



Ptilotus durus (Amaranthaceae), a new species from northern South Australia

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Abstract: A new arid zone species from Arckaringa Station in northern South Australia is formally described as *Ptilotus durus* Lally. Currently it is known only from a single population on a gypseous breakaway escarpment in the Arckaringa Hills and is considered to be endangered.

Keywords: *Ptilotus*, new species, Amaranthaceae, endemic, plant taxonomy, South Australia

Introduction

This new species of *Ptilotus* R.Br. came to light as a result of a collection made in 2010 by Daniel Duval and colleagues as part of a field trip collecting seed for the Millennium Seed Bank Partnership. Initially it was referred to *Ptilotus parvifolius* (F.Muell.) F.Muell., but subsequent examination of specimens indicated the material represented a new species, subsequently given the phrase name *Ptilotus* sp. Arckaringa (D.J. Duval 1958) D.J. Duval.

Ptilotus durus is endemic to the Arckaringa Hills in northern South Australia, and is restricted to a small area within the Breakaways subregion of the Stony Plains biogeographic region (IBRA). According to Daniel Duval (pers. comm., 2018), *Ptilotus durus* is restricted to a ± 1 km band along part of the Arckaringa Hills escarpment. It co-occurs with the endangered *Olearia arckaringensis* P.J. Lang at this site (D. Duval, pers. comm., 2013). Despite subsequent trips to the area, chiefly in search of further populations of *O. arckaringensis*, and a dedicated survey for *O. arckaringensis* in 2017 (SAAL 2018), no further populations of *P. durus* have been located (D. Duval, pers. comm., 2022).

This publication will allow for recognition of this species, and hopefully aid in its conservation as a threatened species, by encouraging further effort in locating additional populations, as *P. durus* would appear to be even more restricted than the endangered *O. arckaringensis*.

Taxonomy

Ptilotus durus Lally, sp. nov.

Holotypus: South Australia, Lake Eyre: Arckaringa Station, [approximately] 5 km E of Imbitchie [Imbitcha] Bore (approximately 30 km NNE [*sic*]

of Homestead), 7 Oct. 2010, D.J. Duval 1958, D.E. Murfet & T.S. Te (AD247655). **Isotypi:** B, BM, CANB838098, MEL, NY, PERTH.

Ptilotus sp. Arckaringa (D.J. Duval 1958) D.J. Duval, Cens. S. Austral. Pl. Algae Fungi [http://www.flora.sa.gov.au/census.shtml].

Open, *perennial shrubs* to 70 cm high and 70 cm wide, with divaricately branching stems produced from a thick woody base. *Stems* many, \pm erect, leafy, terete, newer stems reddish, ageing to greenish-brown, new growth with moderately dense, appressed, nodose hairs to 0.2 mm long, older stems becoming glabrescent. *Cauline leaves* 4.5–9 mm long, 0.8–2 mm wide, narrowly elliptic or narrowly obovate, grey-green to green, drying dark green and readily deciduous in the dried state, with scattered, moderately dense to dense, appressed, nodose hairs to 0.3 mm long; base cuneate, \pm sessile or petiolate, petiole to 0.7 mm long; apices mucronate, mucro to 0.1 mm long. *Basal leaves* not seen. *Inflorescences* terminal, semi-hemispherical or globose spikes with rounded apex, 10–22 mm long, 15–20 mm wide at maturity. *Bracts* 2–2.8 mm long, chartaceous, golden-brown, with a slightly thickened, dark brown portion basally, with some scattered nodose hairs, sometimes hairs extending along the midvein; apex rounded or acute. *Bracteoles* 4–5 mm long, chartaceous, golden-brown, glabrous; apex rounded or acute. *Perianth* 8.5–11 mm long, pale pink to white. *Tepals* linear to narrowly elliptic, concave, basally narrowing to a stalk c. 1 mm long, herbaceous, with broad scarious marginal band; *outer tepals* to 1 mm longer than inner, 1 mm wide, apex \pm truncate, with margins inrolled to appear acute or obtuse; outer face with dense, nodose hairs to 2.5 mm long on basal stalk, remainder of tepal with very dense, nodose hairs to 6.5 mm long, exceeding apex by up to 1 mm, hairs shorter on margins and apex, with sparse to moderately dense, nodose hairs to 0.5 mm long also present; *outer tepals* glabrous on inner face; *inner tepals* 0.5 mm wide,

