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Taxonomic notes on South Australian *Ptilotus* (Amaranthaceae)

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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. Keys to infraspecific taxa in *P. gaudichaudii* and *P. nobilis* are presented.

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

Trans. & Proc. Roy. Soc. S. Australia 69: 309 (1945). — *Trichinium gaudichaudii* Steud., Nom. Bot. ed. 2, 2: 700 (1841). — *T. corymbosum* Gaudich. in H.L.C. de S.Freycinet, Voy. Uranie Bot. 444 (1829), nom. illeg. — **Type:** Western Australia: Shark Bay, *C.Gaudichaud s.n.* (holo: P 00609973).

Trichinium corymbosum 'β' Nees in J.G.C.Lehmann, Pl. Preiss. 1: 630 (1845). — *T. corymbosum* var. *ramosum* Nees ex Moq. in A.P. de Candolle, Prodr. 13: 292 (1849). — **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 sinuous.

Key to subspecies of *Ptilotus 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*

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

Illustration. P.Moore, Guide Pl. Inland Australia 256 (2005).

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.

Ptilotus 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

WESTERN AUSTRALIA. 21 km NW of Ashburton Downs on the Kooline road, 9 Sept. 1986, *R.J.Chinnock* 7049 (AD,

CANB); 2.5 km S of Binnu on Brand Highway, 23 Oct. 2000, *B.J.Lepschi* 4329 & *L.A.Craven* (AD, CANB, L, PERTH, US, W); 18 miles [28.8 km] E of Pindar, 10 Oct. 1945, *R.D.Royce* 670 (CANB, PERTH).

NORTHERN TERRITORY. Katadjuta [Kata Tjuta], The Olgas, 30 May 1985, *R.Bates* 5600 (AD, CANB); Andado Station, Wilyunpa 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 Mulgathing, 26 Sept. 1971, *J.Z.Weber* 2798 (AD, CANB, CHR, G).

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

Trichinium eremita S.Moore, J. Linn Soc., Bot. 34: 218 (1899). — **Type:** Western Australia: ‘Ad Gibraltar florebat mens. Sept.’ [goldfields near Gibraltar], Sept. 1895, *S.Moore s.n.* (holo: BM 000895588, 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*, *Dodonaea* and *Melaleuca*.

Ptilotus gaudichaudii subsp. *eremita*, 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 subsp. *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. Meckering, 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, *M.Koch* 1613 (MEL); 200 km NE of Geraldton and 44 km S of Murgoo Homestead, 3 Sep. 1970, *P.G.Wilson* 9940 (CANB, PERTH).

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

Trichinium corymbosum var. *parviflorum* Benth., Fl. Austral. 5: 226 (1870). — *Hemisteirus psilotrichoides* F.Muell., Linnaea 25: 435 (1852). — *Ptilotus hemisteirus* F.Muell., Fragm. 4: 90 (1864), nom. illeg. — *Ptilotus*

gaudichaudii var. *parviflorus* (Benth.) Benl, Mitt. Staatssamml. Bot. München 3: 36 (1959). — **Type:** South Australia: Cudnaka, Oct. 1851, *F.Mueller s.n.* (holo: MEL, n.v., *vide* A.R.Bean, pers. comm.).

Illustration. S.W.L.Jacobs & L.Lapinpuro in G.J.Harden (ed.), Fl. N.S.W. 1: 259 (1990).

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. *gaudichaudii* in its smaller perianths with shorter stamens and style.

Representative specimens examined

NORTHERN TERRITORY. North Bond Gap, Simpsons Gap National Park, 24 Aug. 1995, *D.E.Albrecht 6833* & *P.K.Latz* (NT); 17 miles [27 km] N of Alice Springs, 19 Nov. 1968, *D.J.Nelson 1786* (AD, NT); 2 miles [3 km] S of Kunoth Well, Hamilton Downs, 27 Sept 1973, *D.J.Nelson 2318* (NT).

SOUTH AUSTRALIA. Next to the Weekeroo – Plumbago Road, just opposite dam at Weekeroo Springs, 30 July 1989, *R.J.Bates 19954* (AD); Bimbowrie 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).

QUEENSLAND. 7 km W of ‘Tomoo’, SW of Mitchell, 11 Sept. 2005, *A.R.Bean 24370* (BRI, CANB, MEL, NSW); 5 km from Adavale towards Blackall, 25 Oct. 1983, *E.M.Canning 6214* (BRI, CANB); Dundee Station, 20 Mar. 1947, *S.L.Everest 2749* (BRI, CANB).

