

Further taxonomic studies in Australian Amaranthaceae

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Abstract

Dipteranthemum F. Muell. is included in *Ptilotus* R.Br. as a subgenus and its only species *D. crosslandii*, endemic to Western Australia, is transferred accordingly and described in detail. *Ptilotus trichocephalus*, a related Western Australian species, is described as new. *Trichinium sessilifolium* Lindley was found to have been published before *T. atriplicifolium* Cunn. ex Moq., hence *Ptilotus sessilifolius* has priority over its synonym *P. atriplicifolius*.

1. *Ptilotus crosslandii*

F. Mueller's interpretation of the shiny wing-like tepals of his *Dipteranthemum crosslandii* as "the two inner" perigon segments ("the three outer short and very narrow") would have fully justified his decision to place the new taxon in a distinct genus of Amaranthaceae, for its obviously closest ally, *Ptilotus*, has two outer and three inner tepals. Mueller's error soon became evident (see D. Oliver 1886), and it was then clear that the difference consists only in the relative sizes of inner to outer tepals and their qualities. The striking differences in size, shape and colour between the outer and inner tepals in *D. crosslandii*, which greatly exceed the respective conditions in any other *Ptilotus* species, make it advisable to maintain *Dipteranthemum* with the rank of a subgenus in *Ptilotus*:

Ptilotus subgen. *Dipteranthemum* (F. Muell.) Beal, comb. et stat. nov.

Basionym: *Dipteranthemum* F. Muell., S. Sci. Rec. 3 : 281 (1884).

Typus: *P. crosslandii* (F. Muell.) Beal (*Dipteranthemum crosslandii* F. Muell.).

Ptilotus crosslandii (F. Muell.) Beal, comb. nov.

Basionym: *Dipteranthemum crosslandii* F. Muell., S. Sci. Rec. 3 : 281 (1884), extra-print; Oliver, Hooker's Icon. Pl. 16 : t.1541, figs. 1-8 (1886); Schinz in Engler & Prantl, Nat. Pflanzenfam. 2nd edn., 16c : 58, figs. 32 A-D (1934).

Typus: Near the Upper Murchison River, towards Mount Hale, 1884, C. Crossland s.n. (MEL, phot. M, holotypus; K, phot. M, PERTH isotypi).

Ephemeral or perennial herb, small- to medium-sized, usually growing in colonies; a slender fusiform tap-root producing rosette leaves and mostly an initially upright central stem dividing near base to form several main branches arcuately ascendent, decumbent, semi-prostrate or trailing, 10-70 cm long rarely longer, spreading in a rosette to 1.5 m rarely up to 2 m across. Stems weakly wiry, terete in lower, angular-striate in upper portion, 1.5-2 mm diam. near ground level, c. 1 mm diam. towards the middle, brownish to purplish red, small-leaved up to the inflorescences; simple or few-branched towards apex with lateral branches 1-15 cm long, arising from upper leaf-axils; stems and branches giving rise to very slender flexuous peduncles and rachises of flower-heads. New shoots and foliage densely clothed with patent straight or slightly curved hairs c. 1-2 mm long, more often denticulate-nodose than subdendroid, ultimately restricted to a sparse pubescence immediately below the spikes and to small tufts in axils of (fallen) leaves. Radical leaves crowded to c. 10 in young flowering plants, subspathulate, obovate-oblong or lanceolate, shortly apiculate, 1.5-4 cm long (including a well-defined or somewhat winged petiole to 1.2 cm long) by 0.5-1 cm broad; cauline leaves c. 1-3 cm apart on stems and lower branches, alternate, turned upwards from trailing stems, lanceolate to elliptic, 1-1.5 cm long (including a petiole c. 0.3 cm long) by 0.2-0.7 cm wide, with an apiculum to 1 mm long. Adult leaves becoming completely glabrous except for axils, rugulose on both surfaces, with cartilaginous margins; midrib immersed on both sides, other veins not evident. Spikes usually solitary, terminating each horizontal branch, upward-tended, rarely lateral and sessile in a leaf-axil below a terminal spike, subglobose maturing to broad-ovoid, (2.5) 3.5-4.5 (5.4) cm long with diameter of 3-4 cm. Rachis elongate, c. 1.5-2 cm long, 0.2-0.4 mm in diameter, densely clothed with a pubescence of thin patent hairs minutely denticulate-jointed, c. 2-3.5 mm long, obscuring the tightly arranged pedicels (c. 0.3 mm long, 0.5 mm in diameter) and the basal parts of about 50-100 and more strikingly opalescent sheeny flowers. Bracts and bracteoles membranaceous, with an evident

