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♦ CONTENTS ♦

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CONTENTS

Western Australian Herbarium,
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A new species of *Trianthema* (Aizoaceae) from the Kimberley region and a note on *T. triquetra*

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Abstract

Bittrich, V. A new species of *Trianthema* (Aizoaceae) from the Kimberley region and a note on *T. triquetra*. Nuytsia 7(2): 117-122 (1990). A new species of *Trianthema* is described, namely *T. kimberleyi* Bittrich & Jenssen, endemic to the Hall District of the Northern Botanical Province of Western Australia. Some observations on several forms of *T. triquetra* Willd. in Australia are provided: these differ mainly in leaf anatomy.

Introduction

The genus *Trianthema* L. (Aizoaceae) consists of about 20 species distributed in the tropics and subtropics, mainly in the southern hemisphere. Until now, twelve species have been recorded from Australia: ten of these are endemics (Prescott 1984).

The genus belongs to the subfamily Sesuvioideae (4 genera), which is characterized by circumscissile capsules, an aril completely sheathing the seed, Kranz anatomy of the leaves (with rare exceptions), and bracteate inflorescences (Bittrich & Hartmann 1988). The genus itself is defined by the monocarpellate gynoecium. Further characteristics are the large-celled hypodermis of the leaves (probably functioning as a water storage organ) and the often myxospermous seeds, where the mucus is produced by the swelling of the aril after moistening, a feature also found in the closely related genus *Zaleya* Burm.f. Jeffrey (1960) described two subgenera, *Trianthema* subgen. *Trianthema* and *Trianthema* subgen. *Papularia* (Forsk.) Jeffrey, distinguished by the number of ovules and the number of flowers per partial inflorescence. The new species described here is included in the subgen. *Trianthema*. *T. triquetra* belongs to the subgen. *Papularia*. However, it needs to be investigated whether the two subgenera defined by Jeffrey (1960) are also monophyletic groups and the characters mentioned by him provide synapomorphies for one or both of these subgenera.

Nearly all Australian species of *Trianthema* are annual herbs; only *T. turgidifolia* F. Muell. is more or less shrubby and perennial. A number of species are conspicuously hairy on all green parts (e.g. *T. pilosa* F. Muell., *T. rhynchocalyptra* F. Muell.); others are only sparsely pubescent or completely glabrous (e.g. *T. portulacastrum* L., *T. triquetra*). The new species belongs to the latter group and is closely related to *T. compacta* C. White, *T. glossostigma* F. Muell., and *T. oxycalyptra* F. Muell.

Trianthema kimberleyi Bittrich & Jenssen sp. nov. (Figure 1)

Herba annua, glabra, prostata, c. 5 cm alta et 20 cm diametro; folia opposita, carnosa, inaequalia, basaliter connata, saepe apiculata, lamina late obovata vel ovalis, c. 4-11 mm longa et 1.5-5 mm lata; petiolus c. 1-2 mm longus, basaliter cum vaginis membranaceis bidentatis; flores solitarii, breviter pedunculati; bracteae 2, membranaceae, apiculatae et denticulatae; tepala 5, basi connata, valvata, dorso viridia, intus albidarosea; stamina 10, 5 opposititepala, 5 alternitepala; stylus 1, c. 1.2 mm longus; ovarium simplex uniloculare, placentatione marginali, ovulis biseriatis; ovula 10-12; capsulae circumscissae, cum pedicellis, operculis conicis; semina c. 1.1 mm longa, brunneanigra, glabra, cum arillis omnino vaginata; embryo hippocrepicus; chromosomatum numerus 2n = 48.

Typus: c. 20 km south of the Great Northern Highway between Fitzroy Crossing and Halls Creek, 199 km west of Halls Creek, c. 2 km WSW of Christmas Creek homestead, Western Australia; near a small lake on flat hills in schistose rocks, 15 March 1989, *V. Bittrich & K. Jenssen* 18618 (holo: HBG; iso: CANB, K, PERTH).

Much branched, prostrate, *annual* herb c. 20 cm in diameter and 5 cm high, glabrous. *Branching* in the vegetative part of the plant monopodial, in the flowering region sympodial, the branches here of unequal diameter. *Leaves* opposite, flat, elliptical to obovate, 4-11 mm long and 1.5-5 mm broad, often with a short mucro at the apex, basally shortly connate, weakly papillose, succulent due to the large water-storing cells of the epidermis and hypodermis, reddish on the abaxial surface; leaves in the flowering region anisophyllous, with the thicker sidebranch in the axil of the larger leaf; petiole 1-2 mm long, basally expanded into a membranaceous sheath with two acuminate lobes. *Flowers* solitary, axillary, with an intense honey smell at anthesis; pedicels up to 2 mm long at anthesis, but elongated to up to 5 mm when fruiting, with two scarious, lanceolate, apiculate and denticulate bracts; perianth c. 7.5 mm in diameter, 5-partite; tube obconical, c. 2 mm long, with a whitish nectary disk inside at the base; lobes green outside, whitish-pink inside, valvate; stamens 10, 5 opposite and 5 alternate to the tepals, inserted at the mouth of the perianth tube; anthers pale pink, smooth; style 1, filiform with a row of short papillae on one side; placenta marginal with 10-12 ovules in 2 rows. *Capsule* dehiscing by circumscissile split about the middle, operculum subovoid; seeds 6-8, broadly ovoid or pyriform, c. 1.1 x 0.9 x 0.6 mm, brownish to black, smooth, completely sheathed by an aril, which swells slightly when moistened; embryo horseshoe-shaped, curved around the mealy perisperm. *Chromosome number* 2n = 48.

Distribution. Known only from the type locality in the southern Kimberley region where it is confined to the Hall District of the Northern Botanical Province of Western Australia.

Habitat. Grows on flat hills in schistose rocks.

Flowering and fruiting period. March to ?.

Conservation status. Rare.

Figure 1. *Trianthema kimberleyi* at the type locality in the southern Kimberley region.

Figure 2. Two different forms of *Trianthema triquetra* occurring sympatrically in the southern Kimberley region near Fitzroy crossing (*Bittrich & Jenssen* 18612 (left), 18610 (right)).

Affinities. *Trianthema kimberleyi* is closely related to *T. compacta*, *T. glossostigma*, and *T. oxycalyptra*. It is distinguishable from these species by the ± valvate (instead of imbricate) tepals. Additionally, it differs from *T. compacta* by the mucronate, more succulent, always petiolate leaves, the constant number and regular arrangement of the stamens, and the aril, which does not swell after moistening in *T. compacta*; from *T. glossostigma* by the stamen number and the unsculptured testa (ribbed in *T. glossostigma*); from *T. oxycalyptra* by the absence of the dorsal unifacial mucro on the tepals, and the smooth aril, which is conspicuously papillate in *T. oxycalyptra*.

Etymology. The specific epithet refers to the distribution of the species, which is known at present only from the type locality in the southern Kimberley region of Western Australia.

Trianthema triquetra Willd.

Trianthema triquetra belongs to a group of species with its centre of distribution in the arid regions of southwest Africa, east Africa and India. As mentioned above, the species of this group belong to the subgen. *Papularia* (Forsk.) Jeffrey (characterized by two superposed ovules and usually clustered flowers), but up to now has not been assigned formal taxonomic rank, and still awaits critical revision. Differences between species described in the published Floras of the areas mentioned often are restricted to form and size of leaves, tepals and the perianth tube, characters which are subject to some plasticity dependent on water supply. Some taxa (species, subspecies or varieties), however, seem to be well circumscribed, but an investigation of the group over its whole distribution is necessary, before a satisfactory classification is possible.

The members of this group are characterized by smooth or papillose leaves and stems; and two-seeded circumscissile capsules, the circular operculae of which are depressed at the apex and partially enclose the upper seed. The dead tepals are generally hygrochastic and, when bending outwards after wetting, loosen the operculae which are then washed away by raindrops, thus functioning as dissemination units. The small, often inconspicuous flowers have only five stamens alternate to the perigon lobes. Also, form and sculpturing of the seeds are rather similar in all members of the group.

Trianthema triquetra contains two subspecies described from Africa and a number of varieties. In the treatment for volume 4 of the "Flora of Australia", Prescott (1984) describes two varieties only. Apparently it was assumed that only *T. triquetra* subsp. *triquetra* occurs in Australia, as no other subspecies are mentioned. Prescott (1984) notes considerable confusion in the use of the names of the two varieties (*T. triquetra* var. *triquetra* and *T. triquetra* var. *clavata* (J. Black) H. Eichler), which are mainly delimited by the different leaf form and degree of succulence. According to her, the variety with clavate, more succulent leaves is restricted to central Australia, and may only be a modification under extreme arid conditions. Such different forms, however, can also be found in northwest Australia, sometimes even occurring sympatrically (Figure 2). It was found in comparative cultivation that the different leaf forms are genetically fixed.

In Australia there occurs, however, a third form, which seems to be far less common than the former two and has been overlooked hitherto. The new form was recently collected by us in northwest Australia (*Bittrich & Jenssen* 18601, 18616, 18646; HBG, PERTH). The difference between the new form and the two other varieties lies in the leaf anatomy, which can be easily recognized in living plants, but only with difficulty in herbarium specimens. The varieties *Trianthema triquetra* var. *triquetra* and var. *clavata* develop a water-storing tissue adjoining the epidermis on the abaxial side of the leaf (Figures 2 & 3). Therefore, the chlorenchyme is developed on the adaxial side of the leaves only or in more succulent leaves (hence the varietal epithet "clavata") where it forms a semicircle around the water tissue. The leaves of the new form, however, show a central water-storing tissue only and have a chlorenchyme on both sides, thus being isobilateral in cross-section (Figure 3). In some leaves a very small gap in the chlorenchyme can be found on the abaxial side, visible as a narrow translucent band which either stretches from the base to the top of the leaf or is present only in the basal part. This is reminiscent of the strongly

Figure 3. Leaves of two forms of *Trianthema triquetra* in abaxial view with different anatomy (*Bittrich & Jenssen* 18612 (above), 18601 (below)).

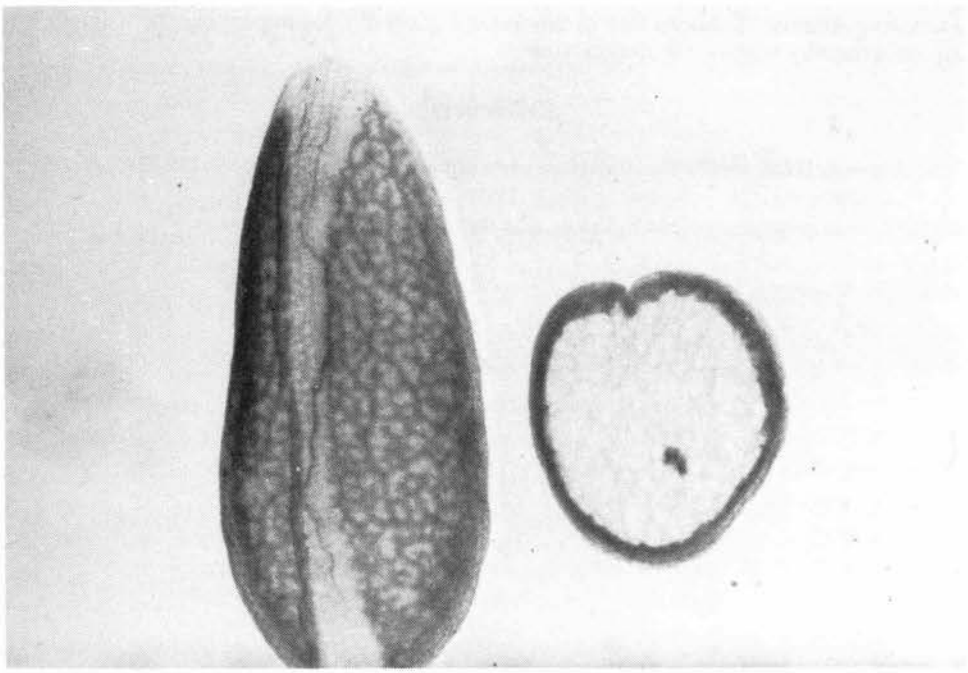

Figure 4. Leaf of *Trianthema turgidifolia* (*Bittrich & Jenssen* 18644) in abaxial view and cross-section.

succulent leaves of the closely related *T. turgidifolia* F. Muell., where at least part of the leaves on every plant also show a narrow translucent band on the abaxial side (Figure 4). In connection with the different position of the water-storing tissue and the chlorenchyme also the innervation of the leaves as seen in cross-section is different. In the first case, where a chlorenchyme is absent on the abaxial side of the leaves, vascular bundles are also absent in this part. In the second case, however, the primary and secondary vascular bundles lie more or less inside the central water-storing tissue, whereas the higher order bundles are arranged circularly at the periphery of the central water-storing tissue. This difference in pattern is not surprising, as all *Trianthema* species are characterized by Kranz anatomy, and the chlorenchyme and the kranzcells lie around the leaf veins (Figure 3). In both leaf types a very narrow translucent stripe in the middle of the adaxial side of the leaves often is visible, as the vascular bundles (with the chlorenchyme around) cross only occasionally here. It is interesting that both leaf types can also be found in African members of the species group.

A formal taxonomic treatment of the new form of *Trianthema triquetra* is still hardly possible, as long as the whole species group is insufficiently known. It is, however, probably identical with *T. glaucifolia* F. Muell. (type MEL 99963 from Queensland), treated as a synonym of *T. triquetra* by Prescott (1984), but this is difficult to decide on the basis of herbarium material. *T. triquetra* in Australia is variable in other characters (epidermis of leaves and stems, number of flowers per inflorescence, seed sculpture, length of the perianth tube, chromosome number), too, which need further investigation. At present it is even uncertain whether the name *T. triquetra* will persist in future, as the earlier described species *T. salsoloides* Fenzl ex Oliver is rather similar and might be an earlier name for the same taxon. In the future, attention should be paid to the differences described above in order to obtain more information about the distribution of the different forms.

Acknowledgements

This research work was supported by a grant from the Deutsche Forschungsgemeinschaft, for which I am very grateful. I should like to thank Dr J. Kadereit for improving the English text and M. Struck for critically reading the manuscript.

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Correction and further notes to 'Studies on the Australasian Asclepiadaceae. I. *Brachystelma* Simms in Australia'

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Abstract

Forster, P.I. Correction and further notes to 'Studies on the Australian Asclepiadaceae. I. *Brachystelma* Simms in Australia. Nuytsia 7(2): 123-124 (1990). It is noted that the name *Brachystelma glabriflorum* (F. Muell.) Schltr. has priority over *B. microstemma* Schltr. for the single species occurring in Australia, New Guinea and Indonesia. A corrected synonymy for this taxon is provided.

The name *Brachystelma* Sims is now conserved over *Microstemma* R. Br. (Brummit 1988).

The earliest available name in *Brachystelma* for the single species that occurs in Australia, New Guinea and Indonesia is *B. glabriflorum* (F. Muell.) Schltr. and not *B. microstemma* Schltr. as earlier reported (Forster 1988). *B. glabriflorum* is based on *Microstemma glabriflorum* F. Muell. from 1858 which has priority over *B. microstemma* from 1914.

The type of *Brachystelma papuanum* Schltr. is not extant at B and was presumably destroyed in World War II.

The corrected synonymy is given below.

Brachystelma glabriflorum (F. Muell.) Schltr., Bot. Jahrb. Syst. 50: 161 (1914). — *Microstemma glabriflorum* F. Muell., Fragm. Phyt. Austral. 1: 58 (1858). *Type:* Seaview Range, s. dat., *F. Mueller* s.n. (holo: K).

Microstemma tuberosum R. Br., Prodr. 459 (1810); Endl., Icon. Gen. Pl. t. 60 (1838); F. Muell., Fragm. Phyt. Austral. 1: 58 (1858); Benth., Fl. Austral. 4: 345 (1869); Bailey, Queensland Fl. 3: 1014-1015 (1900); Bailey Compr. Cat. Queensland Pl. 335, t. 312 (1913); Back & Bakhuizen van den Brink, Fl. Java 2: 257 (1965). — *Brachystelma microstemma* Schltr., Bot. Jahrb. Syst. 50: 160 (1914). *Lectotype* (here designated): Australia, Carpentaria, Turtle Island, Dec. 1802, *R. Brown* s.n. sub. *J.J. Bennett* 2880 (lecto: BM; isolecto: K).

Brachystelma papuanum Schltr., Bot. Jahrb. Syst. 50: 161 (1914). *Type:* Nordöstl. New Guinea: auf grasigen Hügeln am Fusse des Bismarck-Gebirges, October 1908, *R. Schlechter* 18470 (holo: B).

Acknowledgements

Paul G. Wilson (PERTH) brought to notice the priority of *B. glabriflorum*. B. Leuenberger (B) provided a listing of extant Schlecter types of Asclepiadaceae at that institution.

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Taxonomy of the *Grevillea brachystylis* species complex (Proteaceae)

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Abstract

Keighery, G.J. Taxonomy of the *Grevillea brachystylis* species complex (Proteaceae). Nuytsia 7(2): 125-131 (1990). Material formerly included in *Grevillea brachystylis* is shown to comprise two distinct species, one undescribed. *Grevillea bronwenae* is described, and illustrated. This new species is confined to the northern margin of the Blackwood Plateau, whereas *Grevillea brachystylis* contains two distinct subspecies occurring on the Swan and Scott coastal plains.

Introduction

The genus *Grevillea* has recently been studied by McGillivray, who has published a list of new taxa (McGillivray 1986).

McGillivray has a relatively broad species concept within this large genus and he has left a series of species complexes as single units. As an example, the populations studied in this paper were considered to form a single variable species (Marriott 1986) and specimens at PERTH are annotated as such by McGillivray.

Grevillea brachystylis is confined to the Swan and Scott coastal plains and the Blackwood Plateau of south-western Australia. Horticulturalists and field botanists alike have recognized the existence of distinct forms within the species. This paper presents the results of field and herbarium studies on the conservation status and variability of *Grevillea brachystylis* that indicate that the variation is discontinuous and that the Blackwood Plateau populations comprise a distinct species.

Methods

During the flowering season of 1986/87 areas of remnant bushland, state forest and conservation reserves covering the natural range of *Grevillea brachystylis* were surveyed for the occurrence of this species. Observations were made on the habit, habitat, vegetative and floral morphology of these populations. Comparisons are made on the basis of fresh material.

Utilizing this material the populations were found to differ significantly in habitat, habit, the angle of the leaves to the stem, shape of the flower, perianth, pistil and pollen presenter. These characters are occasionally discernible on herbarium material, but form a major character sequence readily obtained by field observations. Characters of habit, leaf presentation, the form of the perianth, pistil and pollen presenter are constant and significant characters in this complex and elsewhere in the genus *Grevillea* (author, pers. obs.). These differences are difficult to describe but are presented in illustrations.

Results

Field surveys carried out in 1986/87 showed that populations occurred in three disjunct regions, namely Swan Plain, Scott Plain and Blackwood Plateau. Tabulation of a wide range of vegetative and floral characters (Table 1) clearly demonstrates that the Blackwood Plateau populations are markedly different from the other plains populations. These differences are reinforced by habitat differences (see under species descriptions) and floral characters (Figures 1 and 2).

There are no intermediate populations, and populations of *Grevillea brachystylis* and *Grevillea bronwenae*, occurring within 100 metres of each other on Queen Elizabeth Road, maintain the differences.

Clearly the Blackwood Plateau populations should be given specific status. The two disjunct coastal plain forms differ in minor characters (habit, colour of pollen presenter) and are thus given subspecific status.

Taxonomy

1. **Grevillea brachystylis** Meissn. in Lehm., Pl. Preiss. 1: 538 (1845); 252 loc. cit. 2: *Type:* Mocloy's Plain, Sussex District, 20.12.1839, *J.A.L. Preiss* 714 (holo: NY, photo seen).

Much branched, prostrate or decumbent to erect *shrub* with branches to 2 m long. *Stems* slender, shiny red with current years growth almost glabrous except at ends, ± 1 mm wide. *Leaves* erect, linear-lanceolate, 64-87 x 8-10 mm; margin recurved; upper surface smooth green; under surface densely hairy-white; apex acute or pungent with a black point 0.5-1 mm long. *Inflorescence* axillary, 6-7 flowered. *Peduncle* 4-6 mm with long, densely pubescent with short silver hairs. *Basal bract of inflorescence* lanceolate-ovate, brown; apex acute, ± 7 mm long, densely hairy. *Bracts/bracteoles subtending flowers* normally 3, imbricate, ovate; brown, 3-4 x 5 mm, pubescent, persistent; apex acute. *Pedicel* 3.5-4.5 mm long. *Perianth* red, slightly saccate, 7-8 mm long; limb 6 mm long, sparingly hirsute. *Pistil* 7-9 mm long; stipe 3 mm long; ovary 0.5 mm long. *Pollen presenter* 3-4 mm long, red or pale purple. *Ovary* densely hairy. *Nectary* yellow, c. 1 mm long, producing copious nectar. *Capsule* 10-11 mm long, sparsely hairy with retained style. *Seed* elliptic, supervolute, ± 7 mm long, brown; eliasome white, ± 2 mm long. Figure 1.

The species contains two subspecies.

1a. **G. brachystylis** Meissn. subsp. **brachystylis**

A much branched, prostrate or decumbent shrub with branches to 60 cm long. Pollen presenter red.

Specimens examined. WESTERN AUSTRALIA: Busselton, 27 Sept. 1944, *C.A. Gardner* s.n. (PERTH); Yoongarillup, *R.D. Royce* 3806 (PERTH); Busselton area, (33° 40' S, 115° 35' E), *A.R. Fairall* 2557 (KPBG); 3 km E of Busselton, *S. Paust* 117 (PERTH); Ruabon, *G.J. Keighery* 1022 (PERTH); Fish Road Nature Reserve, *G.J. Keighery* 9484 (PERTH).

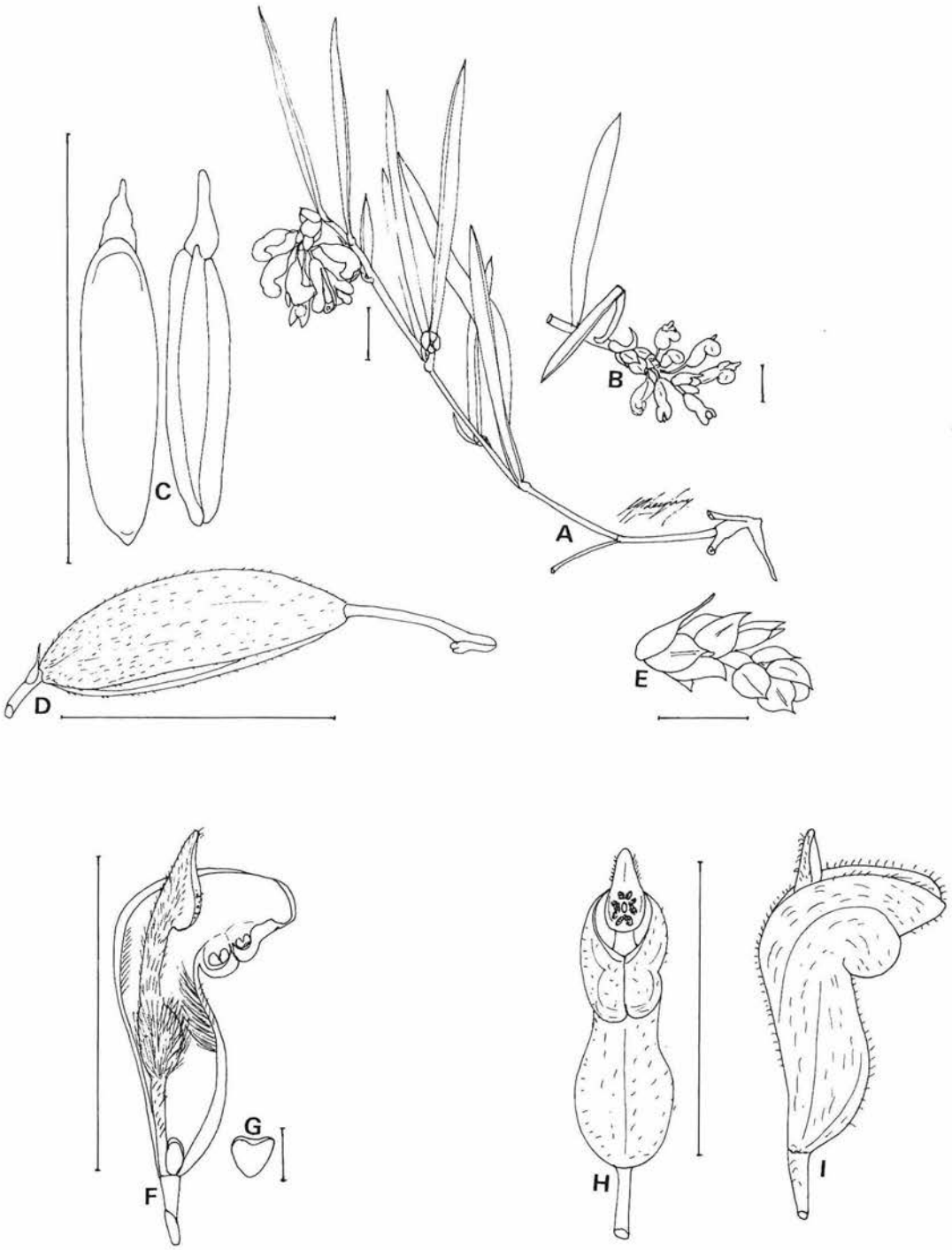

Figure 1. *Grevillea brachystylis* Meissn. A - Habit. B - Inflorescence. C - Seed. D - Capsule. E - Inflorescence in bract showing bracteoles. F - Lateral section of flower. G - Nectary. H - Front view of flower. I - Side view of flower A, B, E-I *G.J. Keighery* 1022. C, D *G.J. Keighery* 9484. Scale bar = 10 mm, except G = 1 mm.

Distribution. Confined to the southern Swan Coastal Plain, east of Busselton.

Flowering period. September.

1b. **Grevillea brachystylis** Meissn. subsp. **australis** Keighery, subsp. nov.

Frutex prostratus vel erectus robustus ramis ad 2 m longis. Flores rubri, praebitor pollinis purpureus.

Typus: Scott River Road, Scott National Park, 29 January 1988, *G.J. Keighery* 9711 (holo: PERTH; iso: CANB, K, MEL).

Other specimens examined. WESTERN AUSTRALIA: Scott River (34° 15' S, 115° 15' E), *D. Young* 348 (KPBG); Scott River Road, *S. Paust* 263 (PERTH); Scott River, 20 Sept. 1973, *E.C. Nelson* s.n. (PERTH, CANB); Scott River Road, *H. Demarz* 4334 (KPBG); Scott River, *E. Wittwer* 2205 (KPBG); intersection Courtney Road and Payne Road, *G.J. Keighery* 9579 (PERTH); Governor Broome Road, *G.J. Keighery* 10343 (PERTH).

Distribution. Endemic to the Scott Coastal Plain, east of Augusta.

Flowering period. September-January.

Notes. The collections designated as *Grevillea brachystylis* subsp. *australis* can be distinguished from *G. brachystylis* subsp. *brachystylis* by the purple pollen presenter, the branches being up to 2 m long (instead of 40-70 cm), often erect, and much branched. No intermediate populations are known because of the disjunct nature of the species.