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 Matakana 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

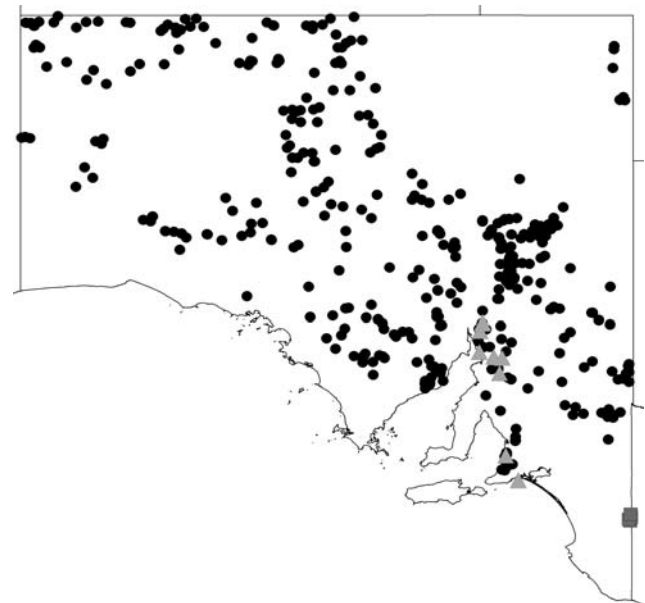


Fig. 1. Distribution of *Ptilotus nobilis* in South Australia: subsp. *nobilis* (black circles); subsp. *angustifolius* (light grey triangles); subsp. *semilanatus* (grey squares).

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*
- 1: 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*
- 2: 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 nobile Lindl. in T.Mitch., Three Exped. Australia 2: 23 (1838). — **Type:** New South Wales: Interior of New Holland, 2 Apr. 1836, *T.L.Mitchell 50* (holo: CGE, n.v.).

Ptilotus exaltatus Nees in Lehm., Pl. Preiss. 1: 630 (1845). — *Trichinium exaltatum* (Nees) Benth., Fl. Austral. 5: 224-5 (1870). — *Ptilotus exaltatus* Nees var. *exaltatus*, Census N.S.W. Pl. 72 (1916). — **Type:** Western Australia: Avon River, between the farms of Messrs Heals and Whitfield, Mar. 1840, *L.Preiss 1367* (holo: LD, n.v.)

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

Trichinium burtonii F.M.Bailey, Bull. Dept. Agric. Queensland 7: 14 (1891). — **Type:** Queensland: Between Camooweal and Urandangi towards Georgina R., 1890, *R.C.Burton s.n.* (holo: BRI; iso: MEL, both n.v.)

Trichinium nervosum F.M.Bailey, Queensland Agric. J. 25: 287 (1910). — **Type:** Queensland: Georgina River, Sept.



Fig. 2. Isotype of *Pilotus 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.

1910, *E.W.Bick* 51 (syn: BRI, n.v.); ditto, *E.W.Bick* 50 (syn: BRI, n.v.).

Ptilotus exaltatus Nees var. *pallidus* Benl, Mitt. Staatssamml. Bot. München 15: 164 (1979), **syn. nov.** — **Type:** Northern Territory: Mt Olga, *B.Barlow* 1877 (holo: AD 97733105).

Illustrations. G.Benl in J.P.Jessop & H.R.Toelken (eds), Fl. S. Austral. ed. 4, 1: 329, fig. 186A–B (1986); N.G.Walsh in N.G.Walsh & T.J.Entwisle (eds), Fl. Victoria 3: 211, fig. 37e–f, o–p (1996), as *P. exaltatus*; P.Moore, Guide Pl. Inland Austral. 255 (2005), as *P. exaltatus*.

Distribution & notes. Widespread throughout Western Australia, the Northern Territory, South Australia, south-western Queensland, western New South Wales and north-western Victoria (Fig. 1). Grows on sometimes skeletal or stony, red loams or sands and brown clays, on plains, dunes or slopes, associated with *Acacia* or mallee-eucalypt woodland or shrubland, *Spinifex* grassland, or ephemeral herbfields.

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.**

Ptilotus nobilis var. *angustifolius* Benl, Mitt. Staatssamml. Bot. München 3: 43 (1959). — **Type:** South Australia: Flinders Range, Oct. 1901, *M.Koch* s.n. [575] (holo: M 0152673, n.v., digital image at CANB; iso: NSW 29534, NSW 790629, both n.v., digital images at CANB).

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*.

Representative specimens examined

SOUTH AUSTRALIA. Back road SE from Quorn, 15 Oct. 1992, *K.M.Alcock* 214 (AD); Wirrabara, ca 30 km NE of Port Pirie, Oct. 1932, *J.E.Brown* s.n. (AD96216068); Mt Brown, ca 25 km E of Port Augusta, 14 Oct. 1962, *H.M.Cooper* s.n. (AD96243015, AD97406207); Mt Brown Forest Reserve, Hd of Woolundunga Sect. 163, 13 Dec. 1984, *S.Dorsch* 029 (AD); Hallett Cove Conservation Park, 21 Oct. 1983, *D.J.E.Whibley* 8522 (AD, CANB); Baroota, s.dat., *S.A.White* s.n. (AD97919291); Yorke Peninsula, s.dat., *leg.ign.* s.n. (AD98115443).