apex obtuse or with margins inrolled to appear acute; outer face with hairs as for outer tepals, hairs exceeding apex up to 1.5 mm; *inner tepals* with very dense, crisped hairs on inner face, the hairs clumped together to form ‘plugs’ and extending to 3.5 mm from base. *Fertile stamens* 3; *filaments* 2.5–3.2 mm long, *anthers* 0.5–0.8 mm long; *staminodes* 2, to 1.4 mm long. *Staminal cup* 0.3–0.6 mm, with fleshy lobes to 0.2 mm long, usually between or adjacent to the staminode filament bases. *Ovary* stipitate, glabrous, to 2 mm long. *Style* eccentric, 1.8–2 mm long, straight, glabrous. *Stigma* capitate. *Seed* ovoid, glabrous, pale golden-brown, sometimes with reddish blush, to 2.2 mm long and 1.2 mm wide. **Fig. 1.**

Common name: Arckaringa fox-tail (DEW 2023).

Distribution and habitat. *Ptilotus durus* is known only from the type locality, in the Arckaringa Hills, northern South Australia. It occurs in upper parts of the gullies that branch up the escarpment, often in localised pockets on upper slopes (D.J. Duval, pers.

comm., 2022), growing in gypseous scree slopes with *Acacia tetragonophylla* and *Anemocarpa saxatilis*. See Lang (2008) and SAAL (2018) for a detailed ecological description for this area.

Phenology. Flowers September to October; fruits / seeds recorded as available for collecting from October to December according to the data sheet for this species on the Seeds of South Australia database (DEW 2023).

Diagnostic characters. *Ptilotus durus* is most similar to the endemic Western Australian species *P. divaricatus* (Gaudich.) F.Muell., for which it is also the sister taxon (Hammer *et al.* 2019). It can be distinguished by the following characters: habit to 60 cm high (vs. to 150 (–300+) cm high in *P. divaricatus*), leaves to 9 mm long (vs. 16–40 mm long), inflorescences to 22 mm long and 20 mm wide (vs. to 40 mm long and 30 mm wide), perianths 8.5–11 mm long (vs. 12–16 mm long), staminal filaments to 3.2 mm long (vs. 4–9.5 mm long) and style to 2 mm long (vs. 3.4–7.7 mm long), and geographic range.



Fig. 1. *Ptilotus durus*, images from type locality: **A** Habitat, the new species growing in upper gullies of slopes; **B** habit of mature shrub; **C** habit of young shrub, growing in gypseous scree; **D** inflorescence. — Photos: D.J. Duval.

Ptilotus durus is also superficially similar to *P. parvifolius* (F.Muell.) F.Muell., which occurs south of the range of *P. durus* (see Lally 2008). Whilst *P. parvifolius* has a similar divaricately branched habit, and similarly sized inflorescences and perianths, it differs from *P. durus* by being largely leafless, inflorescences distinctly less 'fluffy' (due to shorter hair lengths on the tepals), bracts and bracteoles with long apiculate apices, tepals with less dense hairs on the outer face that do not exceed the apices, and much longer staminal filaments and style, \pm equal to the length of the perianth, whereas in *P. durus* stamens and style are less than or just equal to half the perianth length.

Other similar shrubby *Ptilotus* species occurring in the same region as *P. durus* are *P. barkeri* Benl and *P. whitei* (J.M.Black) Lally. *Ptilotus barkeri* is a low sub-spinescent shrub with usually broadly obovate, petiolate leaves, shorter perianths (8–8.5 mm long in *P. barkeri* vs. 8.5–11 mm long in *P. durus*), with curved tepals and tepals with very short hairs on the outer face, the hairs not reaching the apex. *Ptilotus whitei* is a tall, sometimes divaricate, \pm sub-spinescent shrub with grey-green, obovate to spatulate leaves, large 'fluffy' inflorescences to 45 mm long (vs. to 22 mm long in *P. durus*), tepals with very dense and obvious verticillate hairs beneath over-topping nodose hairs (vs. sparse nodose hairs beneath denser over-topping nodose hairs in *P. durus*) and the stamens and style are longer, \pm equal to the length of the perianth (or sometimes the style just exceeding the tepal apices), whereas in *P. durus* the stamens and style are less than or just equal to half the perianth length.