Etymology. From the Latin *australis*, referring to the southern distribution of this subspecies.

Habitat. Both varieties occur on winter wet flats normally covered by heath with sand over clay.

2. **Grevillea bronwenae** G.J. Keighery, sp. nov. Figure 2.

Typus: Sabina Road, Whicher Range, 15 km S of Busselton (33° 45' S, 115° 27' E), *B.J. & G.J. Keighery* s.n. (holo: PERTH; iso: CANB, K, MEL).

Illustration. Marriott (1986), as *Grevillea brachystylis*.

Frutex erectus gracilis, ad 1.5 m altus. Folia erecta, lineari-lanceolata, 104-127 mm longa. Flores rubri, praebitor pollinis purpureus.

Slender erect *shrub*, with 1-5 main branches, to 1.6 metres tall. *Stems* ± 2 mm wide, dull red; current year's growth slightly ribbed; ribs reddish marginally, green, covered centrally by dense, short, bifid hairs, becoming glabrous with age. *Leaves* erect, linear-lanceolate, 104-127 x 5-6 mm; margins recurved, scabrid on upper surface, sparsely hairy on lower surface; apex acute or pungent with a black point 0.5-1 mm long. *Inflorescence* axillary, 6-7 flowered. *Peduncle* 4-6 mm long, densely pubescent with short silver hairs. *Basal bract of inflorescence* lanceolate-ovate, brown, ± 5 mm long, densely hairy. *Bracts/bracteoles subtending flowers* 3, ovate, 1-2 mm, caducous; apex acute. *Pedicel* 6-8 mm long. *Perianth* red, yellow under anther pockets, 11-14 x 4 mm, square in T.S., sparsely hairy. *Pistil* 10-11 mm long; stipe 3 mm long; ovary 0.5 mm long. *Pollen* presenter 3 mm long, purple or dark violet. *Ovary* densely hairy. *Capsule* 8-9 mm long, with retained style. *Seed* elliptic, supervolute, ± 6 mm long; eliasome white, ± 2 mm long.

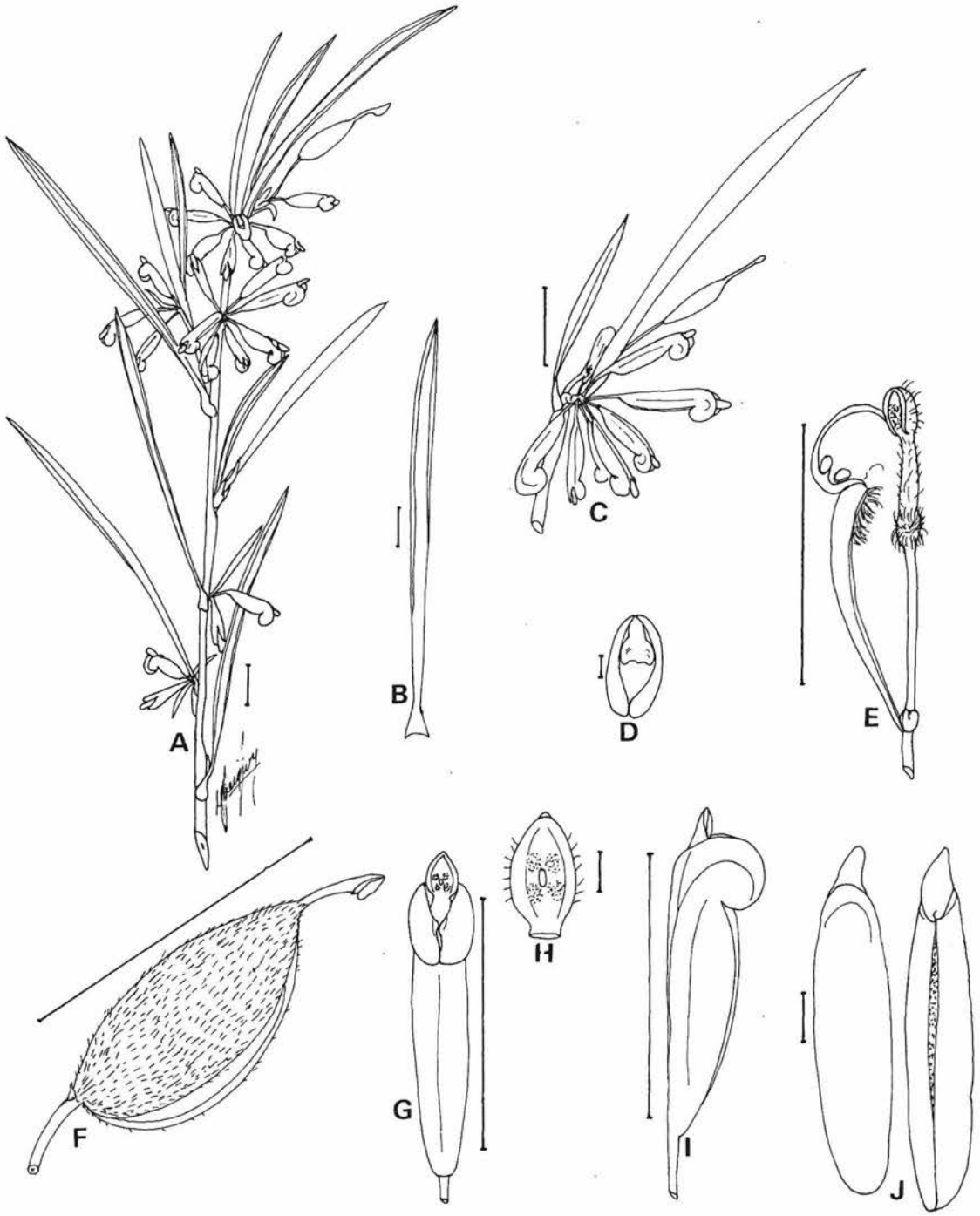

Figure 2. *Grevillea bronwenae* Keighery. A - Habit. B - Leaf. C - Inflorescence. D - Top view of flower. E - Lateral section of flower. F - Fruit. G - Front view of flower. H - Pollen presenter. I - Side view of flower. J - Seed. A-E, G, H, I *B.J. & G.J. Keighery* s.n. (holo: PERTH). F, J *G.J. Keighery* 9471. Scale bar = 10 mm, except D, H, J = 1 mm.

Table 1.
Vegetative and Floral Characters of the *Grevillea brachystylis* complex

TAXON	*G. brachystylis* subsp. *brachystylis*	*G. brachystylis* subsp. *australis*	*G. bronwenae*
HABIT	Prostrate stems from lignotuber	Erect and prostrate from lignotuber	Erect, no lignotuber
BRANCHING	Many stems	Many stems	Few stems
RESPONSE TO FIRE	Resprouts	Resprouts	Killed
LEAF			
Length (mm)	64-87	62-91	104-127
Colour underneath	White	White	Green
Width (mm)	8-10	9-10	4.5
Position	Erect (at 90°)	Erect	Spreading (at 45-60°)
INFLORESCENCE BRACT length (mm)	5	5	7
BRACTEOLE length (mm)	Persistent, 4	Persistent, 4	Caducous, 2
PEDICEL length (mm)	6-8	6-8	3.5-4.5
PERIANTH length (mm)	7-8	7-9	11-14
POLLEN PRESENTER colour	Red	Purple	Purple

Other specimens examined. WESTERN AUSTRALIA: Hill Road, Whicher Range, *G.J. Keighery* 3634 (KPBG); Jarrahwood, Aug. 1949, *E. Salisbury* s.n. (PERTH); Darling Scarp, E of Jarrahwood, 21 June 1965, *C. Davies* s.n. (PERTH); Whicher Road, Whicher Range, 29 Sept. 1979, *T.J. Hawkeswood* s.n. (PERTH); 19 km S of Busselton on Nannup Road, *G.J. Keighery* 9471 (PERTH).

Distribution. Confined to the northern edges of the Blackwood Plateau, between Nannup and Busselton.

Habitat. Grows on sand over laterite under *Eucalyptus haematoxylon* low woodland or *E. marginata/E. calophylla* low woodland. The species forms dense populations 5-8 years after fire in this area.

Flowering period. June-December, peaking August-November. Mature fruits are produced November-February.

Discussion. Grevillea bronwenae is an attractive horticultural subject, and is frequently grown under the name *Grevillea brachystylis* "Whicher Range Form".

Etymology. The specific epithet honours Bronwen Keighery, my wife, for her help both in field work in this and many other studies and for her assistance in maintaining our family during my numerous absences in the field over the past 15 years.

Conservation Status

Although highly restricted, the range of *Grevillea bronwenae* is entirely in State Forest, much of which lies within the proposed Whicher Range National Park. This species does not seem to be under any immediate threat.

Grevillea brachystylis subsp. *brachystylis* was located at 20 sites on the Swan Coastal Plain. However, 17 of these are road verge populations with little protection. Three populations occur in actual or proposed nature reserves at Yoongarillup, Ruabon and Fish Road.

Grevillea brachystylis subsp. *australis* is currently known from six sites, four of which are on road verges. Two (including the type population) are located in Scott National Park.

Currently all the above taxa are located in reserves. The variety most at risk appears to be *Grevillea brachystylis* subsp. *brachystylis* for which the reserves and populations are relatively small.

References

Marriott, N. (1986). Newly cultivated *Grevillea.* Australian Plants 13: 335-340.

McGillivray, D.J. (1986). "New Names in *Grevillea* (Proteaceae)." (D.J. McGillivray: Castle Hill, New South Wales.)

Caesia viscida, a new species of Anthericaceae (Liliaceae s. lat.) from south-western Australia

G.J. Keighery

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Abstract

Keighery, G.J. *Caesia viscida*, a new species of Anthericaceae (Liliaceae s. lat.) from south-western Australia. Nuytsia 7(2): 133-135 (1990). *Caesia viscida* Keighery is described and illustrated.

Introduction

During the biological survey of Cape Arid, an unusual species of *Caesia* was located in *Banksia speciosa* shrublands. This species did not match any collections held in Perth, nor did it correspond to any described in the review by Henderson (1987). It is described here as a new species, *Caesia viscida.*

Taxonomy

Caesia viscida G.J. Keighery, sp. nov. (Figure 1)

Planta caespitosa, radicibus tuberibus gracilis dauciformis. Foliis erectus cannaliculatus viscidus, 15-30 cm longus, laminois 5-6 mm latis. Inflorescentia brevis, 6-10 cm longis, effusus. Perianthum segmentum album internum, externum brunneolus pallidus.

Typus: Tagon Bay Road, 33° 51' S, 123° 00' E, Cape Arid National Park, Western Australia, 23 November 1988, *G.J. Keighery & J.J. Alford* 2010 (holo: PERTH; iso: MEL, K).

Caespitose, perennial *herb* to 300 x 300 mm wide, from a shortly branched rhizome, with 6-20 flowering shoots produced annually. *Rhizome* covered by dense brown fibres (breakdown products of the persistent leaf sheaths). *Roots* white, tuberous below rhizome to c. 5 mm diameter, becoming slender at depth, to 170 mm long, annually renewed. *Leaves* erect, glabrous, viscid; lamina 150-300 x 5-6 mm, channelled, with 6-8 prominent veins; margin entire; apex acute to long pungent.

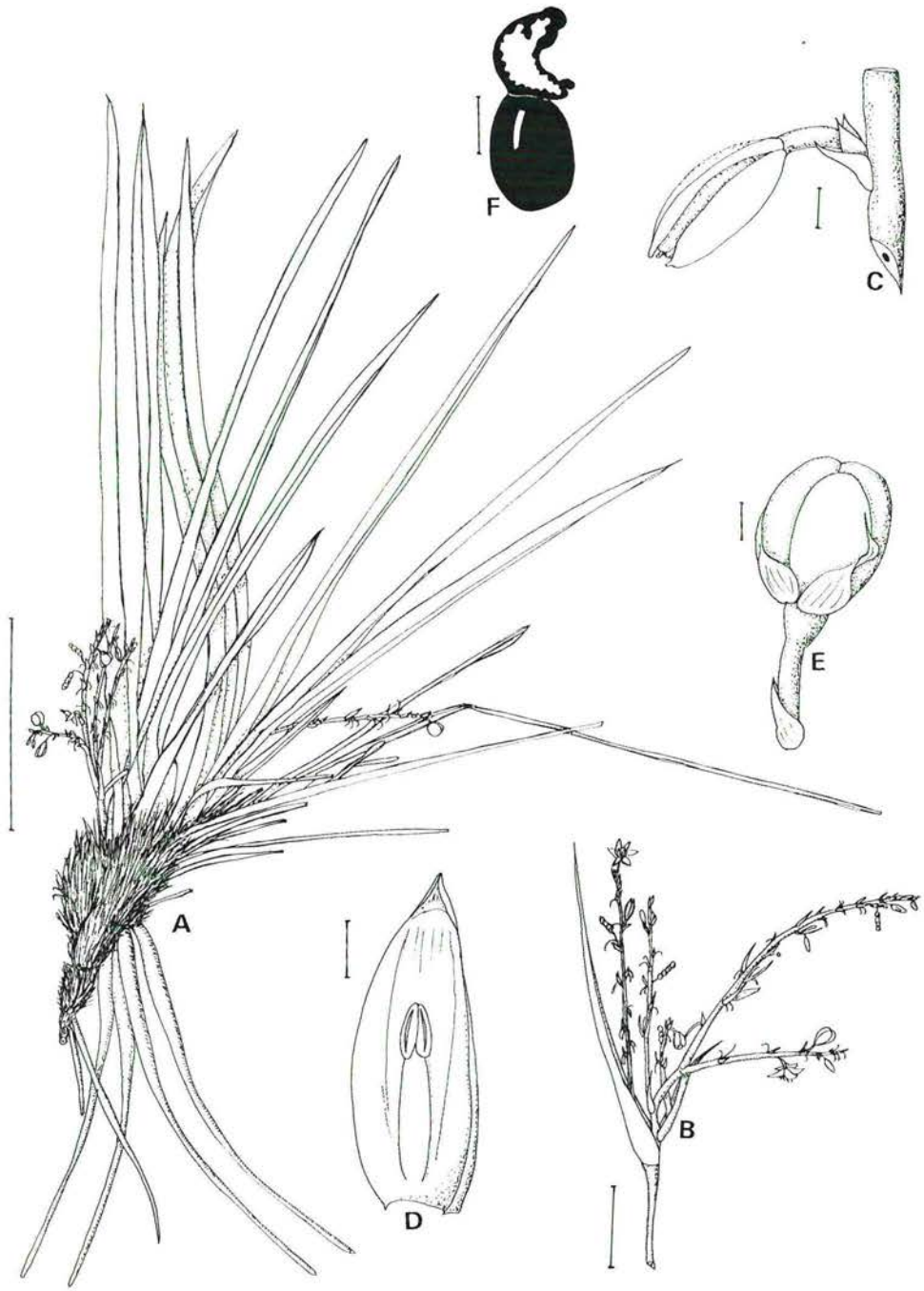

Figure 1. *Caesia viscida*. A - Habit. B - Inflorescence. C - Flower in bud showing bracteoles. D - Anther. E - Fruit. F - Seed. Drawn from *G.J. Keighery & J.J. Alford* 2010. Scale bars A = 10 cm; B = 1 cm; C, D, E, F = 1 mm.

Inflorescence short, 60-100 mm long, spreading, axis white, 10-15 mm enclosed in leaf sheaths, then green, branches 3-6, to 60 mm long. *Lowest bract* (below branches) leaflike, 60-80 mm long, viscid. *Basal bracts on inflorescence branches* linear-subulate, to 15 mm long, scarious, brown. *Upper bracts on inflorescence branches* in clusters of 1-3, subtending flowers, linear-ovate, 2-3 mm long, scarious; apex long pungent. *Bracteoles* scarious, linear ovate, 1.5-2.0 mm long, 1-2 per flower. *Peduncles* 2-4 mm long, decurved, slender. *Outer 3 perianth segments* narrowly elliptic, 4-6 mm long, brown-green outside, white inside; apex acute, thickened, brown. *Inner 3 perianth segments* narrowly elliptic, 4-6 mm long; apex obtuse, white. *Staminal filaments* flattened; outer whorl 2-2.5 mm long; inner whorl c. 1.5 mm long. *Anthers* yellow, dehiscing introrsely by slits. *Ovary* green, angular, c. 1 mm long. *Style* white, c. 1.5 mm long, obscurely lobed. *Capsule* 3-lobed, usually 1-2-celled by abortion, 4-5 mm long, green when mature. *Seed* c. 1.5 mm wide; testa very shiny, black; aril large, fleshy, white with a black margin.

Distribution. Currently known only from the type locality.

Habitat. Caesia viscida grows in *Banksia speciosa* shrubland on low dunes. The soils are deep aeolian sands, grey in the A horizon but white at depth.

Flowering period. Plants at the type locality were in full flower in late November.

Conservation status. The species is currently known only from the type locality which is within Cape Arid National Park. Similar vegetation also occurs in the adjacent Nuytsland Nature Reserve and nearby Cape Le Grande National Park. Searches of these areas may reveal further populations.

Discussion

The viscid leaves and abbreviated inflorescence (which presents the flowers almost at ground level) clearly separates this species from all other *Caesia* species. The dauciform, tuberous roots are also unique in Western Australian *Caesia* species. *Caesia viscida* shares the dense fibrous covering of the rhizome with *Caesia rigidifolia* F. Muell., and is probably most closely related to this species.

Reference

Henderson, R.J.F. (1987). *Caesia* R. Br. *In* George, A.S. (ed.) "Flora of Australia", vol. 45, pp. 281-288. (Australian Government Publishing Service: Canberra.)

Patersonia spirafolia (Iridaceae), a new species from south-western Australia

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Abstract

Keighery, G.J. *Patersonia spirafolia*, (Iridaceae) a new species from south-western Australia. Nuytsia 7(2): 137-139 (1990). *Patersonia spirafolia* G.J. Keighery is described and illustrated.

Introduction

Patersonia was studied for the "Flora of Australia" by Cooke (1986). However, at that time an apparently undescribed species, represented at PERTH by a single collection bearing old capsules, was not commented upon by Cooke. Since then I have been able to collect flowering material and ascertain that these populations indeed represent a distinct, undescribed species which is described below.

Patersonia spirafolia G.J. Keighery, sp. nov. (Figure 1)

Herba perennis caespes ad 40 cm latitudo formans. Folia torsiva, 5-20 cm longa, margine brunnea, pilis adpressis. Scapus glaber, 15-25 cm. longus. Spathae lanceolatae, 24-26 mm vel 21-22 mm longa, brunnea, glabra.

Typus: Unnamed hill, 30° 24' S, 115° 21' E, NW corner of Badgingarra National Park, Western Australia, 15 October 1988, *G.J. Keighery* 10409 (holo: PERTH; iso: CANB, K, MEL, NSW).

Rootstock a spreading woody rhizome, forming a tussock to 40 cm across, producing 2-15 slender, erect, leafy, woody stems to 30 cm, covered by leaf bases. *Leaves* linear, spirally twisted, 50-200 x 3-5 mm, biconvex with minute grooves; margins brown, with silky, appressed hairs pointing to the middle; base brown, scarious, glabrous. *Scape* 150-250 x 1-2 mm, glabrous, reddish-green. *Spathe* lanceolate (longest 24-26 mm, shortest 21-22 mm), brown, glabrous; margins scarious, almost transparent. *Involucre* slightly gaping; inner bracts exposed, 7-9 mm wide. *Flowers* sessile, fugacious, each with a scarious bracteole, diurnal; floral tube filiform,

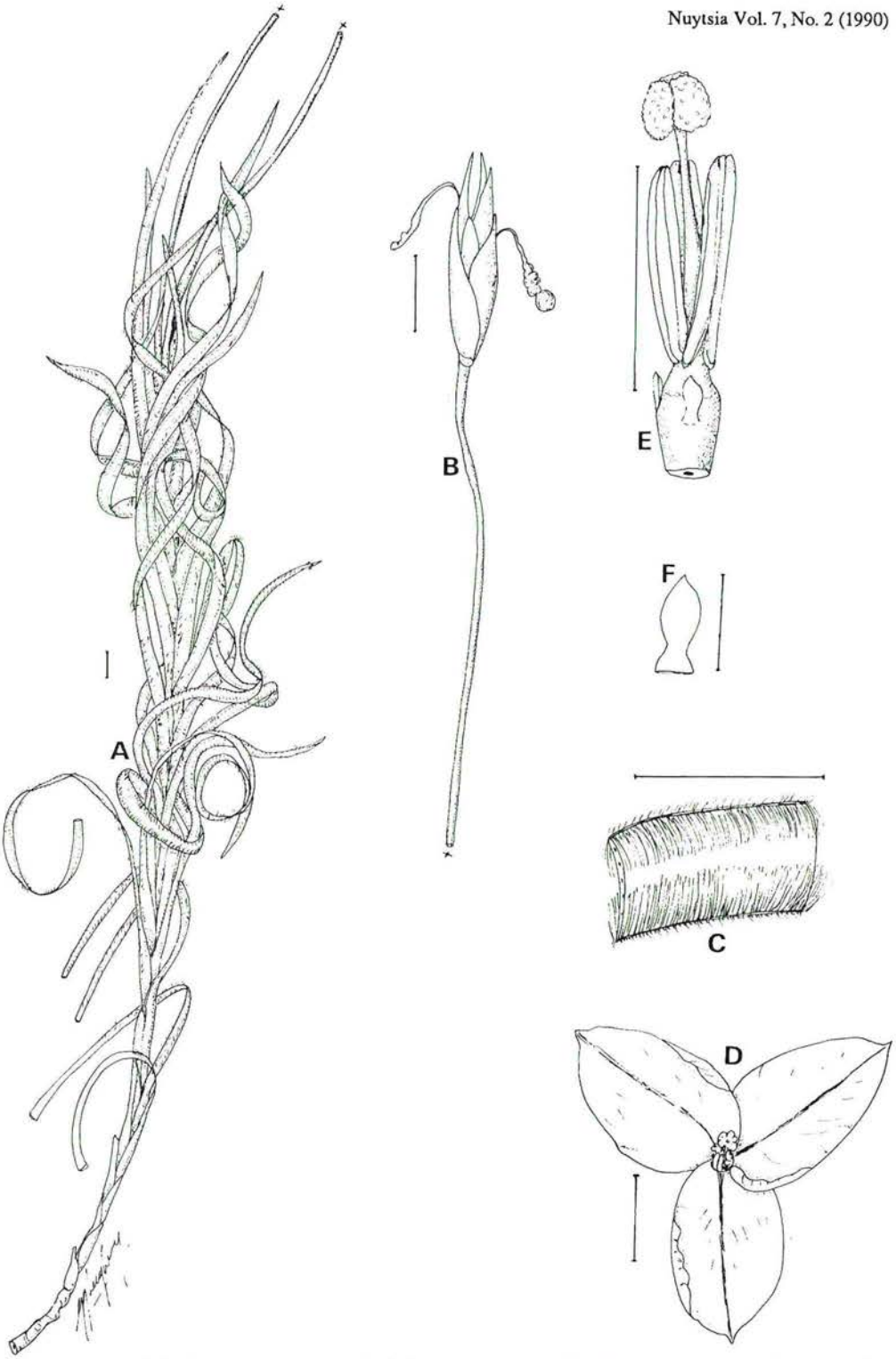

Figure 1. *Patersonia spirafolia*. A - Flowering branch. B - Inflorescence. C - Leaf detail. D - Flower. E - Anthers and style. F - Petal, A-E based on type. Scale bar A,B,D = 10 mm. Scale bar C,E,F = 1 mm.

11-16 mm long, sparsely hairy at ovary summit, included in the bracts. *Sepals* free, rhomboid, spreading, 16-19 mm x 8-14 mm, blue-violet. *Petals*, erect, blue-violet, c. 1 mm long; apex acute. *Stamens* inserted at apex of floral tube; filaments 2-4 mm long, white, connate. *Anthers* connective triangular, basifixed, yellow; 7-8 mm long, dehiscing by slits. *Style* filiform, narrowed towards base, c. 10 mm long; stigmatic lobes 3, equal, flattened, free, papillose on upper surface. *Ovary* pubescent. *Capsule* ovoid-oblong, 1.5-3 cm long. *Seed* not seen.

Other specimens examined. WESTERN AUSTRALIA: W of Yerramullah Road on Cadda Road, 30° 24' S, 115° 20' E, *G.J. Keighery* 10450 (PERTH); 6 km E of Munbinea Road on Cadda Road, 30° 24' S, 115° 18' E, *G.J. Keighery* 10452 (PERTH); 5.5 km E of Munbinea Road on Bibby Road, 30° 28' S, 115° 18' E, *G.J. Keighery* 10457 (PERTH); Badgingarra National Park, April 1984, *G.J. Keighery* s.n. (PERTH).

Notes. Occurs on low hills in and around Badgingarra National Park, along the Gardner Range.

Habitat. Grows in low, species-rich heath in sand over laterite.

Flowering period. October to November.

Discussion. Patersonia spirafolia belongs with those Western Australian species of *Patersonia* which form tussocks, comprising *P. inaequalis* and *P. drummondii*. It differs from *P. inaequalis* in having purple flowers and brown spathes; it differs from *P. drummondii* in the short appressed hairs on the leaf margins and the shorter spathes, which are brown when flowering occurs.

Etymology. The specific epithet refers to the spirally twisted leaves.

Conservation status. The species has a restricted range, but is relatively common within Badgingarra National Park.

Acknowledgements

The *Banksia* Woodlands Survey Group of the Western Australian Wildflower Society rediscovered this species and stimulated the author to describe it. Bronwen Keighery assisted in relocating the type locality.

Reference

Cooke, D.A. (1986). Iridaceae. *In* George, A.S. (ed.) "Flora of Australia", vol. 46, pp. 1-66. (Australian Government Publishing Service: Canberra.)

New species of *Olearia* (Asteraceae: Astereae) endemic to Western Australia

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Abstract

Lander, N.S. New species of *Olearia* (Asteraceae: Astereae) endemic to Western Australia. Nuytsia 7(2): 141-159 (1990). Seven new species of *Olearia* are described, namely *O. eremaea* Lander, *O. fluvialis* Lander, *O. incondita* Lander, *O. laciniifolia* Lander, *O. mucronata* Lander, *O. occidentissima* Lander and *O. plucheacea* Lander. All are endemic to Western Australia. Five of them may be rare and/or endangered.

Introduction

Work in progress towards an account of *Olearia* Moench for the "Flora of Australia" has revealed many new taxa. It will be some years before this project is completed. This paper provides descriptions of seven distinctive new species in order to make their names available for use in the interim. All of these taxa are endemic to Western Australia, and five of them are considered rare and/or endangered.

It is worthy of note that *O. fluvialis* and *O. mucronata* bring the number of endemic plant species recorded in the Fortescue District from 65 (Sandell et al. 1988) to 67 and the number of these restricted to the Hamersley Range National Park to 12.

Olearia eremaea Lander, sp. nov. (Figure 1)

Species nova ad *Oleariam* sectionem *Merismotrichum* pertinens; foliis sessilibus, planis, ellipticis vel obovatis, membranaceis facile distinguitur.

Typus: Beegull [Rockhole], 93 miles [150 km] NE of Cosmo Newberry [Mission], Western Australia, 25 August 1961, *A.S. George* 2881 (holo: PERTH).

