Taxonomic notes on South Australian *Ptilotus* (Amaranthaceae)

T.R. Lally\(^a\) & W.R. Barker\(^b\,\,c\)

\(^a\) Australian National Herbarium, Centre for Plant Biodiversity Research, GPO Box 1600, Canberra, Australian Capital Territory 2601
E-mail: Terena.Lally@csiro.au

\(^b\) State Herbarium of South Australia, P.O. Box 2732, Kent Town, South Australia 5071
E-mail: bill.barker@sa.gov.au

\(^c\) Australian Centre for Evolutionary Biology & Biodiversity, The University of Adelaide, South Australia 5005

Abstract

Taxonomic and nomenclatural changes to three *Ptilotus* taxa are presented in advance of the revised edition of the *Flora of South Australia*. *Ptilotus gaudichaudii* (Steud.) J.M.Black is now considered to comprise three subspecies: *P. gaudichaudii* subsp. *gaudichaudii*, *P. gaudichaudii* subsp. *eremita* (S.Moore) Lally, comb. et stat. nov. and *P. gaudichaudii* subsp. *parviflorus* (Benth.) Lally, comb. et stat. nov. A further subspecies is recognised in *P. nobilis* (Lindl.) F.Muell.: *P. nobilis* subsp. *angustifolius* (Benl) Lally & W.R. Barker, comb. et stat. nov. and its geographical range is clarified. *Ptilotus nobilis* var. *pallidus* Benl is reduced to a synonym of *P. nobilis* subsp. *nobilis*. *Ptilotus spathulatus* f. *angustatus* Benl is also reduced to synonymy under *P. spathulatus* (R.Br.) Poir.

Key words: Amaranthaceae, *Ptilotus*, taxonomy, nomenclature, South Australia.

Introduction

In preparing a treatment of the genus *Ptilotus* for the new edition of the *Flora of South Australia*, a number of taxonomic issues requiring resolution were identified by the first author. Independently of this research, studies by W.R. Barker revealed further taxonomic issues within *Ptilotus nobilis*. The opportunity is taken here to present, in part, the outcomes of this research in advance of the new State Flora.

Materials and methods

This study is based on examination of herbarium specimens from AD, BM, CANB, G-DC, K, M, MEL and P. Measurements were made from fresh specimens and herbarium material (rehydrated where required).

Terminology used here to describe the hairs follows that of Benl (1971), as translated by Burbidge (1972). The hairs are basically of the same type (simple) but vary in the degree to which lateral projections are produced at the septa between the primary cells. The leaves of taxa described here superficially appear petiolate, but are here treated as sessile. The leaf lamina extends and narrows to the leaf base, with no discernable petiole.

Benl commonly used the ranks of variety and forma to classify infraspecific variation. In more recent times subspecific rank has been utilised (Bean 2008) for eastern Australian *Ptilotus*. The first author has chosen to continue with this approach for her progressive revision of the genus.

Taxonomy

1. *Ptilotus gaudichaudii*

As indicated by Bean (2008), morphological differences are apparent between the two existing varieties in this species. Further study has revealed there are three infraspecific taxa sufficiently distinct to be recognised at subspecies rank.

*Ptilotus gaudichaudii* (Steud.) J.M.Black


**Type**: Western Australia: Shark Bay, C.Gaudichaud s.n. (holo: P 00609973).


**Type**: Western Australia: Shark Bay, C.Gaudichaud s.n. (holo: P 00609973).

**Type**: Western Australia: near Marrell’s farm, York, 30 Mar. 1840, L.Preiss 1368 (holo: LD 1214295, n.v., digital image at CANB).

