



Ptilotus crinitus (Amaranthaceae), a new species from Western Australia's Kimberley region

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Abstract: Evaluation of a specimen of *Ptilotus* R.Br. (Amaranthaceae), collected from a remote location in the northern Kimberley, reveals it to be a unique taxonomic entity. The morphological differences between this entity and its closest relatives *P. distans* (R.Br.) Poir. and *P. capensis* (Benl) A.R.Bean are discussed and found to support its recognition as the new species *Ptilotus crinitus* T.Hammer & R.W.Davis. An identification key is given for the three species.

Keywords: Amaranthaceae, new species, *Ptilotus*, taxonomy, Western Australia

Introduction

Ptilotus R.Br. (Amaranthaceae) encompasses approximately 125 species with most of the taxonomic diversity within the genus occurring in arid or semi-arid Australia, particularly in Western Australia's Eremaean province (Hammer *et al.* 2018, 2019b). Smaller numbers of species are native to monsoonal northern Australia or temperate southern Australia.

Ptilotus distans (R.Br.) Poir. is a species endemic to northern Australia, occurring mainly in the north of the Northern Territory (i.e. the 'Top End') and with three records (*K.F. Kenneally 11109*, PERTH01647946; *M.D. Barrett MDB 4917*, PERTH09302077; *R.L. Barrett 737*, PERTH06606806) from the Kimberley, Western Australia. *Ptilotus distans* is a member of a species group with *P. fusiformis* (R.Br.) Poir., *P. xerophilus* T.Hammer & R.W.Davis and *P. polystachyus* (Gaudich.) F.Muell. (i.e. the *P. fusiformis* species group). These species together with five others form a well-supported subclade of what has been informally referred to as 'Clade D' (Hammer *et al.* 2019a). Some typical characters within the subclade are an herbaceous habit, greenish flowers (sometimes tinged pink) that are presumably moth-pollinated (e.g. some have nocturnal anthesis, see Hammer *et al.* 2019a), and with the typically five fertile stamens commonly reduced to four, plus one inconspicuous staminode.

Benl (1984) described *P. distans* subsp. *capensis* Benl from the York Peninsula, Queensland. He differentiated this subspecies from typical *P. distans* (i.e. in the Northern Territory) based on staminal filament and style lengths and differences in the indumentum on the bracts, staminal cup and ovary. Bean (2008) considered

the differences between these two subspecies to be significant enough to warrant them to be recognised as distinct species, so he raised Benl's taxon to species rank as *P. capensis* (Benl) A.R.Bean.

The present study evaluates the morphology of a specimen that was collected from a remote coastal area in the northern Kimberley, Western Australia and initially identified as *Ptilotus* aff. *distans* (referred to below as *Ptilotus crinitus*).

Methods

This study was based on examination of dried specimens of *Ptilotus* housed at PERTH and AD.

Results and discussion

Within the genus, the new species *Ptilotus crinitus* is most similar to *P. distans* but can be segregated by its habit, bract shape and size, and sepal indumentum.

Ptilotus crinitus is quite different in habit to *Ptilotus distans* and *P. capensis*. These species are few-branched, narrow and erect tuberous herbs, 0.3–1 m high (e.g. see specimens, K000356752 and K000356753, available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000356752>). The new species is a rounded herb or subshrub with lateral ascending branches to 40 cm high with numerous branches (Fig. 1). Unfortunately, neither the root system nor the base of the plant was collected, and a measurement as to the width of the whole plant was not recorded.