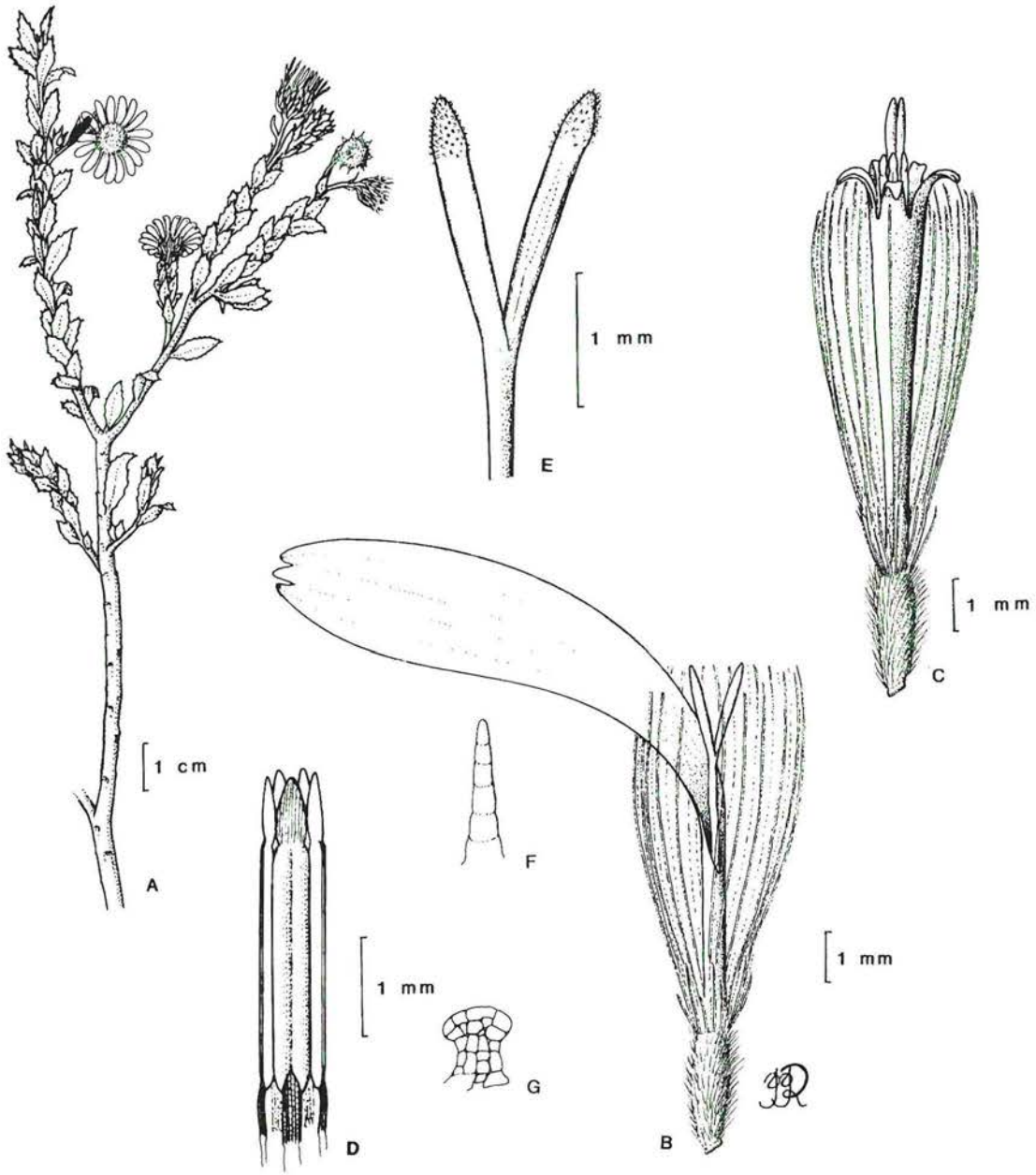

Figure 1. *Olearia eremaea*. A - Habit. B - Ray floret. C - Disc floret. D - Anthers. E - Stylar arms. F - Multicellular, uniseriate simple eglandular hair (from leaf). G - Multicellular, multiseriate capitate glandular hair (from involucral bract). Drawn from *A.S. George* 2881 (holo: PERTH).

Shrub to 1.5 m high. *Vestiture* of vegetative surfaces with minute, sessile glandular hairs and multicellular, uniseriate, simple eglandular hairs. *Stems* erect, reddish when young, becoming brown, viscid, densely glandular and with scattered eglandular hairs. *Leaves* alternate, scattered, ascending, sessile; lamina flat, elliptic or somewhat obovate, 6-16 x 2-5 mm, concolorous, pale green, viscid; venation indistinct apart from midvein; vestiture uniformly densely glandular and with scattered eglandular hairs; texture membranous; base narrowly cuneate; margin serrate, flat; apex acute, muticous. *Heads* terminal, solitary, pedunculate, conspicuously radiate, 15-40 mm diameter; disc 6-15 mm diameter. *Peduncle* to 18 mm long, densely glandular and with scattered eglandular hairs, with several leaflike bracts grading into those of the involucre. *Involucre* hemispheric; bracts 4-6-seriate, 3.4-8.0 x 0.6-1.0 mm. *Outer involucral bracts* linear, somewhat cymbiform; stereome green, viscid, densely glandular and with scattered eglandular hairs abaxially; margin membranous, entire; apex narrowly acute. *Inner involucral bracts* linear, flat; stereome pale green, smooth, glabrous; margin membranous, fimbriate; apex acuminate, sometimes purplish, fimbriate. *Receptacle* flat. *Ray florets* 13-22, biseriate, female, 10.3-18.5 mm long; tube glabrous; limb linear or narrowly ovate, 8.2-15.3 x 2.0-2.4 mm, white, glabrous, acute and minutely 2-3-lobed apically; staminodes absent; stylar arms filiform, 1.3-3.0 mm long. *Disc florets* 41-46, bisexual, yellow, buccinate, 7.6-8.8 mm long, glabrous; lobes 5, 0.7-1.4 mm long, acute; anthers 2.8-3.3 mm long, basally acute and shorter than the filament collar, with narrowly ovate, sterile terminal appendage; filament collar 0.5-0.7 mm long; stylar arms oblong, 1.8-2.4 mm long, with halfconic sterile appendages bearing botuliform collecting hairs above the stigmatic lines. *Achene* narrowly obovoid, somewhat flattened, 3.5-4.6 x 1.2-1.6 mm, pale brown, sericeous with duplex hairs; venation indistinct; carpopodium central. *Pappus* biseriate, with 16-25 free, minutely barbellate bristles more or less equal in length to the tubular florets, and an outer row of several much shorter ones c. $\frac{1}{4}$ as long.

Flowering period. July to August.

Distribution. Endemic to the Eremaean Botanical Province of Western Australia, occurring at scattered localities in the Ashburton and Giles Districts between 25-29° S and 118-127° E (Figure 8).

Habitat. In shallow, stony soil on lateritic breakaways amongst open *Acacia* shrubland.

Conservation status. Although widely distributed, this species has been little collected, occurring only in small populations restricted to a specific habitat; it does not appear to be endangered or vulnerable. It thus appears to warrant the category 3R in the coding system of Leigh et al. (1981).

Other specimens examined. WESTERN AUSTRALIA: 103 miles [166 km] W of Warburton Mission, June 1973, *A. Blomberry* s.n. (NSW, PERTH); Scorpion Hill, 'Carnegie', *F.M. Bennett* 169 (PERTH); Robinson Range, N of Meekatharra, *J. Elkington* 329 (PERTH); 124 miles [200 km] SW of Warburton Mission, *A.S. George* 2974 (PERTH); Tugaila Rockhole [as "The Zoo"], Laverton-Warburton road, *A.S. George* 2984 (PERTH); Beegull [Rockhole], Warburton road, *A.S.George* 3763 (PERTH); 14 miles [22.5 km] E of Neale Junction, Great Victoria Desert, *A.S. George* 8420 (PERTH); 'Carnegie', *A. Salkin* 12 (PERTH).

Etymology. The specific epithet draws attention to the distribution of this taxon in the Eremaean Botanical Province of Western Australia.

Notes. The rigid, septate eglandular hairs and the glandular hairs found on the vegetative parts of plants of this species place it in *Olearia* section *Merismotriche* Archer ex Benth.

In the handbook of Grieve & Blackall (1975) specimens of this species will key variously to *O. calcarea* F. Muell. ex Benth. and *O. muelleri* (Sonder) Benth. (*O.* section *Adenotriche* Archer ex Benth.) *O. eremaea* can be distinguished from the latter two species by its leaves, which are membranous rather than incrassate and have serrate rather than entire, dentate or lobed margins; and by its discs, which comprise 41-46 rather than 21-30 (*O. calcarea)* or 12-18 (*O. muelleri)* florets.

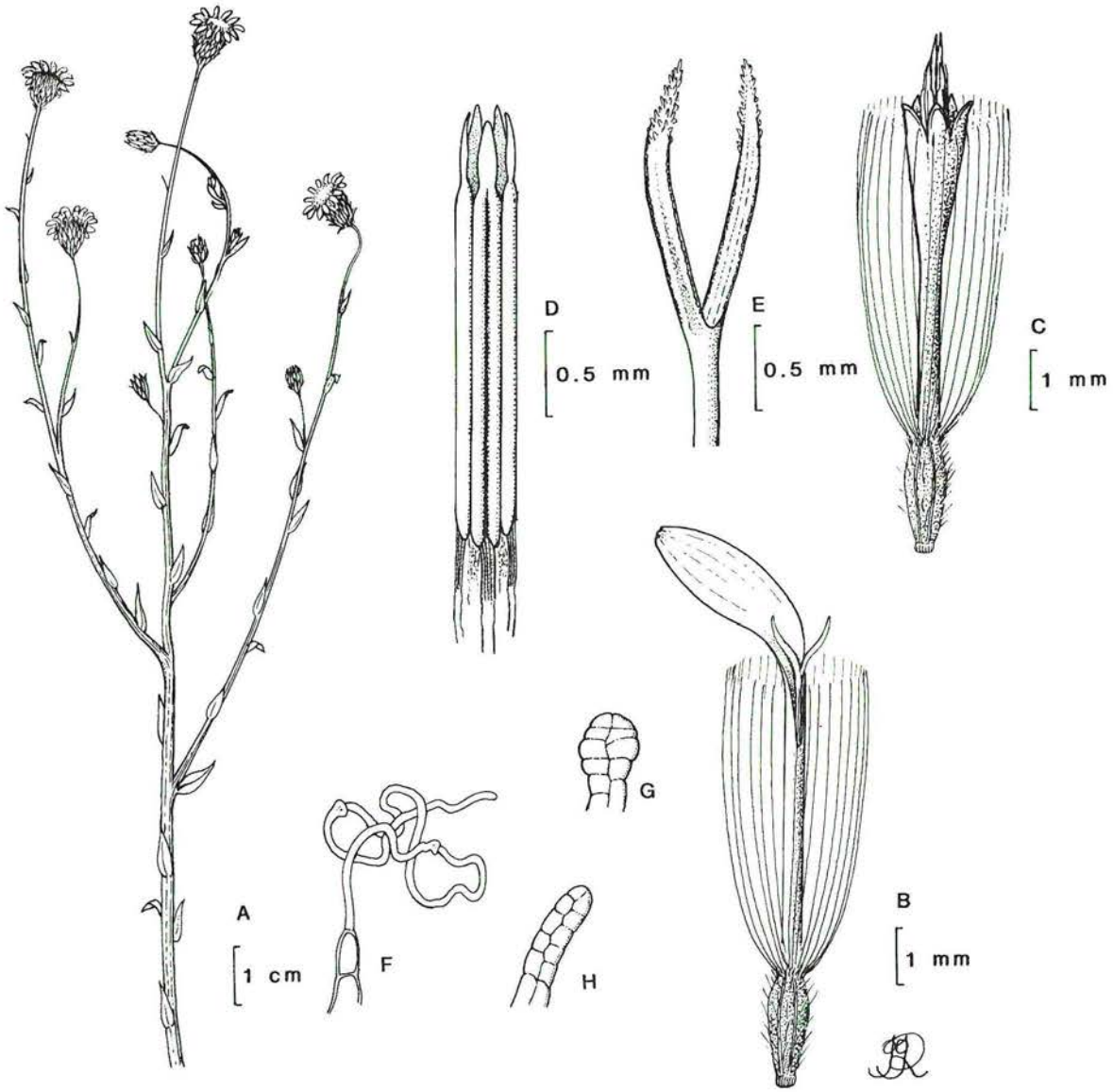

Figure 2. *Olearia fluvialis*. A - Habit. B - Ray floret. C - Disc floret. D - Anthers. E - Stylar arms. F - Long, intricate, articulate, multicelluar, uniseriate, simple eglandular hair (from leaf). G - Minute, multicellular, biseriate, capitate glandular hair (from leaf). H - Multicellular, biseriate, simple eglandular hair (from ray floret). Drawn from *W. Cussock* s.n. (holo: MEL 1547238).

Olearia fluvialis Lander, sp. nov. (Figure 2)

Species nova ad *Olearia* sectionem *Eriotrichum* pertinens; foliis disperis, sessilibus, planis, anguste ovatis, minute bullatis, integris, et capitulis heterochromis conspicue radiatisque facile distinguitur.

Typus: Fortescue River, Western Australia, anno 1895, *W. Cussock* s.n. (holo: MEL 1547238).

Shrub to 0.6 m high. *Vestiture* of vegetative surfaces with long, intricate, articulate, multicellular, uniseriate, simple eglandular hairs and minute multicellular, biseriate, capitate glandular hairs. *Stems* erect, smooth, subglabrous or arachnoid, pale green, striate. *Leaves* alternate, scattered, ascending, sessile; lamina flat, narrowly ovate, 2.0-9.0 x 1.0-2.0 mm, concolorous, green, minutely bullate; venation indistinctly reticulate with prominent midvein; vestiture uniformly subglabrous or weakly arachnoid; texture herbaceous; base rounded; margin entire, flat; apex narrowly acute. *Heads* terminal, solitary, pedunculate, consipicuously radiate, 8.8-12.5 mm diameter; disc 5-8 mm diameter. *Peduncle* to 76 mm long, subglabrous or arachnoid, with several leaflike bracts grading into those of the involucre. *Involucre* obconic; bracts 6-7-seriate, 1.7-9.2 x 0.9-1.3 mm. *Outer involucral bracts* somewhat cymbiform, narrowly triangular or linear; stereome pale green, smooth and subglabrous or weakly arachnoid abaxially; margin membranous, fimbriate; apex narrowly acute or acute. *Inner involucral bracts* somewhat cymbiform, linear; stereome pale green, smooth and glabrous or subglabrous with only eglandular hairs abaxially; margin membranous, fimbriate; apex narrowly acute. *Receptacle* flat. *Ray florets* 12-14, uniseriate, female, 6.8-9.7 mm long; tube subglabrous with multicellular, biseriate, simple eglandular hairs scattered apically; limb elliptic or ovate, 3.8-4.5 x 0.9-1.2 mm, white or mauve, glabrous, broadly acute or obtuse apically; staminodes absent; stylar arms filiform, 1.2-1.8 mm long. *Disc florets* c. 12, infundibular, 5.7-6.8 mm long, yellow, glabrous; lobes 5, 0.7-0.8 mm long, acute; anthers 2.3-2.6 mm long, basally minutely sagittate and shorter than the filament collar, with narrowly ovate, sterile terminal appendage; filament collar 0.4-0.5 mm long; stylar arms oblong, 1.5-1.7 mm long, with narrowly halfconic, sterile terminal appendage bearing botuliform collecting hairs above the stigmatic lines. *Achene* narrowly obovoid, 1.5-2.9 x 0.5-1.0 mm, brown, densely sericeous with duplex hairs, distinctly 6-7 ribbed; carpopodium conspicuous, central. *Pappus* uniseriate, with 31-40 minutely barbellate bristles subequal to the tubular florets.

Flowering period. April.

Distribution. Known from only a single locality in the Hamersley Range National Park between 22-23° S and 118-119° E in the Fortescue District, Eremaean Botanical Province, Western Australia (Figure 8).

Habitat. On iron rich alluvium.

Conservation status. Since it is restricted to a single known population, this species appears to warrant the category 2V in the coding system of Leigh et al. (1981).

Other specimen examined. Wittenoom area [precise locality withheld], *J.V. Blockley* 148 (KPBG, PERTH).

Etymology. The specific epithet draws attention to the riverine habitat favoured by this species.

Notes. The intricate, arachnoid eglandular hairs and the glandular hairs found on the vegetative parts of plants of this species place it in *Olearia* section *Eriotriche* Archer ex Benth.

In the handbook of Grieve & Blackall (1975) specimens of this species will key (with some difficulty) to *O. propinqua* S. Moore (= *O. pimeleoides* (DC.) Benth. sens. strict.). *O. fluvialis* can be distinguished from the latter by its heads, which are conspicuously pedunculate rather than

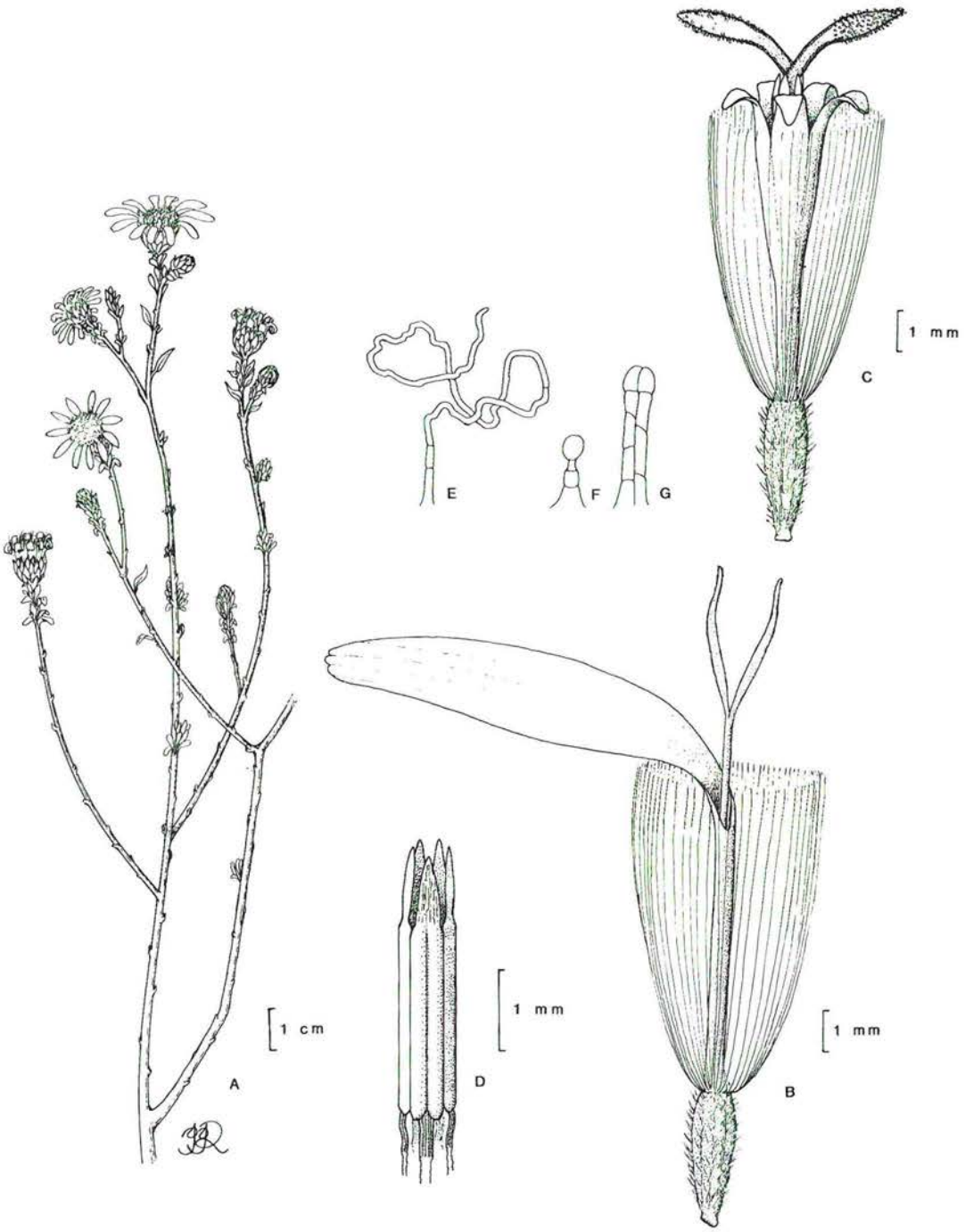

Figure 3. *Olearia incondita*. A - Habit. B - Ray floret. C - Disc floret. D - Anthers. E - Long, multicellular, uniseriate, simple eglandular hair (from leaf). F - Short, uniseriate, capitate glandular hair (from leaf). G - Multicellular, biserate, simple eglandular hair (from disc floret). Drawn from *A.M. Ashby* 2855 (holo: PERTH).

subsessile; by its involucral bracts, which are 6-7 rather than 3-5-seriate; and by its pappus, which comprises 31-40 rather than 39-65 bristles.

Olearia incondita Lander, sp. nov. (Figure 3)

Species nova ad *Oleariam* sectionem *Merismotrichum* pertinens; foliis diminutis, dispersis, anguste ellipticis, dense pustulatis, incrassatis, integris, revolutis facile distinguitur.

Typus: Near Morawa, Western Australia, 15 June 1969, *A.M. Ashby* 2855 (holo: PERTH; iso: AD).

Shrub to 1.3 m high. *Vestiture* of vegetative surfaces with long, multicellular, uniseriate, simple eglandular hairs and short, uniseriate, capitate glandular hairs. *Stems* erect and somewhat spreading, tomentose and brown or green when young, glabrous and dark green when older. *Leaves* alternate, scattered, ascending, sessile; lamina narrowly elliptic, 4-14 x 1-3 mm, concolorous, green, uniformly densely pustulate; venation obscure apart from midrib; vestiture weakly tomentose abaxially, glabrous adaxially; texture incrassate; base narrowly cuneate; margin entire, revolute; apex acute, inconspicuously mucronate. *Heads* terminal, solitary, subsessile with leaves grading into the involucral bracts, conspicuously radiate, 25-35 mm diameter; disc 10-20 mm diameter. *Involucre* hemispheric; bracts 4-seriate, 4.0-10.5 x 1.5-2.0 mm. *Outer involucral bracts* linear or narrowly elliptic, more or less flat; stereome uniformly white-tomentose abaxially; margin entire; apex acute. *Inner involucral bracts* linear, somewhat cymbiform; stereome green, smooth and with an apical tomentose patch abaxially; margin membranous, fimbriate; apex acuminate, purplish. *Receptacle* convex. *Ray florets* 7-10, uniseriate, female, 9.8-12.5 mm long; tube glabrous; limb linear or ovate, 2.0-2.5 x 7.8-10.0 mm, white or pink, glabrous, acute and minutely 3-lobed apically; staminodes absent; stylar arms filiform, 2.7-3.6 mm long. *Disc florets* 10-24, bisexual, buccinate, 8.0-9.5 mm long, yellow, subglabrous with multicellular, biseriate, simple eglandular hairs and glandular hairs adaxially; lobes 5, 0.8-1.6 mm long, acute; anthers 2.5-3.0 mm long, basally acute and shorter than the filament collar, with narrowly triangular, sterile terminal appendage; filament collar 0.5-0.6 mm long; stylar arms oblong, with narrowly half-ovoid, sterile terminal appendages bearing botuliform collecting hairs above the stigmatic lines. *Achene* narrowly obovoid, somewhat flattened, 3.0-6.6 x 0.8-1.0 mm, pale brown, hirsute with duplex hairs and glandular hairs, conspicuously ribbed; carpopodium central or somewhat oblique. *Pappus* biseriate, with 74-102 minutely barbellate bristles more or less equal to the tubular florets, and several much shorter ones c. as long.

Flowering period. January to April.

Distribution. Endemic to the South-West Botanical Province of Western Australia occurring in the Avon and Roe Botanical Districts between 29-35° S and 116-120° E (Figure 8).

Habitat. Found on margins of playa lakes and around granite outcrops.

Conservation status. Although this species is widely distributed it has been little collected, occurring only in small populations restricted to specific habitats in areas likely to experience changes in land use which would threaten its survival. It thus appears to warrant the category 3V in the coding system of Leigh et al. (1981).

Other specimens examined. WESTERN AUSTRALIA: Princess R[oyal] Harbour, May 1868, s.leg. (MEL); King George Sound, anno 1892, *M. Cronin* (MEL); 39 km N of Lake King, *H. Demarz* 8709 (KPBG, PERTH); Swan River, anno 1899, *J. Lewele* s.n. (MEL); King George Sound, s.dat., *G. Maxwell* s.n. (MEL); Golden Valley, anno 1888, *E. Merral* s.n. (MEL); Broomehill, April 1904, *A. Morrison* s.n. (K); Bromehill, Nov. 1904, *A. Morrison* s.n. (PERTH); N of Avon location 24133, 30° 55' S, 117° 22' E, *B.H. Smith* 577 (CBG, MEL, PERTH); 9 km W of Dukin, 30° 57' S, 117° 52' E, *P.G. Wilson* 11875 (PERTH); 15 km W of Dukin, 30° 57' S, 117° 20' E, *P.G. Wilson* 11878 (PERTH).

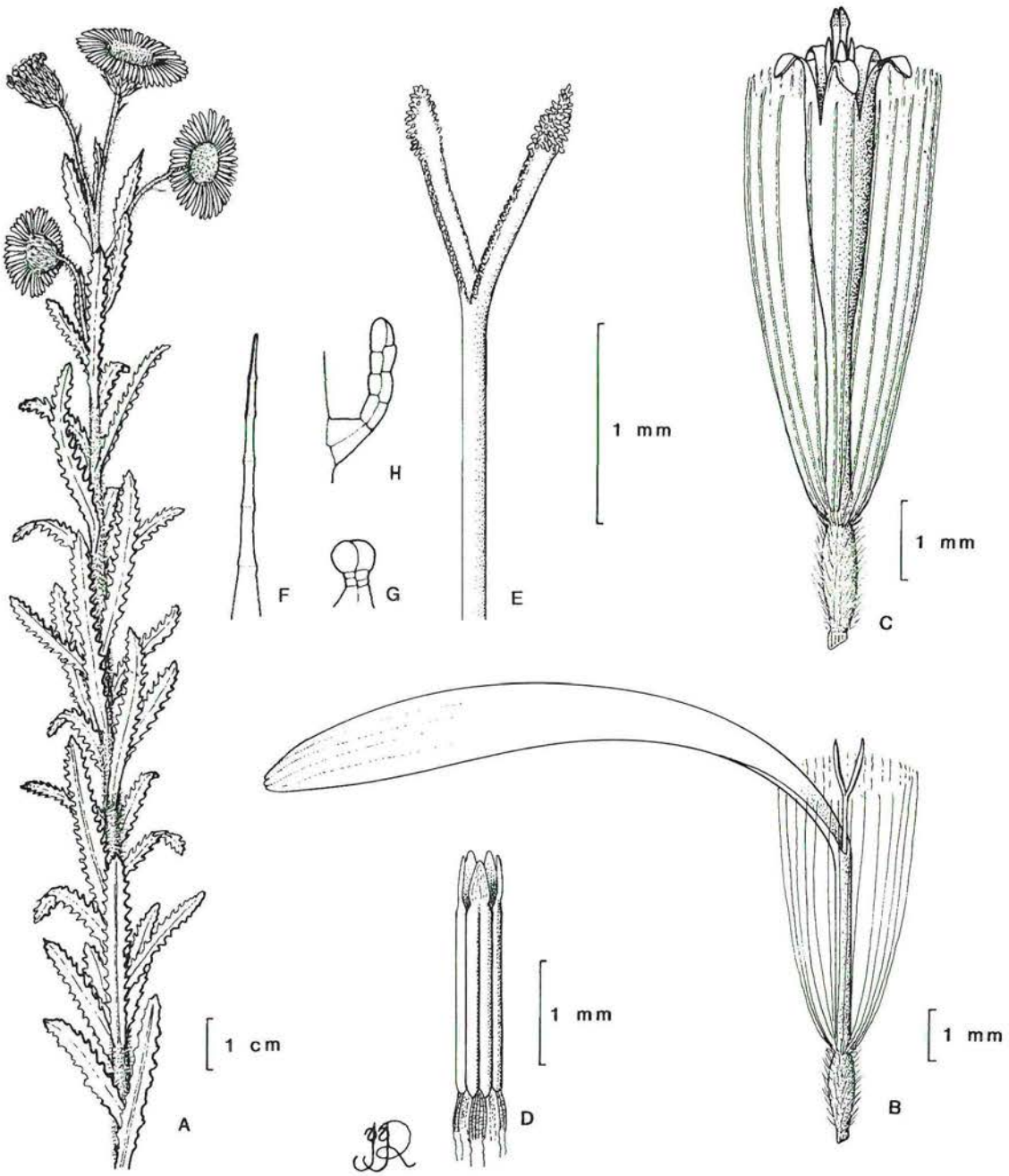

Figure 4. *Olearia laciniifolia*. A - Habit. B - Ray floret. C - Disc floret. D - Anthers. E - Stylar arms. F - Multicellular, uniseriate, simple eglandular hair (from stem). G - Multicellular, biseriate, capitate glandular hair (from leaf). H - Multicellular, biseriate, simple eglandular hair (from ray floret). Drawn from *A.R. Fairall* 1623 (holo: PERTH).