midrib, persisting, unequal. Bract lanceolate, 1.2-1.5 cm long, to 0.4 cm broad, becoming brownish with age, the midrib excurrent in a fine awn-like point c. 0.2 cm long, densely white villous throughout with straight denticulate-nodose hairs 0.3-0.4 cm long, attaining the apex. Bracteoles minor, distinctly cybiform, 0.9-1.0 cm long (including a point of 0.05 cm), c. 0.2 cm wide, translucent-shining, appressed to the perianth, sparsely pilose only along the keel with hairs to 2.8 mm long, never reaching the apex. Perianth elongated up to about 3 cm merely by the outer lustrous tepals, thickened at the base to a short narrow hardening tube finally 2.5-3.3 mm rarely 4 mm long and 0.5-1 mm in diameter. Free parts of the concealed inner tepals closely connecting after aestivation with the basal free parts of the outer tepals to a 3-ribbed, somewhat indurated pseudotube, short-hirsute externally, c. 3-5 mm long and 1-1.5 mm in diameter immediately above the perianth tube, a dilatation below the middle the length indicating the expanding ovary within. Outer and inner tepals extremely different from one another. Outer segments linear in lower, spatulately broadening in upper halves, 2.5-3.2 cm long, 0.5-0.8 mm wide at the pseudotube, 3-5 mm broad below the rounded, minutely serrate apices, conspicuous for their macerous white colour shading into orange-yellow towards the lower third, 3-nerved, midrib not reaching the top, fainter lateral nerves restricted to the lower third; sparse dorsal pubescence comprising erect denticulate-nodose hairs up to 4 mm long confined to a portion of 3-6 mm above the pseudotube and finally evanescent; inner surface glabrous. The two wing-like outer tepals of one flower almost identical in length and shape, fitting with, and closely appressed to, each other when fully developed, thus looking at first glance like a single tepal. Free parts of the three inner segments linear, 5-6.5 (7.5) mm long, 0.4-0.6 mm broad above the tube, narrowed more or less abruptly near the apex to form an acute tip, bearing dorsal jointed hairs 0.7-1.0 mm long, erect, appressed to the surface, hardly exceeding apex; glabrous internally, 3-ribbed towards base, the reddish-brown midrib evident up to apex in juvenile state. 3 stamens consistently found perfect, their filaments to 3.5 mm long; staminodes somewhat shorter, all broadened to c. 0.3 mm at base, fused to form a membranous turbinate cup firmly adnate to the perianth tube; free ring to 0.4 mm high, somewhat oblique, surrounded by short hairs from edge of the perianth tube; anthers broad-ellipsoid, c. 0.4 mm long. Pistil entirely glabrous; ovary gibbously club-shaped, markedly stipitate, 3.8-4.3 mm long (including stipe of 2.5-3.3 mm) by 1-1.2 mm across; style very eccentric, filiform almost to base, at first arched but straightening to 2.5 mm at maturity; stigmatic tip papillate, becoming dark, more or less levelling with the anthers.

Additional collections examined.

WESTERN AUSTRALIA: 25° 30' S, 116° 5' E, 25.4 miles S of Dalgety Downs Homestead, 239.6 miles N of Mullewa, 1 Sept. 1973, S. de la Henty s.n. (AD, ADW, BRI, CANB, K, NSW, NT, NY,

PERTH, phot. M); idem, 2 Sept. 1975 (PERTH); idem, 1 Oct. 1975 (PERTH); 4.8 km NE of Division well, Mt James Sta via Meekatharra, 15 Sept. 1973, T.L. Setter 346 (ADW, PERTH); 23-25 miles S of Dalgety Downs, 240 miles N of Mullewa, 4 Sept. 1975, S. Strickland S 3585 (PERTH, phot. M).