Annual or perennial herb to 70 cm high; stems ribbed, with very sparse, long, weak, simple or ± nodose, sometimes twisted or crisped hairs, denser on newer growth, becoming glabrescent or glabrous. Leaves sessile, narrowly obovate or narrowly elliptic, rarely subspathulate or ovate, 5–47 (–65) mm long, including the long attenuate bases of the basal leaves, 0.5–5 (–8) mm wide, hairs as for stems, basal leaves often curled and senescent by anthesis; apices with mucro to 0.8 mm long. Inflorescence globular or oblong,
rarely hemispherical spikes, rachis to 3 cm long, 8–35 flowered. Bract and bracteoles usually glabrous, or with long, sparse, simple hairs on or near midrib, both with a fleshy herbaceous pad at base, remainder hyaline, golden-brown; apices apiculate, the bract 2.7–5 mm long, bracteoles 3–5.4 mm long. Perianth 7.5–15 mm long, green with broad white margins, aging to yellow; tepals narrowly ovate, slightly concave, geniculate above bulbous base, outer tepals marginally longer than inner; outer surface with dense, nodose hairs to 3.5 mm long on bulbous base, remainder of tepal with sparse to moderately dense, nodose hairs to 2 mm long, attached to midrib, forming two comb-like rows; margins scarious, glabrous, apices acute; inner surface of outer tepals glabrous; inner surface of inner tepals with moderately dense, crisped, nodose hairs, attached to the margins on lower quarter, hairs extending to a third tepal length. Fertile stamens 3 or 4, filaments 2–10 mm long, deep red, purple or cream; anthers 0.4–1.8 mm long; staminodes 1 or 2, approximately half fertile stamen length. Ovary with few to many nodose hairs at apex, sometimes glabrous; style eccentric, 2–10.5 mm long, sometimes sinuose.

**Key to subspecies of Pilotus gaudichaudii**

1. Perianth 10–15 mm long; style 7–10.5 mm long. 
   - subsp. gaudichaudii

   1. Perianth 6–9 mm long; style 2–5 mm long.
   2. Fertile staminal filaments 4–5 mm long, deep red to purple; style 4–5.3 mm long; central and eastern Australia. 
   - subsp. parviflorus

2. Fertile staminal filaments 2–3 mm long, cream; style 2–2.5 mm long; Western Australia. 
   - subsp. eremita

**Pilotus gaudichaudii** (Steed.) J.M.Black subsp. gaudichaudii


- Bract 4–5 mm long; bracteoles 4.5–5.2 mm long. 
- Perianth 10–15 mm long. 
- Staminal filaments 8.5–10 mm long, cream, sometimes deep red or with pale purple or red streaks. 
- Style 7–10.5 mm long.

*Distribution & notes.* Occurs from the west coast of Western Australia, between Perth and Shark Bay, eastwards to Alice Springs in southern Northern Territory and south to the northern part of the Eyre Peninsula in South Australia. It grows on dunes, plains or creek banks, in red or brown sand, loam or clay-loam, in open mulga (*Acacia aneura*) woodland, chenopod shrubland or *Triodia* communities.

**Pilotus gaudichaudii** subsp. gaudichaudii is distinguished from subsp. *eremita* and subsp. *parviflorus* by its longer perianths and correspondingly larger inflorescences (to 3 cm long × 3 cm wide), longer stamens and style, and, frequently larger, more robust habit.

*Representative specimens examined* 


**Northern Territory.** Katadju [Kata Tjuta], The Olgas, 30 May 1985, R.Bates 5600 (AD, CANB); Andado Station, Wilumpa Tableland, 18 Apr. 1977, T.S. Henshall 1492 (AD, CANB, DNA, MEL); 10 miles [c. 16 km] SW of Alice Springs, 9 May 1972, P.K. Latz 2486 (CANB, DNA).

**South Australia.** 32 km N of Marla Bore, 14 July 1982, P.E. Conrick 763 (AD, CANB); Durkin Outstation, which is ca 15 km W of Mulgatung, 26 Sept. 1971, J.Z. Weber 2798 (AD, CANB, CHR, G).

**Pilotus gaudichaudii** subsp. *eremita* (S. Moore) Lally, comb. et stat. nov.

*Trichinium eremium* S. Moore, J. Linn Soc., Bot. 34: 218 (1899).

- **Type:** Western Australia: ‘Ad Gibraltar floribat mens. Sept.’ [goldfields near Gibraltar], Sept. 1895, S. Moore s.n. (holo: BM 00089558, n.v., digital image at CANB; iso: K 000356905, n.v., digital image at CANB, NY n.v.).

- **Bract** 3–4.5 mm long; bracteoles 3.5–5 mm long.
- Perianth 6.6–8.5 mm long. 
- Staminal filaments 2–3 mm long, cream. 
- Style 2–2.5 mm long.