Etymology. The specific epithet refers to the rather unkempt appearance of plants of this taxon.

Notes. The densely intricate, woolly eglandular hairs and the glandular hairs found on the vegetative parts of plants of this species place it in *Olearia* section *Eriotriche* Archer ex Benth.

In the handbook of Grieve & Blackall (1975) specimens of this species will key to *O. pimeleoides* (DC.) Benth. *O. incondita* can be distinguished from the latter by its outer involucral bracts, which are cymbiform rather than flat; by its disc florets, the vestiture of which includes glandular as well as eglandular hairs; and by its pappus, which comprises 74-102 rather than 39-65 long bristles.

Olearia laciniifolia Lander, sp. nov. (Figure 4)

Species nova ad *Oleariam* sectionem *Merismotrichum* pertinens; foliis oblongis, scleris, laciniatis, leviter revolutis facile distinguitur.

Typus: Newdegate-Lake Grace road, Western Australia, 22 September 1964, *A.R. Fairall* 1623 (holo: PERTH; iso: KPBG).

Shrub to c. 1 m high. *Vestiture* of vegetative surfaces with long, multicellular, uniseriate, simple eglandular hairs and minute, multicellular, biseriate, capitate glandular hairs. *Stems* erect, pale yellow when young, becoming purplish, hirsute. *Leaves* alternate, scattered, ascending, sessile; lamina flat, oblong, 6-35 x 1-10 mm, concolorous, grey-green, reticulate; venation indistinct apart from the stout midvein; vestiture uniformly glandular; texture sclerous; base narrowly cuneate; margin laciniate, weakly revolute; apex lobed. *Heads* terminal, solitary, pedunculate, conspicuously radiate, 26-35 mm in diameter; disc 12-20 mm diameter. *Peduncles* to 25 mm long, hirsute, with several leaflike bracts grading into those of the involucre. *Involucre* hemispheric; bracts 5-seriate, 2.2-7.5 x 0.6-1.2 mm. *Outer involucral bracts* narrowly triangular, cymbiform; stereome conspicuously vesicular along midrib and glandular abaxially; margin, narrowly membranous, weakly fimbriate; apex acute. *Inner involucral bracts* linear, flat; stereome conspicuously vesicular along midrib and subglabrous with glandular hairs abaxially; margin entire; apex acuminate, purplish, fimbriate. *Receptacle* somewhat convex. *Ray florets*, 35-43, 3-seriate, female, 10.5-18.0 mm long; tube with simple multicelluar, biseriate eglandular hairs scattered abaxially limb narrowly ovate, 8-14 x 1-2 mm, lilac, glabrous, emarginate apically; staminodes absent; stylar arms filiform or very narrowly half-ellipsoid, 1.4-1.6 mm long. *Disc florets* 53-90, bisexual, white below, yellow above, buccinate, 4.8-6.0 mm long, subglabrous, with multicellular, biseriate, simple eglandular hairs scattered abaxially; lobes 5, 0.1-0.8 mm long, acute; anthers 2.2-2.3 mm long, basally acute and shorter than the filament collar, with narrowly elliptic, sterile terminal appendage; filament collar 0.3-0.5 mm long; stylar arms oblong, with half-conic, sterile terminal appendage bearing long, clavate collecting hairs above the stigmatic lines. *Achene* ellipsoid, flattened, 1.2-2.0 x 0.4-0.5 mm, pale brown, sericeous with duplex hairs; venation indistinct; carpopodium oblique. *Pappus* uniseriate, with c. 20 free, minutely barbellate bristles more or less equal in length to the tubular florets.

Flowering period. June to November.

Distribution. Endemic to the Roe District, South-West Botanical Province, Western Australia, occurring between 33-34° S and 118-124° S (Figure 8).

Habitat. Occurs on white sand amongst mallee and *Melaleuca* shrubland around playa lakes.

Conservation status. Although this species is widely distributed it has been little collected, occurring only in small populations restricted to specific habitats in an area likely to experience changes in land use which would threaten its survival. It thus appears to warrant the category 3V in the coding system of Leigh et al. (1981).

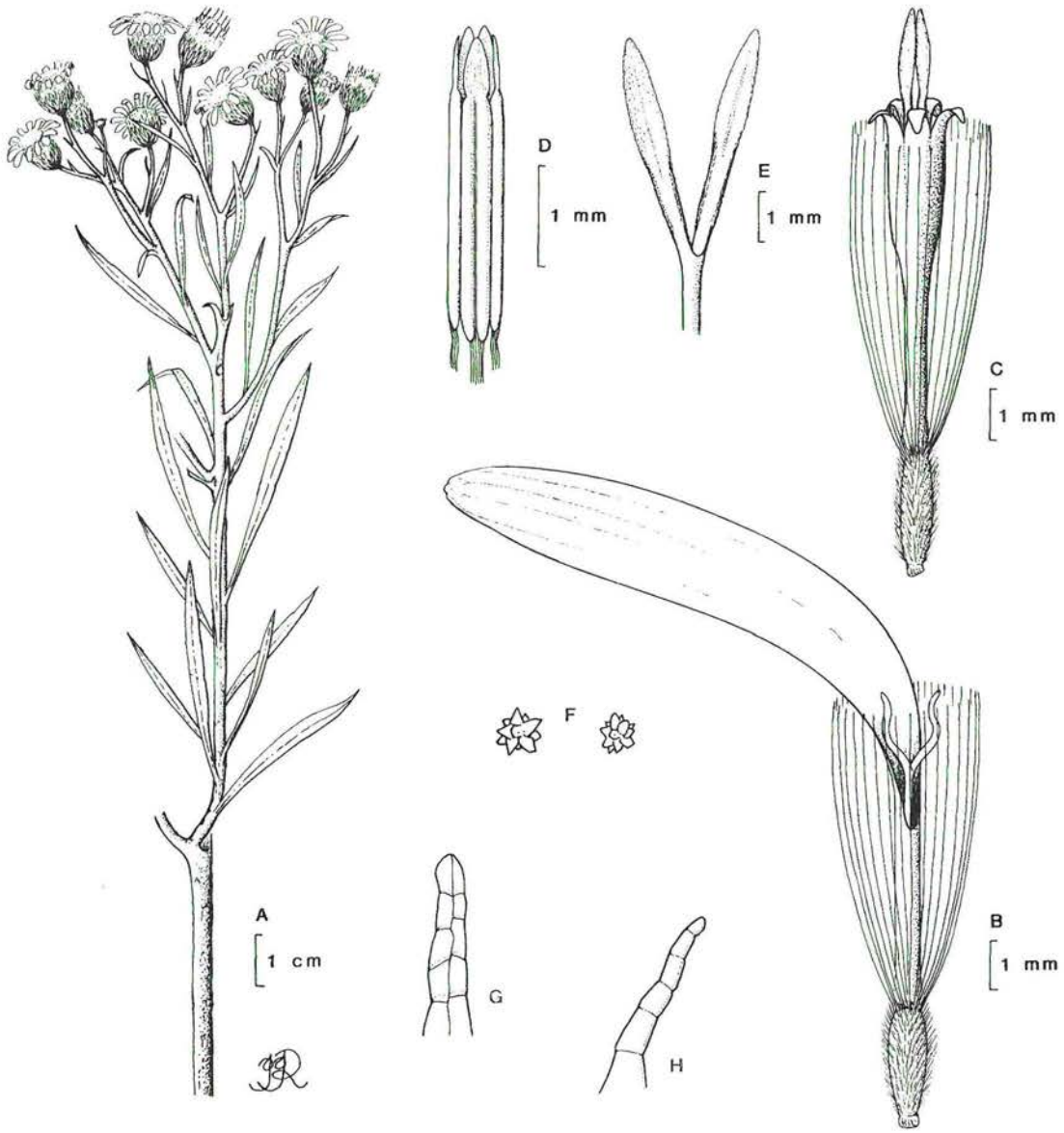

Figure 5. *Olearia mucronata*. A - Habit. B - Ray floret. D - Disc floret. D - Anthers. E - Stylar arms. F - Druses (from florets). G - Multicellular, biseriate, simple eglandular hair (from ray floret). H - Multicellular, uniseriate, simple eglandular hair (from leaf). Drawn from *McGuire* 18 (holo: PERTH).

Other specimens examined. WESTERN AUSTRALIA: W of Kukerin, *A.M. Ashby* 5235 (AD, CHR, K, MEL, NSW, NT, PERTH); 5.5 km NE of Clyde Hill, 33° 17' 35" S, 123° 00' 54" E, *M.A. Burgman* 1792 (PERTH); Lake King, 72 miles [116 km] E of Lake Grace, Nov. 1980, *N. Steedman* s.n. (BM, PERTH); Lake King road, *E. Wittwer* 173 (KPBG, PERTH); Dowels-Lake King road, 32° 40' S, 120° 30' E, *E. Wittwer 1435* (KPBG).

Etymology. The specific epithet draws attention to the narrowly lobed leaves characteristic of this taxon.

Notes. The patent, septate eglandular hairs and the glandular hairs found on the vegetative parts of this plant place it in *Olearia* section *Merismotriche* Archer ex Benth.

In the handbook of Grieve & Blackall (1975) specimens of this species will key (with difficulty) to *O. rudis* (Benth.) F. Muell. ex Benth. *O. laciniifolia* can be distinguished from the latter by the vestiture of its vegetative surfaces, which comprises glandular as well as eglandular hairs; by its conflorescences, which are solitary-headed rather than compound corymbose; by its ray, which comprises 35-43 rather than 39-75 florets; by its disc, which comprises 53-90 rather than 86-241 florets; and by its pappus, which comprises c. 20 long bristles only rather than 31-42 long bristles with 10-14 much shorter ones.

Olearia mucronata Lander, sp. nov. (Figure 5)

Species nova ad *Oleariam* sectionem *Adenotrichum* pertinens; foliis sessilibus, planis, linearibus vel anguste obovatis, scleris, integris, mucronatis et crystallis ("druses") characteristicis in floribus radii discique facile distinguitur.

Typus: Wittenoom area [precise locality withheld], Western Australia, January 1972, *McGuire* 18 (holo: PERTH).

Shrub to 1 m high, strongly and unpleasantly aromatic. *Vestiture* of vegetative surfaces with multicellular, uniseriate, simple eglandular hairs and multicellular, biseriate, capitate glandular hairs. *Stems* erect, pale green when young, becoming reddish, subglabrous with eglandular hairs. *Leaves* alternate, crowded, ascending, sessile; lamina flat, linear, sometimes obovate, 13-46 x 1-5 mm, concolorous, dark green, reticulate; venation with distinct midvein only; vestiture uniformly subglabrous with eglandular hairs; texture sclerous; base attenuate; margin entire or with a few teeth; apex acute, mucronate. *Heads* terminal, solitary, pedunculate, conspicuously radiate, 6.4-13.7 mm diameter; disc 1.0-1.7 mm diameter. *Peduncle* to 23 mm long, subglabrous with eglandular hairs, with several leaflike bracts grading into those of the involucre. *Involucre* campanulate; bracts 5-seriate, 3.5-5.5 x 0.7-1.0 mm. *Outer involucral bracts* somewhat cymbiform, narrowly triangular; stereome yellowish, vesicular along midrib and weakly glandular abaxially; margin narrowly membranous, minutely fimbriate; apex acuminate. *Inner involucral bracts* narrowly ovate, flat; stereome pale yellowish, vesicular along midrib and glabrous abaxially; margin broadly membranous, fimbriate; apex acute. *Receptacle weakly* convex. *Ray florets* 9-12, uniseriate, female, 14.7-15.5 mm long; limb narrowly elliptic, 5.4-14.0 x 1.4-2.5 mm, white, glabrous or subglabrous with multicellular, biseriate, simple eglandular hairs abaxially, obtuse and entire or minutely 3-lobed apically; staminodes sometimes present; stylar arms filiform, 1.8-2.4 mm long. *Disc florets* 39-45, bisexual, buccinate, 6.8-7.0 mm long, yellow, glabrous; lobes 0.9-1.3 mm long, narrowly acute; anthers basally acute and shorter than the filament collar, with ovate, sterile terminal appendage, obtuse apically; filament collar c. 0.7 mm long; stylar arms filiform, with narrowly half-ovoid, sterile terminal appendages 2.8-3.0 mm long bearing minute collecting hairs above the stigmatic lines. *Achene* narrowly obovoid, somewhat flattened, 3.0-3.4 x 0.8-1.0 mm, sericeous with duplex hairs; venation indistinct; carpopodium central. *Pappus* uniseriate, with 19-27 free, minutely barbellate bristles more or less equal in length to the tubular florets.

Flowering period. August to January.

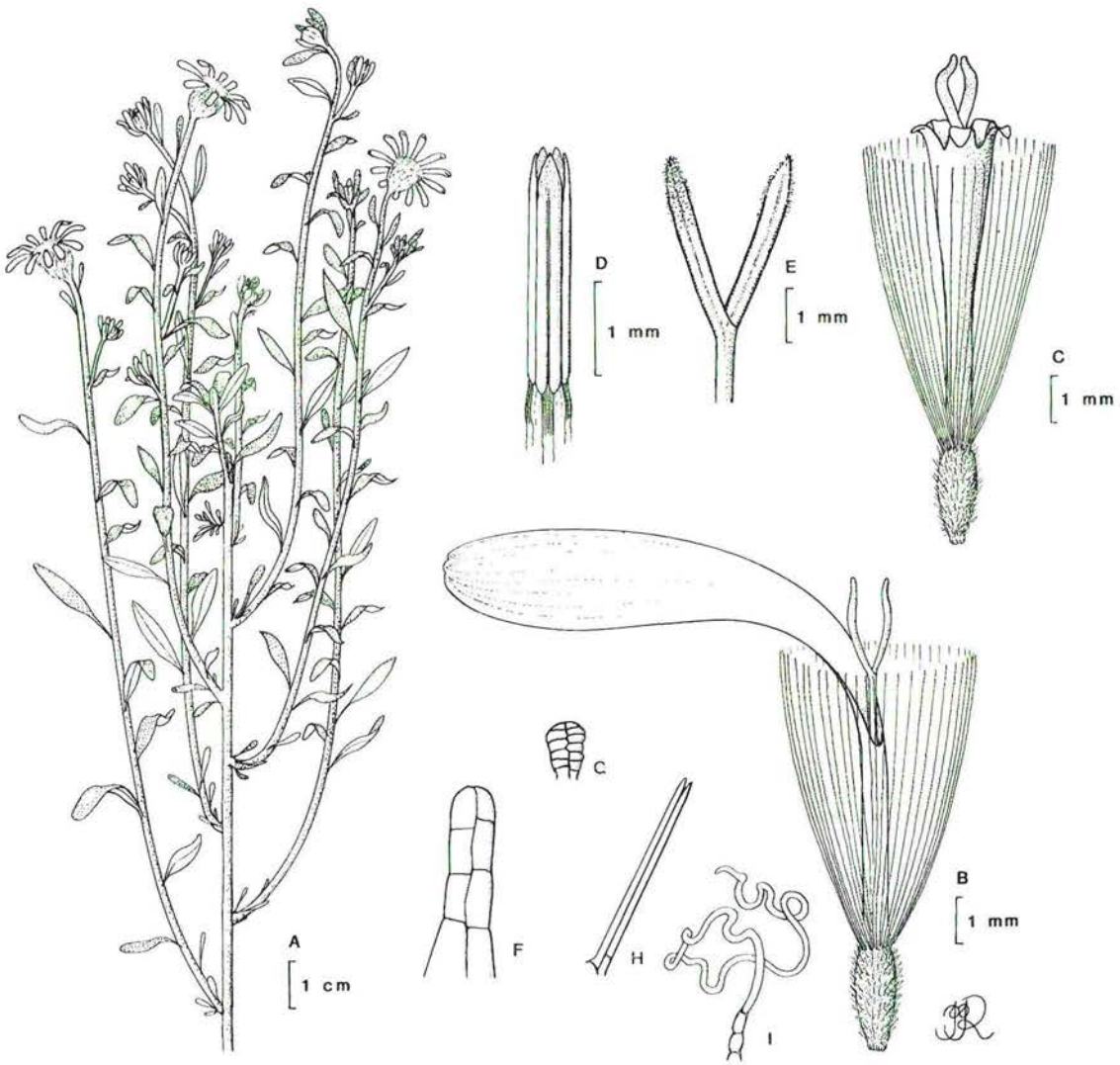

Figure 6. *Olearia occidentissima*. A - Habit. B - Ray floret. C - Disc floret. D - Anthers. E - Stylar arms. F - Multicellular biseriate, simple eglandular hair (from disc floret). G - Multicellular, biseriate, capitate glandular hair (from leaf). H - Duplex hair (from ray floret). I - Multicellular, uniseriate, simple eglandular hair (from leaf). Drawn from *A.S. George* 11568 (holo: PERTH).

Distribution. Known from only two localities between 21-23° S and 117-119° E in the Fortescue District, Eremaean Botanical Province, Western Australia (Figure 8).

Habitat. Schistose hills.

Conservation status. Since it is restricted to two populations a mere 60 km apart, this species appears to warrant the category 2V in the coding system of Leigh et al. (1981).

Other specimens examined. [locality withheld], *W.E. Blackall* 435 (PERTH); [locality withheld], *C.A. Gardner* 2477 (BM, K, PERTH).

Etymology. The specific epithet draws attention to the mucronate leaves characteristic of this taxon.

Notes. The glabrous vegetative parts of plants of this species (apart from the scattered eglandular hairs on the leaves and a few glandular hairs on the stereome of the involucral bracts) place it in *Olearia* section *Adenotriche* Archer ex Benth.

In the key of Grieve & Blackall (1975) specimens of this species key (with difficulty) to *O. stuartii* (F. Muell.) F. Muell. ex Benth. (*Olearia* section *Merismotriche). O. mucronata* can be distinguished from *O. stuartii* sens. lat. (see Lander 1989) by its outer involucral bracts, the midribs of which are vesicular; by the ray, which comprises 9-12 rather than 21-64 florets; and by the ray florets, which are 14.7-15.5 mm long rather than 7-11.5 mm long.

The ray florets of this species are remarkable for the scattered crystalline deposits in the cells of the tube and limb (Figure 5F). To date I have observed such druses elsewhere in *Olearia* in the tubular florets of *O. ferresii* (F. Muell.) F. Muell. ex Benth. which is placed in section *Merismotriche*, and of *O. pimeleoides* var. *incana* D.A. Cooke, which is placed in section *Eriotriche* Archer ex Benth.

Olearia occidentissima Lander, sp. nov. (Figure 6)

Species nova ad *Oleariam* sectionem *Eriotrichum* pertinens; habitu effuso, foliis petiolatis, planis, lanatis, flaccidis, integris, revolutis et floribus radii discique pilis duplicibus distinguitur.

Typus: Dirk Hartog Island [precise locality withheld], Western Australia, 5 September 1972, *A.S. George* 11568 (holo: PERTH; iso: K, NSW).

Shrub to 0.2 m high. *Vestiture* of vegetative surfaces with densely intricate, long, multicellular uniseriate, simple eglandular hairs, patent, shorter, multicelluar, uniseriate, simple eglandular hairs and multicellular, biseriate, capitate glandular hairs. *Stems* prostrate (wind-pruned) or erect, white and lanate when young, becoming grey and somewhat arachnoid with waxy bark. *Leaves* alternate, scattered, spreading, petiolate; lamina flat, narrowly elliptic, 6-24 x 3-6 mm, discolorous, white-lanate abaxially, and grey-green adaxially, smooth; venation indistinct apart from the midrib; vestiture lanate abaxially, somewhat arachnoid adaxially; texture flaccid; base narrowly cuneate; margin entire, revolute; apex acute, ± mucronate. *Heads* terminal, solitary, subsessile with leaves grading into the involucral bracts, conspicuously radiate, 25-30 mm diameter; disc 15-18 mm diameter. *Involucre* hemispheric; bracts 4-seriate, 4.5-9.0 x 1.5-2.0 mm. *Outer involucral bracts* narrowly elliptic, flat; stereome white-lanate abaxially, apically weakly arachnoid adaxially; margin entire; apex acute. *Inner involucral bracts* linear or spathulate, somewhat cymbiform; stereome pale green, basally smooth and glabrous but apically densely glandular and with scattered long, eglandular hairs abaxially; margin broadly membranous, fimbriate; apex narrowly acute. *Receptacle* somewhat convex. *Ray florets* 10-12, uniseriate, female, 12-18 mm long; tube white, with duplex hairs scattered abaxially; limb obovate, 7.4-11.0 x 2.5-3.5 mm, white or pink, glabrous, obtuse and minutely 3-lobed apically; staminodes absent; stylar arms filiform, 2.2-2.4 mm long. *Disc florets* c. 25, bisexual, white (tinged violet), buccinate, 7.5-8.0 mm long, 5-lobed, with

multicellular, biseriate, simple eglandular hairs and duplex hairs scattered adaxially; lobes c. 1.0 mm long, acute; anthers 2.0-2.5 mm long, basally acuminate and shorter than the filament collar, with narrowly triangular, sterile, terminal appendage; filament collar 0.4-0.6 mm long; stylar arms oblong, 2.6-3.0 mm long, with narrowly half-conic, sterile terminal appendages bearing long, botuliform collecting hairs above the stigmatic lines. *Achene* obovoid, c. 2.5-2.8 x c. 0.8 mm, sericeous with duplex and glandular hairs; venation indistinct; carpopodium central. *Pappus* biseriate, with c. 75 free, minutely barbellate bristles equal to or subequal to the tubular florets.

Flowering period. September.

Distribution. Endemic to Dirk Hartog Island in the Carnarvon District, Eremaean Botanical Province, Western Australia, occurring between 25-26° S and 112-113° E (Figure 8).

Habitat. In shallow sand above limestone amongst tall open heath (shrub steppe) on coastal cliff-top.

Conservation status. This species is known only from its type locality. The 'kwongan' vegetation in which it occurs extends over several 100 hectares. There are no stock in the vicinity. Extensive searching on the adjacent mainland by me in 1986 failed to locate populations there.

The presence of *O. occidentissima* on Dirk Hartog Island reinforces recent proposals to declare the island as a National Park (Anonymous 1987). In particular, any proposal to modify vegetation at the northern end of the island should be rejected unless further, viable populations of *O. occidentissima* are located in areas free from interference.

O. occidentissima is clearly a vulnerable species, not presently endangered but possibly at risk over a longer period. It thus appears to warrant the category 1V in the coding system of Leigh et al. (1981).

Other specimens examined. WESTERN AUSTRALIA: Dirk Hartog Island [precise locality withheld], *B.R. Maslin* 4304 (PERTH).

Etymology. The specific epithet draws attention to the fact that this species of *Olearia* is that with the most westerly distribution in Australia.

Notes. The dense, intricate, multicellular, uniseriate eglandular hairs found on the vegetative parts of plants of this species place it in *Olearia* section *Eriotriche.*

In the handbook of Grieve & Blackall (1975) specimens of this species will key to *O. pimeleoides* (DC.) Benth., to which it is probably closely related. *O. occidentissima* can be distinguished from the latter by its habit, which is prostrate rather than erect; by its florets, which bear duplex hairs abaxially; and by its pappus, which comprises c. 75 rather than 39-65 bristles.

The duplex hairs observed on the abaxial surfaces of both ray and disc florets are identical to those found on achenes of this and most other species of *Olearia.* They have not been recorded on the florets of any other species in this genus.

It is no small measure of the need for continuing taxonomic research on the Australian flora that this distinctive species remained apparently uncollected until 1972 and hitherto undescribed in the vicinity of the first recorded landing on Australian shores by a European, namely the Dutchman Dirk Hartog in 1616 (Burbidge & George 1978), and of the first authenticated botanical collections by Europeans in Australia, namely those made in 1699 by William Dampier (George 1971).