Key to species

1. Rounded and ascending much-branched herbs or subshrubs to 0.4 m high; bract <1 mm wide; abaxial sepal indumentum with hairs to c. 8 mm long, exceeding the sepal apices by 1–2 mm . . . ***Ptilotus crinitus***
- 1: Erect little-branched herbs to 1 m high; bract ≥ 1.5 mm wide; abaxial sepal indumentum with hairs to c. 4 mm long, shorter than or equal to the sepal apices
2. Bract ovate, <4 mm long; style <3.5 mm long ***Ptilotus distans***
- 2: Bract narrowly lanceolate, >5 mm long; style >5 mm long ***Ptilotus capensis***

The bracts of *P. crinitus* are similar to *P. capensis* in being narrowly lanceolate but are much shorter (2.9–3.2 mm) and narrower (0.7–0.9 mm) than those of *P. capensis* (c. 5.2 mm long and c. 1.5 mm wide). The bracts of *Ptilotus distans* differ in shape to the other two species, being ovate, and are much wider than *P. crinitus* at 1.6–2 mm wide. *Ptilotus distans* has a bract length of 2.3–3.8 mm long, similar to *P. crinitus*.

The hairs on the outer surface of the sepals of *P. crinitus* are up to 8 mm long and extend beyond the sepal apex by 1–2 mm (Fig. 2D). Sepal hairs in *P. capensis* and *P. distans* are at most half of the length (to 4 mm long) and do not extend beyond the sepal apex (Fig. 2B). The sepals of *P. crinitus* are more finely tapering than those of *P. distans* (especially the inner three), so much so that the apex is more or less obscured within the hairs that surpass it (Fig. 2A, D).

We find that the differences in these characters are sufficient to recognise the new entity at species rank, and therefore we formally describe it below as *Ptilotus crinitus* T.Hammer & R.W.Davis.

Taxonomy

Ptilotus crinitus T.Hammer & R.W.Davis, *sp. nov.*

Holotypus: North Kimberley, Western Australia [precise locality withheld for conservation reasons], 6 Feb. 2008, *G.J. Keighery & M.N. Lyons KIBS 1188* (PERTH09170898). **Isotypi:** CANB, DNA [to be distributed].

Rounded and ascending *perennial herbs or subshrubs* 30–40 cm high, numerous branches. *Stems* spreading and ascending, angled, ribbed, glabrous or with very sparse hairs. *Leaves* narrowly lanceolate to narrowly elliptical, 5–20 mm long, 0.4–0.8 mm wide, glabrous; base sessile; margins entire; apex acute. *Inflorescences* terminal, spiciform, interrupted, 3–10 cm long, <10-flowered, flowers spaced 1–2 cm apart. *Bracts* narrowly lanceolate, 2.9–3.2 mm long, 0.7–0.9 mm wide, translucent, central portion with a few sparse thickened hairs to c. 0.2 mm long; midrib darkened; apex acute. *Bracteoles* narrowly ovate, uneven in size, 5.5–7.0 mm long, 2.9–3.1 mm wide, opaque, straw-coloured, glabrous or with a few sparse fine hairs to c. 0.5 mm long; midrib prominent, pinkish; apex acute. *Outer sepals* narrowly lanceolate, 12.0–13.0 mm long, 1.4–1.5 mm wide at the base;

adaxial surface glabrous, tinged pale pink; abaxial surface with sub-verticillate hairs to 8 mm long that exceed the sepal apex by 1.0–2.0 mm; apex very narrowly attenuate. *Inner sepals* narrowly lanceolate, 11.5–12.0 mm long, 1.4–1.5 mm wide at the base; adaxial surface with a few fine hairs on the margin, tinged pale pink; abaxial surface with sub-verticillate hairs to 8 mm long that exceed the sepal apex by 1.0–2.0 mm; apex very narrowly attenuate. *Fertile stamens* 3; *filaments* uneven in length, 2.5–3.0 mm long, with silky hairs c. 0.5 mm long on the dilated base; *anthers* 0.9–1.0 mm long, 0.2–0.3 mm wide. *Staminodes* 2, 1.3–1.5 mm long. *Staminal cup* 0.4–0.6 mm long, symmetrical, lacking appendages, with long fine silky hairs to c. 1.5 mm long. *Ovary* ovoid, 1.8–2.0 mm long, 1.3–1.5 mm wide, with silky hairs to c. 0.8 mm long on the apical ½ of the ovary surface; *stipe* very short and flattened, 0.1–0.2 mm long. *Style* slightly to distinctly curved, 2.0–2.5 mm long, slightly excentric on the ovary apex. *Stigma* unlobed, distinctly capitate. *Seeds* not seen. **Figs 1, 2D–F.**