***Ptilotus nobilis* subsp. *semilanatus* (Lindl.) A.R.Bean**

Telopea 12: 242 (2008). — *Trichinium semilanatum* Lindl. in T.Mitch., J. Exped. Trop. Australia 45 (1848). — *Ptilotus exaltatus* Nees var. *semilanatus* (Lindl.) Maiden & Betche, Census N.S.W. Pl. 72 (1916). — *P. semilanatus* (Lindl.) J.M.Black, Fl. S. Austral. ed. 2, 2: 327 (1948). — **Type:** New South Wales: Duck Creek, subtropical New Holland, 27 January 1846, *T.L. Mitchell* 74 (holo: CGE, n.v.; iso: MEL, n.v.)

Illustrations. G.M.Cunningham et al., Pl. Western N.S.W. 286 (1981), as *P. exaltatus* var. *semilanatus*; N.G.Walsh in N.G.Walsh & T.J.Entwisle (eds), Fl. Victoria 3: 211, fig. 37q–r (1996).

Distribution & notes. *Ptilotus nobilis* subsp. *semilanatus* occurs from eastern Queensland through northern New South Wales to north and north-western Victoria, and just across the border into south-eastern South Australia near Bordertown (Fig. 1).

This taxon shares the narrow basal leaves with long attenuate bases and the usually hemispherical or ovoid inflorescences, with subsp. *angustifolius*, but differs from this subsp. in the shorter perianths and styles.

3. *Ptilotus* *spathulatus*

Some morphological variation in floral characters is evident in this species, and this presumably led Benl (1965) to erect *P. spathulatus* f. *angustatus*, distinguished by long, narrow spikes, short perianths, bract and bracteoles, and tepal apices projecting beyond the short tepal hairs. However, morphological variation in this species, including the characters used by Benl to circumscribe f. *angustatus*, is continuous, and does not allow for the recognition of separate entities. There is also no apparent geographic or ecological correlation with the observed variation in *P. spathulatus* sens. lat. Accordingly, *P. spathulatus* f. *angustatus* is here formally reduced to a synonym of *P. spathulatus*.

***Ptilotus* *spathulatus* (R.Br.) Poir.**

in J.B.A.P. de Lamarck, Encycl. Suppl. 4: 620 (1816). — *Trichinium spathulatum* R.Br., Prodr. 415 (1810). — *Ptilotus spathulatus* (R.Br.) Poir. f. *spathulatus*, Mitt. Bot. Staatssamml. München 5: 568 (1965). — **Type:** Tasmania: Derwent River, above the fall, 29 Mar. 1804, *R.Brown* [Bennett No. 3051] (holo: BM 000900536, n.v., digital image at CANB; iso: K, n.v.)

Trichinium mucronatum Nees in J.G.C.Lehmann, Pl. Preiss. 1: 628 (1845). — **Types:** in regionibus interioribus Australiae meridionali-occidentalis, Martio a. 1841, *L.Preiss* 1366 (syn: ?LD, n.v.; BM 00895601, n.v., digital

image at CANB); in limoso-calculosis ad latus orientale montis Brown prope urbiculum 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.).

Ptilotus spathulatus f. *angustatus* Benl, Mitt. Bot. Staatssamml. München 5: 568 (1965), **syn. nov.** — **Type:** South Australia: Yandinga Falls, c. 32 km N of Minnipa, 16 Oct. 1958, *P.G.Wilson 508* (holo: AD 95931068; iso: B, M, n.v.)

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References

- Audas, J.W. (1929). The botanical activities of Max Koch. *Journal of the Royal Society of Western Australia* 15: 83–86.
- Bean, A.R. (2008). A synopsis of *Ptilotus* (Amaranthaceae) in eastern Australia. *Telopea* 12: 227–250.
- Benl, G. (1959). Beitrag zu einer Revision der Gattung *Ptilotus* R.Br. (Amaranthaceae) 2. Teil. *Mitteilungen der Botanischen Staatssammlung München* 3: 34–43.
- Benl, G. (1965). Beitrag zu einer Revision der Gattung *Ptilotus* R.Br. (Amaranthaceae) 5. Teil. *Mitteilungen der Botanischen Staatssammlung München* 5: 563–569.
- Benl, G. (1971). Ein Bestimmungsschlüssel für die Gattung *Ptilotus* R.Br. (Amaranthaceae). *Mitteilungen der Botanischen Staatssammlung München* 9: 135–176.
- Benl, G. (1979). Ergänzende Bemerkungen zu bisher wenig bekannten *Ptilotus*-Sippen (Amaranthaceae) nebst einigen Neubeschreibungen. *Mitteilungen der Botanischen Staatssammlung München* 15: 161–174.
- Benl, G. (1986). *Ptilotus*. In: Jessop, J.P. & Toelken, H.R. (eds), *Flora of South Australia* 1: 321–332. (Govt Printer: Adelaide).
- Benl, G. (1988). *Ptilotus*. *Flora of Australia* 5. Manuscript. Unpublished. (Australian Biological Resources Study: Canberra).
- Burbidge, N.T. (1972). Key to species of *Ptilotus*. Manuscript. Unpublished. (Australian National Herbarium: Canberra).
- Lee, K.K., Harrison, D.K., Johnston, M.E. & Williams, R.R. (2007). Molecular taxonomic clarification of *Ptilotus exaltatus* and *Ptilotus nobilis* (Amaranthaceae). *Australian Systematic Botany* 20: 72–81.