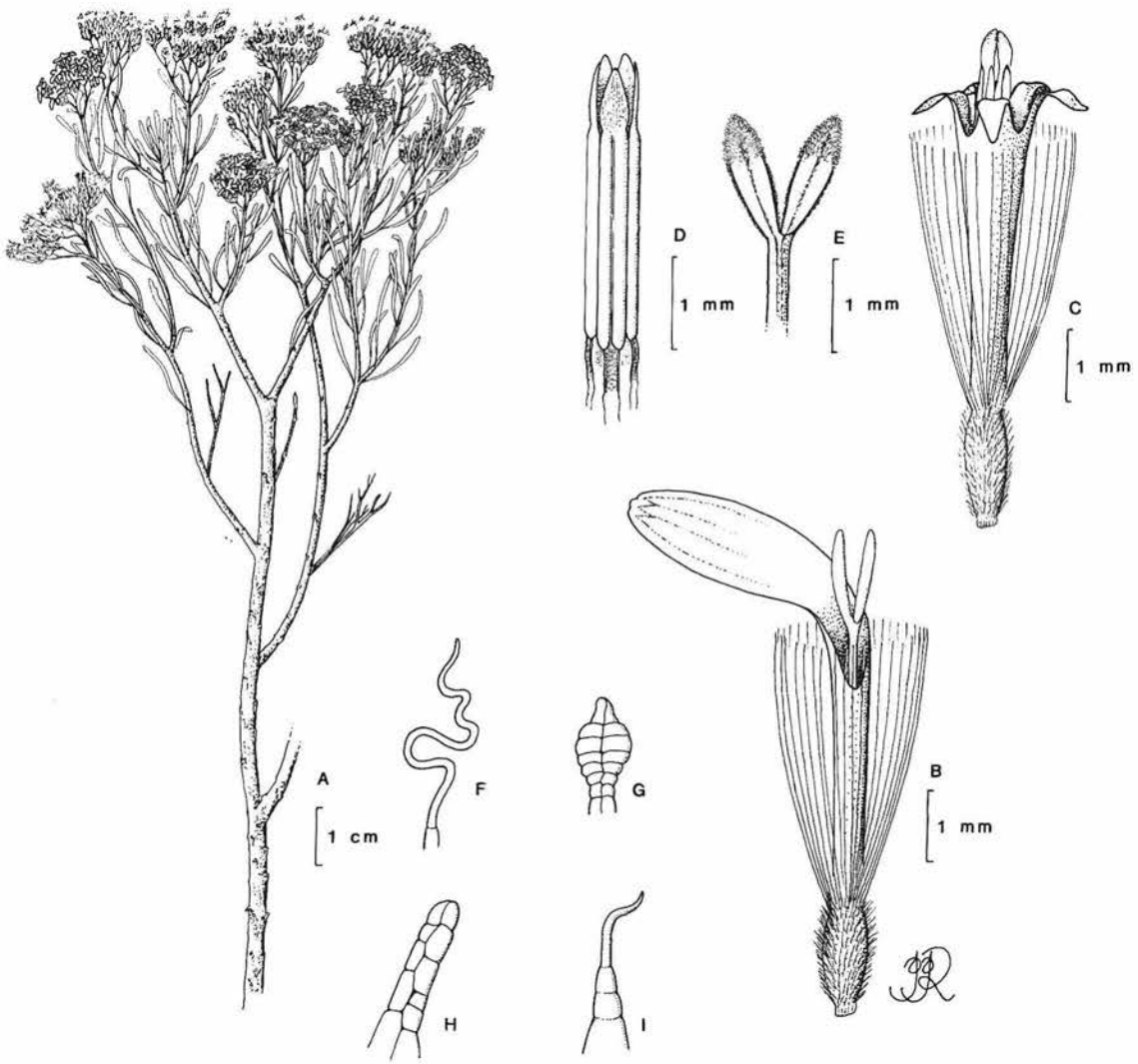

Figure 7. *Olearia plucheacea*. A - Habit. B - Ray floret. C - Disc floret. D - Anthers. E - Stylar arms. F - Multicellular, uniseriate, simple eglandular hair (from leaf). G - Multicellular, biseriate, simple eglandular hairs (from leaf). H - Multicellular, biseriate, capitate glandular hair (from leaf). I - Multicellular, uniseriate, simple eglandular hair (from ray floret). Drawn from *R J. Cranfield* 6279 (holo: PERTH).

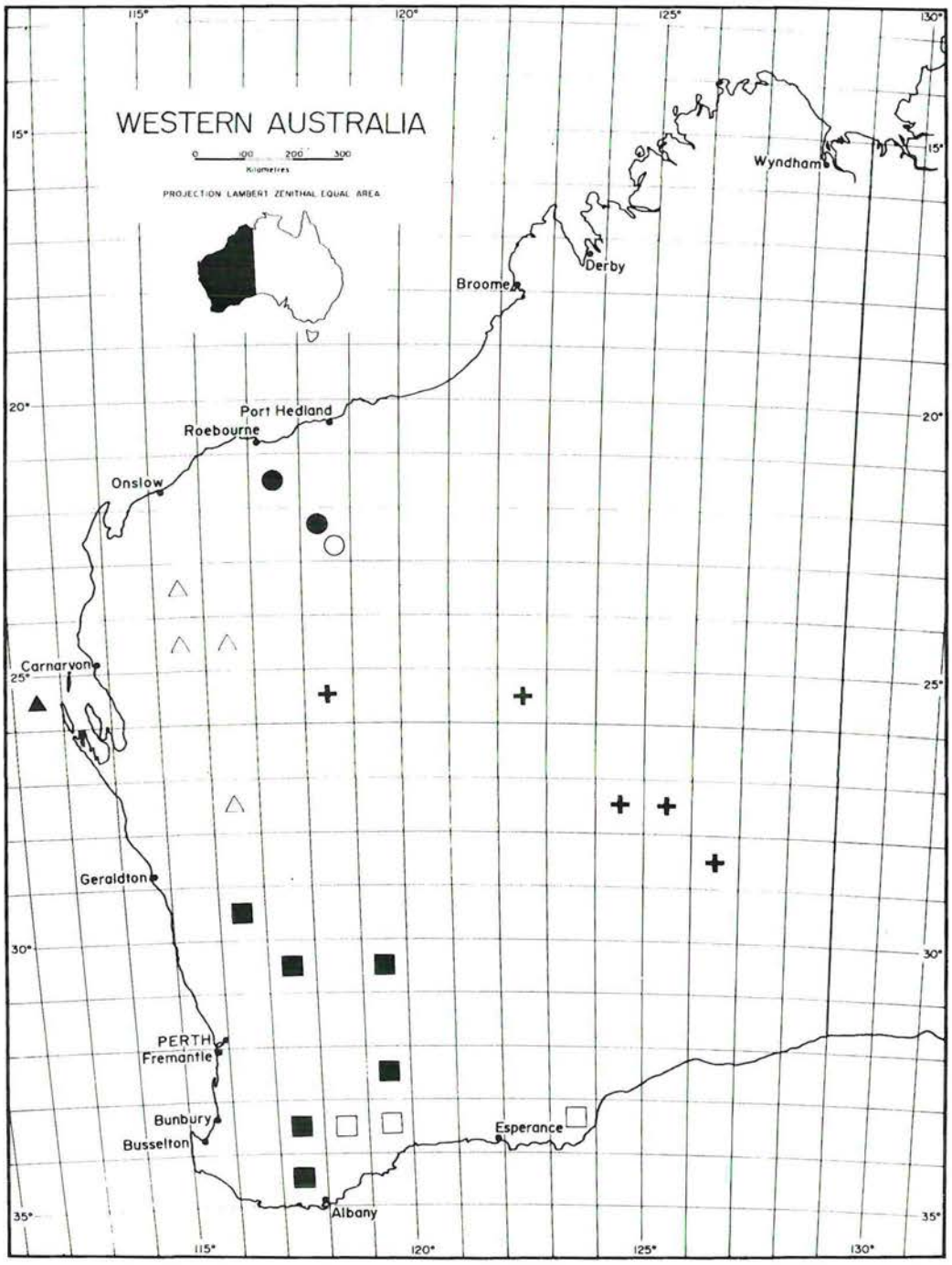

Figure 8. Distribution of *Olearia eremaea* (+), *O. fluvialis* (○), *O. incondita* (■) *O. laciniifolia* (□), *O. mucronata* (●), *O. occidentissima* (▲) and *O. plucheacea* (△), indicating occurrence in 1° x 1° squares.

Olearia plucheacea Lander, sp. nov. (Figure 7)

Species nova ad *Oleariam* sectionem *Merismotrichum* pertinens; foliis longis, filiformibus vel anguste linearibus, flaccidis, integris vel irregulariter serrulatis vel serratis, revolutis, conflorescentiis dense paniculatis et capitulis anguste obconicis distinguitur.

Typus: 16.5 km N of 'Meka', 27° 17' S, 116° 50' E, Western Australia, 22 September 1987, *R.J. Cranfield* 6279 (holo: PERTH; iso: AD, K, NSW)

Shrub to 1.5 m high. *Vestiture* of vegetative surfaces with minute, multicelluar, biseriate, capitate glandular hairs, scattered, long, spreading, multicellular, uniseriate, simple eglandular hairs and patent, short, multicellular, biseriate, simple eglandular hairs. *Stems* yellowish and somewhat viscid when young, pale brown and dry when older, glandular and with scattered long eglandular hairs. *Leaves* alternate, scattered, ascending, sessile; lamina incurved, flat or recurved, filiform to narrowly linear, 12-45 x 1-5 mm, concolorous, pale green, weakly to strongly viscid; venation obscure apart from the prominent midvein, sulcate above, raised below; vestiture uniformly weakly to densely hirsute on both surfaces with short, eglandular hairs and also with glandular and long eglandular hairs scattered abaxially; texture flaccid; base narrowly attenuate; margin entire or irregularly serrulate to serrate, revolute; apex acute to acuminate, muticous. *Heads* many in dense, terminal, paniculate conflorescences, pedunculate, conspicuously radiate, 9.5-13.5 mm diameter; disc 2.5-4.5 mm diameter. *Peduncles* to 35 mm long, glandular and with long eglandular hairs, with several minute leaflike bracts grading into those of the involucre. *Involucre* narrowly obconic; bracts 4-seriate, 1.7-4.5 x 1.0-1.7 mm. *Outer involucral bracts* obovate, cymbiform; stereome green, glandular and with a few short and long eglandular hairs scattered abaxially; margin narrowly membranous, fimbriate; apex broadly acute. *Inner involucral bracts* elliptic, cymbiform; stereome pale green, subglabrous with glandular and short and long eglandular hairs abaxially; margin broadly membranous, almost entire; apex broadly acute to obtuse. *Receptacle* somewhat convex. *Ray florets* 5-7, uniseriate, female, 5.2-7.0 m long; tube subglabrous with multicellular, biseriate, simple eglandular hairs abaxially; limb narrowly ovate, 1.0-1.2 x 3.5-4.5 mm, white, glabrous, acute and minutely 3-lobed apically; staminodes absent; stylar arms filiform, 1.1-1.7 mm long, yellow. spreading supinate. *Disc florets* 3-5, bisexual, buccinate, 4.8-7.0 mm long, yellow, glabrous, 5-lobed; lobes 1.2-1.3 mm long, narrowly acute; anthers 2.6-2.9 mm long, basally acute and shorter than the filament collar, with narrowly elliptic, sterile terminal appendage; filament collar 0.3-0.4 mm long; stylar arms ligulate, 1.3-1.6 with broadly half-conic, sterile terminal appendages bearing long botuliform collecting hairs above the stigmatic lines. *Achene* narrowly ellipsoid or obovoid, 1.7-2.4 x 0.5-0.8 mm, pale brown, villous with duplex hairs; carpopodium somewhat oblique. *Pappus* of 25-38 uniseriate, free, minutely barbellate bristles somewhat shorter than the tubular florets. *Chromosome number*, n = 9 (P.S. Short, pers. comm.).

Flowering period. August to October.

Distribution. Endemic to the Eremaean Botanical Province of Western Australia, occurring in the Ashburton and Austin Districts, between 23-28° S and 115-117° E (Figure 8).

Habitat. In stony soil on sandstone breakaways amongst open low *Eucalyptus/Acacia* woodland or high shrubland.

Conservation status. This species is widely distributed and has been collected in recent years at four sites. At Mt Augustus K.R. Newbey (pers. comm.) reported 10 or so plants; at his Kennedy Range site he encountered a single plant. P.S. Short & N.S. Lander observed scattered plants at the summit of the Kennedy Range. At 'Meka', R.J. Cranfield noted occasional plants. Although this species is not currently considered endangered it may be at risk over a longer period through continued depletion due to grazing. It thus appears to warrant the category 3V in the coding system of Leigh et al. (1981).

Other specimens examined. WESTERN AUSTRALIA: Sources of the Minilya River [as "Minilyalya"], anno 1882, *J. Forrest* s.n. (NSW); Mt Augustus, *J.R. Cannon* 122 (PERTH); Williambury Trig, Minilya River, *C.A. Gardner* 6157 (PERTH); Mt Augustus, 24° 20' S, 116° 51' E, *S.D. Hopper* 3171 (K, PERTH); Mt Augustus, *K.R. Newbey* 11696 (K, NSW, PERTH); 17.5 km W of 'Lyons River', Kennedy Range, *K.R. Newbey* 11576 (AD, DNA, PERTH); Kennedy Range, 24° 10' S, 118° 13' E, *P.S. Short* 2535 & *N.S. Lander* (MEL, PERTH).

Etymology. The specific epithet draws attention to the fact that this taxon bears a superficial resemblance to species of *Pluchea* from which it can easily be distinguished by the presence of distinctly radiate rather than filiform tubular marginal florets.

Notes. The patent, simple, septate eglandular hairs and the glandular hairs found on the vegetative parts of plants of this species place it in *Olearia* section *Merismotriche.*

In the handbook of Grieve & Blackall (1975) specimens of this species key to *O. rudis. O plucheacea* can be distinguished from the latter by its leaves, which are narrowly linear rather than ovate, obovate or elliptic and 1-5 rather than 6-40 mm wide; by its ray which comprises 5-7 rather than 39-75 florets; by its disc, which comprises 3-5 rather than 86-241 florets; by its achene, which is villous rather than glabrous; and by its pappus, which lacks an outer series of short bristles.

Although the J. Forrest specimen cited above is from F. Mueller's herbarium, I have not encountered a duplicate at MEL. Further, this species is not amongst Mueller's account of plant specimens collected by Forrest during his 1882 trigonometric survey of the Gascoyne region, many of which bear the locality "Minilyalya" (Mueller 1883).

Acknowledgements

I thank Mr J.J. Rainbird for research assistance and for preparing the illustrations, and Mr M.I.H. Brooker for providing the Latin diagnoses.

Much vital background work towards my ongoing revision of Australian *Olearia* was carried out during my assignment as Australian Botanical Liaison Officer at the Royal Botanic Gardens, Kew, London, during 1984-5 and during subsequent visits to the National Herbarium of Victoria, Melbourne, in 1986 and 1987. This work has been further supported by Australian Biological Resources Study Grants in 1988 and 1989.

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Taxonomic Studies of *Fimbristylis* (Cyperaceae) in Northern Australia

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Abstract

Latz, P.K. Taxonomic studies of *Fimbristylis* (Cyperaceae) in northern Australia. Nuytsia 7(2): 161-182 (1990). The following new species are described: *Fimbristylis arnhemensis*, *F. blakei*, *F. caloptera*, *F. carolinii*, *F. composita*, *F. dunlopii*, *F. laxiglumis*, *F. rupestris* and *F. simulans*. *F. allenii* Turrill, *F. oligocephala* W. Fitzg. and *F. stellata* S.T. Blake are relegated to synonymy under *F. furva* R. Br., *F. cephalophora* F. Muell and *F. schultzii* Boeck, respectively. Problems with several other species are discussed. A key to Australian species is presented.

Introduction

Fimbristylis Vahl is a large world-wide genus of predominantly tropical distribution. In Australia it is more or less restricted to northern tropical and sub-tropical areas. S.T. Blake contributed much to our understanding of the Queensland species, so in this paper I concentrate mostly on the more westerly members of the genus. Much more research is required on this poorly collected but large and difficult group, especially in regard to the species occurring in Western Australia and also in regard to its generic limits.

Description of New Species

1. **Fimbristylis arnhemensis** Latz, sp. nov. (Figure 1)

Fimbristylis subaristatae Benth. affinis sed nuce sine costis prominentibus, stylo glabro absque base bulbosa, bracteis involucralibus brevioribus, et absentia spicularum disticharum basalium differt.

Typus: Deaf Adder Gorge (13° 02' S, 132° 57' E), Northern Territory, 21 February 1977, *C.R. Dunlop* 4333, (holo: DNA; iso: BRI, CANB n.v., NT). Sandy soil on rocky ledge on sandstone escarpment.

Annual with fibrous roots. *Stems* densely tufted, setaceous, angular, smooth or hispidulous-scabrid just below the inflorescence, 2.5-16 cm x 0.25-0.4 mm. *Leaves* basal, c. half the length of the stems or shorter, erect, flattened or with margin inrolled, glabrous, abruptly terminating in an acute point, 0.4-0.7 mm wide; ligule absent, sheaths stramineous, glabrous or with minute fringe of hairs on the upper margin. *Inflorescence* simple to decompound, consisting of (1-)2-9 spikelets; the rays up to 2 cm long. *Involucral bracts* 1-4, glume-like, mucronate or filiform, to 13 mm long. *Spikelets* solitary, lanceolate, subterete, acute, 6-20-flowered, 4.5-8.0 x 1.0-1.5 mm, rachilla broadly winged. *Glumes* spirally arranged, thinly membranous, erect, ovate-lanceolate, acute, glabrous; lower glumes shortly mucronate, the mucro often slightly recurved; upper glumes muticous, keeled, with 1 or 2 nerves on either side of central nerve, reddish brown except for the broad hyaline margins, 2.0-3.0 x 1.0-1.5 mm. *Stamens* 2-3; anthers linear, 0.5-1.3 mm long. *Style* slender, glabrous, slightly thickened at base, 1.0-2.5 mm long; stigmas 3, shorter than style. *Nut* obtusely trigonous, obovoid, obscurely tricostulate, shortly stipitate, umbonulate, tuberculate, stramineous, 0.5-0.8 x 0.3-0.4 mm; epidermal cells obscure.

Other specimens examined. NORTHERN TERRITORY: ESE of Mudginberry (12° 36' S, 132° 58' E), 19 Feb. 1973, *C.R. Dunlop 3290* (BRI, CANB n.v., DNA, NT); Magela Creek (12° 40' S, 133° 03' E), 25 Feb. 1973, *C.R. Dunlop* 3362 (BRI, DNA, NSW n.v., NT); Deaf Adder Gorge (13° 02' S, 132° 57' E), 21 Feb. 1977, *C.R. Dunlop* 4466 (BRI, DNA, NT); Mt Brockman (12° 45' S, 132° 53' E), Feb. 1978, *C.R. Dunlop* 4680 (BRI, DNA, K n.v., NT); Arnhem Land (12° 55' S, 135° 23' E), 17 June 1972, *P.K. Latz* 3546 (BRI, DNA).

Distribution. This species appears to be restricted to the sandstone escarpments in western Arnhem Land, Northern Territory.

Habitat. Restricted to well-watered sandy soils on upper areas of sandstone escarpments.

Affinities. Fimbristylis arnhemensis is closely related to *F. subaristata* but can be distinguished by its smaller, less prominently ribbed, pale nuts, glabrous style lacking a bulbous base, shorter involucral bracts and the absence of distichous basal spikelets.

Conservation status. Although having a restricted distribution, this species does not appear to be rare or threatened.

Etymology. The specific epithet refers to the localised distribution of this taxa in the Arnhem Land region.

2. **Fimbristylis blakei** Latz, sp. nov. (Figure 1)

Fimbristylis denudatae R. Br. affinis spiculis grandioribus multioribus squarrosis, nuce rotundiore, glumis glandibus rubris dispersis differt; a speciebus affinibus foliis reductis et glumis valde carinatis recedit.

Typus: Davenport Ranges, Northern Territory, 23 Sept. 1983, *P.K. Latz* 9767 (holo: DNA; iso: BRI, NSW, PERTH). Spreading perennial. Restricted to area of springs at base of quartzite cliff. Precise locality withheld.

Glabrous *perennial* with short rhizome. *Stems* erect or spreading, densely tufted, somewhat flattened above, striate, 8-50 cm x 0.6-1.2 mm. *Cauline* leaves reduced to 1-2(3) bladeless, tubular, obliquely truncate, cinnamomeous-margined sheaths, the uppermost up to 10 cm long; juvenile plants with several subterete (up to 2.5 cm long) leaves which are soon lost; ligule absent. *Inflorescence* simple, rarely subcompound, with (1) 3-4 (9) spikelets, up to 3 cm long. *Involucral* bracts 1-2, glume-like, c. 3 mm long. *Primary rays* 0-6, generally erect, compressed, striate, up to 3 cm long; secondary rays when present 1-2, up to 1 cm long, rachilla broadly winged. *Spikelets* solitary, narrowly ovoid, angular, acute, many-flowered, pale reddish-brown, 8-18 x 2-3 mm.

Glumes spirally arranged, erect, ovate-lanceolate, densely reddish gland-dotted with minutely ciliolate margins, prominently keeled by the thickened mid-nerve which continues to a 0.3-0.8 mm long recurved mucro; otherwise nerveless and thinly membranous, 3-4 x 1.3-1.8 mm. *Stamens* 3; anthers linear, 1.4-1.5 mm, connective apically produced, bristly at the top. *Style* flat (rarely triquetrous) swollen at the base, ciliate for whole length, sparsely below, 1.0-1.6 mm long; stigmas 2(3), longer than style. *Nut* biconvex to trigonous, obovate, shortly stipitate, umbonulate, verruculose, stramineous, 1.1-1.2 x 0.9-1.0 mm; epidermal cells inconspicuously quadrangular or transversely oblong.

Other specimens examined (precise locality withheld). NORTHERN TERRITORY: Calvert River, 30 Sept. 1986, *P.K. Latz* 10375 (BRI, DNA, NT).

WESTERN AUSTRALIA: Ord River, 25 Oct. 1971, *D. Kitchener* 64 (DNA, PERTH); Hamersley Range, 15 May 1980, *M.E. Trudgen* 2594 (PERTH).

Distribution. This species is only known from four widely separated locations in the Northern Territory and Western Australia between 16° and 21° S.

Habitat. F. blakei appears to be restricted to permanently moist areas in rocky sandstone or quartzite hills.

Affinities. This species has closest affinities with *F. denudata* R. Br. but it differs by the larger, squarrose and more numerous spikelets, more rounded nut and red gland-dotted glumes. It can be separated from other related species by its prominently keeled glumes and the absence of leaves.

Conservation status. Although widespread, *F. blakei* appears to be quite rare. Using the Leigh, Briggs & Hartley (1981) convention, its status should be 3RC. Trampling by stock watering at the springs at which it grows may have already reduced its numbers.

Etymology. The specific epithet honours the late Dr S.T. Blake who contributed so much towards the taxonomy of this genus.

3. **Fimbristylis caloptera** Latz, sp. nov. (Figure 1)

Ex *Fimbrystylis cardiocarpa* F. Muell. et speciebus affinibus nuce manifeste alata; tantum *F. pterygosperma* R. Br. nuce alata affinis sed specierum australiensium proprietibus ceteris, differt.

Typus: East Alligator River (12° 32' S, 133° 09' E), Northern Territory, 16 February 1973, *C.R Dunlop* 3269 (holo: DNA; iso: AD, BRI, CANB, K, L, MEL, NT, NSW, PERTH). Lateritic soil [on] edge [of] *E[ucalyptus] miniata* forest.

Annual. Stems tufted, terete or somewhat angular, deeply grooved, scabrid, 5-26(40) cm x 0.4-0.7 mm. *Leaves* basal, much shorter than the stems, erect or spreading, subterete, ciliate on margins, 0.3-0.7 mm wide; ligule absent, sheaths with broad hyaline margins about 1 mm wide, white above, somewhat red gland-dotted below. *Inflorescence* a single terminal spikelet. *Spikelet* erect, lancelolate to ovoid, terete to somewhat flattened, acute, many-flowered, reddish-brown, 7-20 x 2-4 mm, rachilla narrowly winged. *Glumes* spiral, subchartaceous, ovate to oblong, obtuse to somewhat acute, muticous, with single nerve slightly thickened and keeled near apex, densely red gland-dotted and minutely appressed-puberulous in the apical part, rarely sub-glabrous, 4.5-6.5 x 2.0-3.5 mm: lower 2-5 glumes shorter, empty, shortly mucronate. *Stamens* 3; anthers linear, 1.5-2.5 mm long, connective apically produced, ciliate at apex, 0.3-0.3 mm. *Style slender, compressed triquetrous, slightly thickened and somewhat rounded at base, ciliolate in upper half but sometimes almost glabrous, 2.8--5.0 mm long; stigmas 3, shorter than the style. Nut* broadly winged, wings deeply invaginated with ciliate, hyaline margins, 5-7 lobes on either side, sometimes also similarly winged on the third angle; body of nut compressed trigonous, obovoid, stipitate, not or hardly

umbonulate, stramineous or whitish, 3.0-4.5 x 2.5-4.0 mm (including wings); epidermal cells isodiametric in vertical rows.

Other specimens examined. NORTHERN TERRITORY: 16 miles [24 km] NE of Katherine (14° 18' S, 132° 05' E), 25 March 1974, *N. Forrester* 69 (DNA); Gunn Point (12° 09' S, 130° 58' E), 7 May 1973, *J. McKean* 1101 (CANB n.v., DNA); 0.5 miles [0.8 km] NW of Edith River Siding (14° 11' S, 132° 01' E), 30 Jan. 1965, *I.B. Wilson* 211 (CANB n.v., DNA).

Distribution. This species appears to be restricted to an area east and south-east of Darwin, Northern Territory.

Habitat. Either occurring in lateritic or granitic, gravelly soils.

Affinities. The only other Australian species which has similarly winged nuts is *F. pterygosperma* R. Br. but it is quite different in other parts. *F. caloptera* is related to *F. cardiocarpa* F. Muell. and its allies, all of which have wingless nuts.

Conservation status. Unknown, but probably not particularly rare.

Etymology. The specific epithet refers to the attractive wings bordering the nut.

4. **Fimbristylis carolinii** Latz, sp. nov. (Figure 1)

Species nova spiculis grandibus multifloribus notabilis; *Fimbristylis pterygosperma* R. Br. aemulans nuce exalata, foliis equitantibus, basi styli incrassata pyramidali et partibus omnibus grandioribus differt.

Typus: N of Maggieville on Myravale road , Queensland, 20 April 1974, *R.C. Carolin* 8773, (holo: DNA; iso: NSW). Box woodland. Sandy loam. Precise locality withheld.

Glabrous *annual. Stems* densely tufted, erect, somewhat flattened below, becoming terete above, sulcate, 30-55 cm x 1.0-1.8 mm, the base clothed with laterally compressed, acuminate or shortly laminate, up to 11 cm long sheaths. *Leaves* much shorter than the stems, strongly laterally compressed, equitant, striate, without prominant mid-nerve, about 1-2 mm wide; ligule absent. *Inflorescence* consisting of a single terminal spikelet. *Spikelet* erect, ebracteate, broadly ovoid to obovoid, obtuse, very densely many-flowered, stramineous 10-25 x 6-8 mm; rhachilla winged. *Glumes* spiral, closely imbricate, membranous, oblong-ovate or oblong, obtuse with rounded apex, muticous, concave, 3-nerved, 4.0-4.5 x 3 mm. *Stamens* 3; anthers linear, 2-3 mm long. *Style* triquetrous, pyramidally thickened at base, long hyaline-fimbriate on upper 1/4 otherwise glabrous, 3-4 mm long; stigmas 3, shorter than the style. *Nut* trigonous, turbinate, abruptly narrowed in lower half, with 3 ridges just above the small stipe, rugulose, umbonulate, greyish-white or greyish-brown, 1.3-1.5 x 1.0-1.3 mm, epidermal cells hexagonal.

Distribution. F. carolinii is presently only known from the type location near the Gulf of Carpentaria, Queensland.

Habitat. See *Typus* above.

Affinities. This species is similar to *F. pterygosperma* R. Br. but it lacks the winged nut (although this is also sometimes absent in depauperate *F. pterygosperma* specimens), is larger in all parts, has equitant leaves and a different style. The large, many-flowered spikelets are unique in Australian species of *Fimbristylis.*

Conservation status. Not known, but probably rare, so under the Leigh, Briggs & Hartley (1981) convention its status should be IK.

Etymology. The specific epithet honours Prof. R.C. Carolin, who collected the only known specimen and who has contributed much towards our knowledge of the Australian Flora.

5. **Fimbristylis composita** Latz, sp. nov. (Figure 1)

Affinis arte *Fimbristylis arthrostyloides* W. Fitzg. sed partibus omnibus parvioribus et spiculis plus differt, *F. thouarsii* (Kunth) Merr. aemulans sed glumis spiralibus, nucibus grandioribus, stylo longiore et bracteis involucralibus latioribus recedit.

