Five new taxa of Ptilotus (Amaranthaceae) from Western Australia

By G. Benl[1]

Abstract

Benl, G. Five new taxa of Ptilotus (Amaranthaceae) from Western Australia. Nuytsia 3, 2: 157–172 (1980).

Three species and two varieties are described as new, *viz P. marduguru* sp. nov., *P. aphyllus* sp. nov., *P. stipitatus* sp. nov., *P. divaricatus* var. *rubescens* var. nov., *P. drummondii* var. *elongatus* var. nov. Their relationships are discussed. The new species are illustrated by analytical drawings of the flowers; photos of all type specimens are provided. In addition a key to the *P. drummondii* complex is given.

1. Ptilotus marduguru Benl sp. nov. (Figures 1 to 3)

Diagnosis: Planta perennis robusta ex fissuris rupis oriens, caulibus ramosis ad 70 cm altis per totam longitudinem foliatis. Folia carnosa ad 12 cm et ultra longa, tomento albo-lanuginoso permanente vestita, pilis ut in caulibus ramisque crispis. Spicae amplae solitariae, elongati-cylindraceae ad 30 cm longae et 2 cm diametro, caules ramosque terminantes (Fig. 1A). Bractea bracteolaeque chartaceae, acuminatae, persistentes. Tepala straminea cum areola mediana viridula, venosi-nervosa, extus dense pilosa, interiora intus lana barbata induta. 5 stamina fertilia, filamenta indurescentia albescentia; cupula anulo libero. Gynoecium glaberrimum breviter stipitatum; stylo centrali tenui.

Species nova ad *P. rotundifolium* (F. Muell.) F. Muell. appropinquans, sed ob staturam coloremque spicarum, ob structuram androecei unica.

Perennial herb to 70 cm tall and 50 cm across, several upright branches forming open bushes (Figure 1B). Shoots, foliage and outer floral organs woolly-pubescent throughout. Bract and bracteoles chartaceous, acuminate, persistent. Tepals straw-yellow with a greenish centre and obscurely anastomosing veins, externally densely hairy; the inner ones woolly inside. Stamens all fertile; the filaments becoming hard and white (Figure 3A); staminal cup with a free ring. Pistil glabrous, shortly stipitate; style central, slender.

The greenish-white spikes up to about 30 x 2 cm and the different androecium render the new plant quite distinct from *P. rotundifolius* to which it bears some resemblance.

Type: Godfreys Tank, Southesk Tablelands, 20°15′S, 126°34′E, W.Aust.; coll. *A. S. George* 15451, 29 April 1979 (holotype: PERTH; isotypes: AD, CANB, K, M, MEL, NT, PERTH).

Description: Rootstock woody, producing several radical leaves and an erect rigid central shoot (Figure 2B), the latter dividing near base into arcuate-ascending main branches. Main branches usually simple, 15–40 cm long, 3–4·5 mm thick, leafy, rarely with one or two side branches to 10 cm long (Figure 2A), each terminating in a pedunculate spike. Shoots brownish-green, striate with ribs concealed by a continuous white tomentum of curled, jointed interwoven hairs ca 2·5 mm long.

Leaves up to 40 or more (Figure 2B), lamina often undulate or obscurely crenate, apex obtuse, shortly mucronate with a dark pungent mucro ca 2 mm long, base attenuate into a slightly winged petiole or ± decurrent; indumentum flannel-textured on both

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surfaces, the hairs regularly curled, loosely appressed, venation evident below, pale grey (Figure 2B). Radical leaves crowded, spathulate, up to about 8 cm long and 3 cm wide, petiolate, soon withering without becoming glabrous, finally brown and recurved. Lower cauline leaves crowded, upper 2–5 cm apart, patent to erect-spreading, hoary when young, later pale green; lower ones spathulate, long-petioled, up to 12 cm or more long (a slightly winged decurrent petiole of ca 4 cm included), to 6 cm wide, upper ones gradually smaller (to 1·5 x 1 cm), broadly subspathulate to ovate or elliptical.

Flower spikes candle-like, dense, greenish-white to creamy-green, narrow-cylindrical, 5 to 30 cm long, 1·8 to 2·2 cm wide, conical at the apex before fully grown, erect or slightly curved at times, lower perianths deciduous as spikes elongate.

Rachis brown, densely white-tomentose, the crisped hairlets mixed with substraight, obscurely septate ones of ca 2·5 mm long, passing into pubescence of pedicels and bracts. Pedicels 0·6–0·8 x 0·4–0·5 mm, jointed above bracteoles, less crowded towards the base of the spike, lowest up to 5 mm apart.

Bracts and bracteoles scarious, very inconspicuous in flowering stage but visible after falling of perianth, puberulous on back with straight nodose hairs 1·8–2·2 mm long, slightly keeled, acuminate; unequal. Bract narrowly ovate, (4·0–) 4·3–5·0 (–5·5) x (1·0–) 1·3–1·6 (–1·8) mm, subentire, a brownish median area with three, five or more basal stripes (Figure 3B), only the central one reaching apex, densely villous throughout except usually at apex. Bracteoles subcordate, concave, (3·7–) 4·2–4·5 (–4·8) x (2·1–) 2·5–2·8 (–3·0) mm, appressed to perianth, transparent, shining, entire, 0·8–1·2 mm long (Figure 3C); hirsute along midrib with hairs hardly reaching apex and finally evanescent.

Perianth rigid, erect, later subcampanulately diverging, 9 mm long, the base constricted and connected to a short hardened cup scarcely 0·8 mm high, pubescent outside with bristle-like weakly septate hairs ± 1 mm long.

Tepals pale straw-coloured with a light green median areole, later fading, 3-nerved inside (Figure 3D), only the midnerve reaching apex; outside hirsute throughout except glabrous apex with fine erect to spreading hairs, the lower ones indistinctly septate, the upper longer ones short-jointed.

Two outer tepals lanceolate-oblong, broadest at or below middle, (7·4–) 7·7–8·3 (–9·0) mm long, up to (1·2–) 1·4 (–1·8) mm wide, faintly keeled in lower half, glabrous within; margins dilated upwards, then more or less abruptly contracted (Figure 3D) ca 0·8 mm below the mucronate or serrulate apex.

Inner tepals lanceolate-linear, (6·7–) 7·1–7·8 (–8·5) mm long, (0·8–) 1·0 (–1·2) mm broad, apex more or less acuminate, glabrous, ca 0·6–0·8 mm long, mostly obscured by hairs inserted below, margins hardly inrolled; woolly inside, with nodose hairs 4–5 mm long, mostly along lower margins (usually the outer of the three segments sparsely woolly on one side only) at and up to 2·5 mm above the edge of the perianth cup.

Stamens 5, all perfect. Filaments (2·8–) 3·6–4·3 mm long, dilated to 0·7 (–0·9) mm at base, tapering upwards, diaphanous and flat when very young, soon becoming thick, hard, opaquely and chalky white except for apical and basal parts (Figure 3E), later contrasting with the black fruit (Figure 3A); upper halves sometimes breaking off, the lower portions persisting for some time, united with acute to broad sinuses in a membranous staminal cup 1·0–1·4 mm high, brownish, attached to perianth cup at base, with a free ring (0·5–0·7 mm) irregularly pubescent outside with crisped nodose hairs 1·5–2 mm long; pseudostaminodial lobes absent. Anthers oblong ellipsoid, to 0·9 x 0·4 mm.

Pistil glabrous. Ovary subclavate 2–2·3 x 1·0–1·1 mm including the 0·6–0·8 mm long stipe, becoming sub-globose (ca 2·4 x 2·0 mm) when mature. Style central, straight or slightly bent in upper part (Figure 3A), slender almost to base, 3·2–3·8 mm long by 0·06–0·08 mm wide in middle, ca 0·12 mm at base. Stigma inconspicuous.

Specimens examined: Western Australia: Godfreys Tank, Southesk Tablelands, 20°15′S, 126°34′E, *A. S. George* 15451 (typus), 29 April 1979 (AD, CANB, K, M, MEL, NT, PERTH).

