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## ***Prasophyllum laxum* (Orchidaceae), a new leek-orchid species from southern Eyre Peninsula, South Australia**

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### **Abstract**

*Prasophyllum laxum* R.J.Bates, a rare local endemic leek orchid from southern Eyre Peninsula, South Australia, is described as new and illustrations and a key to related South Australian species are provided.

### **Introduction**

A single collection at the State Herbarium of South Australia (AD) of an apparently undescribed *Prasophyllum* from southern Eyre Peninsula, hundred of Koppio, section 212 (*M.G.Clark 212*) had long intrigued the author but despite many searches on Southern Eyre Peninsula from 1982 to 2002 no further plants were located.

Members of the Clark family collected many other interesting orchids around their home near Koppio in the 1960's including several other *Prasophyllum* species not published at the time. The exact location of their *P. laxum* collection is not known.

It was not until October 2004, while working with Sarah Way on a three day survey of nesting habitats of the endangered Eyre Peninsula race of yellow-tailed black cockatoo, that a large population of the orchid was located on private property south-west of Koppio, about 10km from the Clark property. A suitable type collection was made and a photograph taken.

The new species is a member of the suspected apomictic group of species (Bates 1989b; van der Cingel 1989) of which *Prasophyllum fitzgeraldii* R.S.Rogers & Maiden was the first South Australian species named. For this reason the complex (of about fifteen taxa, some unpublished) is often referred to as the *P. fitzgeraldii* complex (Group 5 of Jones 2006); it includes *P. pallidum* Nicholls, *P. goldsackii* J.Z.Weber & R.J.Bates, *P. fecundum* R.J.Bates, *P. occultans* R.J.Bates and *P. sp. Enigma* (*R.Bates 2350*) in South Australia. Like *P. laxum* all of these species have been observed growing sympatrically with other members of the complex without introgression, indicating genetic isolation.

As is usual for apomictic species, the flowers of the *P. fitzgeraldii* complex are very short lived, the ovaries swelling even before the flowers open and all the capsules producing a large amount of seed without fertilization (Bates 1989b). At least one species of this group, *P. goldsackii*, is cleistogamous.

*Prasophyllum laxum* has been compared with *P. lindleyanum* Rchb.f. (as *P. aff. lindleyanum*; Bates 2006), mainly because of the sigmoid labellum, but that species is restricted to Tasmania and (mostly eastern) Victoria and has rigidly erect spikes with usually green and white, very neat flowers with the short labellum having strongly incurved margins, and the callus shortly pubescent.

The nearest verified populations of *P. lindleyanum* are many hundreds of kilometres away from Eyre Peninsula. *Prasophyllum lindleyanum* also prefers cool moist woodland, mostly flowers in November and is stimulated to flower by bushfires, whereas *P. laxum* prefers dry woodland, flowers mostly in early October and was badly affected by the 2005 Eyre Peninsula bushfires.

*Prasophyllum lindleyanum* is not closely allied to any South Australian forms. Plants from Western Victoria with pink tinged flowers, previously included under *P. lindleyanum* (Backhouse & Jeanes 1995), have been determined by D.L.Jones (pers. comm.), Rouse (unpubl. data) and Backhouse and Jeanes (2006) as belonging to an unpublished taxon with rigidly erect flower spikes and a short straight labellum.

Jones (1998) described four eastern Australian members of the *P. fitzgeraldii* complex, i.e. *P. favonium* D.L.Jones, *P. perangustum* D.L.Jones, *P. secutum* D.L.Jones and *P. taphanyx* D.L.Jones, none of which are likely to occur in South Australia. He has not as yet named any South Australian members of the complex.

Jones (2006, pp. 216–218) treated all published species of the complex as *Prasophyllum* Group 5, except for *P. goldsackii* which was placed in his Group 4. Most species are pictured, but not all correctly, e.g. the image on p. 216 captioned as *P. fecundum* is actually *P. sp. Enigma* (*R. Bates 2350*).

