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State Herbarium of South Australia
PO Box 2732
Kent Town SA 5071
Australia



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**A PUTATIVE HYBRID BETWEEN *PTEROSTYLIS CURTA* AND
P. PEDUNCULATA (ORCHIDACEAE) FROM
SOUTH AUSTRALIA**

R. Bates

Portmarnock Street, Fairview Park, South Australia 5126

and

J. Z. Weber

State Herbarium, Botanic Gardens, North Terrace,
Adelaide, South Australia 5000

Abstract

A putative naturally occurring hybrid between *Pterostylis curta* R. Br. and *P. pedunculata* R. Br. is reported from two localities near Adelaide. The validity of previous reports of this hybrid is discussed and the characteristics of the putative hybrids and its parents are tabulated as well as illustrated.

Discussion

A population of the putative hybrid between *Pterostylis curta* R. Br. and *P. pedunculata* R. Br. was discovered by R. Bates in the Belair Recreation Park (south of Adelaide) in September 1979 and observed for several seasons since then. One hundred years earlier R.D. Fitzgerald (1879) illustrated a plant from New South Wales which he suggested was a hybrid between *P. curta* and *P. pedunculata* but Dockrill (1969) and Clemesha (1972) referred this illustration to *P. hildae* Nicholls. This latter view is accepted here as Fitzgerald's plant has narrow lateral sepals which are shorter than the galea and an acute, not twisted labellum which clearly protrudes from the flower. These are features of *P. hildae* but not of the hybrid. *P. hildae* occurs in Queensland and north-eastern New South Wales, mainly near the coast where it is a widespread species not associated with either *P. curta* or *P. pedunculata*. It has not been recorded from South Australia.

P. curta and *P. pedunculata* are widely distributed through south-eastern Queensland, New South Wales, Victoria and Tasmania. In South Australia both species are found in the northern Lofty, southern Lofty and South-Eastern regions. *P. pedunculata* has also been recorded from the southern Yorke Peninsula and Kangaroo Island (cf. Map 2). Both species generally occur in dense colonies and flower between August and October. *P. curta* is restricted to deeply shaded gullies and creek banks but *P. pedunculata*, although commonly occurring with *P. curta* in these habitats, is also found in heath or mallee heathlands and open forests in clay, sandy or calcareous soils in South Australia (Markwick & Bates, 1982). Willis (1962) observes that *P. curta* is widespread in Victoria (woodlands) and that *P. pedunculata* is "... more abundant on sandy ground under coastal tea-tree scrub but extending into mountain forests and even shaded fern gullies".

It is in this last habitat that the two species occur, together with a colony of about one hundred plants of the putative hybrid in the Belair Recreation Park in the Mt Lofty Range. Much of the information presented here is based on several years observation of this colony. As there is little morphological variation in the hybrid plants and they all grow in one dense colony it is probable that the population is derived from a single hybrid ancestor by cloning. The hybrid plants generally produce 2-3 tubers annually.



Fig. 1-3. 1. *P. curta*, plant; 2. Putative hybrid between *P. curta* and *P. pedunculata*, plant; 3. *P. pedunculata*, plant. (a. partly fused lateral sepals; b. column and labellum in side view; c. labellum in front view; d. tip of labellum).

So far, 35 plants of the putative hybrid have been collected from two localities in this region. Eight plants were collected by Miss Verena Jacobs (23.ix.1915) from Cherry Gardens. R. Rogers noted their similarity to *P. curta* and *P. pedunculata* and, in fact, suggested on the sheet that they were hybrids. R. Bates (15.ix.1980, 9.ix.1981 and 8.ix.1982) collected a total of 27 specimens from the Belair Recreation Park. The specimens from the 1981 collection were used for the illustrations.

During observations of the colony two species of Mycetophilid flies (fungus gnats) were found visiting the hybrids, although neither was observed to transfer pollinia. The larger of the two flies was observed to be a possible pollinator for *P. curta* in the area and was also observed on the flowers of *P. pedunculata*; its large size, however, prevented it from entering the narrow galea of these flowers. The smaller fly was observed entering the flowers of *P. pedunculata* and removing the pollinia but was not seen to enter flowers of *P. curta* although it is possible that it does so. The small size of this fly would perhaps prevent its removing pollinia from the larger flowers of *P. curta*, but if a fly bearing pollen massulae from *P. pedunculata* were to enter a flower of *P. curta* there is no barrier to prevent transfer of pollen to the stigma. Observations indicate that this would be an uncommon occurrence.