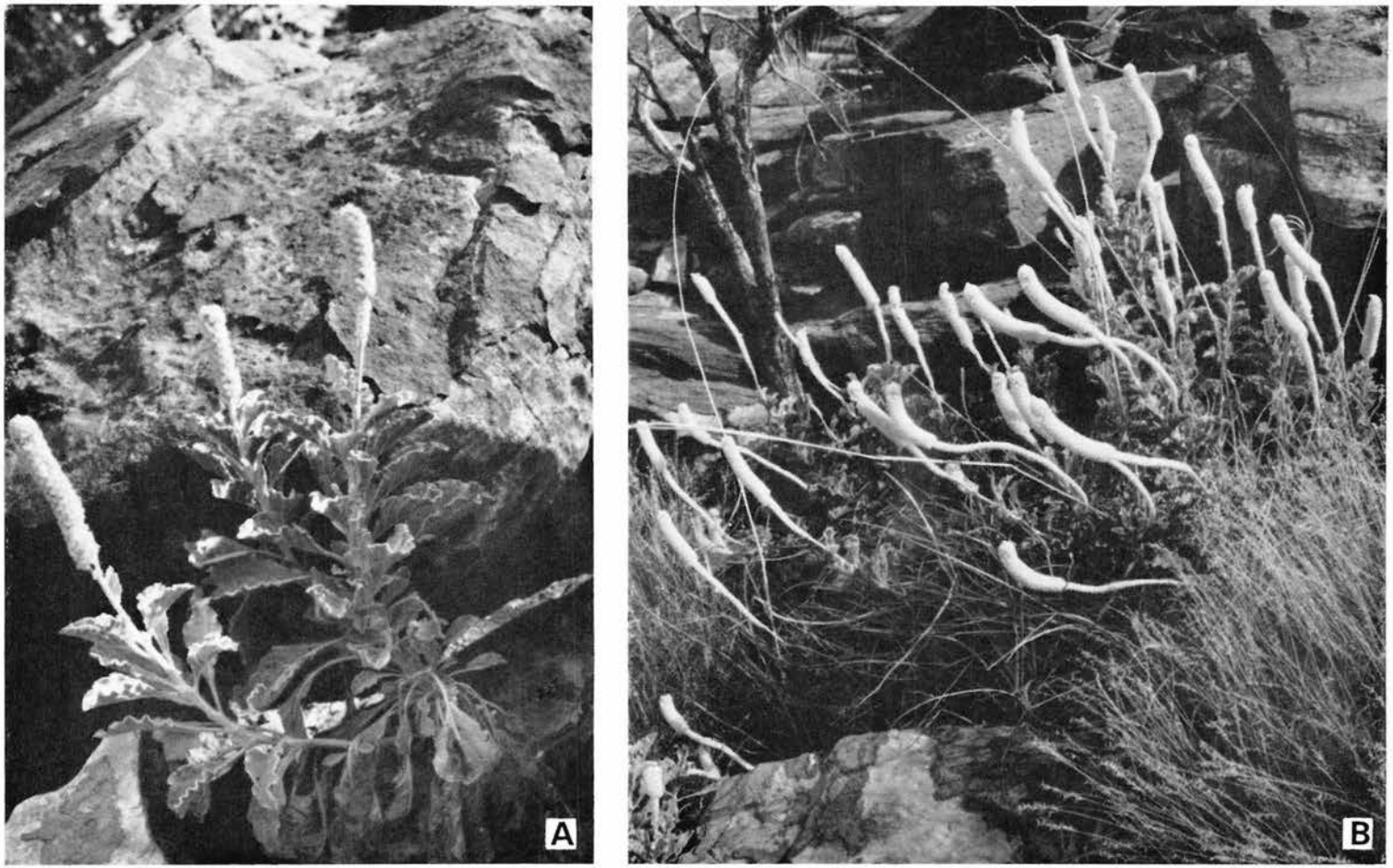

Figure 1. *Ptilotus marduguru* Benl. Photographs showing the habitat of George 15451 in the Southesk Tablelands, Great Sandy Desert, Western Australia. A—Young plant growing from rock fissure. B—On softer slopes the plants form large clumps. (phot. A. S. George).

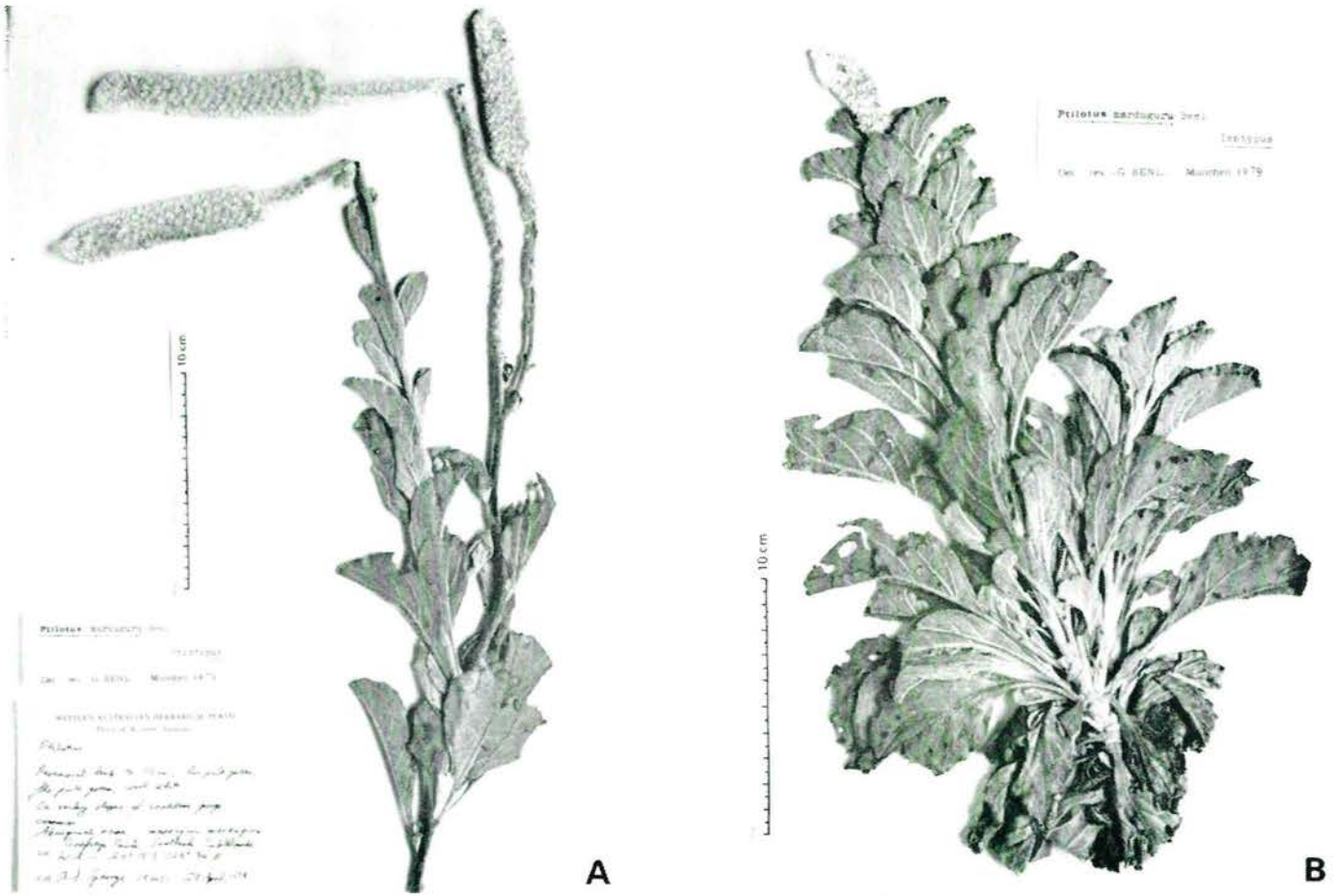

Figure 2. *Ptilotus marduguru* Benl. A—holotype specimen (PERTH). B—An isotype (PERTH) with the crowded foliage of a young plant. (phot. K. Liedl).

The above description is based on eleven specimens of the type material comprising complete young plants of 25 cm and 30 cm tall (Figure 2B), as well as parts of main stems and main branches up to 55 cm long including the spike.

Distribution and ecology: Mr. A. S. George reported the plant as 'common on rocky slopes of sandstone gorge'. 'Like P. *royceanus* the species grows only on steep rock faces'. There is no other collection of this interesting novelty.

Discussion: There is a number of *Ptilotus* species remarkable for their candle-like inflorescences, i.e. *P. exaltatus* Nees var. *exaltatus* (largest spikes recorded 30 x 5 cm), *P. nobilis* (Lindley ex Mitch.) F. Muell. var. *nobilis* (22 x 5 cm), *P. macrocephalus* (R.Br.) Poiret (27 x 6 cm), *P. polystachyus* (Gaud.) F. Muell. emend. Benl var. *polystachyus* (25 x 1·5–4 cm), *P. pullenii* Benl (29 x 2·3 cm), *P. rotundifolius* (F. Muell.) F. Muell. (20 x 4 cm). The closest relative to the new species is *P. rotundifolius*, yet in this species the soft and thick leaves are nearly orbicular (up to 7 x 6 cm) and shortly petiolate, never spathulate (up to 12 x 6 cm) as in *P. marduguru*, which is readily recognizable even in vegetative condition. The purple-pink to rose-pink spikes of *P. rotundifolius* are sometimes divided basally into one or two (rarely more) lateral subsessile inflorescences, and the bracts are considerably shorter than the bracteoles. Moreover in *P. rotundifolius*, which appears to be confined to the north-west of Western Australia, the perianth is up to 20 mm long, compared to 9 mm for *P. marduguru*, including a tube of 2 mm, 0·8 mm for *P. marduguru*, and there is no trace of hardened, incrusted filaments. Consequently the specific status of the new *Ptilotus* is beyond any doubt although a close relationship to *P. rotundifolius* must be assumed.