The author has provided living material of most South Australian taxa of the *P. fitzgeraldii* complex to D.L. Jones (Canberra), who, based on this material, has several South Australian leek orchids of the complex in

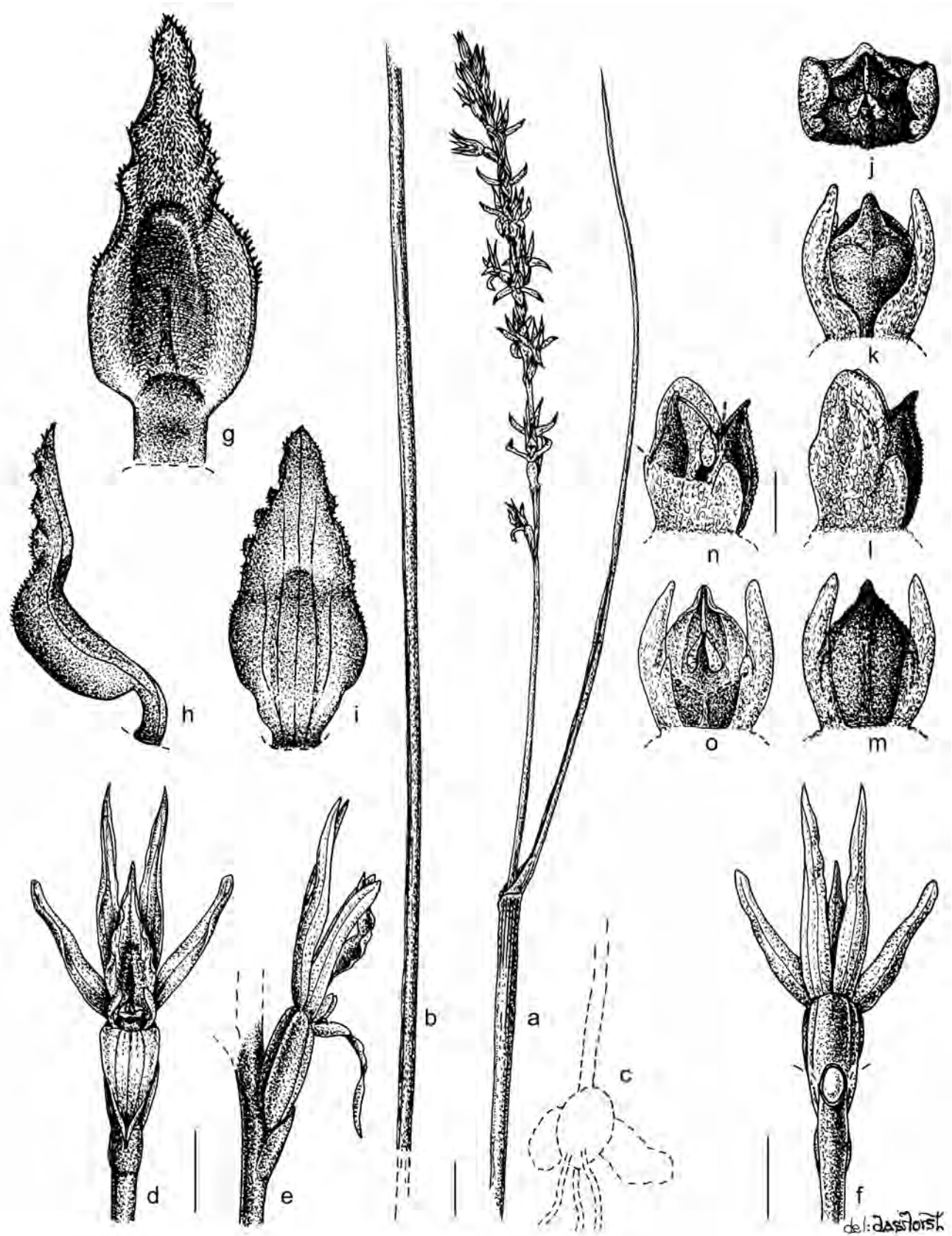


Fig. 1. *Prasophyllum laxum*. a–b habit; c underground tuber; d–f flower: d front view; e side view; f rear; g–i labellum: g front view; h side view; i rear; j–o column, views from various angles. Scale: a–c 1 cm; d–f 2.5 mm; g–o 0.5 mm. R.J. Bates 64064.

manuscript. These unpublished species are treated in *Orchids of South Australia* (electronic version, 2006) as *Prasophyllum* sp. Enigma (R.J.Bates 2350), *P.* sp. Gum Lagoon (P.J.Lang 1633) and *P.* sp. Bright shiny maroon (R.J.Bates 3040).