Distribution in subtropical Western Australia between 114° and 118° longitude; infrequent but locally gregarious on thin colluvial soil, on rocky plains, creeping in sandy soil. Map ear-marked for vol. 5 of "FLORA OF AUSTRALIA".

The as yet incompletely described plant may be regarded as "Rare" (coded 3RW78) within the meaning of BRIGGS & LEIGH, 1988.

2. *Ptilotus trichocephalus* Beal, sp. nov.

Planta annua (vel perennis?) prostrata. Caules complures tenues ad 25 cm et ultra longi, parce vel modice ramosi et foliati; iuveniles pilis rectis denticulati-articulatis dense induti, tandem pubescentia in partes superiores et in axillas restricta. Folia petiolata laminis rotundati-subovatis apiculatis, iuvenilia puberula pilis sicut in caulibus. Spices (roseo-)albidae spectabiles solitariae, erectae, late penicilliformes, demum cum tepalis laxis ad 7 : 8.5 cm longae lataeque, rhachide breviusculo dense villosa. Bractee bracteolaeque scariosae acuminatae uninerviae, inaequales. Bractea ovati-lanceolata fuscescens, extus omnino villosa; bracteolae distincte maiores, lineari-lanceolatae, subulatae, carinatae, in carina basin versus pilosulae. Perianthium pentaphyllum tepalis visu piliformibus usque ad c. 5 cm longum aperiens. Tepala in dorso capillosa, primo erecta demum divergentia, elongati-lineariter gradatim in apicem acuminatum pubescentia absconditum excurrentia, basi in tubum turbinatum extus hirsutum c. 2 mm longum coalita, supra tubo pseudotubum latiore, annulo pilorum longiorum munitum formantia; tepalorum partes liberae exteriorum ad 4.5 cm, interiorum ad c. 3 cm longae. Stamina fertilia 3, staminodia 2, cupula staminalis tubo perianthii arcte insidens, annulo libero integro, pseudostaminodiis nullis. Filamenta ligulata superne subulata, inferne dilatata; antherae ellipsoideae. Ovarium clavatum demum obconicum, conspicue stipitatum, in parte superiore pilis brevibus strictis vestitum; stylus rectus plus minusve excentricus, glaberrimus.

Taxon novum manifeste differt ab speciebus adhuc cognitis ob habitum florum cum tepalis angustissime linearibus, ob spicas visu penicillatas.

Typus: 3 km S of Peak Bore, Mt James Sta, via Meekatharra, W.A., 16 Sept. 1973, T.L. Setter 354 (PERTH, phot. M, holotypus; ADW no 54062, phot. M, isotypus).

Prostrate herb spreading to 0.5 m across, forming patches with upturned whitish inflorescences to c. 7 cm tall. Small