Name: The specific epithet refers to the aboriginal name for the plant 'marduguru marduguru', which means 'down' in the sense of fine short hairs as on the feathers of young birds (A. S. George, personal communication, 20 June 1979).

2 Ptilotus aphyllus Benl sp. nov. (Figures 4 and 5)

Diagnosis: Herba perennis frutescens ad 1 m alta, caulibus tenuibus strictis glaberrimis multiramosis; juvenilis inferne paucifolia, ceterum visu aphylla, foliis superne ad squamulas minutas reductis. Cupula staminalis cum lobulis fissis ut in *P. drummondii* (Moq.) F. Muell. et *P. schwartzii* F. Muell. ex Tate; species nova adulta autem ramis pseudodichotomis aphyllis et structura inflorescentiarum diversa manifeste recedit.

Much-branched perennial to 1 m tall, bearing leaflets only when young. Stems slender, glabrous, pseudodichotomously branched, each terminating in a spike (Figure 4). Bract and bracteoles unequal. Perianth rigid, outer tepals not entirely glabrous inside, inner tepals with internal beard-like wool. Stamens all fertile; staminal cup with conspicuous intervening fringed lobes reminiscent of *P. drummondii* and *P. schwartzii* which, however, differ markedly from the new taxon in other characters.

Type: 46 mls N. of (New) Mundiwindi, W. Aust., *A. S. George* 3609, 5 March 1962 (holotype: PERTH).

Description: Shrubby, slender branched herb up to 1 m tall, spreading to more than 45 cm across. Young flowering plants ca 20 cm high (type specimen) arising from an erect woody stock 3 mm diameter. Stems greyish-green, striate to ribbed, pruinose between ribs. In larger plants the 'stems leafless . . . rush-like' (R. D. Royce in sched.); branchlets stiff, ascending to divaricate, up to 15 cm long.

Leaves obovate to linear, 6–13 x 1·5–2 mm, tapered at both ends, shortly mucronate, subsessile, decurrent, with a few tiny (up to 0·7 mm long) crisped scabrous hairlets in the axils; replaced in upper portions of stems by minute, more or less appressed scales 1 to 4 cm apart, up to 2 mm long, bearing some tiny hairlets inside.

Spikes terminal, varying in shape and size, 7–16 mm wide, depressed hemispheric and 4–8-flowered, or elongate (up to 22 mm) with up to 15 flowers.

Rachis densely woolly with crisped, weakly septate hairs about 2 mm long, obscuring the pedicels of ca 1 mm long and distinctly jointed above bracteoles.

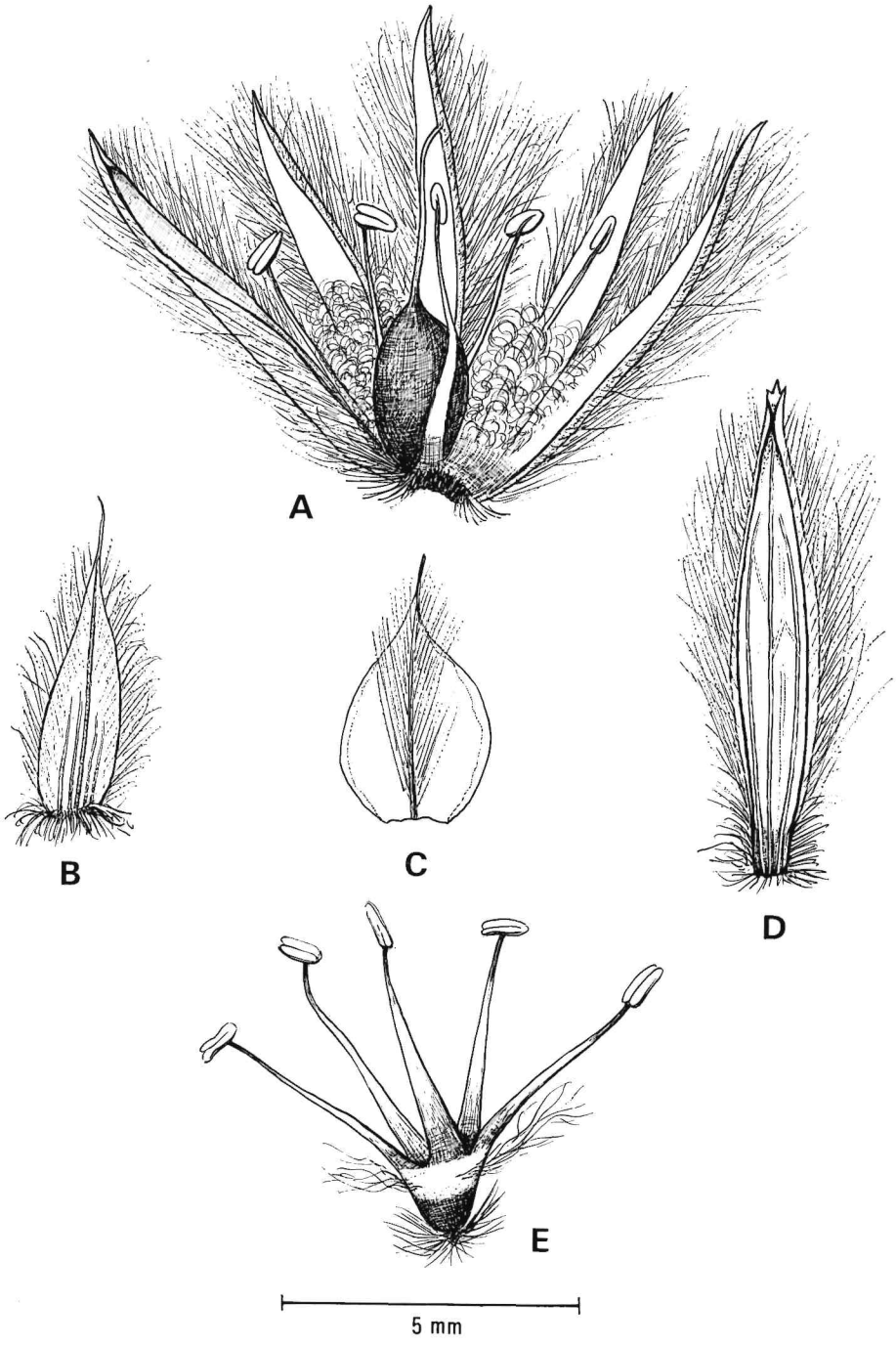

Figure 3. *Ptilotus marduguru* Benl. A—Expanded flower, inner view, B—Bract, inner face, C—Bracteole, outer face, D—Outer tepal, inner view, E—Androecium. (Drawn by A. Böhm from holotype).

Bract and bracteoles scarious, entire, concave, acute, more or less keeled by a finally reddish-brown midrib, persistent, unequal. Bract ovate-lanceolate, 3·2–4 x 2–2·2 mm, tapering to a point about 0·3 mm long, initially densely pubescent all over (Figure 5A) with fine dorsal hairlets obscurely articulate, more or less straight, ca 1 mm long; midrib becoming crest-like towards apex. Larger bracteoles with colourless, thin, membranous, translucent, lustrous margins, broadly ovate to subcordate-orbicular, 3·8–5 x 2·5–3·3 mm, closely appressed to perianth, the evident midrib excurrent in a short arista of ca 0·4 mm (Figure 5B); in young flowers hirsute especially along a yellowish-tinged midrib, at length glabrous all over and golden like the bract.

Perianth feathery, rigid, at first erect, afterwards divergent, not exceeding 8·2 mm long, thickened towards indurated base, concave below due to sunken attachment of pedicel; forming with lowest dark-coloured parts of segments a turbinate tube ca 0·7 mm long densely enveloped by a long-haired dorsal vestiture.

Tepals purple when fresh, fading to pink and pale orange, finally straw-coloured (the red tinge kept longest at margins and apex), narrowly elliptical to lanceolate-linear, internally opaque almost throughout and conspicuously 3-nerved in lower half, the scarious margins of varying width obvious in young flowers; apices of tepal glabrous, not or slightly exceeding the copious dorsal vestiture consisting of long (up to 5–6 mm), stiffly erect trichomes covering the back, and of shorter (ca 0·6–1·5 mm), more or less patent hairs chiefly at the margins, all simple, obscurely septate.