Typus: Radon Creek area, 12 km S of Jabiru (12^0 45' S, 132^0 54' E), Northern Territory, 10 June 1978, *P.K. Latz* 7686 (holo: DNA; iso: NT). Erect perennial. Often dominant, in sand with *Eriachne triseta.*

Leafless *perennial* with short rhizome, roots woolly-tomentose. *Stems* densely tufted, terete but deeply grooved, densely scabrid to smooth, (10) 77-155 cm x (0.35) 0.5-1.5 mm; at first erect then drooping. *Leaves* reduced to 2-3 bladeless sheaths, the lower ones terminating in a short mucro, the upper with hyaline margins for c. 1 cm before terminating in a short mucro c. 0.2 mm long, often several short, broad stramineous bracts present at base. *Inflorescence* capitate, depressed globular or hemispherical with (6) 20-50 spikelets, up to 1 cm in diameter but sometimes much reduced (rarely to a single fully developed spikelet). *Involucral bracts* numerous, 10-40, up to 8mm long, scabrid, the outer 2 flattened (0.2-0.3 mm broad), the inner ones becoming setaceous. *Spikelets* sessile, eventually falling off as a whole, somewhat compressed, acute, apparently consistently 1-flowered, 4.5-5.5 mm long, c. 1 mm wide. *Glumes* 5(6), spirally arranged, lanceolate, with 3-nerved keel and nerveless hyaline margin, at first green on the keel and white on the margin; eventually stramineous or light-brown, the lowest 3 awned, scabrid above, the 2 uppermost acute and mostly glabrous. *Glume 1* (the lowest); 2.5-3.6 mm long, c. 0.5 mm wide, tapering into a 1.0-1.6 mm long awn, scabrid on upper half. *Glume 2*; 3.0-3.6 mm long, c. 1.0 mm wide, tapering into a 1.2 mm long awn, scabrid on upper 1/3. *Glume 3*; 3.5-4.5 mm long, c. 1.5 mm broad, with a 1 mm long awn, scabrid on upper half. *Glume 4*; 4-5 mm x 1.5-2.2 mm, acute. *Glume 5* (fertile glume); 3.5-4.5 x 1.5-2.0 mm, acute; this and glume 4 with minutely ciliolate margins or glabrous. *Stamens* 3, anthers linear with 0.5-0.7 mm long glabrous terminal point, 3.0-3.5 mm long and c. 0.3 mm wide. *Style* triquetrous, thickened at base, shortly ciliate on upper half, 4-6 mm long, stigmas 3, ciliolate, about half the length of the style. *Nut* obtusely trigonous or almost rounded, ellipsoid or obovoid, conspicuously stipitate, scarcely umbonulate, rugulose, pale-brown to silvery-grey, 1.8-3.0 by 1.0-1.2 mm including the 0.5-0.7 mm long stipe, which is brown to yellow-brown.

Selected specimens from 21 collections examined. NORTHERN TERRITORY: Katherine Gorge (14^0 19' S, 132^0 25' E), 13 Oct. 1946, *S.T. Blake* 17212 (BRI, DNA); Adelaide River (13^0 20' S, 131^0 05' E), 26 Jan. 1972, *N. Byrnes* 2476 (CANB n.v., DNA, NT); 44 km SE of Oenpelli (12^0 34' S, 133^0 23' E), 15 June 1978, *P.K. Latz* 7797 (DNA, NT); Edith Falls (14^0 11' S, 132^0 11' E) 18 June 1978, *P.K. Latz* 7814 (DNA, NSW); U.D.P. Falls (13^0 30' S, 123^0 30' E), 18 Sept. 1984, *P.K. Latz* 9950 (DNA, NSW); Nourlangie Rock (12^0 57' S, 132^0 50' E), 3 May 1972, *R. Schodde* AE 33 (CANB n.v., DNA, NT).

Distribution and habitat. F. composita is restricted to sandstone ranges east and south-east of Darwin, Northern Territory.

Affinities. This species is similar to *F. thouarsii* (Kunth) Merr. but differs by its spiral glumes, larger nuts, longer style and broader involucral bracts. It is probably more closely related to *F. arthrostyloides* W. Fitz. which is bigger in all parts and has fewer spikelets in the inflorescence. (All three species may be better placed in *Actinoschoenus* Benth).

Conservation status. Although *F. composita* is restricted in distribution, it appears not to be rare or threatened.

Etymology. The specific eptihet refers to the composite inflorescence.

6. **Fimbristylis dunlopii** Latz, sp. nov. (Figure 1)

Fimbristylis rectae F. Bail. affinis sed plerumque spiculis numerosioribus, glumis parvioribus, nuc pyiformi,basi styli bulbosa differt; a *F. neilsonii* F. Muell. spiculis paucioribus, vaginis foliorum sine marginbus latis hyalinis distinguitur.

Typus: Tabletop Range, Northern Territory, 19 May 1985, *C.R. Dunlop* 6782 (holo: DNA; iso: NSW). Annual in white sand in seasonally wet area. Precise locality withheld.

Annual. Stems erect, somewhat flattened, sulcate, minutely and densely scabrid above, becoming glabrous below, 7-57 cm x 0.5-1.0 mm. *Leaves* shorter than the stems, rather rigid, flat, 8-12-nerved, abruptly terminating into a blunt apex, glabrous but scabrid on margins, up to 23 cm long and (1-) 2-4 mm wide, sheaths with somewhat hyaline margins, gradually narrowing onto the leaf blade, hairy on margins above; upper sheaths up to 12.5 cm long, lower sometimes reduced to bracts; ligule absent. *Inflorescence* consisting of (1-) 2-3 spikelets, the rays when present 1.8-2.5 mm long. Involucral bracts glume-like, c. 8 mm long. *Spikelets* solitary, erect, ovoid, somewhat acute, many-flowered, pale-brown, 8-12 x 3.5-5.0 mm; rachilla winged. *Glumes* spiral, membranous, ovate to ovate-lanceolate, obtuse, with long-ciliate margins, reddish gland-dotted in upper half, 9-11-nerved, 5.0-5.5 x 2.5-3.0 mm, central nerve thickened, greenish, terminating below upper margin, bordered on both sides by a yellowish stripe. *Stamens* 3; anthers linear, 2.5-3.0 mm long. *Style* triquetrous, slender but abruptly thickened into the bulbous base, glabrous, becoming twisted, 3.5-4.0 mm long, stigmas 3, about as long as the style. *Nut* trigonous, pyriform, truncate, abruptly narrowed in lower half, shortly stipitate, umbonulate, tuberculate in upper half, white, 1.5-1.8 x 1.3-1.5 mm; epidermal cells obscure.

Other specimens examined (precise localities witheld). NORTHERN TERRITORY: Darwin area, 11 Feb. 1961, *H.S. McKee* 8383 (CANB n.v., DNA); near Daly River road, 4 Jan. 1964, *C.S. Robinson* R101 (DNA); Cox's Peninsula, 27 March 1948, *R.L. Specht* 62 (BRI, DNA).

Distribution. This species is only known from four collections in the Darwin region of the Northern Territory.

Habitat. Either occurring in moist sandy or skeletal lateritic soils, in *Eucalyptus* open-forest.

Affinities. *F. dunlopii* has affinities with *F. recta* F. Bail. but can be readily separated by the fact that it rarely has solitary spikelets, and by its smaller glumes, pyriform nut (unequally trigonous in *F. recta*) and bulbous style base. *F. dunlopii* also has some affinities to *F. neilsoni* F. Muell. but can be easily separated by the fewer spikelets and the absence of wide hyaline margins on the leaf sheaths.

Conservation status. Unknown, but probably rare.

Etymology. The specific epithet honours Mr Clyde R. Dunlop, whose collections have contributed much to further our understanding of this difficult genus.

7. **Fimbristylis laxiglumis** Latz, sp. nov. (Figure 2)

Ab affinibus *Fimbristylis solidifolia* F. Muell. et *F. clavata* S.T. Blake sed partibus omnibus gradioribus, foliis pubescentioribus, glumis marginibus ciliatis distinguenda; a *F. corynocarya* F. Muell. glumis obtusis, nuce laevi, folius eligulatis distinguenda.

Typus: Near Dunmarra Roadhouse, Northern Territory, 20 June 1974, *P.K. Latz* 5484 (holo: DNA; iso: BRI, L, NT, PERTH). Erect annual. Quite rare in grey cracking clay, *Eucalyptus microtheca* grassland. Precise locality withheld.

Annual. Stems densely tufted, erect, deeply grooved, 4-5-angular, with numerous short fine hairs (especially above), 10-80 cm x 1-4 mm; the base clothed with broad, papery leaf-sheaths. *Leaves* less than half the length of the stems, somewhat rigid, flat or incurved, striate, acuminate, densely hairy below, less so above, c. 3.0-3.5 mm wide; no ligule. *Inflorescence* compound or decompound, rather dense with (2) 5-numerous spikelets, about 6 cm long and wide. *Involucral bracts* 3-5, the lowest shorter than the inflorescence. *Primary rays* several, erecto-patent, grooved, densely hairy, up to 5.5 cm long. *Spikelets* solitary, broadly ovoid, ragged below, obtuse, many-flowered, 9-25 x 5-7 mm; rachilla winged. *Glumes* spiral, chartaceous, becoming reflexed before falling and giving the spikelet a ragged appearance, oblong-ovate, obtuse, muticous or shortly and bluntly mucronulate, 3.6-4.0 x 2.0-3.0 mm, with strong mid-nerve bordered on both sides by a yellowish stripe, ferrugineous or brownish sides and densely ciliate margins. *Stamens* 3; anthers linear, 2.0-2.5 mm long. *Style* triquetrous, slightly thickened at base, sparsely ciliolate, 2.0-2.5 mm long; stigmas 3, about as long as the style. *Nut* obtusely trigonous, narrowly clavate, shortly stipitate, umbonulate, smooth or sparsely verruculose, usually white, 1.0-1.3 x 0.4-0.6 mm; epidermal cells transversely linear.

Other specimens examined (precise localities withheld). NORTHERN TERRITORY: NE of Roper River Mission, May 1921, *N.B. Tindale* s.n. (DNA, NSW n.v.).
WESTERN AUSTRALIA: Kimberley Research Station, 13 April 1963, *P.J. Rijn* s.n. (DNA).

Distribution. F. laxiglumis apparently occurs occasionally in the Northern Territory and Western Australia between 14° 30' S and 17° S.

Habitat. This species appear to grow only in cracking grey clays, near water.

Affinities. F. laxiglumis is related to both *F. solidifolia* F. Muell. and *F. clavata* S.T. Blake but is larger in all parts, has more hairs on its leaves and ciliate glume fringes. It differs from *F. corynocarya* by its obtuse glumes, smooth nut and absence of a ligule.

Conservation status. Although widespread, *F. laxiglumis* appears to be rare. Trampling by stock watering at the water bodies on the edge of which it occurs may be affecting its continued existence. Using the Leigh, Briggs & Hartley (1981) convention its status should be 3R.

Etymology. The specific epithet refers to the ragged appearance of the mature spikelets caused by the reflexed glumes.

8. **Fimbristylis rupestris** Latz, sp. nov. (Figure 2)

Ex *Fimbristylis trachycarya* F. Muell. et specierum affinium, habitu parvo annuo, ligula deficienti, inflorescentia simplici, glumis emarginatis, marginibus distalibus ciliatis glumarum, stylo glabro, nuc subglobosa cellulis epidermidis quinquangularis isodiametris distinguenda.

Typus: Mitchell River (14° 50' S, 125° 42' E), Western Australia, 23 Feb. 1980, *C.R. Dunlop* 5265, (holo: DNA; iso: NT, PERTH). In shallow, sandy seepage on sandstone pavement.

Erect *annual*. *Stems* rigid, somewhat flattened, deeply grooved, glabrous, 8-17 cm x 0.3-0.7 mm. *Leaves* basal, about half the length of the stems, somewhat recurved, flattened or with margins inrolled, ciliate on margins or glabrous, 5-7-nerved above, gradually narrowing to an acute apex, 3-8 cm x 0.6-1.5 mm; ligule absent; sheaths glabrous, many-nerved with wide hyaline margins, up to 3.5 cm long, rarely reduced to bracts. *Inflorescence* simple with (1) 2-5 spikelets, 2-5 cm long. *Involucral bracts* 1-5 with narrow hyaline margins, ciliate on upper margins or glabrous, up to 1.5 cm long; rays spreading, similar to stems. *Spikelets* solitary, erect, narrowly ovoid, angular, acute, 5-25-flowered, reddish-brown, 5-10 x 2.-5 mm; rachilla winged. *Glumes* spirally arranged, erect, broadly ovate, shortly emarginate, margins membranous, red gland-dotted, forming 2 apical lobes, ciliate in the upper half; 1.8-2.5 x 1.5-1.8 mm, reddish-brown except for greenish central nerve, which is thickened above to continue into a short recurved mucro and is bordered on both sides by a yellowish stripe; lower 2 glumes long mucronate. *Stamens* (2)3; anthers linear, 0.7-1.0 mm long. *Style* trigonous, distinctly swollen at the base, glabrous, 0.9-1.2 mm long; stigmas 3, about as long as the style. *Nut* trigonous, obovate, shortly stipitate, umbonulate, sparsely verruculose, dark brown, 0.8-1.2 x 0.8-1.0 mm, epidermal cells isodiametrically pentagonal.

Other specimens examined. NORTHERN TERRITORY: Cox River Station, Tanumbirini Creek (16° 01' S, 134° 47' E), 11 July 1977, *P.K. Latz* 7855 (DNA); Echo Gorge area, Wollogorang Station (17° 12' S, 137° 42' E), 9 June 1987, *P.K. Latz* 10500 (BRI, DNA, NSW, PERTH).

Distribution. *F. rupestris* is presently only known from three locations in the drier tropical areas of Western Australia and the Northern Territory between 14° 30' S and 17° 30' S.

Habitat. This species appears to be restricted to skeletal soil on quartzite or sandstone ranges.

Affinities. *F. rupestris* is closely related to *F. trachycarya* F. Muell. and its allies, but it can be separated by the combination of certain characters; namely being a small annual with eligulate leaves, and having a simple inflorescence and emarginate glumes which are ciliate on the upper margins. It has a glabrous style and a subglobular nut with isodiametrically pentagonal epidermal cells.

Conservation status. There is no reason to suspect that *F. rupestris* is either rare or threatened; the lack of collections is probably due to the paucity of botanical collections in the area in which it occurs and its resemblance to other, more common, members of this genus.

Etymology. The specific epithet refers to the preference of this species for a rocky habitat.

9. **Fimbristylis simulans** Latz, sp. nov. (Figure 2)

Ex *Fimbristylis cardiocarpa* F. Muell. et specierum affinium marginibus latis hyalinis foliorum vaginarum, foliis glabris, nervo centrali glumarum fertilium mucroni procurrenti, nuce obovoidea distinguenda.

Typus: Coodna Waterhole (19° 18' S, 134° 14' E), Phillip Creek Station, Northern Territory, 1 June 1975, *P.K. Latz* 6015 (holo: DNA; iso: BRI, L, NT). Erect annual. Infrequent in skeletal soil, recently burnt outcrop; *Triodia pungens* and *Eucalyptus leucophloia* open-woodland.

Annual. *Stems* weak, densely tufted, terete, sulcate, glabrous (rarely sparsely scabrid), few-leaved at the base, 17-30 cm by 0.3-0.6 mm but often reduced and as little as 1 cm tall. *Leaves* the length of the stems or less, at first somewhat flattened by soon becoming inrolled and terete, scabrid on margins (rarely glabrous), strongly nerved, 0.3-0.6 mm wide; sheaths with wide hyaline margins, wider than central portion of sheath in upper part, abruptly terminated; ligule absent. *Inflorescence* a single terminal spikelet. *Spikelets* erect, lanceolate, obovoid, terete, acute, densely many-flowered, pale reddish-brown, 7-27 x 2-4 mm; rachilla winged. *Glumes* spirally arranged, thinly membranous, erect, ovate-lanceolate, acute, mucronate, not or indistinctly keeled, with single

central nerve and microscopically ciliolate margins at the apex, densely reddish gland-dotted, 4.5-6.0 x 1.7-2.2 mm. *Stamens* 3; anthers linear 2.5-3.0 mm long. *Style* slender, glabrous 2.5-4.0 mm; base bulbous; stigmas 3, much shorter than the style, sparsely ciliolate. *Nut* trigonous, tricostate, with somewhat convex sides, obovoid to turbinate, shortly stipitate, umbonulate, tuberculate on upper half, shining black at maturity, 1.2-1.5 x 1.2-1.4 mm; epidermal cells obscure, oblong to hexagonal in vertical rows.

Selected specimens from 15 collections examined. NORTHERN TERRITORY: Negri River area (17° 10' S, 129° 15' E), 4 May 1974, *C.R. Dunlop* 4110 (DNA, NT); Tanami Desert (20° 11' S, 129° 43' E), 3 July 1980, *P.K. Latz* 8399 (AD, CANB, DNA, MEL, NSW, PERTH); Frankenia Rise, 9 km W of Rabbit Flat (20° 10' S 129° 53' E), 5 July 1983, *P.K. Latz* 9570 (BRI, DNA, K, NSW).

WESTERN AUSTRALIA: 33 miles [53 km] S of Sturt Creek Homstead (19° 39' S, 128° 12' E), 20 July 1973, *P.K. Latz* 4032 (BRI, CANB, DNA, PERTH); above Dales Gorge, Hamersley Ranges National Park (22° 20' S, 118° 35' E), 8 Aug. 1974, *A.C. Beauglehole* 48607 (DNA, PERTH); 6.5 km NE of Mary River Crossing, Great Northern Highway (18° 41' S, 126° 42' E), 19 June 1976, *A.C. Beauglehole* 43249 (DNA, PERTH); White Mountain Hills, near Ord River Station, East Kimberley (17° 16' S, 128° 58' E), 20 April 1977, *R. Pullen* n.v. (CANB n.v., DNA).

Distribution. F. simulans occurs over a wide area of the semi-arid zone of the Northern Territory and Western Australia between 17° and 22° S.

Habitat. This species mostly occurs on gravelly slopes dominated by *Triodia* spp. and *Eucalyptus brevifolia* or *E. leucophloia.* It appears to be most common the first year after fire.

Affinities. F. simulans is closely related to *F. cardiocarpa* F. Muell. and its allies but it is characterized by its wide, hyaline, leaf-sheath margins, its glabrous leaves (± scabrid on the margins), its fertile glumes with a single central nerve which is produced into a distinct mucro, and its dark obovoid nut.

Conservation status. Not considered rare or endangered.

Etymology. The specific epithet refers to its similarity to the other plants in this difficult group of species with solitary, gland-dotted spikelets.

Comments on other Species

Fimbristylis cephalophora F. Muell., Fragm. 1: 196 (1859). *Type*: Upper Victoria River, Northern Territory, *F. Mueller* s.n. (holo: MEL n.v.; iso: BRI, KEW n.v.).

F. oligocephala Fitzg., Roy. Soc. Western Australia 3: 120 (1918). *Type*: Packhorse Range, Western Australia, *W.V. Fitzgerald* s.n. (holo: PERTH).

Blake (1969, 7-10) clarified the confusion that occurs between *F. furva* R. Br., *F. capitata* R. Br. and *F. cephalophora* in Bentham (1878). In his description of *F. oligocephala*, Fitzgerald did not provide features that distinguish it from other species. Having examined type material of both of the above species, I am of the opinion that *F. oligocephala* should be considered conspecific with *F. cephalophora.*

Fimbristylis furva R. Br., Prodr. 228 (1810) *Type*: Booby Island and Endeavour River, Queensland, *J. Banks & D. Solander* s.n. (holo: BM, fragment n.v. and photo BRI; iso: BRI, MEL n.v.).

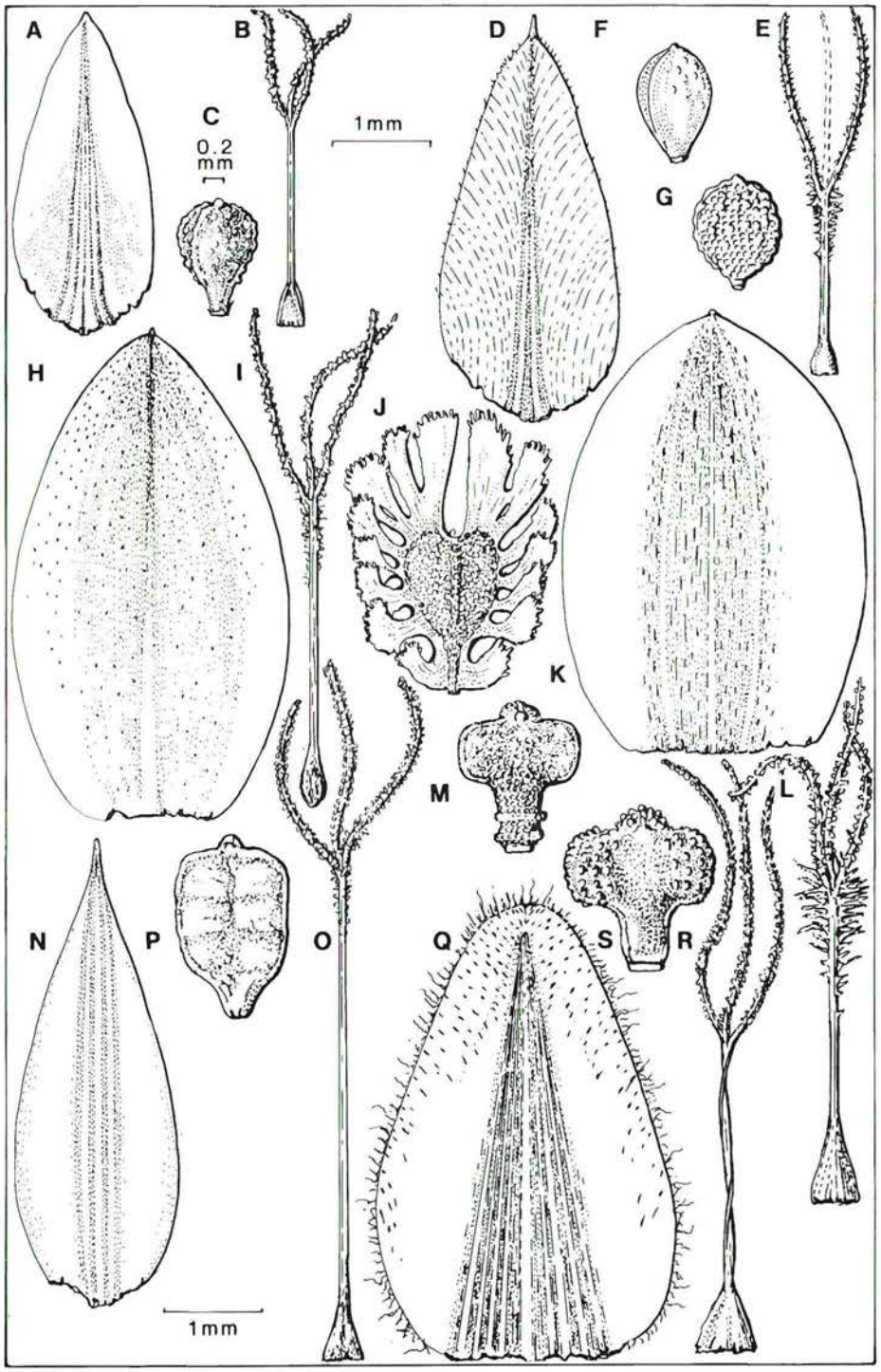

Figure 1. A - B *Fimbristylis arnhemensis* (drawn from *C.R. Dunlop* 4333). A - Glume. B - Style. C - Nut. D - G *F. blakei* (drawn from *P.K. Latz* 9767). D - Glume. E - Style. F - Nut. H - J *F. caloptera* (drawn from *C.R. Dunlop* 3269). H - Glume. I - Style. J - Nut. K - M *F. carolinii* (drawn from *R.C. Carolin* 8773). K - Glume. L - Style. M - Nut. N - P *F. composita* (drawn from P.K. Latz 7686). N - Glume-4. O - Style. P - Nut. Q - S *F. dunlopii* (drawn from *R.L. Specht* 62). Q - Glume. R - Style. S - Nut.

F. allenii Turrill, Kew Royal Bot. Gdns. Bull. Misc. Inf. (1915) 117. *Type*: near Darwin, Northern Territory, *C.E.F. Allen* 170 (holo: K; iso: NSW).

F. furva is a variable species (Blake 1969). After examination of the type material of both of these species, I consider that *F. allenii* falls well within the range of variation and should be considered conspecific with *F. furva*.

Fimbristylis schulzii Boeck. Linnaea 38 (1874) 391.

F. stellata S.T. Blake, Proc. Roy. Soc. Qld. 58(2): 46 (1947). *Type*: c. 50 miles NW of Munyana, Queensland, *S.T. Blake* 17241 (holo: BRI).

In his description of *F. stellata* Blake (1947) gave what appears to be valid differences between it and *F. schultzii* (but see also Kern 1974: 559-10). On close examination of a large number of collections I have, however, found numerous intermediates and must therefore consider these two species to be conspecific.

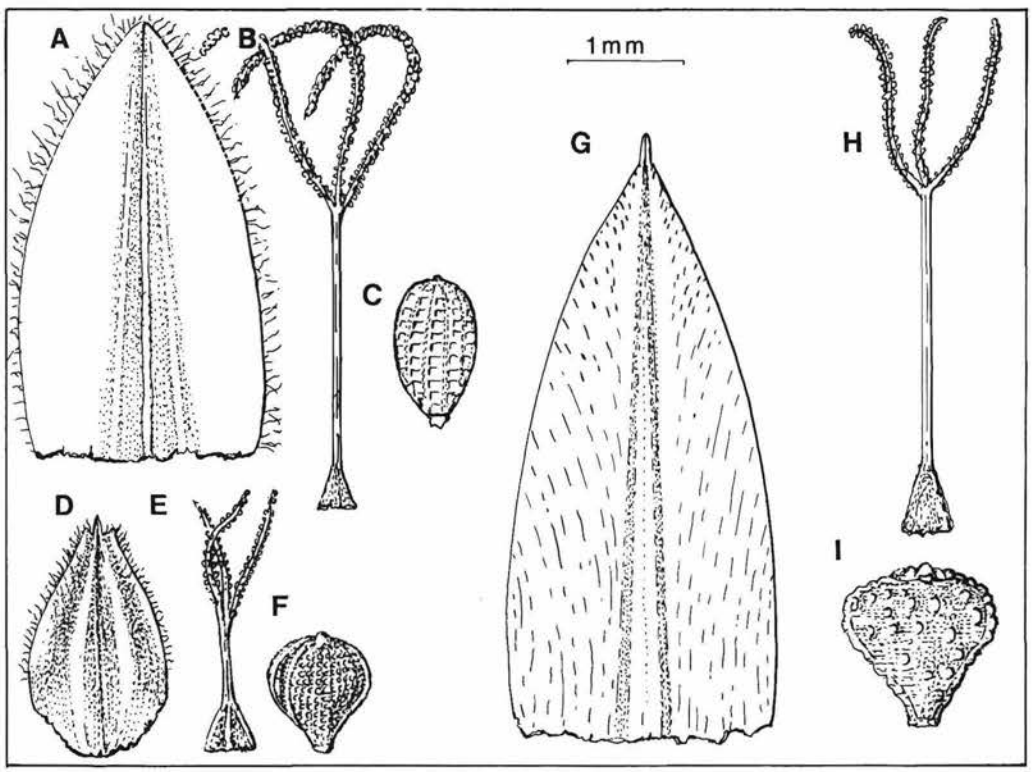

Figure 2. A - C *Fimbristylis laxiglumis* (drawn from *P.K. Latz* 5484). A - Glume. B - Style. C - Nut. D - *F. rupestris* (drawn from *C.R. Dunlop* 5265). D - Glume. E - Style. F - Nut. G - I *F. simulans* (drawn from *P.K. Latz* 6015)

Key to *Fimbristylis* in Australia

A draft key to all the Australian species of *Fimbristylis* has been prepared and is now presented.