plants producing, from a very thin tap-root, a central almost sessile flower head and c. 6 pedunculate spikes terminating wiry stems which radiate from below the central spike and rarely branch towards apex. Larger specimens with obtuse-angled, rather irregular dividing stems to 25 cm and more long, c. 2 mm in diameter, sometimes reddish in part. Young shoots and foliage densely coated with straight denticulate- and verticillate-jointed to almost dendroid hairs 1.5-3 mm long, vanishing with age except in apical parts and in leaf-axils. Leaves ascending all along stems and branches, broadly ovate to suborbicular; larger ones to 4 cm long by 2.5 cm wide, the lamina gradually attenuate to a petiole of 0.3-0.5 cm; smaller ones on branches and very slender branchlets, 1-1.5 cm long (including a petiole of 0.2-0.5 cm, abruptly set off against the blade) by 0.5-0.8 cm wide, the upper ones sometimes grading into bracts; all with excurrent point; midrib mostly inconspicuous. Spikes terminating stems, side-branches and -branchlets (except for the central spike in small plants), at first elongate-ovate, c. 3-5 x 1.5-2 cm, then turning to openly brush-shaped, c. 5-7 x 3.5-8.5 cm; flowers about 15 to 20 per spike, conspicuous for the almost hair-like tepals. Rachis comparatively short, up to c. 1 cm long and 0.3 cm in diameter, densely clothed with straight patent denticulate- to verticillate-nodose hairs, c. 0.2 cm long, obscuring the very short pedicels and basal parts of flowers. Bracts and bracteoles membranous, with a prominent midrib, unequal. Bract ovate-lanceolate, 0.7-0.9 cm long, to 0.25 cm wide, becoming brownish with age, the broad midrib excurrent in an acumen to 0.12 cm long; densely white villous with short-jointed hairs to 0.3 cm long, never attaining the apex. Bracteoles larger, linear-lanceolate to subulate upwards, keeled, 1.3-1.4 cm long including a point of 0.08-0.1 cm, to 0.3 cm wide towards base, very thinly scarious-transparent, sparsely pilose with 0.25 cm long hairs originating from about lower half of the broad midrib. Perianth consisting of 5 extremely narrow tepals joined at the base to a turbinate tube 1.8-2.2 mm long and 0.8 mm across at the edge, shortly hirsute externally. Tepals somewhat broadened above the tube to form an indurated pseudotube 2-2.7 mm long and 1.5 mm across, surrounded by a ring of tufted spreading, faintly articulate hairs up to 3-4 mm long; free parts of tepals above the pseudotube initially upright, then loosely diverging, most narrowly linear-subulate, regularly tapering into a straight point, pale green fading to straw-colour and whitish, bordered by incurving margins especially toward the apex, turning red with age; midrib and shorter lateral nerves only visible in lowest section of the glabrous inner surface; outer surface feathery pilose throughout, bearing very fine white hairs variable in length (1.5 to 4.5 mm), oblique erect and delicately (denticulate-) jointed, increasing in number and length toward the apex which is usually invisible amidst a tuft of projecting trichomes to 3 mm long. Outer and inner tepals differing merely somewhat in size: free parts of the outer ones (3.5) 4-4.5 cm long and 0.3-0.4 mm wide at base, c. 0.25 mm near middle; free parts of inner segments 2.3-2.8

(3.2) cm long, c. 0.3 mm wide at base and 0.15 mm near middle. 3 stamens perfect, their filaments ligulate, up to 2.5 mm long by 0.08 mm wide in the middle, strongly subulate above; staminodes mostly filiform, varying in length; all greatly broadened up to 0.25 mm at the base and fused to form a narrowly turbinate hyaline cup c. 2 mm long, firmly adnate to the perianth tube; free ring glabrous, 0.3 mm high; anthers ellipsoid, c. 0.4 mm long; no pseudostaminodes. Ovary almost symmetrically club-shaped to obconical, conspicuously stipitate, 2-3 mm long (including stipes of c. 1.5 mm) by 1.0-1.3 mm diam., densely pilose in upper part with straight septate hairlets 0.2 mm long; style glabrous throughout, more or less eccentric, 1.0-1.2 mm long and c. 0.1 mm diam. in the middle, slightly dilated to 0.15 mm at the base; stigmatic tip inconspicuous.

Additional collections examined.

WESTERN AUSTRALIA: Paraburdoo Mine area, Paraburdoo, 23° 15' S, 117° 39' E, 17 Sept. 1979, K.F. Atkins s.n. (CANB, PERTH); 15 km E of Bulloo Downs Homestead, on southern access track to Great Northern Highway, 26 July 1988, A.A. Mitchell 1653 (KARRATHA, M).

Distribution:

The new taxon is known from only 3 localities in the central west area of Western Australia; one collection from sandy colluvial plain, where the plant is frequently associated with eroding surfaces, the other from red sandy loam on flats, whilst A. Mitchell's collection came from bare black uplands where it was found growing in small depressions together with "wind grass". It may be regarded as "Rare" and coded 3KW7 according to BRIGGS & LEIGH, 1988.