Outer tepals 6·7–8·2 x 1·5–1·8 mm, widest in middle, obtuse and minutely serrate, margins scarcely or weakly inrolled; glabrous within except for sparse more or less straight hairs (to 2 mm long, nodose) marking pilose upper edge of tube (Figure 5C). Inner tepals slightly shorter, 6·2–7·6 x 0·8–1·2 mm, widest below middle, distinctly acute, margins infolded; inside strongly beard-like, woolly (Figure 5D), the curly entangled hairs up to 4 mm long and obscurely nodose, borne above the tube ca 3 mm along both margins (occasionally on one side only), as well as on inner surface (edge of tube).

Stamens all perfect. Filaments slightly flattened, 2·3–4·8 mm long, 0·15–0·2 mm broad in middle, subulate above, scarcely widened below, fused with rounded sinuses into a turbinate cupule more or less firmly adnate to perianth base, a narrow free ring with conspicuous ligulate interstaminal lobes, 0·9–1·8 mm long, ca 0·35 mm broad, regularly or unequally fringed (Figure 5E); more or less straight hairs (ca 3·5 mm long) developed mostly on edge of perianth tube, some also on outer face of low staminal ring. Anthers ellipsoid 0·8–0·9 x 0·5 mm.

Ovary (Figure 5F) at first subclavate-stipitate, ca 2·6 mm long (the stipe of 0·8 mm included) and 1·2–1·4 mm wide, more or less pilose at apex (hairlets to 0·4 mm long) or completely glabrous, later subglobose. Style central, straight, 2·7 mm long, ca 0·12 mm across, hardly dilated to ca 0·2 mm at its very base. Stigma somewhat conspicuous to 0·2 mm diameter.

Specimens examined: Western Australia: 73·6 km N. of (New) Mundiwindi, 'in red sand on burnt spinifex plain', *A. S. George* 3609 (typus), 5 March 1962 (PERTH); 754 mile peg N. from Mundiwindi, 'leafless shrub', *F. Lullfitz & A. R. Fairall* L 2675, 16 Oct 1963 (PERTH); 29 km N. of Sandy Creek, 'in red sandy soil along No. 1 Rabbit Proof Fence', *R. D. Royce* 1673, 15 May 1947 (PERTH).

Distribution: The collections have been made in a comparatively small area along the western edge of the Little Sandy Desert.

Discussion: Superficially the new taxon bears some resemblance to *P. schwartzii* in its common f. *schwartzii* which has pruinose stems often pseudodichotomously divided. However, in the latter plant the branches bear linear to acicular leaves mostly up to the apices. The subglobose spikes consist of ca 20 or more flowers softer and smaller in all parts. Further manifest floral differences of *P. schwartzii* are: bract and bracteoles subequal, dorsal pubescence of tepals finer, shorter and still more homogenous, outer perianth segments entirely glabrous within, staminal cup flatter, etc.

In contrast to the spreading *P. aphyllus* with its regular pseudodichotomous branching, the infraspecific taxa of *P. drummondii* are characterized by stems leafy almost throughout (var. *drummondii*, var. *scaposus*, var. *elongatus*) or with leaves more or less reduced upwards in var. *minor*, the latter being distinguished by its dense-flowered, creamy-white, subglobose spikes terminating the often broom-like stems.

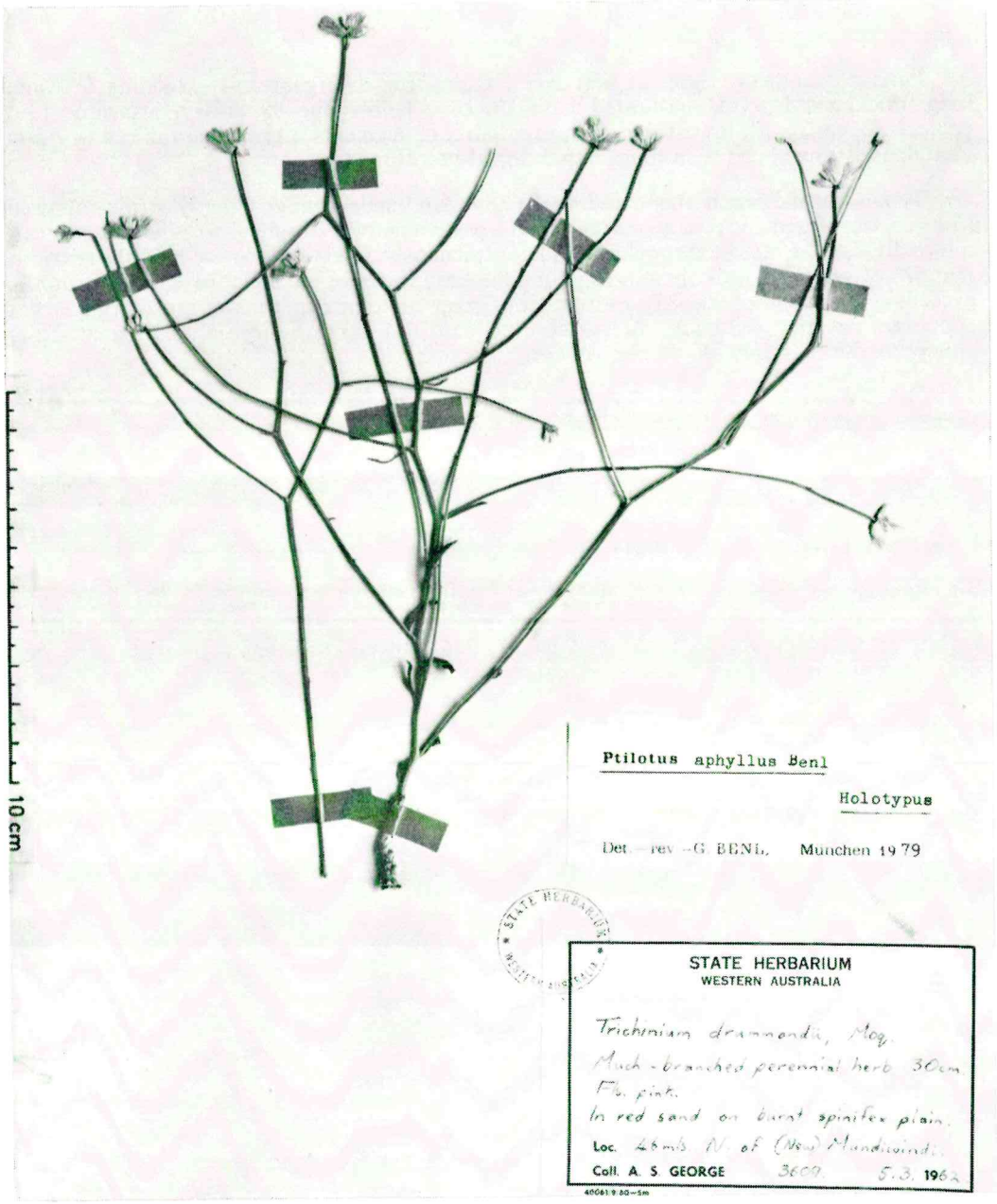

Figure 4. *Ptilotus aphyllus* Benl. Holotype sheet. Coll. A. S. George No. 3609, 5 March 1962, 73·6 km N. of (New) Mundiwindi, Western Australia. PERTH. (phot. K. Liedl).