*Distribution & notes.* Occurs in Western Australia between Shark Bay and Kalgoorlie. It occurs in dune country, or on hillslopes or outcrops, with soils of red brown or yellow sand or clay, sometimes overlying laterite. It grows in open eucalypt woodland or tall shrubland with *Acacia, Dodonea* and *Melaleuca.*

**Pilotus gaudichaudii** subsp. *parviflorus,* has previously been included within the similar *P. gaudichaudii* subsp. *parviflorus.* It differs from this subsp. by its short, cream-coloured staminal filaments, and the short style. From *P. gaudichaudii* subsp. *gaudichaudii* it differs by its usually more delicate habit, with a smaller inflorescence (to 2 cm long × 2 cm wide) and smaller sized perianths. Although its distribution overlaps with that of *gaudichaudii,* this taxon is easily distinguished by its very short staminal filaments and style. The style of subsp. *gaudichaudii* is 7.5–10.5 mm long, and usually easily visible near the perianth apex at anthesis, whereas in subsp. *eremita* the style is shorter (2–2.5 mm long) and enclosed in the perianth at anthesis.

*Representative specimens examined* 

**Western Australia.** Meekering, 5 Oct. 1977, G. Benl Au 10 & A.S. George (CANB, M); 3.2 km E of Laurances Find, Walling Rock Station, 14 Sep. 1988, R.J. Cranfield 7419 (CANB, PERTH); 0.8 km W of homestead, Dirk Hartog Island, 3 Sep. 1972, A.S. George 11421 (CANB, PERTH); Cowcowing, Sep. 1904, P. K. Latz 2486 (CANB, DNA); 3.2 km E of Laurances Find, 10 & A.S. George (CANB); Durkin Outstation, which is ca 15 km W of Mulgatung, 26 Sept. 1971, J.Z. Weber 2798 (AD, CANB, CHR, G).

**Pilotus gaudichaudii** subsp. *parviflorus* (Benth.) Lally, comb. et stat. nov.


Bract 2.7–4.2 mm long; bracteoles 3–5.4 mm long. Perianth 7.5–9 mm long. Staminal filaments 4.5–5 mm long, deep red or purple. Style 4–5.3 mm long.

Distribution & notes. Occurs in southern Northern Territory near Alice Springs, in south-west Queensland, southwards through western New South Wales, and into eastern South Australia in the southern Flinders Ranges and adjacent area south of Barrier Highway. The subspecies grows on flats or low rises in red sand, loam or clay-loam, sometimes with stones or gravel particles, growing in open eucalypt and mulga (Acacia aneura) woodland or shrubland, grassland or herbfields.

This subspecies shares a similar delicate habit, small inflorescences and small perianths with subsp. eremita, but is readily distinguished from that taxon by its longer, deep red to purple staminal filaments, and longer style. It differs from subsp. gaudichaudi in its smaller perianths with shorter stamens and style.

Representative specimens examined


SOUTH AUSTRALIA. Next to the Weckeroo – Plumbergo Road, just opposite dam at Weckeroo Springs, 30 July 1989, R.J. Bates 19954 (AD); Bimbowie Station, 2 Oct. 1995, R.J. Bates 41228 (AD); Oakbank Station, 20 Sept. 1968, J.B. Cleland s.n. (AD97308290); Danggali Conservation Park, 100 m along track to NW – 5 km N of turn off to Mulga Dam, 3 Mar. 1993, D.D. Cunningham & B.R. Moore 613 (AD).


NEW SOUTH WALES. 40 km NNW of Cobar, Bundella Station W boundary, 1.9 km SSE of Joe’s Tank, 7 Sept. 1978, M.D. Crisp 4152 (CANB, NSW); Roto, S of railway, 8 Oct. 2000, K.D. Hill 5528 et al. (CANB, MEL, NSW); Road between Trida and Keewong, c. 36.5 km N from turnoff along road between Mataka and Ivanhoe, 19 Apr. 2003, R.W. Purdie 5653 (CANB, NSW).

2. Ptilotus nobilis

Ptilotus nobilis (Lindl.) F.Muell. (including P. exaltatus Nees) is a widespread and variable taxon which has been treated for eastern Australia by Lee et al. (2007) and Bean (2008). Two subspecies are presently recognised, P. nobilis subsp. nobilis and P. nobilis subsp. semilanatus (Lindl.) A.R.Bean, but further variation exists in populations in South Australia, the Northern Territory and Western Australia. Additional infraspecific taxa, originally described under P. exaltatus, require further assessment, particularly in Western Australia. For the purposes of this paper, only taxa recorded for South Australia are considered. Synonymy and typification largely follow Bean (2008).

Key to subspecies of Ptilotus nobilis in S.A.