A distribution map as well as a figure of the holotype will be given in vol. 5 of "FLORA OF AUSTRALIA".

Affinity:

This attractive species is clearly separated from all known others. It is well-defined by having exceedingly narrow, almost hair-like tepals forming a hairy flower head (hence its name, derived from the Greek trichos, hair, and kephalé, head) and is thus unique within the subgen. *Ptilotus*. Some of its features indicate closer relationship to *P. crosslandii*. However, *P. trichocephalus* does not exhibit the marked difference in tepal size, inner tepals being minute in comparison with outer ones, which characterizes the monotypic subgen. *Dipteranthemum*.

3. *Ptilotus sessilifolius* (Lindley) Beal comb. nov.

Basionym: *Trichinium sessilifolium* Lindley in T.L. Mitchell, Three Exped. East Austral. 2: 12 (1838).

Typus: Interior of New Holland, [N.S.W.], 24 March 1836, T.L. Mitchell 23 (CGE, phot. M, holotypus).

Synonymy:

Trichinium atriplicifolium Cunn. ex Moq., in DC., Prod. 13(2): 286 (1849), excl. *T. obovatum* Gaudich.
T. obovatum var. *atriplicifolium* (Cunn. ex Moq.) Domin, Biblioth. Bot. 89: 634 (1921).
Trichinium atriplicifolium (Cunn. ex Moq.) Beal, Mitt. Bot. München 2: 404 (1958); l.c. 9: 141 (1971).
Types: Interior of Eastern New Holland, [N.S.W.], Swampy-plains, 1817, A. Cunningham s.n. (G-DC holotypus; P isotypus).

The holotype of *Trichinium sessilifolium*, published in 1838 has proved to be identical with that of *T. atriplicifolium*, published in 1849.

Further synonyms:

Trichinium obovatum var. *grandiflorum* Benth., Fl. Austral. 5: 221 (1870).

T. incanum var. *grandiflorum* Benth. ex J.M. Black, Trans. & Proc. Roy. Soc. S. Austral. 41: 380 (1917).

Ptilotus obovatus var. *grandiflorus* (Benth.) Ewart & O.B. Davies, Fl. Northern Territory 100 (1917).

Types: Harrington plains, N.S.W.; BM lectotypus (here chosen): Oct. 1817, A. Cunningham s.n.

Trichinium (Ptilotus) incanum var. *intermedium* Ewart in Ewart & J. White, Proc. Roy. Soc. Victoria 22: 97 (1909).

Types: Warrina, S.A., May 1891, R. Helms s.n., Elder Explor. Exped. (MEL holotypus; AD, BM, K, MEL, NSW isotypi).

Ptilotus oblongifolius Gand., Bull. Soc. Bot. France 66: 222 (1919).

Types: not seen.

There are two varieties:

a) *Ptilotus sessilifolius* (Lindley) Beal var. *sessilifolius*. Illustrations in A.J. Ewart, Fl. Indig. Victoria 2: fig. 78 (1910), sub *Trichinium atriplicifolium* Cunn. ex Moq.; G.M. Cunningham et al., Pl. W. New South Wales 285 (1981), sub *Ptilotus atriplicifolius* (Cunn. ex Moq.) Beal var. *atriplicifolius*.

Known from all main states of the continent.

b) *Ptilotus sessilifolius* var. *elderi* (Farrar) Beal comb. nov.

Basionym: *Trichinium elderi* Farrar, Bull. Herb. Boissier, sér. 2, 5: 1089 (1905).

Synonym: *Ptilotus atriplicifolius* var. *elderi* (Farrar) Beal, Mitt. Bot. München 2: 404 (1958); G.M. Cunningham et al., l.c.: 285 (1981).

Types: Cavenagh Range, E. Division, W.A., 31 July 1891, R. Helms s.n., Elder Explor. Exped. (K, phot. M, holotypus; AD, MEL, NSW isotypi).

Confined to N.T. and N.S.W.

Transitional forms between the two varieties are rather frequent.

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