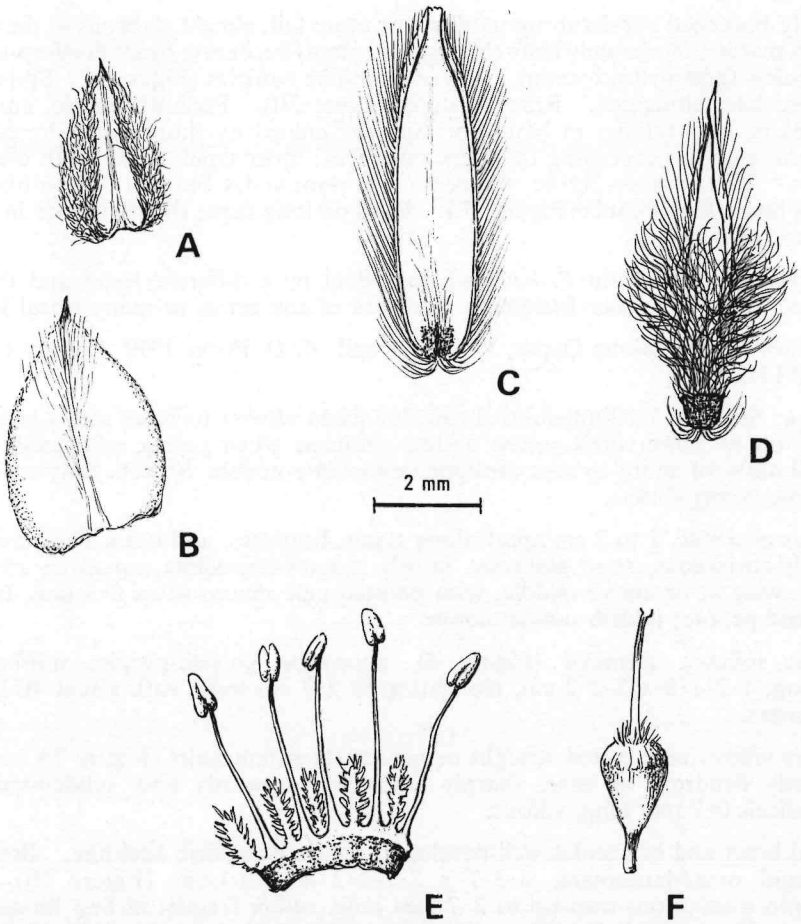

Figure 5. *Ptilotus aphyllus* Benl. A—Bract, inner face, B—Bracteole, outer face, C—Outer tepal, inner view, D—Inner tepal, inner view, E—Androecium, opened, F—Gynoecium. (Drawn by A. Böhm from holotype).

The new taxon is quite dissimilar in general habit to *P. schwartzii* and *P. drummondii* but the flower morphology suggests a close relationship with both species. Together with *P. beckeranus* (F. Muell.) F. Meull., *P. calostachyus* (F. Muell.) F. Muell., *P. clementii* (Farmar) Benl, *P. fraseri* (A. Cunn. ex Moq.) F. Muell., *P. gardneri* Benl, *P. helipteroides* (F. Muell.) F. Muell. these species form a series with tongue-like, ciliate or fringed pseudostaminodia. Yet, 'as a sectional character . . . the presence or absence of teeth is valueless as it brings together species totally dissimilar in other respects' (L. Farmar, Bull. Herb. Boiss. **5**: 1086; 1905).

3. **Ptilotus stipitatus** Benl sp. nov. (Figures 6 and 7)

Diagnosis: Fruticulus caulibus (curvati-)erectis ramosis, 20–30 cm et ultra longis, glabris, per totam longitudinem modice foliatis, pluristachyis (Fig. 6). Spicae pedunculati-erectae, primo hemisphaericae demum oblongae. Bractea longitudine aristae notabilis (Fig. 7B). Perianthium purpureum dense pilosum, basi indurata tubum cylindraceum longum extus hirsutum formans; pili pubescentiae dorsalis apices truncatos tepalorum paulo superantes; tepala interiora pilis crispis marginalibus, plus minusve copiosis, introflexis munita. Stamina in floribus examinatis 2 fertilia, 3 minora abortiva; filamenta late taeniata (Fig. 7E). Ovarium apice biserialiter pilosiusculum, longe stipitatum.

A *Ptiloto kenneallyano* Benl imprimis ob habitum et pubescentiam deficientem, ab aliis speciebus fruticulosis praeterea structura florum distinctus.

Erectly branched subshrub up to 30 cm or more tall, almost glabrous in the vegetative parts when mature, moderately leafy throughout; stems becoming rigid; floriferous branches and branchlets (peduncles) forming loose corymb-like panicles (Figure 6). Spikes initially semiglobose later elongated. Bract aristate (Figure 7B). Perianth purple, enveloped in plumose hairs, long-tubular in basal portion, surrounded by short hairs; dorsal vestiture of tepals more or less exceeding the truncate apices; inner tepals inside with crisped marginal hairs. Two stamens fertile; filaments and staminodes broadly ribbon-like in lower half, fused into a high cupula (Figure 7E). Pistil on long stipe, slightly pilose in two rows toward apex of ovary.

Sharply separated from *P. kenneallyanus* Benl by a different habit and the lack of pubescence, and from other frutescent members of the genus in many floral features.

Type: 5 miles N. of Jigalong Depot, W. Aust.; coll. *R. D. Royce* 1592, 13 May 1947 (holotype: PERTH).

Description: Small to medium-sized shrub, branched almost to base, stems and branches spreading, up to 3 mm thick, more or less pruinose when young, practically glabrous, with small tufts of more or less straight denticulate-nodose hairlets only in older leaf axils bearing young shoots.

Leaves alternate, 1 to 2 cm apart along stems, branches, and branchlets, erect-spreading, thickly-coriaceous, soon glabrous, mostly narrow-lanceolate, up to ca 25 mm long and 4 mm wide at or above middle, with pointed pale mucro of ca 0·8 mm, tapering to an undefined petiole; midrib sunken above.

Spikes solitary, terminal (Figure 6), appearing greyish-purple, sub-hemispheric when young, 1·2–1·8 x 2–2·2 cm, elongating to 2·7 cm long, with about 40 loosely arranged flowers.

Rachis villous with tufted straight or geniculate patent hairs (Figure 7A) ca 1·5 mm long, mostly dendroid at base, sharply verticillate upwards and subdenticulate near apices; pedicels 0·7 mm long, villous.

Floral bract and bracteoles well-developed, scarious; midrib keel-like. Bract brownish semirigid ovate-lanceolate, 6·3–7 x 2·7–3·2 mm, aristate (Figure 7B), gradually tapering into a setaceous awn up to 2·7 mm long, rather fragile; at first hirsute all over the surface. Bracteoles light amber, shortly acuminate, (4·5–) 4·8 (–5·3) x 3·3–3·8 mm, broadly subovate with membranaceous hyaline shining wings, concave, appressed to perianth, more or less abruptly acuminate, the rigid point (0·5–) 0·8 (–1·2) mm long; midrib villous, hairs exceeding apex (Figure 7C), evanescent with age.

Perianth purple but with a dense, fine plumose dorsal indumentum, thickened at base to a cylindrical tube 1·7 to 2·3 mm long with hairs obscurely denticulate-nodose, up to 1·5 mm long, intermingled with obviously dendroid to verticillate ones.

Tepals sublanceolate-linear, unequally marginate, 3-ribbed, the median vein engraved in a ridge-like keel above tube, the fainter lateral ones somewhat raised externally near the narrow thinner margins; outside unevenly pubescent all over, chiefly with copious patent denticulate-nodose or subverticillate trichomes, the hairs longer towards base up to 8 mm (Figure 7D); also with underlying hairlets up to 0·8 mm long, dendroid at their base, especially visible near margins (not shown in Figure 7D).

Outer tepals about 9·5–11 mm long, ca 1·0 mm broad near the middle, glabrous inside throughout. Inner tepals about 9–10·3 mm long, ca 0·8 mm broad in middle, woolly inside above the tube mainly near the margins or on one margin only, the hairs incurved, crispy, more or less entangled, to 3 mm long, indistinctly nodose.

Stamens 5, only two adjacent ones consistently fertile in the flowers examined. Free filaments 4·8–5·8 mm long, subulate, gradually widened downwards to ca 0·5–0·7 mm (Figure 7E); staminodes of varying length, 2·2–4·5 mm long, 0·4–0·6 mm wide, the longer ones bearing a minute button-like rudimentary anther. Filaments of stamens and

staminodes united with acute sinuses in a cupule up to 2·7 mm tall, strongly adnate to perianth tube, with a narrow, somewhat oblique free ring ca 0·3–0·4 mm high, almost glabrous; occasionally some small fascicles of curved hairs (ca 5 mm long) between filaments, rising chiefly outside at edge of perianth tube; pseudostaminodes absent. Anthers (oblong-)ellipsoid ca 0·8 x 0·4 mm.