1. Basal leaves 16–34 mm wide, attenuate leaf bases < one third the length of the lamina; inflorescences usually cylindrical, rarely ovoid ................. subsp. nobilis
   1a. Basal leaves 1–15 mm wide, attenuate leaf bases > half the length of the lamina; inflorescences usually hemispherical or ovoid, rarely cylindrical
   2. Perianth 21–27 mm long; style > 15 mm long; southern South Australia ................. subsp. angustifolius
   2a. Perianth 13–22 mm long; style < 15 mm long; eastern South Australia, Victoria, New South Wales and Queensland ................. subsp. semilanatus

Ptilotus nobilis (Lindl.) F.Muell. subsp. nobilis


Trichinium densus A.Cunn. ex Moq. in A.DC., Prodr. 13: 289 (1849). — Type: New South Wales: Swampl-plain near Lachlan River, June 1817, A. Cunningham s.n. (holo: G-DC; iso: CGE, both n.v.).


Fig. 2. Isotype of *Ptilotus nobilis* subsp. *angustifolius* (Benl) T.R.Lally & W.R.Barker (NSW 29534). Specimen image supplied by the National Herbarium of New South Wales, Botanic Gardens Trust, Sydney.
Ptilotus nobilis

V. Levitzke 561 (syn: BRA, n.v.) could not be located at the one of which (nobilis shorter hemispherical-rounded inflorescences. Whilst grassland, or ephemeral herbfields.

Ptilotus for eastern Australian congruent with the approach adopted by Bean (2008) indicates subspecific rank is appropriate. This is also this taxon and other infraspecific taxa within this genus, but differs in the much longer perianths less robust habit. It is vegetatively similar to subsp. microcarpa association. grows on rocky slopes or hills, occurring in skeletal or stony, red loams or sands and brown clays, north-western Victoria (Fig. 1). Grows on sometimes plains, dunes or slopes, associated with Acacia or mallee-eucalypt woodland or shrubland, Spinifex grassland, or ephemeral herbfilds.

Benl (1979) distinguished P. exaltatus var. pallidus by its larger, pallid bract and bracteoles and relatively shorter hemispherical-rounded inflorescences. Whilst this combination of characters is uncommon it is considered to be within the range of variation for P. nobilis subsp. nobilis. Other than the type, only two additional specimens had been determined as this taxon, one of which ('V. Levitzke 561') could not be located at the State Herbarium of Adelaide (AD).

Ptilotus nobilis subsp. angustifolius (Benl) Lally & W.R. Barker, comb. et stat. nov.


Distribution & notes. Ptilotus nobilis subsp. angustifolius is distributed in southern South Australia from near Quorn, north-east of Port Augusta, south to Victor Harbor (Fig. 1), but it is apparently uncommon and few recent collections exist. The type of Ptilotus nobilis var. angustifolius (Fig. 2) is thought to occur around Port Pirie, the South Australian collecting locality recorded for Max Koch in 1901 (Audas 1929). The subspecies grows on rocky slopes or hills, occurring in Eucalyptus microcarpa association.

Ptilotus nobilis subsp. angustifolius differs from subsp. nobilis by its narrow basal leaves with long attenuate bases, the leaf lamina usually less coriaceous than in subsp. nobilis, and its usually shorter and less robust habit. It is vegetatively similar to subsp. semilanatus, but differs in the much longer perianths and styles. Benl (1959) described Ptilotus nobilis var. angustifolius at varietal rank, but the distinction between this taxon and other infraspecific taxa within P. nobilis indicates subspecific rank is appropriate. This is also congruent with the approach adopted by Bean (2008) for eastern Australian Ptilotus.
image at CANB); in limoso-calculosis ad latus orientale montis Brown prope urbiculam York, Septembri a. 1839, L. Preiss 1363 (cum Trichinio humili) (syn: ?LD, n.v.); Swan River, 1843, L. Preiss 1373 (syn: G-DC G00200111, n.v., digital image at CANB, MEL, n.v.).


Acknowledgements

Thanks are due to the heads and curators of AD, CANB and P for the loan of specimens in their care, and to MEL for permission to examine their holdings of P. gaudichaudii and P. nobilis. Curators at G-DC, M and NSW for provided digital images of type material of Trichinium mucronatum (G-DC) and Ptilotus nobilis var. angustifolius (M, NSW). Tony Orchard as Australian Botanical Liaison Officer 2008-2009 kindly measured type material of Trichinium eremita at K and provided images of Ptilotus specimens from BM and K. Tony Bean (BRI) checked the MEL type of Trichinium corymbosum var. parviflorum, on loan to him at the time, and Murray Henwood organised the unsuccessful search for type material of Ptilotus nobilis var. angustifolius at SYD. The first author thanks Brendan Lepschi for encouragement, guidance and helpful comments on the manuscript.

References