Twelve taxa of uncertain affinities are included in the key. Several of these may be better placed in *Actinoschoenus* Benth. or *Trachystylis* S.T. Blake (or even a new genus) but are placed in *Fimbristylis* for convenience, at this stage. Further collections and research are required to clarify the situation.

I have excluded *Fimbristylis rhyticarya* F. Muell. in the key as I agree with Kern (1974) that it should be relegated to synonymy under *F. acuminata* Vahl.

1a. Glumes spirally arranged 2

b. Glumes (at least in young spikelets) distichous; sometimes becoming twisted with age. Spikelets strongly laterally compressed, similar to those in *Cyperus* 114

2a. Nut sub-cylindrical, oblong-linear in outline 3

b. Nut not oblong-linear in outline 4

3a. Inflorescence a single terminal spikelet, glumes obtuse, 3-5 mm long ..... *F. tetragona*

b. Inflorescence compound, glumes mucronate, 1-2 mm long ..... *F. dipsacea*

4a. Stigmas 3, nut trigonous or triquetrous 5

b. Stigmas 2, nut biconvex 82

5a. Spikelets solitary on the stem 6

b. Spikelets more than one on each stem 28

6a. Nut winged 7

b. Nut not winged (sometimes with an apical ridge) 8

7a. Wing rounded, glumes obovate ..... *F. pterygosperma*

b. Wing divided, glumes lanceolate ..... 3. *F. caloptera*

8a. Nut with transverse wavy ridges (sometimes obscure in *F. punctata*) 9

b. Nut smooth or tuberculate, wavy ridges absent, or restricted to lower third of nut 11

9a. Spikelets 1-2 flowered, nut 2.5-3 mm long ..... *F. sp.* A

b. Spikelets many flowered, nut less than 2.5 mm long 10

10a. Style glabrous 1 mm long, glumes glabrous, 2.5-3.5 mm long ..... *F. ammobia*

b. Style hairy 2 mm long or more, glumes softly hairy above, 5-6 mm long .... *F. punctata*

11a. Spikelets oblique or at right angles to the stem 12

b. Spikelets exactly terminal (except *F. trigastrocarya* where the spikelet is sometimes pushed to one side by the involucral bract) 14

12a. Glume with two terminal wings, glabrous ..... *F. costiglumis*

b. Glume apices rounded, with ciliate margins 13

13a. Glumes less than 3 mm long, leaves glabrous, (except for ciliate margins), nut less than 1.2 mm long; in sandy soils ..... *F. densa*

b. Glumes greater than 3 mm long, leaves hairy (often sparsely), nut greater than 1.2 mm long; in gravelly soils ..... *F. xyridis*

14a. Glumes with ciliate margins (sometimes obscure), conspicuously red gland-dotted, leafy plants with glabrous styles 15

b. Glumes glabrous, not or inconspicuously gland-dotted, leafy or leafless, styles glabrous or hairy 23

15a. Leaves flat, 2-4 mm wide, glumes greater than 4.5 mm long with thickened raised mid-nerve, nut pale 16

b. Leaves incurved or terete, less than 2 mm wide, other characters not combined 17

16a. Nut pyriform, style with large bulbous base ..... 6. *F. dunlopii*

b. Nut unequally trigonous, style with tapering base..... *F. recta*

17a. Mature nuts white or pale brown, glumes obtuse with a conspicuous yellowish stripe on either side of the central nerve 18

b. Mature nuts brown or black, glumes acute, central nerve only conspicuous 20

18a. Glumes greater than 3 mm long, stems with fine stiff hairs, nut 0.9-1.4 mm long, somewhat flattened on back ..... *F. sp.* B

b. Glumes less than 3 mm long, stem scabrid, nut less than 0.9 mm long, somewhat rounded on back..... 19

19a. Nut sub-globular, glumes densely overlapping, spikelets obtuse, style only slightly twisted at maturity ..... *F. sphaecocephala*

b. Nut obovoid, constricted just below middle, glumes less dense, spikelet acute, style strongly twisted at maturity ..... *F. trigastrocarya*

20a. Fertile glumes mucronate, nerve tip extending well past glume margin, leaf sheaths with wide conspicuous hyaline margins, leaves scabrid on margins or smooth ..... 9. *F. simulans*

b. Fertile glumes acute, nerve tip not extending past glume margin, if leaf sheaths with wide conspicuous hyaline margins then leaves hairy 21

21a. Nut 3-lobed, sub-globular, foliage densely scabrid..... *F. leucocolea*

b. Nut not 3-lobed, flattened on back, foliage sparsely scabrid 22

22a. Glumes greater than 4.7 mm long, nut broadly ovate to cuneate, usually tuberculate, epidermal cells hexagonal or isodiametric..... *F. cardiocarpa*

b. Glumes less than 4.7 mm long, nut obovate, smooth, epidermal cells conspicuously transversely oblong in vertical rows on each face ..... *F. sp.* C

23a. Nut abruptly constricted above base, style either with hyaline margin or dense tuft of hairs in upper portion, spikelets generally greater than 5 mm wide 24

b. Nut gradually narrowed below, style glabrous or sparsely ciliate, spikelets less than 5 mm wide..... 25

24a. Nut about as wide as broad, style greater than 2.7 mm long, leaves equitant ..... 4. *F. carolinii*

b. Nut flattened, style less than 2.7 mm long, leaves not equitant ..... *F. pterygosperma*

25a. Glumes acute, usually greater than 3 mm long, lowest (empty) glume more than half as long as spikelet 26

b. Glumes obtuse, usually less than 3 mm long, lowest glume less than half the length of the spikelet 27

26a. Style 3-5 mm long, leaf sheaths disintegrating into fine reticulate (herring bone) fibres, glumes 1 nerved ..... *F. dictyocolea*

b. Style 1.5-3 mm long, leaf sheaths not as above, glumes obscurely several nerved ..... *F. pauciflora*

27a. Stamens 3, glumes greater than 2 mm long, perennial ..... *F. simplex*

b. Stamens 1(-2), glumes less than 2 mm long, annual ..... *F. modesta*

28a. Spikelets all, or majority, solitary 29

b. Spikelets all, or majority, clustered (in a composite head, or heads) 71

29a. Mature spikelets greater than 3.8 mm wide 30

b. Mature spikelets less than 3.8 mm wide 37

30a. Style glabrous, upper stems scabrid 31

b. Style hairy, upper stems glabrous or clothed with fine dense hairs 33

31a. Style less than 2.5 mm long, nut not tuberculate (its cells transversely lineolate), glumes less than 3.5 mm long ..... *F. clavata*

b. Style greater than 2.5 mm long, mature nut tuberculate, glumes greater than 3.5 mm long 32

32a. Glume fringes long-ciliolate, spikelets generally less than 4 per head, leaves smooth, sheaths without wide hyaline margins ..... 6. *F. dunlopii*

b. Glumes fringes shortly ciliolate or glabrous, spikelets generally more than 4 per head, leaves scabrid with wide hyaline margins ..... *F. neilsonii*

33a. Glume fringes ciliolate whole length, involucral bracts hairy 34

b. Glume fringes glabrous or ciliolate on upper margins, involucral bracts glabrous or with ciliate margins 35

34a. Glume with nerve continuing past tip which is usually reflexed, mature nut tuberculate, distinct ligule present ..... *F. corynocarpa*

b. Glume not mucronate, mature nut smooth or sparsely verruculose, distinct ligule absent ..... 7. *F. laxiglumis*

35a. Style greater than 3 mm long, winged above, glumes sharply acute ..... *F. insignis*

b. Style less than 3 mm long, not winged above, glumes obtuse 36

36a. Nut clavate, style less than 1.3 mm long, glumes glabrous ..... *F. solidifolia*

b. Nut rounded, style generally greater than 1.3 mm long, glumes minutely ciliolate on upper margins ..... *F. rara*

37a. Style glabrous 38

b. Style hairy (sometimes only at base) 57

38a. Style either less than 1 mm long or glumes less than 1.9 mm long, or both (*F. cymosa*, *F. littoralis* and *F. rupestris* are often intermediate and key both ways) 39

b. Style greater than 1 mm long, glumes greater than 1.9 mm long 46

39a. Perennial with stiff leaves ..... *F. cymosa*

b. Annuals with soft leaves 40

40a. Spikelets sub-globular, leaves equitant or spongy 41

b. Spikelets acute and ragged, leaves flat or absent 42

41a. Stamens 3, nut obovate, glume fringes ciliolate at apex ..... *F. rara*

b. Stamens 1-2, nut clavate, glume fringes glabrous ..... *F. littoralis*

42a. Inflorescence simple with less than 7 spikelets, nut epidermal cells isodiametric ..... 8. *F. rupestris*

b. Inflorescence compound with more than 7 spikelets, nut epidermal cells transversely linear 43

43a. Ligule present, nerves on leaves several, not raised or thickened ..... *F. microcarya*

b. Ligule absent, leaves with prominent mid-rib and rib-like margins 44

44a. Underside of leaves ciliate (especially in lower part), glume fringes ciliolate at apex 45

b. Underside of leaves glabrous, glumes glabrous ..... *F. miliacea*

45a. Fertile glumes mucronate with narrow hyaline margin, stems less than 1 mm wide ..... *F. elegans*

b. Fertile glumes obtuse with wide hyaline margins, stems more than 1 mm wide ..... *F. trachycarya*

46a. Perennials with stiff leaves 47

b. Annuals with soft leaves 50

47a. Ligule present, stems flattened 2-3 mm wide ..... *F. complanata*

b. Ligule absent, stems rounded or angled 48

48a. Glumes greater than 2.8 mm long, spikelets sub-distichous, greater than 2 mm wide ..... *F. eragrostis*

b. Glumes less than 2.8 mm long, spikelets spirally arranged, less than 2 mm wide 49

49a. Glumes with 0.4 mm long awn ..... *F. sp.* D

b. Glumes obtuse ..... *F. cymosa*

50a. Stems flattened, nut smooth but with deeply sculptured cells . ..... *F. micans*

b. Stems terete or angled, mature nuts tuberculate or ridged 51

51a. Nut with 7-10 coarse transverse ridges ..... *F. ammobia*

b. Nut without transverse ridges 52

52a. Style 3-4 mm long, glumes 4-5 mm long ..... *F. sp.* F

b. Style less than 3 mm long, glumes less than 3.5 mm long 53

53a. Fertile glumes sharply acute or awned, 2-3 mm long 54

b. Fertile glumes obtuse, muticate, generally less than 2.6 mm long 56

54a. Glumes ciliate on upper margin, nut epidermal cells transversely lineolate ..... *F.* sp. F

b. Glumes glabrous, nut cells not transversely lineolate 55

55a. Mature nut white or stramineous, less than 0.5 mm wide ..... 1. *F. arnhemenis*

b. Mature nut dark brown, greater than 0.5 mm wide ..... *F. subaristata*

56a. Glumes and spikelets obtuse, stems nerved ..... *F. rara*

b. Glumes and spikelets acute, stems deeply grooved ..... *F. phaeoleuca*

57a. Plants less than 20 cm tall,
inflorescence simple (spikelets less than 10) ..... 8. *F. rupestris*

b. Plants greater than 20 cm tall, inflorescence compound
(spikelets more than 10) 58

58a. Glumes less than 2.6 mm long, style less than 2 mm long..... 59

b. Glumes greater than 2.6 mm long,
style generally greater than 2 mm long (if less then glume awned) 66

59a. Nut maturing purplish-black, glume margins hairy, style base hairy 60

b. Mature nuts white or dark brown, other characters not combined 61

60a. Glumes acute, style twisted at maturity, glumes subdistichous ..... *F. furva*

b. Glumes with 2 obtuse lobes, style not twisted,
glumes spiral ..... *F. macassarensis*

61a. Glumes and spikelets obtuse, spikelets 2.5 mm wide ..... *F. rara*

b. Glumes and spikelets acute,
spikelets generally less than 2.5 mm wide 62

62a. Small annual, stamens 1 (2), glumes less than 1.6 mm long ..... *F. milacea*

b. Perrenials, stamens 3 (2), glumes generally greater than 1.6 mm long 63

63a. Rhizomatous or stoloniferous perennials, leaves narrow
(subterete) with long hairs on lower margins 64

b. Tufted perennials, leaves flattened or inrolled,
shortly scabrid on lower margins 65

64a. Style ciliate at base, glumes sub-distichous, rhizotomous plant ..... *F. cinnomometorum*

b. Style base glabrous, glumes spiral, stoloniferous plant ..... *F. vagans*

65a. Style with relatively long conspicuous hairs for most of its length, nut maturing white; desert plant ..... *F. eremophila*

b. Style shortly hairy above, nut maturing dark brown; coastal plant ..... *F. cymosa*

66a. Fertile glumes with 1-1.5 mm long scabrid awns, leafy annuals ..... *F. signata*

b. Fertile glumes not awned, perennials or leafy annuals 67

67a. Small annual with distichous basal spikelets, apical spikelets 1-5, glumes glabrous ..... *F. spiralis*

b. Perennials without basal spikelts, apical spikelets generally numerous, glumes glabrous or hairy 68

68a. Glumes ciliate on margins, nuts maturing black 69

b. Glumes glabrous or minutely ciliolate on margins (then style base glabrous), mature nuts stramineous or brown 70

69a. Style ciliate whole length, glumes less than 3.5 mm long, spikelets less than 1 cm long ..... *F. furva*

b. Style ciliate at base only, glumes greater than 3.5 mm long, spikelets generally greater than 1 cm long ..... *F. lanceolata*

70a. Leaves flat, glabrous, style winged or ciliate above, tufted plant ..... *F. insignis*

b. Leaves subterete, hairy on lower margins, style ciliate at base, glabrous above, rhizotomous plant ..... *F. cinnamometorum*

71a. Spikelets capitate 70

b. Spikelets not capitate (sometimes stunted *F. neilsonii* appearing capitate) 79

72a. Fertile spikelets 1 (-2) flowered, style greater than 2.8 mm long, nut with spongy attachment on stipe 73

b. Fertile spikelets 2-many flowered, style less than 2.3 mm long, nut without attachment on stipe 76

73a. Spikelets 4-many per head, fertile glumes less than 5 mm long 74

b. Spikelets 3 or less per head, fertile glumes greater than 5 mm long 75

74a. Glumes spiral, style 4 mm long or more, spikelets all erect or suberect ..... 5. *F. composita*

b. Glumes sub-distichous, style less than 4 mm long, outer spikelets becoming reflexed at maturity ..... *F. sp.* G

75a. Glumes sub-distichous, lowest glume subequal to spikelets, stems hairy ..... *F. arthrostyloides*

b. Glumes spiral, lowest glume about one third of length of spikelet, stems cilitate or glabrous ..... *F. sp.* H

76a. Underside of leaves and involucral bracts silky-hairy ..... *F. sericea*

b. Underside of leaves and bracts glabrous or ciliate on margins, or absent 77

77a. Fertile glumes sparsely gland-dotted, distinctly awned, nut pyriform to obovoid ..... *F. schultzii*

b. Fertile glumes densely gland-dotted, central nerve protruding only slightly past tip, nut sub-globular 78

78a. Style glabrous or sparsely and shortly ciliate at base, glumes lobed but somewhat acute, lowest glumes glabrous on central nerve ..... *F. cephalophora*

b. Style densely long ciliate at base, glume with 2 broad lobes at apex, ciliate on central nerve ..... *F. compacta*

79a. Leaves densely silky pubescent beneath, glumes pubescent ..... *F. sericea*

b. Leaves not densely silky pubescent beneath, glumes ciliate on margins only or glabrous..... 80

80a. Glumes greater than 2.2 mm long, ciliate on upper margins, mature nuts usually tuberculate 81

b. Glumes less than 2.2 mm long, glabrous, mature nut smooth or sparsely verruculose ..... *F. cymosa*

81a. Glumes greater than 3.5 mm long, style glabrous, leaves with wide hyaline margins ..... *F. neilsonii*

b. Glumes less than 3.5 mm long, style hairy, leaves (if present) without wide hyaline margins ..... *F. furva*

82a. Nut with transverse, wavy ridges, one spikelet per stem 83

b. Nut longitudinally striate, finely reticulate, smooth or tuberculate, spikelets usually more than one per stem 91

83a. Glumes hairy, or if glabrous, then rest of plant densely hairy 84

b. Plants glabrous 85

84a. Leaves hairy, nut broadly ellipsoid, upper glumes glabrous..... *F. pilifera*

b. Leaves scabrid on margins, otherwise glabrous, nut obovate, upper glumes with short fine hairs above..... *F. punctata*

85a. Majority of spikelets nodding 86

b. Majority of spikelets erect 87

86a. Leafless perennial, style greater than 2.6 mm long, usually greater than 0.4 mm wide, glumes greater than 3.3 mm long ..... *F. nutans*

b. Annuals, usually leafy, style less than 2.6 mm long, usually less than 0.4 mm wide, glumes less than 3.3 mm long ..... *F. sp.* I

87a. Glumes less than 2 mm long, rich red, nut ridges generally 3-4, style base ciliate ..... *F. nuda*

b. Glumes greater than 2 mm long, pale, nut ridges 4 or more, style base glabrous or ciliate 88

88a. Fertile glumes and spikelets broadly obtuse, nut narrowly and deeply furrowed, furrows generally 5, leaves conspicuous ..... *F. pallida*

b. Fertile glumes acute to somewhat obtuse, nut furrows broad and shallow, generally more than 5, leafless or leaves inconspicuous 89

89a. Fertile glumes less than 3.5 mm long ..... *F. sp.* J

b. Fertile glumes greater than 3.5 mm long 90

90a. Mature nut with distinct pale rounded rim at base, the remainder usually dark brown, lowest glume broadly obtuse, much shorter than the fertile glumes ..... *F. acuminata*

b. Mature nut without distinct white rounded rim at base, usually pale, lowest glume obtuse or acute only slightly shorter than the fertile glume ..... *F. acicularis*

91a. Leaves ligulate (sheaths and blades separated by a distinct fringe of short hairs or membranous projections) 92

b. Leave eligulate or plant leafless (irregularly spaced hairs may be present on upper leaf surface) 101

92a. Glumes hairy on back at least in apical part 93

b. Upper glumes glabrous on back (several lower glumes may have stiff white hairs on or near central nerve) 95

93a. Glumes less than 2.6 mm long, style less than 1.5 mm long, stamens 2 ..... *F. pubisquama*

b. Glumes greater than 2.6 mm long, style greater than 1.5 mm long, stamens usually three 94

94a. Glumes nearly as broad as long, style about 0.4 mm wide, involucral bracts usually longer than the inflorescence, nuts shortly stipitate ..... *F. sieberiana*

b. Glumes considerably longer than broad, style about 0.25 mm wide, involucral bracts shorter than the inflorescence, nut distinctly stipitate ..... *F. ferruginea*

95a. Nut distinctly longitudinally striate and transversely cancellate (lattice-like) 96

b. Nut smooth, finely reticulate or verrucose 98

96a. Spikelets less than 2 mm wide, glumes less than 2 mm long ..... *F. bisumbellata*

b. Spikelets greater than 2 mm wide, glumes greater than 2 mm long 97

97a. Perennial, style slender, longer than nut, leaves almost distichous ..... *F. dichotoma*

b. Annual, style equal or shorter than nut (including stipe), leaves spiral .... *F. depauperata*

98a. Glumes greater than 2 mm long, spikelets greater than 3 mm wide 99

b. Glumes less than 2 mm long, spikelets less than 3 mm wide 100

99a. Glumes greater than 4 mm long, style greater than 2 mm long, anthers greater than 1 mm long ..... *F. tristachya*

b. Glumes less than 4 mm long, style less than 2 mm long, anthers less than 1 mm long ..... *F. schoenoides*

100a. Spikelets 1-4 per inflorescence, leaves setaceous, glabrous ..... *F. polytrichoides*

b. Spikelets 5 or more per inflorescence, leaves flat with scabrid margins ..... *F. sp.* K

101a. Small annuals, style less than 1 mm long, glumes less than 2 mm long, stamen 1 (if style and/or glume longer, then style base with long hairs covering nut) 102

b. Perennials or large annuals, style either greater than 1 mm long or glumes greater than 2 mm long, stamens 1-3 106

102a. Fertile glumes obtuse, involucral bracts much shorter than inflorescence 103

b. Fertile glumes acute or mucronate, bracts longer than inflorescence 104

103a. Inflorescence a single terminal spikelet, upper glume fringes ciliate, style glabrous ..... *F. distincta*

b. Inflorescence with 1-12 spikelets, glumes glabrous, style minutely ciliate ..... *F. stenostachya*

104a. Style glabrous, nut ornamented with a row of clavate appendages ..... *F. dipsacea*

b. Style hairy at least at base, nut smooth 105

105a. Base of style with long hairs encompassing nut ..... *F. velata*

b. Base of style with short hairs ..... *F. aestivalis*

106a. Annual 25 cm or more tall, with broad spongy stems (1) 2.5 mm wide, style glabrous ..... *F. dolera*

b. Perennials or annuals less than 25 cm tall, stems stiff, style usually hairy 107

107a. Annual with single terminal spikelet, fertile glumes with an awn about 0.5 mm long ..... *F. adjuncta*

b. Perennials with 1- numerous spikelets, fertile glumes not awned 108

108a. Style base and glume surface ciliate, leaves silky hairy on underside ..... *F. sericea*

b. Style base and glume surface glabrous, leaves (if present) glabrous or nearly so 109

109a. Nut less than 0.5 mm long, black, style narrow, ciliate whole length, spikelets numerous ..... *F. caespitosa*

b. Nut greater than 0.5 mm long, white or brown, other characters not united 110

110a. Plants with numerous generally flat leaves, glumes less than twice as long as broad, spikelets predominately greater than 6 per inflorescence 111

b. Plants leafless or with few setaceous leaves, glumes generally twice as long as broad, spikelets predominately 1-6 per inflorescence 112

111a. Nut trabeculate (lattice-like), base of stem clothed with fibrous remains of old leaf sheaths; desert plant ..... *F. dichotoma* (desert form)

b. Nut not trabeculate, base of stem not clothed with old leaf sheaths; coastal plant ..... *F. cymosa*

112a. Spikelets squarrose, fertile glumes 3 mm long or more with mucro greater than 0.3 mm long, red gland-dotted ..... 2. *F. blakei*

b. Spikelets rounded, fertile glumes up to 3 mm long, obtuse or muticate, not red gland-dotted 113

113a. Stems distinctly flattened, nuts white, less than 0.6 mm broad, involucral bracts much shorter than spikelets; in non-saline soils ..... *F. denudata*

b. Stems rounded or somewhat flattened, nut pinkish brown or greyish, greater than 0.6 mm broad, bracts as long or slightly shorter than spikelets; in saline soils ..... *F. polytrichoides*

114a. Majority of inflorescences terminated by a single spikelet (occasional inflorescence with 2 or 3) 115

b. Inflorescences with 3 or more spikelets 122

115a. Nut distinctly winged, leaf sheaths with broad scarious margins which continue onto the lamina ..... *F. pachyptera*

b. Nut not winged (sometimes with 3 apical lobes), leaf sheath margins (if present) abruptly terminated 116

116a. Style greater than 8 mm long, fertile glume greater than 8 mm long 117

b. Style less than 8 mm long, fertile glume less than 8 mm long 118

117a. Nut (including stipe) 2-2.6 mm long with 1 mm long non-angular stipe ..... *F. odontocarpa*

b. Nut greater than 2.6 mm long, stipe short or ridged or absent ..... *F. squarrulosa*

118a. Leaves reduced to loose scarious scales, spikelets often more than one per inflorescence ..... *F. sp.* L (*brownii*)

b. Leaves with distinct lamina, 2 cm or more long, spikelets solitary 119

119a. Style less than 3 mm long, glume less than 4.5 mm long, basal spikelets present ..... *F. spiralis*

b. Style greater than 3 mm long, glumes greater than 4.5 mm long, basal spikelets absent 120

120a. Annual, leaves contributing less than a third of the bulk of the plant ..... *F. oxystachya*

b. Perennial, leaves contributing more than a third of the bulk of the plant 121

121a. Nut less than 2.5 mm long, glumes less than 6 mm long ..... *F. ovata*

b. Nut greater than 2.5 mm long, glumes greater than 6 mm long..... *F. macrantha*

122a. Leaves reduced to loose scarious scales 123

b. Leafy plants 125

123a. Spikelets capitate, fertile florets 1-(2) 124

b. Spikelets generally solitary, fertile florets numerous ..... *F. sp.* L (*brownii*)

124a. Stems scabrid, spikelets 3-6 per inflorescence, 6 mm long ..... *F. arthrostyloides*

b. Stems smooth, spikelets generally more than 6 per inflorescence, less than 6 mm long ..... *F. sp* G

125a. Glumes hairy on back, style 4-6 mm long..... *F. fusca*

b. Glumes glabrous, style less than 3.5 mm long 126

126a. Leaves with ligule, style hairy at base ..... *F. cinnamometorum*

b. Leaves without ligule, style glabrous at base 127

127a. Annual, leaves strongly falcate, nut abruptly truncate, conspicuously broader than the short but distinct stipe..... *F. fimbristyloides*

b. Perennial, leaves subfalcate, nut not truncate at base ..... *F. eragrostis*

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Acacia Miscellany 1. Some oligoneurous species of *Acacia* (Leguminosae: Mimosoideae: Section *Plurinerves*) from Western Australia

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Abstract

Cowan, R.S. & B.R. Maslin. *Acacia* Miscellany — 1. Some oligoneurous species of *Acacia* (Leguminosae: Mimosoideae: Section *Plurinerves*) from Western Australia. Nuytsia 7(2): 183-199 (1990). A key is presented to seven new Western Australian species of plurinerved wattles (*A. awestoniana*, *A. cassicula*, *A. consobrina*, *A. lanei*, *A. lobulata*, *A. spongolitica* and *A. verricula*), one new variety (*A. flavipila* var. *ovalis*) and to several other related and previously described species. The need for a new name (*A. lanuginophylla*) for *A. lanuginosa* C. Gardner is discussed and the identity of *A. glutinosa* F. Muell. is considered.

Introduction

The taxa of the *Acacia verricula* and *A. flavipila* alliances, some of which are treated herein, have few characteristics in common other than that many have resinous vegetative and/or flower parts and the flower-heads are borne in axillary racemes, although these are often very short. In addition, both groups of taxa have oligoneurous phyllode-nervature (for definition, see Maslin & Pedley (1988). Pedley (1987) used the term oligoneurous in a much more restricted sense than we are: we use it to refer informally to taxa characterized by phyllodes having only a few, distant longitudinal nerves with or without anastomosing minor nerves between them). These alliances are informal groupings, intended merely as mnemonic devices for ourselves and for potential users; however, the species in each grouping, or alliance, are probably genuinely related to one another. They are all treated in the following key but descriptions are provided only for the new taxa; these are numbered in the key and arranged alphabetically in the text.