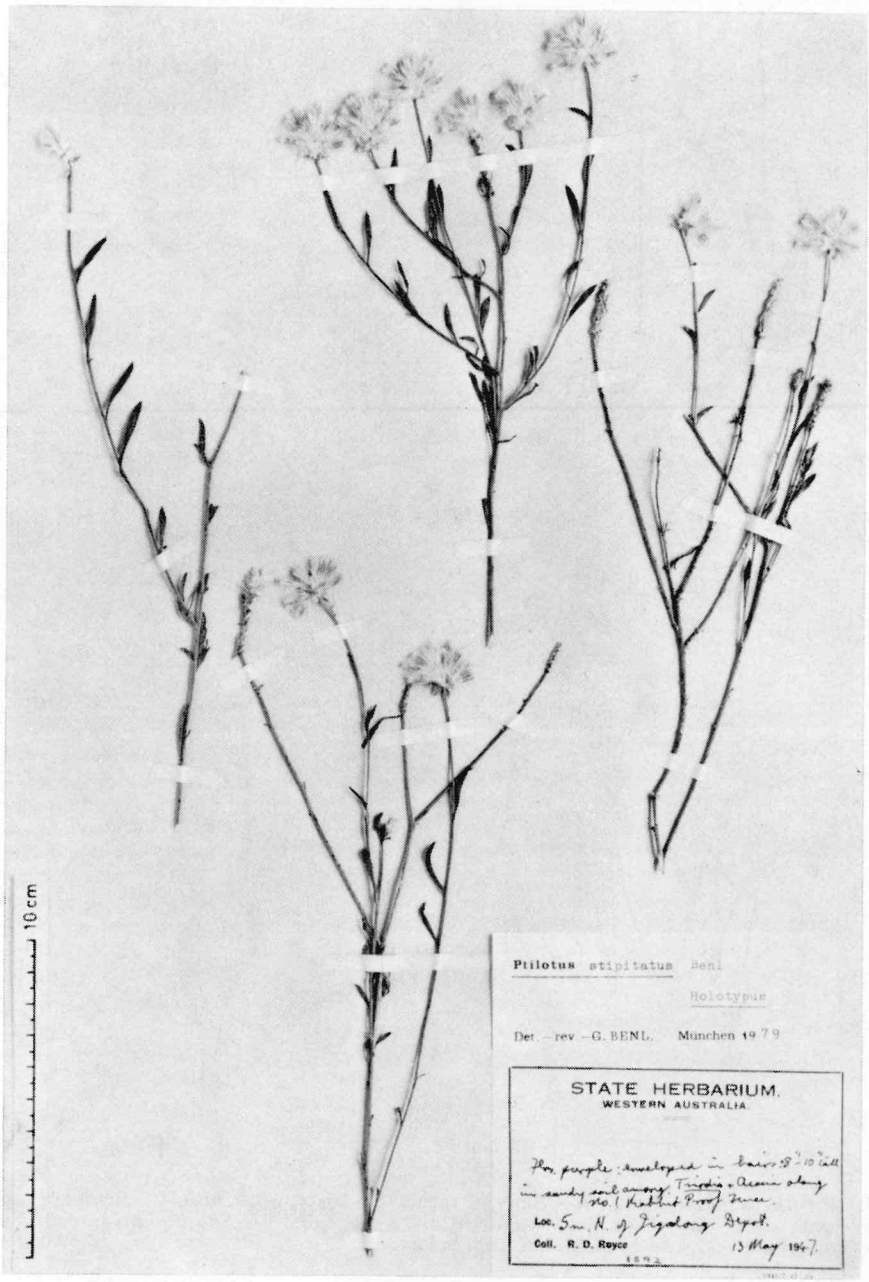

Figure 6. *Ptilotus stipitatus* Benl. Holotype sheet. Coll. R. D. Royce No. 1592, 13 May 1947, 8 km N. of Jigalong Depot, Western Australia. PERTH. (phot. K. Liedl).

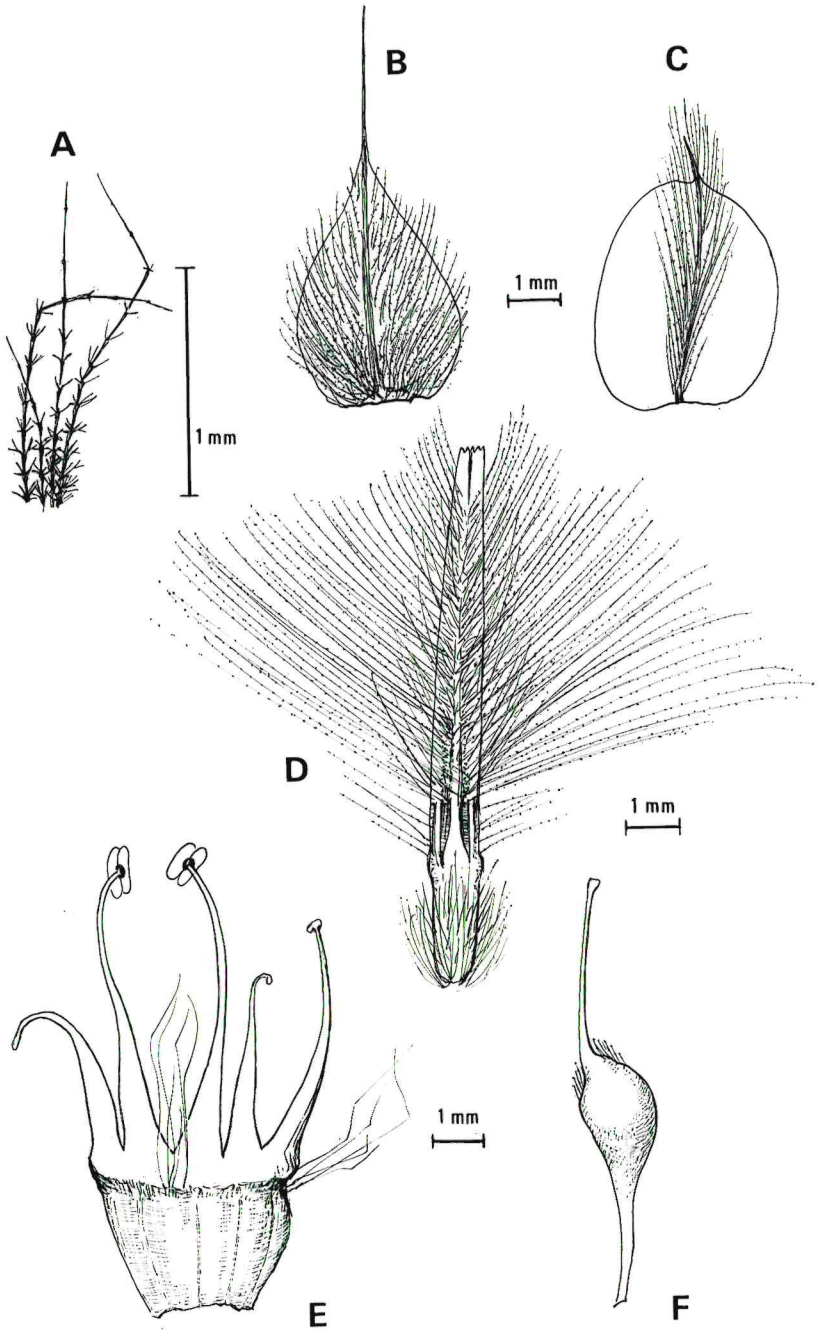

Figure 7. *Ptilotus stipitatus* Benl. A—Hairs of rachis, B—Bract, outer face, C—Bracteole, outer face, D—Outer tepal, outer view, hairs partly removed above the tube, E—Androecium spread open, outer face, F—Gynoecium. (Drawn by A. Böhm from holotype).

Pistil remarkably long-stipitate (Figure 7F). Ovary clavate 3·0–4·7 mm long including stipe of 1·7 to 3·0 mm, 0·8–1·3 mm wide, very sparsely pilose towards apex on opposite sides, with rigid subverticillate hairlets rarely up to 0·8 mm long. Style eccentric, more or less filiform, 2·7–3·4 mm long, ca 0·07 mm diam. in middle and 0·13 mm at the thickened base. Stigma level with the anthers, inconspicuous, often dark red.

Specimens examined: Western Australia: 8 km N. of Jigalong Depot, 'in sandy soil among *Triodia* and *Acacia* along No. 1 Rabbit Proof Fence', *R. D. Royce* 1592 (typus), 13 May 1947 (PERTH); ca 64 km S. of Mt Archie (= 32 km N. of NMF-21), 'in sandhills', *M. de Graaf* K 200, 30 Jan. 1969—(PERTH).

The very scanty material of de Graaf's collection has not been fully respected in the above description. In this the apices of the outer tepals are more mucronate than serrate and not exceeded by dorsal vestiture; the inner tepals are acute by more infolded margins. de Graaf's plant may represent a distinct infraspecific taxon, but clarification must await further gatherings.

Discussion: Basally widely dilated filaments as well as constantly two fertile stamens also occur in *P. aristatus* Benl, *P. chippendalei* Benl, and *P. kenneallyanus*, only the last species being shrubby. The others are herbaceous with numerous tufted more or less rod-like shoots (*P. aristatus*) or with prostrate stems from a rosette (*P. chippendalei*). The very bushy *P. kenneallyanus*, however, has a well-developed though evanescent pubescence on stems and foliage, subrhombic to spathulate leaves, copious axillary and terminal flower heads which are more compact, bracts with markedly shorter awns, a different kind of perianth indumentum, a pistil with decidedly shorter stipe and style, etc. The new species is clearly distinct from this, presumably its closest relative.