Diagnostic features. *Ptilotus crinitus* can be distinguished from all other members of the genus by the combination of being a perennial herb or subshrub to c. 40 cm high and having narrowly lanceolate to narrowly elliptical glabrous leaves <0.9 mm wide, interrupted inflorescences with flowers spaced flowers 1–2 cm apart, narrowly lanceolate bracts 2.9–3.2 mm long and 0.7–0.9 mm wide, hairs on the abaxial surface of the sepals to 8 mm long and exceeding the sepal apex by 1–2 mm, a staminal cup with long silky hairs, and an ovary with long silky hairs (to c. 0.8 mm long) on the distal half.

Phenology. Flowers recorded for February, probably January to April.

Distribution and habitat. *Ptilotus crinitus* is only known from one record in northern Kimberley, where it was collected near the beach on shallow sand over sandstone and in a low open eucalypt woodland over tussock grassland.

Conservation status. *Ptilotus crinitus* is currently only known from a single location in the remote northern Kimberley, Western Australia. We therefore recommend that this taxon be listed as Priority One under the Conservation Codes of Western Australian Flora (Smith & Jones 2021).

Proposed vernacular name. Long-haired mulla mulla.

Etymology. The specific epithet is from Latin for “long-haired”, which refers to the hairs on the abaxial surface of the sepals that exceed the sepal apex.

Taxonomic Notes. Flowers on *P. crinitus* were found to have three fertile stamens and two staminodes. Four fertile stamens and one staminode are typical for all

other species in the *P. fusiformis* species group, including for *P. distans* and *P. capensis*. Benl (1984), reported *P. distans* subsp. *capensis* to have typically four fertile stamens, but found it to rarely have five or three. Fertile stamen number is usually consistent within *Ptilotus* species, except with a few notable cases (e.g. *P. manglesii* (Lindl.) F.Muell.; see Hammer 2020). It may be that



Fig. 1. Scan of the holotype of *P. crinitus* (G.J. Keighery & M.N. Lyons KIBS 1188; PERTH 09170898).



Fig. 2. Composite image comparing the indumentum between *P. distans* (A–C) and *P. crinitus* (D–F): whole flower (A, D), outer sepal (B, E) and ovary (C, F). — A–C K.F. Keneally 11109 (PERTH01647946), D–F G.J. Keighery & M.N. Lyons KIBS 1188 (PERTH09170898). Note: Separate scales were used for the flowers and sepals (A, B, D, E; scale bar = 2 mm) versus the ovaries (C, F; scale bar = 1 mm).

having three fertile stamens is typical for *P. crinitus* or it could vary in number like in *P. capensis*.

Benl (1984) described the ovary indumentum of *P. distans* subsp. *distans* as being shortly pubescent in the upper half with simple hairs, 0.2–0.3 mm long, and the ovary indumentum of *P. capensis* consisting of articulate hairs to 2.4 mm long. This is in contrast to Bean (2008), who described the hairs on the ovary of

P. distans to be pubescent, non-articulate and to 1.4 mm long and the ovary hairs of *P. capensis* to 3.3 mm long. Our examinations of *P. distans* specimens at PERTH and AD only found ovary hairs of the type described by Benl (i.e. pubescent and 0.2–0.3 mm long). We found that *P. crinitus* had silky and articulate hairs on the ovary to c. 0.8 mm long, which are noticeably longer and of a different texture than those typical of *P. distans* (Fig. 2C, F). Since we could not confirm the indumentum characters described by Bean (2008), we believe that ovary indumentum may be an additional difference between *P. crinitus* and *P. distans*, at least for most morphotypes of *P. distans*.

Acknowledgements

The authors thank the Curators and staff of the Western Australian Herbarium (PERTH) and State Herbarium of South Australia (AD). Greg Keighery and Mike Lyons are also thanked for providing additional field notes on their specimen. We also thank the reviewers of the manuscript for their helpful comments.

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