Jeanes & Backhouse (2006) discuss and illustrate three un-named taxa of the complex as *P.* aff. *fitzgeraldii* 1 'Pink-lip Leek-orchid', *P.* aff. *fitzgeraldii* 2 'Elfin Leek-orchid' and *P.* aff. *fitzgeraldii* 3 'Brown-lip Leek-orchid'. The first and third of these also occur in South Australia, the 'Brown-lip Leek-orchid' being synonymous with *P.* sp. Gum Lagoon (P.J.Lang 1633), above. None of these taxa closely resemble *P. laxum*.

#### Key to the *P. fitzgeraldii* complex in South Australia

1. Sepals not or hardly separating, dark coloured, segments parchment like in texture ..... 2
- 1: Sepals widely separating, of varying colour but not dark, segments soft, not parchment like ..... 3
2. Flowers almost black, smaller than the ovary; sepals not expanding, tips incurved ..... **P. goldsackii**
- 2: Flowers dark maroon and green, as large as or larger than the ovary; sepals partly expanding and the tips recurved . . . . . **P. sp. Enigma (R.J.Bates 2350)**
3. Labellum callus almost glabrous except for vestigial pubescence around margins; few-flowered plants ..... **P. occultans**
- 3: Labellum callus variously pubescent; flowers usually numerous ..... 4
4. Flowers wholly pale green ..... **P. pallidum**
- 4: Flowers with at least some purple or pink tints ..... 5
5. Flowers less than 5 mm across, of similar size to ovary . . . . . **P. fecundum**
- 5: Flowers greater than 5 mm across, larger than ovary . . . 6
6. Whole plant rather lax; flowers more than twice as long as wide, in tints of green, pale brown and pale pink; labellum weakly sigmoid in profile, its apex not erect ..... **P. laxum**
- 6: Whole plant rigidly erect; flowers about twice as long as wide, predominantly maroon; labellum not sigmoid in profile, its apex strictly erect ..... 7
7. Labellum brown; lateral sepals widely spreading, thick textured and greater than 2 mm broad ..... **P. sp. Gum Lagoon (P.J.Lang 1633)**
- 7: Labellum maroon; lateral sepals not widely spreading, often partly connate, thin textured 1–2 mm broad . . . . 8
8. Flowers well spaced, glistening; lateral sepals falcate; plants flowering after bushfire ..... **P. sp. Bright shiny maroon (R.J.Bates 3040)**
- 8: Flowers crowded, matt; lateral sepals not falcate; plants flowering freely without fire ..... **P. fitzgeraldii**

#### Taxonomy

##### *Prasophyllum laxum* R.J. Bates, sp. nov.

A *Prasophyllum fitzgeraldii* R.S.Rogers & Maiden *similis*, sed habitu laxo, floribus pallidis labellis anguste sigmoidensibus et callis longioribus differt.

**Typus:** South Australia, Eyre Peninsula region. 'Kevin Mann's Cockatoo Hill' about 4 km NE of Wanilla, 4 Oct. 2004, R.J.Bates 64046 & S.Way (holo.: AD212645; iso.: MEL, distribuendus).

*Prasophyllum* aff. *lindleyanum*: Bates (2006).