4. Ptilotus divaricatus (Gaud.) F. Muell. var. **rubescens** Benl, var. nov. (Figure 8)

Differt a varietate typica spicis rubescentibus, primo conoideis demum ovoideis vel subglobosis.

Diverging from the type variety of *P. divaricatus* in having red flower heads, initially cone-shaped (Figure 8), turning ovoid or subspherical.

Type: ± 1 km NE. of Bore Camp, Dirk Hartog Island, W. Aust. (± 25°37′S, 112°57′E); coll. *A. S. George* 11578, 6 Sept. 1972 (holotype: PERTH; isotype: CANB). 'Straggling perennial herb; flowers pink. In sand, in low open-heath.'

Except at the short glabrous tips, the purplish-red colour of the tepals is brightened to pink or mauve by a white silky pubescence and obscured by the comparatively large bracteoles in young spikes. In this stage the inflorescences (in the type material) are acutely coniform, their length and breadth averaging in the ratio of 1 to 0·8; spikes of about the same stage in var. *divaricatus* are usually subhemispherical with a ratio of 1 to 1·3.

Specimens examined: Western Australia: ± 1 km NE. of Bore Camp, Dirk Hartog Is., ± 25°37′S, 112°57′E, *A. S. George* 11578 (typus), 6 Sept. 1972 (CANB, PERTH); between Tamala and Carrarang in heath, *J. S. Beard* 6808, 11 Oct. 1973 (NSW, PERTH). 'Scandent semi-woody plant, flowers mauve.'

Discussion: This taxon is not merely a red flowering 'forma' of the typical white-flowered plant, as is found in *Ptilotus polystachyus* (Gaud.) F. Muell. f. *rubriflorus* (J. M. Black) Benl, which often occurs together with the typical form. There are no known collections of red-flowering specimens of *P. divaricatus* earlier than in 1972. The pink-flowered specimens gathered by A. S. George were not mingled with normal plants: 'As far as I recall *P. divaricatus* was not common on Dirk Hartog Island, and those plants I saw had the pink flowers. Had there been the normal white-flowered plants as well I would have collected them also', the collector in a letter dated 3 July, 1979.

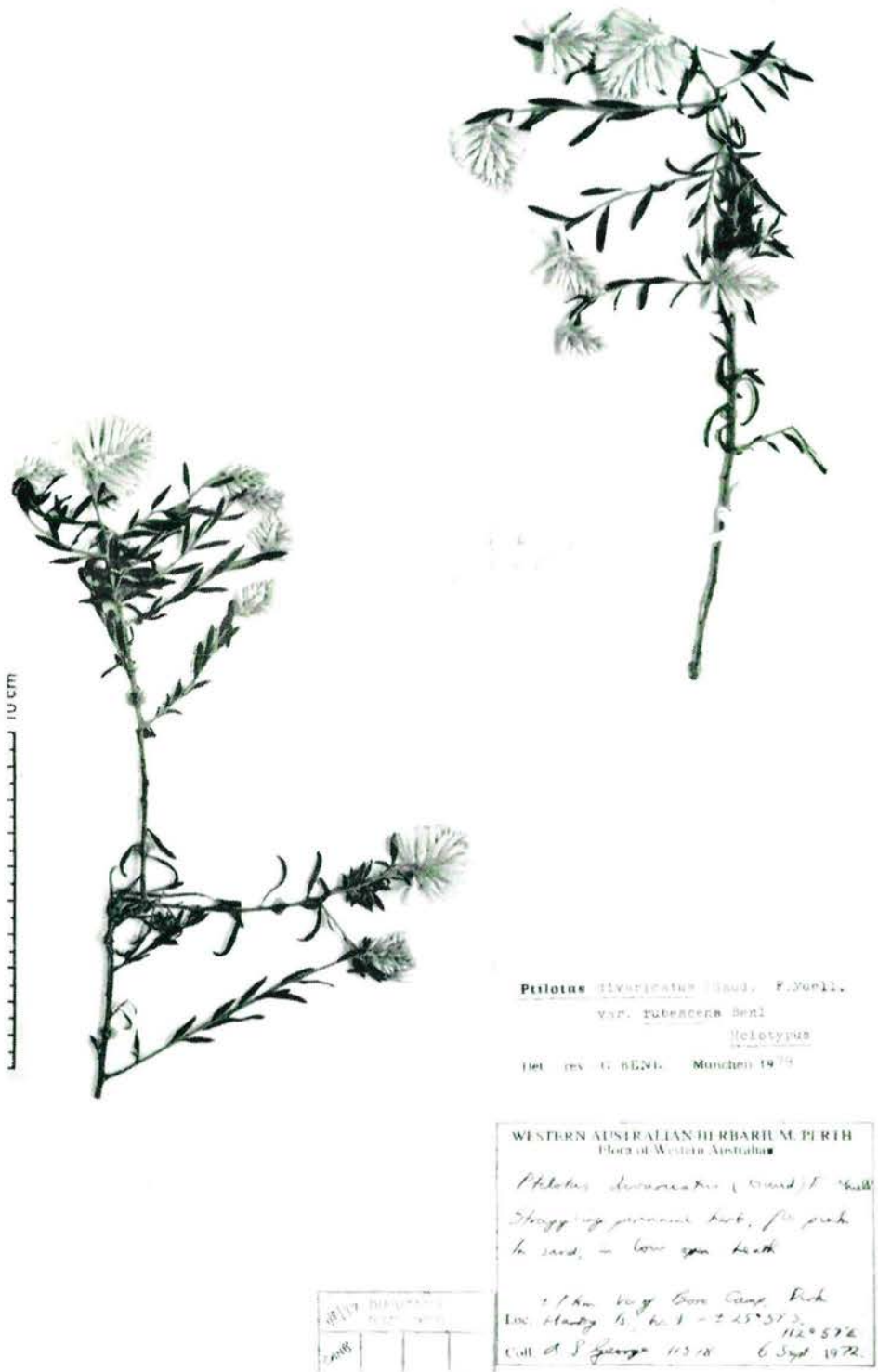

Figure 8. *Ptilotus divaricatus* (Gaud.) F. Muell. var. *rubescens* Benl. (J. S. Beard 6808) (phot. K. Liedl).

5. Ptilotus drummondii (Moq.) F. Muell. var. **elongatus** Benl, var. nov. (Figure 9)

A varietate *drummondii* ob habitum humiliorem caespitosum atque caules partim decumbentes (Fig. 9), a var. *minore* (Nees) Benl ob bracteam bracteolis minorem et perianthium pilis dorsalibus paucioribus apices tepalorum haud superantibus obsessum, a var. *scaposo* Benl ob caules conspicue ramosos et ob folia basalia distincta deficientia, a formis omnibus speciei ob spicas 1·6–2 cm latas ad 4·5 cm elongatas distinguitur.

Type: Fitzgerald River just above Twertup Creek, Fitzgerald River National Park, W. Aust.; coll. *A. S. George* 11266, 16 March 1972 (holotype: PERTH). 'Herb with perennial stock; flowers pink. In loam, in mallee-scrub close to river.'

Low bushy herb ca 18 cm across with numerous very slender stems from a weakly divided stock, up to about 15 cm tall. Ca 40 erect, ascending or prostrate stems and branches with terminal spikes, those of horizontal stems vertical (Figure 9). Spikes resembling those of *P. drummondii* var. *drummondii* in colour, but finally elongating up to 4·5 x 1·6–2 cm. Bracts and bracteoles strongly keeled, the smaller bracts at first pubescent. Gynoecium quite glabrous, densely enveloped by woolly hairs arising from inner tepals, outer face of staminal ring and fimbriate pseudostaminodes.

Discussion: Usually *P. drummondii* var. *drummondii* has 'erect simple rigid . . . stems' (Bentham **5**: 235; 1870) rarely branched: 'Caules semper stricti nunc non nisi basi parce ramosi nunc (praesertim ramis primariis pecore destructis) ramosissimi virgati caespitosi' (Diels & Pritzel, Bot. Jb. **35**: 191; 1904).

In large-headed forms of var. *drummondii* the inflorescences may also reach a length of 4·5 cm, but then the spikes are ca 3·6 cm across, thus having a broadly ovoid, not narrow-cylindrical, aspect.