Conservation status. Due to its estimated area of occupancy being less than 500 km², and population size of fewer than 250 mature individuals, this species should at least be considered nationally as Endangered (EN), using the IUCN 2001 categories (IUCN 2012). According to the guidelines in IUCN (2022),

criterion D would currently apply, as the condition of the population is unknown, but the low number of mature individuals could render them susceptible to environmental impacts such as climate change and drought.

Etymology. The epithet is derived from the Latin *durus* (hard, tough), in reference to the ability of this species to persist in the harsh, arid, environment it occurs.

Notes. Seeds of this species are conserved ex-situ, with the seeds banked at the South Australian Seed Conservation Centre in the Adelaide Botanic Gardens (DEW 2023).

A survey undertaken in October and November 2017, to search for further populations of the endangered *Olearia arckaringensis* (SAAL 2018), resulted in opportunistic additional collections of this *Ptilotus* species, cited below, with associated population number data. According to Daniel Duval (pers. comm., 2022), there were approximately a few hundred plants in total observed by him personally on this survey.

Specimens examined.

SOUTH AUSTRALIA. **Lake Eyre:** Arckaringa Station, 5 km E of Imbitcha Bore, 7 Sep. 2013, *D.J. Duval* 2721 & 2722 (AD; AD, CANB); c. 4 km NE of Arckaringa Ck crossing on escarpment, 25 Sep. 2016, *D.J. Duval* 3492, *J.G. Guerin*, *T.S. Te* & *R. Johnson* (AD, B, BRI, CANB, K, MEL, MO); 2 km S along escarpment from tk to Imbitcha Bore, 27 Oct. 2017, *D.J. Duval* 3668 & *L.A. Kampherst* (AD, BRI, KUN, M, NSW, NT, US); c. 3 km S of Imbitcha Bore Tk along escarpment, 27 Oct. 2018, *D.J. Duval* 3671 (AD); SE of main tk that ascends 'The Jump Up', 22.8 km NNW of Arckaringa Homestead, 27 Oct. 2017, *P.J. Lang* 3234 (AD, BRI, CANB); c. 5 km E of Imbitcha Bore on Arckaringa Stn, 7 Sep. 2013, *M.J. Thorpe* 450 & 451, *J. Duval* & *D.J. Duval* (AD; AD).

Amended key to *Ptilotus* in South Australia

In the key to *Ptilotus* in the *Flora of South Australia* (Palmer *et al.* 2014), *P. durus* keys out in two places.

Couplet 25, for specimens with perianths 9 mm or longer, can be altered to accommodate *P. durus* as follows:

- 25. Stems and leaves (new growth) glaucous; bract (3.2–) 4.5–6 mm long, equal length to bracteoles ***P. propinquus***
- 25: Stems and leaves not glaucous; bract < 3.5 mm long, shorter than bracteoles
 - 25a. Bract and bracteoles long apiculate apically; style 6–7 mm long ***P. parvifolius***
 - 25b. Bract and bracteoles rounded or acute apically; style to 2 mm long ***P. durus***

Couplet 30, for specimens where the perianth is less than 9 mm long, can be altered to accommodate *P. durus* as follows:

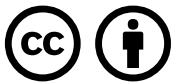
- 30. Upper portion of outer tepal surface with hairs only along the midrib; herbaceous ***P. gaudichaudii***
- 30: Upper portion of outer tepal surface with hairs covering most of surface; woody shrub
 - 30a. Perianth 8–8.5 mm long; tepals with short hairs to 2 mm long, not exceeding tepal apices . . . ***P. barkeri***
 - 30b. Perianth 8.5–11 mm long; tepals with long hairs to 6.5 mm long, exceeding tepal apices ***P. durus***

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