 1995, D.L.Jones pers. obs.), whereas those from Tasmania are mainly reddish brown with some specimens being wholly red.

Conservation status: This species is listed as endangered under the Tasmanian *Threatened Species Protection Act 1995*. The main population of this species, which

occurs on the Campbell Town Golf Course, consists of about 1000 individuals (Coates *et al.* 1999). The site is not part of a formal reserve but the orchids are well known to the owners of the property and are protected by a covenant which includes a management plan. In 1999 a single plant of this orchid was found at a second locality nearby (J.E. Wapstra pers. comm.). Suggest 2E according to the criteria of Briggs and Leigh (1996).

Etymology: The Latin *incorrectum*, incorrect, wrong, in reference to my mistake of including the species in *P. correctum*.

Specimens examined: **TASMANIA**: Campbell Town Golf Course, 5 Nov. 1998, Jones 16180 & Garratt (CANB); *ibid*, 20 Oct. 1995, J.E. & A. Wapstra (Jones 14539) (CANB); 21 Nov 1995, J.E. & A. Wapstra (Jones 14681) (CANB); *ibid*, 9 Nov. 1996, J.E. & A. Wapstra (ORG 439) (CANB).

Acknowledgements

I thank Hans and Annie Wapstra for ongoing help in numerous ways with Tasmanian orchids, including commenting on this manuscript, Mark Wapstra for the initial specimens of *P. crebriflorum*, Elizabeth James and Lindy Orthia for bringing the results of their genetic study on *P. correctum* to my attention, and Dean Rouse for additional specimens of *P. bagoensis*. I express my appreciation to Marion Garratt and Karina FitzGerald for technical assistance and reading the manuscript, Laurie Adams for the Latin diagnoses and Dean Rouse, Brendan Lepschi and Tom Hartley for commenting on the manuscript.

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