The principal points of distinction within the *P. drummondii* complex may be summarized as follows:

1a. Basal leaves persistent, narrowly spathulate, long-petiolate, markedly different from cauline ones. Stems up to ca 15 cm tall, unbranched or divided at ground-level ..... var. *scaposus*

b. No conspicuous basal leaves in mature plants; all leaves (sub)linear-lanceolate to filiform, mostly sessile or nearly so 2

2a. Spikes subglobose up to 2 cm long, soon becoming (yellowish-) white. Bract larger than bracteoles. Apices of tepals obscured by copious dorsal hairs var. *minor*

b. Spikes up to 4·5 cm long, dull purple fading to light pinkish, finally becoming dirty whitish-green to stramineous. Bracts not larger than bracteoles. Apices of outer tepals glabrous, exceeding pubescence 3

3a. Stems to ca 15 cm long, partly decumbent, conspicuously branched. Spikes 1·6–2 cm across, ovoid to narrow-cylindrical. Bract smaller than bracteoles var. *elongatus*

b. Stems to 80 cm tall, usually stiffly erect and simple. Spikes subglobose to (broadly) ovoid up to 3·6 cm across. Bract more or less equalling bracteoles var. *drummondii*

(There may be some justification for separating the large-headed and the small-headed variants of this taxon at the level of 'formae', although there are intermediates between plants with subglobose inflorescences of less than 2 cm diameter and those with broadly ovoid ones of up to 3·6 x 4·5 cm; on the other hand in large-spiked specimens the tepals have a more copious pubescence.)

Figure 9. *Ptilotus drummondii* (Moq.) F. Muell. var. *elongatus* Benl. (A. S. George 11266) (phot. K. Liedl).

A new species of Eucalyptus from the margins of salt lakes in Western Australia

By S. G. M. and D. J. Carr[1]

Abstract

Carr, S. G. M. and D. J. A new species of Eucalyptus from the margins of salt lakes in Western Australia. Nuytsia 3, 2: 173–178 (1980).

A new species (*Eucalyptus halophila*) is described. It is included in the informal series "Bisectae" but appears to have no close affinity with any other species. It is characterized by persistent spiral phyllotaxis and stomata with anterior chambers occluded by cutinised polar wall ingrowths.

Eucalyptus halophila D. J. Carr et S. G. M. Carr sp. nov.

Frutex parvus affinitatis incertae qui ab speciebus Eucalypti omnibus ut sequente differt: cotyledones bisectae; medulla sine glandibus oleosis; cubiculum anticum stomatale incementis intrusis cutinalibus parietis polaris ornatum; phyllotaxis semper (2, 3) spiralis; staminodia externa; valvarum apices in fructu nulla; testa brunnea, favosa, ordinatione cellularum indistincta.

Type: 12·5 km NNW of Dalyup, Western Australia, near small salt pan (131°32′E, 34°37′S), 25 February 1966 *A. S. George* and *S. G. M. Carr* 7661. (holotype: PERTH).

A small shrub of uncertain affinity which differs from all other known species in the possession of the following constellation of characters viz: bisected cotyledons; pith without oil glands; anterior stomatal chamber ornamented with cutinised polar wall ingrowths; phyllotaxis persistently (2, 3) spiral; external staminodes; tips of valves lacking in fruit; testa brown, honeycombed, cell pattern indistinct.

Description

A lignotuberous *shrub* up to 2 m tall; bark deciduous, pale-grey or brown, both it and the pith without oil glands. *Leaves* green, concolorous, held more-or-less erect, triplinerved, the lateral nerves distant from the margin, minor veins obscure; seedling and juvenile leaves narrow-linear to narrow-obovate, blunt, phyllotaxis (2, 3) spiral (Fig. 2E); intermediate (Fig. 1B) and adult leaves (Fig. 1A) (2, 3) spiral or sub-decussate (Fig. 2F), narrowly elliptical, symmetrical or slightly falcate. *Unit inflorescences* axillary (3–) 7-flowered, the upper ones subtended by leaves, the lower by prophylls, peduncle slightly flattened with acute margins. *Flower buds* obpyriform, stalked, pedicel slender, shorter than the hypanthium. Sepaline *operculum* shed early, petaline operculum conical or rounded, much wider than long, usually with a small umbo. *Staminophore* projecting over the tube of the flower; outer filaments anantherous or with abortive anthers, not all inflexed, zig-zag before anthesis; filaments of fertile stamens very short, inflexed. *Anthers* broader than long, lobes globular, dehiscence by introrse oblique slits, filament inserted at the mid-point or below it. *Nectary* lining the tube of the flower; upper surface of ovary

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slightly domed and with small ridges indicating the mid-lines of the loculi. *Style* straight, slightly tapered, as long as the cone of stamens in bud; stigma inconspicuous, domed, as wide as the style. *Fruit* (Fig. 2C) sharply contracted into the pedicel, globular-truncate or ovate-truncate, 5–8 mm diameter, contracted at the orifice; valves truncate, projecting

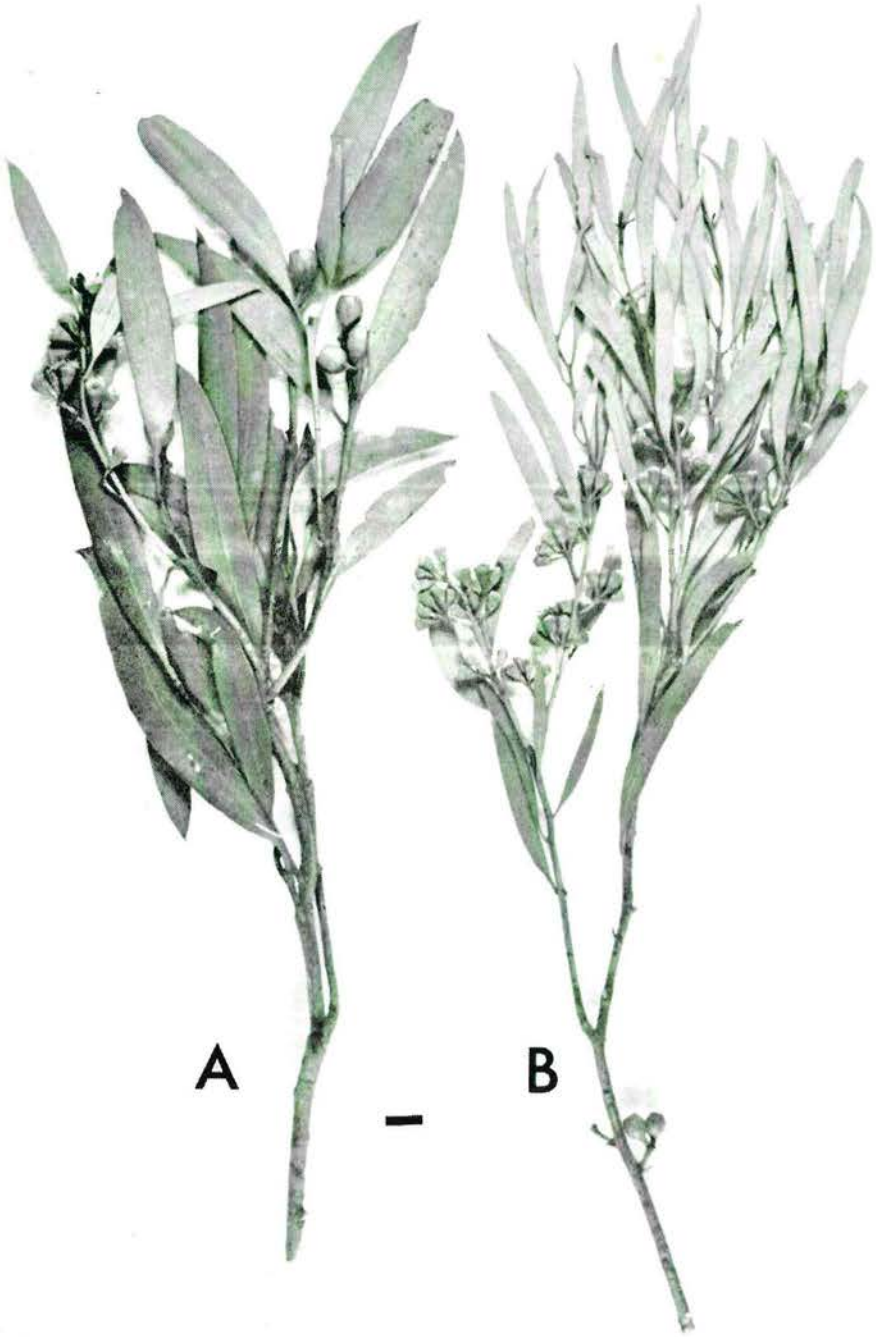

Figure 1. *Eucalyptus halophila* sp. nov. Scale marker 1 cm. A—Fragment of S. G. M. Carr 646, adult foliage. B—Fragment of A. S. George and S. G. M. Carr 7661; intermediate foliage.