Structurally there is little chance of self fertilisation occurring in the putative hybrid or the parent species. A count of 100 withered flowers of each species in the area showed that only 35 of the *P. curta* flowers were setting seed and 27 of the *P. pedunculata*. None of the putative hybrid plants have yet been observed to produce seed. Judging by the uniformity of the hybrids it seems that backcrossing is not taking place.

Many artificial hybrids of *Pterostylis* species have been produced (Bates, 1981; Stoutamire, 1982) but to our knowledge the above hybrid is not one of these. Stoutamire (l.c.) stated that "crossing *Pterostylis curta* and *P. pedunculata* resulted in few seeds with poorly developed embryos. Some of these germinated but seedlings died in flask." It is possible that the crossing occurs more commonly in nature but poor seed viability may be responsible for the apparent rarity of hybrid plants.

Both species, *P. curta* and *P. pedunculata*, as well as the hybrid are illustrated in Figs. 1-3 and their morphological characteristics summarised in Table 1.

Table 1. Diagnostic features of *P. curta*, putative hybrid and *P. pedunculata*. (Based on the specimens from the Belair Recreation Park collected by Bates in 1980 and 1981).

Feature	<i>P. curta</i>	Putative hybrid	<i>P. pedunculata</i>
Basal leaves	3-6 cm long, elliptical to oblong-elliptical, 2-6 on long petioles.	3-5 cm long, ovate, 2-5 on long petioles.	2-3 cm long, ovate to oblong, elliptical, 2-4 on long petioles.
Stem at flower	c. 2 mm diam.	c. 2.5 mm diam.	c. 3 mm diam.
Flower	greenish and white	green with a rusty coloration about the apex of the galea.	green with dark brown coloration about the apex of the galea and sinus of the lower lip.
Hood (Galea)	3-3.5 cm long	c. 2.2 cm long	c. 1.3 cm long
Lateral sepals	with sinus, 120-180° wide; the lobes not as long as the galea.	with sinus 90-110° wide; the lobes about as long as the galea.	with sinus c. 75° wide; the lobes much longer than the galea.
Labellum	rusty coloured, c. 14 mm long, oblong linear but twisted and wider toward the apex, almost acute and projecting through the sinus.	brown, c. 9 mm long, oblong-elliptical, slightly twisted, obtuse, reaching just level with the sinus.	dark brown, c. 5.5 mm long, bluntly ovate, not reaching the sinus.
Column	c. 20 mm long	c. 15 mm long	c. 11 mm long
Stigma	linear elliptical	elliptical	ovate

Selected South Australian specimens housed at AD were examined.

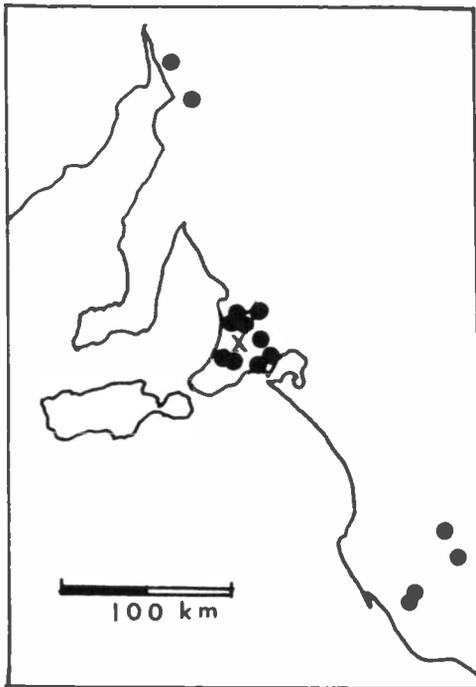
P. curta (From Belair Recreation Park): *H.A. Gunter s.n.*, 30.ix.1929, Long Gully; *R.S. Rogers 4032*, 27.viii.1909, National Park Belair; *S.A. White s.n.*, 19.vii.1906, National Park.

P. pedunculata (From Belair Recreation Park): *R.S. Rogers s.n.*, 22.viii.1905, National Park Belair; *S.A. White s.n.*, 19.vii.1906, Long Gully; *S.A. White s.n.*, early 20th Century, National Park Belair.

Putative hybrids (From Belair Recreation Park and vicinity): *R. Bates s.n.*, 15.ix.1980, Belair Recreation Park; *R. Bates s.n.*, 9.ix.1981, Belair Recreation Park (Voucher specimens of hybrid and parent species, also in wet collection at AD); *R. Bates 2252 & 2253*, 8.ix.1982, Belair Recreation Park; *V. Jacobs* sub *R.S. Rogers 4147*, 23.ix.1915, Cherry Gardens.

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Map 1. Distribution of *P. curta* in South Australia (X denotes putative hybrid).



Map 2. Distribution of *P. pedunculata* in South Australia.