Plants slender, pallid, to 30 cm tall, leaf and scape rather lax, leaf base green, scape and leaf of similar length. *Leaf* to 30 cm long and to 4 mm diam., narrow-cylindrical and tapering. *Scape* emerging from hollow leaf at a fistula set 10–20 cm above ground level, pale green and shiny, to 4 mm diam., with no sterile bracts. *Flowers* 5–20, irregularly arranged in a loose, typically drooping spike to 6 cm long, in pale tones of green, tan and lilac, a darker brown median stripe outside each segment. *Floral bract* ovate, pale, c. 1.5 × 1 mm, obtuse to subacute; ovary sub-sessile, partly enclosed, green, erect, 4–5 × 2–3 mm, obovoid, swelling to 4 mm diam., and dehiscing apically at maturity. *Sepals* 6–7 × 1–1.5 mm; dorsal sepal ovate-lanceolate, much decurved at maturity, pale green inside, pale brown outside; lateral sepals free, sub-erect, curved, slightly divergent with a sub-gibbous base, green inside brown out, tips entire. *Petals* linear, c. 4 × 1 mm, pale green with white edges, widely spreading. *Labellum* sigmoid, lanceolate, to c. 5 × 2 mm when flattened; lamina palest pink, the margins incurved, undulate, ciliate, base horizontal, ovate and slightly humped, recurved gradually about the middle to give a sigmoid appearance in side view, the tip curved forward, acute with inrolled margin; callus plate smooth green and channelled before the bend, then raised into a tongue c. 0.6 × 0.4 mm; labellum surface minutely papillose with sparse lateral pubescence. *Column* c. 0.5 × 0.5 mm with a brown caudate anther cap; stigma 0.2 × 0.2 mm with a curved surface, rostellum erect, slender, to 0.1 mm high; viscidium tiny; stipe to 0.1 mm long; column arms bilobed, white, oblong, c. 1 × 0.5 mm, obtuse, dentate, basal lobe only c. 0.1 mm long; pollinia ovoid, to 0.4 mm diam., in bright yellow bundles. Fig. 1.

**Flowering.** Late September to October; the short lived flowers emit a strong sweet fragrance.

**Distribution and ecology.** Known presently only from a single hill between Wanilla and Koppio on southern Eyre Peninsula (Port Lincoln district). The Clark property population has not been relocated. The main population grows under Drooping Sheoaks (*Allocasuarina verticillata* (Lam.) L.A.S.Johnson), in red-brown earths, above and around minor sandstone outcropping on a small isolated hill with sparse Sugar Gum (*Eucalyptus cladocalyx* F.Muell.) woodland. This area is surrounded by grazed paddocks. The location has a diverse array of *Prasophyllum* species including the outcrossing *P. elatum* R.Br. and *P. odoratum* R.S.Rogers and at least two other species of the *P. fitzgeraldii* complex, *P. fecundum* and *P. goldsackii*.

**Notes.** Easily recognised from its lax habit, pale colouring and sigmoid labellum. It is worthy of noting that two of its closest congeners, *P. fecundum* and *P. goldsackii*, are sympatric with it at the type site without intermediates, indicating their genetic isolation.

There is very little variation in any of these species except in number of flowers. The flowers of all species in the *P. fitzgeraldii* complex are short lived, the seed

capsules swelling even before flowers open, even though the pollinia remain intact and set viable seed in cultivation, even if pollinia are removed at anthesis and the plants covered; indeed in one species, *P. goldsackii*, the floral segments never expand. These are common features of apomictic flowers. Nevertheless the flowers of all species have a strong sweet fragrance and insects do visit suggesting that some seed may be produced sexually and indicating that the plants are facultative apomicts.

**Etymology.** The epithet *laxum*, Latin for loose, applies to the loosely erect scape and leaf. Most other *Prasophyllum* species are rigidly erect.

**Conservation status.** Suggest E (IUCN criteria, as implemented in NPWAC 2003) unless further populations are located. The population is not conserved and estimated number of plants was less than five hundred in 2004 and the population has declined since probably due to the combined effect of drought and a bush fire.

**Other specimen examined**

SOUTH AUSTRALIA: **Eyre Peninsula:** Hundred of Koppio, section 212, 22 Oct. 1966, *M.G.Clark 212* (AD).

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