This is the first of a series of papers, by one or more of the "Wattle Team" at PERTH; this and those following are intended to validate the names of new taxa and to present extended notes, new names, new combinations and redescriptions of previously described taxa, prior to the synoptic treatment of them in the "Flora of Australia". Measurements in the following descriptions are taken from dry material unless otherwise noted.

Key to taxa

1. Phyllodes four times or more longer than wide
   2. Phyllodes terete ..... 7. *A. lobulata*
   2. Phyllodes flat
      3. Flowers 4-merous ..... 8. *A. spongolitica*
      3. Flowers 5-merous
         4. Phyllodes obviously soft-pubescent
            5. Phyllodes and branchlets densely lanate, nervation of phyllodes ± obscured by pubescence ..... 6. *A. lanuginophylla*
            5. Phyllodes and branchlets villose but phyllode nervation not obscured
               6. Phyllodes more than 2.5 cm long and 3 mm wide; legumes 6-8 mm wide, strongly plicate ..... 3. *A. consobrina*
               6. Phyllodes less than 2.5 cm long and 3 mm wide; legumes 3-4 mm wide, straight, undulate or ± coiled, not at all plicate
                  7. Phyllodes linear-oblanceolate; flower heads not borne in racemes..*A. chrysopoda*
                  7. Phyllodes elliptic; flower heads in 1- or 2-headed racemes ..... 4a. *A. flavipila* var. *flavipila*
         4. Phyllodes glabrous or, especially when young, inconspicuously sub-glabrous
            8. Phyllodes 12-15 times as long as wide; at least base of peduncles and phyllode axils with hoary patch of resin-matted hairlets ..... 5. *A.lanei*
            8. Phyllodes less than 8 times as long as wide; base of peduncles and phyllode-axils not hoary
               9. Phyllodes with gland at blade/pulvinus junction; pubescence on young branchlets and phyllodes simple and stellate (100x); legumes constricted between seeds ..... *A. ixiophylla*
               9. Phyllodes with gland 2-12 mm above pulvinus; all pubescence simple
                  10. Racemes 2-headed; phyllodes narrowly elliptic; secondary-nerve reticulum fine, regular ..... 9. *A.verricula*
                  10. Racemes 1-headed or flower heads solitary, borne on an inflorescence axis or not; phyllodes of other shapes, the secondary-nerve reticulum coarse, indistinct, or poorly developed
11. Flower heads solitary, inflorescence axis absent; phyllodes oblong-oblanceolate to oblong-elliptic, secondary nerves impressed, coarsely reticulate ..... 2. *A. cassicula*
11. Flower heads solitary on an axis; phyllodes of other shapes, secondary nerves more or less raised, not obviously reticulate
    12. Phyllodes arcuate-oblong narrowly; peduncles with crisped white pubescence; branchlets and phyllodes not resinous ..... *A. kingiana*

12. Phyllodes oval, elliptic or oblong-elliptic, straight; peduncles with short, golden pubescence; branchlets and sometimes phyllodes resinous

13. Secondary nerves forming a regular, fine, but not always distinct, reticulum; racemes mostly 2-headed, rarely with one head ..... 9. *A. verricula*

13. Secondary nerves scarcely visible, not obviously reticulate ..... *A. loxophylla*

1. Phyllodes less than four times as long as wide

14. Phyllodes undulate, rounded, obviously mucronate abruptly

15. Phyllodes usually 2 cm long or longer; peduncles mostly 12-20 mm long; calyx lobes 3/4-united ..... 1. *A. awestoniana*

15. Phyllodes less than 2 cm long; peduncles less than 12 mm long; calyx lobes free ..... *A. dictyoneura*

14. Phyllodes not at all undulate, acute, obtuse or rounded-truncate, if mucronulate obscurely so

16. Racemes mostly 2-headed

17. Phyllodes elliptic to oblong-elliptic, usually obviously tomentulose, about 2-3 times longer than wide, not strongly resinous; bracteoles exserted in bud ..... 4a. *A. flavipila* var. *flavipila*

17. Phyllodes oval to elliptic, glabrous or at least obscurely subglabrous, mostly less than twice as long as wide, base as well as often veins strongly resinous-viscid; bracteoles not exserted ..... 4b. *A. flavipila* var. *ovalis*

16. Racemes 1-headed or heads solitary in phyllode axils

18. Flower heads solitary, inflorescence axis absent

19. Nervature of phyllodes ± obscured by dense, lanate pubescence ... *A. lanuginophylla*

19. Nervature of phyllodes clearly evident, secondary nerves impressed, reticulate ..... 2. *A. cassicula*

18. Flower heads solitary on an axis

20. Phyllodes less than three times longer than wide, oval, elliptic, or oblong-elliptic, straight; peduncles with short, golden pubescence; branchlets and sometimes phyllodes, densely resinous ..... *A. loxophylla*

20. Phyllodes three or more times longer than wide, narrowly arcuate-oblong; peduncles with crisped white pubescence; branchlets and phyllodes not resinous ..... *A. kingiana*

Descriptions

1. Acacia awestoniana Cowan & Maslin, sp. nov (Figure 1, A-C)

Frutex effusus 2.5-3 m altus, ad 4 m diametro, *cortice* truncorum prope basin cinereo, longitudinaliter fissurata, *ramulis* teretibus, glabris, plerumque ad nodos apicesque valde resinosis. *Stipulae* persistentes, plus minusve foliaceae, obliquo-ovatae, 2-2.5 mm longae, 1-1.5 mm latae, glabrae. *Phyllodia* obliquo-ovalia ad elliptica, complanata, ad apicem obtusa ad truncata et brevi-acuminata, ad basem rotundata sed inaequilateraliter attenuata, pulvino 1-2 mm longo, lamina 15-30 mm longa, 11-22 mm lata, coriacea, patentia, undulata, glabra, atro-viridia, 3-nervata per

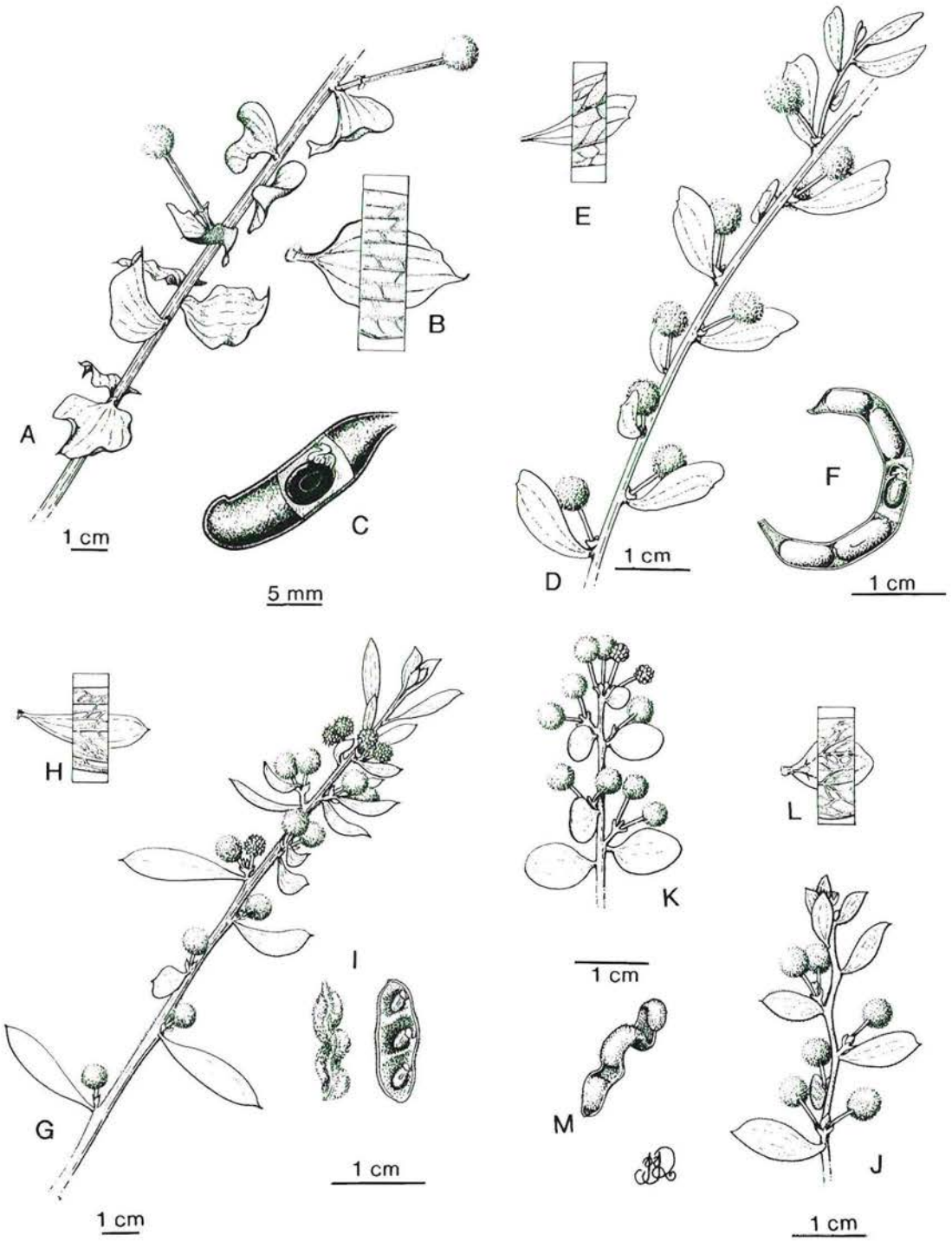

Figure 1. Flowering branchlet, enlarged portion of phyllode to show nervature and fruit of new taxa of *Acacia*. A-C - *A. awestoniana*. D-F - *A. cassicula*. G-I - *A. consobrina*. J - *A. flavipila* var. *flavipila*. K-M - *A. flavipila* var. *ovalis*. A-C drawn from *B.R. Maslin* 3745 (flowering branchlet) and *H. Steedman* s.n. (fruit); D-F from *K.R. Newbey* 488 (flowering branchlet) and *J. Kitcher* 5853 (fruit); G-I from *K.R. Newbey* 2441 (flowering branchlet) and *N. Stevens* KRN95111-1 (fruit); J from *R.J. Hnatiuk* 70397; K-M from *P. Roberts* 28 (flowering branchlet) and *B.R. Maslin* 522 (fruit).

superficiem, nervis salientibus, glande parva, basali. *Racemorum* axis 2-7 mm longus, resinosus, puberulus, 1-3-capitulatus, bracteis basalibus circa semicircularibus, plus minusve foliaceis, 1.5-2.5 mm longis, 1.5-2 mm latis, glabris. *Pedunculi* (6-)12-20 mm longi, glabri. *Capitula* globularia, aurea, 5-6 mm diametro, 54-60-floribus, bracteolis peltatis, lamina ovata, acuminata, breviore quam gracili stipite. *Flores* 5-meri. *Sepala* petalis 1/2-3/4 breviora, 3/4-connata, puberula. *Petala* oblanceolato-linearia, discreta, glabra. *Legumen* anguste oblongum, 10-22 mm longum, 3-5 mm latum, rectum, villosum, marginibus valde incrassatis. *Semina* obliqua, oblongo-elliptica, c. 4 mm longa, 3 mm lata, nitido-brunnea, pleurogramma magna, conspicua, arillo subapicali.

Typus: West side of Chester Pass Road at northern boundary of Stirling Range National Park, Western Australia, 15 Oct. 1974, *A. S. Weston* 9708 (holo: PERTH; iso: BRI, CANB, K).

Spreading *shrubs* 2.5-3 m tall, to 4 m diam. *Bark* longitudinally fissured at base of trunks, grey, red-brown on branchlets. *Branchlets* terete, glabrous, usually heavily resinous apically and at nodes. *Stipules* persistent, more or less foliaceous, obliquely ovate, 2-2.5 mm long, 1-1.5 mm wide, glabrous. *Phyllodes* obliquely oval to elliptic, apex obtuse to truncate and with a distinct, short-acuminate tip, base rounded but inequilaterally attenuate to 1-2 mm long pulvinus, blades 15-30 mm long, 11-22 mm wide, coriaceous, patent, often becoming deflexed in drying, undulate, glabrous, dark green, 3 or 4 distant, longitudinal, raised, main nerves on each face, openly anastomosing with salient secondary nerves. *Gland* small, situated on upper margin just above pulvinus. *Raceme axes* 2-7 mm long, resinous, puberulous, 1-3-headed. Peduncles (6-)12-20 mm long, glabrous; basal peduncular bract encircling base of peduncle, more or less foliaceous, 1.5-2.5 mm long, 1.5-2 mm wide, glabrous. *Flower-heads* globular, golden, 5-6 mm diam., 54-60-flowered. *Bracteoles* peltate, blade ovate, acuminate, shorter than slender claw. *Flowers* 5-merous. *Sepals* 1/2-3/4 length of petals, 3/4-united, puberulous externally. *Petals* oblanceolate-linear, free, glabrous. *Legumes* narrowly oblong, 10-22 mm long, 35 mm wide, straight, villose, margins strongly thickened. *Seeds* oblique (?), oblong-elliptic, c. 4 mm long, 3 mm wide, glossy brown; pleurogram large, conspicuous; *aril* subapical.

Distribution. South-west Western Australia in Eyre Botanical District (1:250,000 map I50-11). Endemic in Stirling Range National Park and apparently rare and confined to the northern boundary area.

Habitat. In Wandoo woodland or along watercourses.

Flowering and fruiting periods. Flowering October—November. A few valves with mature seeds collected in March and April.

Affinities. Most closely related to *A. dictyoneura* but easily distinguished by the much larger phyllodes with cuspidate apex, the larger stipules and bracts, longer peduncles, peltate bracteoles and connate sepals of *A. awestoniana* which is apparently a very rare species and is presently known in nature from only a few plants. Both species are in cultivation in Tasmania.

Conservation status. 2RC, using the criteria of Briggs & Leigh (1988).

Etymology. The new species is named in honor of Arthur S. Weston, collector of most of the material known of the species and a most enthusiastic and knowledgeable field botanist in Western Australia.

2. Acacia cassicula Cowan & Maslin, sp. nov. (Figure 1, D-F)

Frutex effusus 1-2.5 m altus, 1.5-4 m diametro, cortice aspri, cinerea, ramulis parce ad sparse puberulis vel pilosulosis, saepe ad apicem resinosis. *Stipulae* persistentes, subulatae ad subulato-triangulares, ad 1 mm longae, ciliolatae. *Phyllodia* oblonga ad elliptica, plus minusve inaequilateralia, ad apicem rotundata ad subtruncata et retusa, mucronulata ad rostrato-mucronulata,

ad basem acuta, pulvino 0.5-1 mm longo, glabro, lamina (12-)15-20(-22) mm longa, (4-)5-7(-8) mm lata, tenue coriacea, inclinata, recta, glabra vel rare ad marginem aliquot micro-pilis, 2-nervata per superficiem, nervis secondariis impressis, aperte reticulatis, glande conspicuo, annulari, latiore quam phyllodiorum crassitudine, 2-3 mm supra pulvinum. *Pedunculi* 3-5 mm longi, solitarii, glabri, bracteis basalibus persistentibus, late ovatis, 1.5 mm longis, glabris ciliolatis exceptis. *Capitula* globularia, 4 mm diametro, 22-30-floribus, bracteolis spathulatis, lamina late ovata, acuminata vel acuta. *Flores* 5-meri. *Sepala* petalis minus quam dimidia breviora, 1/2-3/4-connata, sericea. *Petala* anguste elliptica, discreta, glabra. *Ovarium* granulosum vel papillosum, aliquando ad apicem puberulum vel sericeum. *Legumen* linearis, inter semina depressum, 4-7 cm longum, 3-4 mm latum, chartaceum, plus minusve circinatum, glabrum, plerumque valde resinosum. *Semina* longitudinalia, oblonga, 4-5 mm longa, 2.5-3 mm lata, nitide atro-brunnea, pleurogramma angusta, c. 3 mm longa, arillo apicali.

Typus: 8 mi. [12.8 km] E of Gnowangerup, Western Australia, 23 Aug. 1964, *K.R. Newbey* 1302 (holo: PERTH; iso: CANB, K, MEL, PERTH).

Spreading *shrubs* 1-2.5 m tall, 1.5-4 m diam. *Bark* rough, grey. *Branchlets* sparingly to sparsely puberulous or pilosulose, often resinous apically. *Stipules* persistent, subulate to subulate-triangular, to 1 mm long, ciliolate. *Phyllodes* oblong to elliptic, more or less asymmetric, apex rounded to subtruncate and retuse, mucronulate to rostrate-mucronulate, base acute, pulvinus 0.5-1 mm long, glabrous, blades (12-)15-20(-22) mm long, (4-)5-7(-8) mm wide, thin-coriaceous, inclined, straight, glabrous or rarely few micro-hairs on margins, two longitudinal main nerves on each face distant, salient, secondary nerves impressed and openly reticulate. *Gland* conspicuous, annular, wider than phyllode thickness, situated on upper margin of phyllode 2-3 mm above pulvinus. *Peduncles* 3-5 mm long, solitary, glabrous; basal peduncular bracts persistent, broadly ovate, 1.5 mm long, glabrous except ciliolate. *Flower-heads* globular, 4 mm diam., 22-30-flowered. *Bracteoles* spathulate, blade broadly ovate, acuminate or acute. *Flowers* 5-merous. *Sepals* less than 1/2 length of petals, 1/2-3/4-united, sericeous externally. *Petals* narrow-elliptic, free, glabrous. *Ovary* granulose or papillose, sometimes puberulous or sericeous apically. *Legumes* linear, depressed between seeds, 4-7 cm long, 3-4 mm wide, chartaceous, in one or two coils, glabrous, usually strongly resinous. *Seeds* longitudinal, oblong, 4-5 mm long, 2.5-3 mm wide, glossy dark-brown; pleurogram narrowly U-shaped, c. 3 mm long; aril apical.

Specimens examined. WESTERN AUSTRALIA: Wagin, 10 Sept. 1955, *J. Graffin* s.n. (PERTH 00697192); 2 miles [3.2 km] E of Jerramungup, *K.R. Newbey* 488 (PERTH) and 488D (MEL, PERTH); 8 miles [12.8 km] E of Gnowangerup, *K.R. Newbey* 1302D (PERTH); 7 miles [11.2 km] NE of Ongerup, *K.R. Newbey* 3686 (PERTH); 4 km ENE of Jerramungup, *K.R. Newbey* 9535-1 (MELU, PERTH); 2.4 miles [3.8 km] E of Jerramungup on road to Ravensthorpe, *M.D. Tindale* 248 & *B.R. Maslin* (PERTH).

Distribution. South-west Western Australia in southern Avon and Roe Botanical Districts (1:250,000 maps I50-7, 8). Infrequent but locally common from Wagin ESE to Jerramungup.

Habitat. Found predominantly in *Eucalyptus occidentalis* woodland on sandy or granitic loam.

Flowering and fruiting periods. Flowers August—September; legumes with mature seeds collected in December.

Affinities. Related to *A. lanuginophylla* which is very distinct because of its densely lanate branchlets, phyllodes, peduncles, bracts, bracteoles and legumes. Both species have the same sort of annular phyllode-gland, stipules, solitary flower-heads, ovate bracteoles and broadly ovate bracts.

Conservation status. 3R, using the criteria of Briggs & Leigh (1988).

Etymology. The name is intended to call attention to the distinct secondary nerve reticulum in *A. cassicula* (a little net).

3. Acacia consobrina Cowan & Maslin, sp. nov. (Figure 1, G-I)

Frutex humilis 0.5-1.3 m altus, 2-3.5 m patens, ramulis plus minusve compressis, villosis, interdum appresso-pilosis, pilosis vel uncinato-pilosis. *Stipulae* persistentes, 1.5-4 mm longae, triangulares ad subulatae, villosae vel solum ciliolatae. *Phyllodia* anguste oblanceolata vel oblongo-oblanceolata, complanata, plerumque rotundato-obtusa et excentrice mucronulata, pulvino 0.5-1.5 mm longo, villoso, lamina 27-38 mm longa, 4-9 mm lata, coriacea, inclinata ad patenti, parce falcata vel recta, plerumque villosa sed aliquando uncinato-pilosa vel suberecte villosa, 3- vel 4-nervata per superficiem, nervis secondariis plus minusve parallelis, anastomosantibus, glande inconspicua, usque 5 mm supra pulvinam. *Racemorum* axes ad 4.5 mm sub anthesi, rare apparenter deficiens, pilosulosi, bracteis basalibus ovatis, acutis ad acuminatis, 1.5-4 mm longis, plus minusve villosulosis. *Pedunculi* binati, 2-6 mm longi, rare ad 10 mm longi, puberuli ad pilosi, interdum pilis appressis. *Capitula* globularia, 4-6 mm diametro, (27)-36-47-floribus, bracteolis ovatis ad lanceolatis, acutis ad acuminatis, stipitatis, ciliatis. *Flores* 5-meri. *Sepala* petalis plus minusve 1/4-1/2 breviora, discreta ad 1/3-connata, ligulata vel oblanceolato-ligulata. *Petala* angusto-elliptica, discreta. *Ovarium* granulosum vel ad apicem papillatum ad appresso-puberulum saltem. *Legumen* oblongum, supra semines valde elevatum, 12-30 mm longum, 6-8 mm latum, inter semines valde plicatum, tenuiter coriaceum, villosum vel pilosum. *Semina* obliqua, lato-ovata vel rotundato ad oblongo-ovalia, 2.5-3 mm longa, 2-2.5 mm lata, nitide atro-brunnea, pleurogramma distincta, circa 1.5 mm longa, arillo subapicali.

Typus: 15 miles [24 km] N of Ongerup, Western Australia, 21 June 1964, *K.R. Newbey* 395 D (holo: PERTH; iso: BRI, CANB, K, NSW, NY).

Low, spreading *shrubs* 0.5-1.3 m tall, spreading 2-3.5 m. *Branchlets* ± compressed, villose, occasionally appressed-pilose, pilose or uncinate-pilose. *Stipules* persistent, 1.5-4 mm long, triangular to subulate, villose or at least ciliolate. *Phyllodes* narrowly oblanceolate or oblong-oblanceolate, apex generally rounded and excentrically mucronulate, pulvinus 0.5-1.5 mm long, villose, blades 27-38 mm long, 4-9 mm wide, coriaceous, inclined to patent, slightly falcate or straight, usually villose but sometimes uncinate-pilose or subappressed pilose, each face with 3 or 4 distant, longitudinal main nerves, secondary nerves nearly as prominent, forming many anastomoses more or less parallel to main nerves. *Gland* inconspicuous, situated on upper margin of phyllode to 5 mm above pulvinus. *Racemes* axillary, (1-)2-headed, axes to 4.5 mm long at anthesis, rarely apparently lacking, pilosulose; basal peduncular bract ovate, acute to acuminate, 1.5-4 mm long, more or less villosulose. *Peduncles* 2-6 mm long, rarely to 10 mm, puberulous to pilose, occasionally hairs appressed. *Flower-heads* globular, 4-6 mm diam., (27-)36-47-flowered. *Bracteoles* ovate to lanceolate, acute to acuminate, stipitate, ciliate. *Flowers* 5-merous. *Sepals* 1/2-3/4 length of petals, free to 1/3-united, ligulate or oblanceolate-ligulate. *Petals* narrowly elliptic, free. *Ovary* granulose, papillate or appressed puberulous, at least apically. *Legumes* oblong, 12-30 mm long, 6-8 mm wide, strongly plicate, folded between seeds, thin-coriaceous, villose or pilose. *Seeds* oblique, broadly ovate or round to oblong-oval, 2.5-3 mm long, 2-2.5 mm wide, glossy dark brown, pleurogram U-shaped, c. 1.5 mm long; aril subapical.

Selected specimens examined. WESTERN AUSTRALIA: on Borden water-catchment just S of Borden townsite, 34° 05' S, 118° 15' E, *K. Bradby* 44 (PERTH); Swan River Colony, *J. Drummond* 5:13 (PERTH); 12 km S of Highway 1 on Monkey Rock Road, E of Jerramungup, *G. Craig* 1671 (CANB, K, PERTH); 6 miles [9.6 km] N of Nyabing, *V.F. McDougall* 1 (PERTH); 15 miles [24 km] N of Ongerup, *K.R. Newbey* 395 (PERTH) and 395D (frt) (CANB, PERTH); 1 mile [1.6 km] E of Lake Grace, *K.R. Newbey* 1760 (B, BM, G, MO, PERTH); 29 miles [46.6 km] SE of Ongerup, *K.R. Newbey* 3382 (AD, BRI, PERTH, W); 1.6 km N of Chillilup Pool, Pallinup River, *K.R. Newbey* 3389 (CANB, K, MEL, PERTH); Kalgarin [Karlgarin], April 1968, *H.G. Rae* s.n. (PERTH 00185752); Nembudding district, *E.M. Williams* (PERTH 931829).

Distribution. South-west Western Australia, predominantly in Roe Botanical District but extending into adjacent Avon and Eyre Botanical Districts (1:250,000 maps H50-15; I50-4, 7, 8, 11, 12). Most collections are from the Gnowangerup--Jerramungup--Chillilup Pool area with a few occurrences as far north as Karlgarin near Hyden. Although we do not have a representative collection from Gnowangerup, *K.R. Newbey* (pers. comm., 31 Aug. 1987) reports it as growing there. There is an outlying population, represented by E.M. Williams (PERTH 931829), in the Nembudding area about 200 km NNW of the main distribution.

Habitat. Growing in *Eucalyptus loxophleba* or *E. occidentalis* low woodland or *E. redunca* open shrub mallee in clayey sand to red clay-loam. It is to be expected on lower valley slopes, colluvial flats on sandplain or dolerite dikes in red crumbly soils (pers. comm., K.R. Newbey 31 Aug. 1987).

Flowering and fruiting periods. Flowers late May to September. Legumes with mature seeds collected November and December.

Affinities. Acacia consobrina is rather similar to *A. flavipila*, differing in proportions of the phyllodes and their nervature in particular, but also in the number of flowers per head, and in the fruit size and shape. At least superficially, it also resembles *A. ixiophylla* which has both stellate and simple hairs on many parts, basal phyllode-glands, and linear, undulate fruits. The oblique orientation of the seeds in the pods is unlike any of the related species which all have longitudinally oriented seeds. *A. consobrina* appears to be relatively long-lived, perhaps up to 20-25 years according to K.R. Newbey (pers. comm., 31 Aug. 1987).

Conservation status. 2R, using the criteria of Briggs & Leigh (1988).

Etymology. The name has been chosen to indicate relatedness but distantly, i.e., cousins rather than siblings.

4. Acacia flavipila A.S. George, Western Austral. Naturalist 10(2): 32 (1966) (as "*Acacia flavopila*").

Based on *A. aurea* C. Gardner, J. & Proc. Roy. Soc. Western Australia 27: 174 (1942). *Type:* Stirling district, near Gnarming, Aug. 1925, *W.E. Blackall* (holo: PERTH 00741523); non Noronha ex Hoeven & de Vriese, Tijdschr. Natuurk. Gesch. 11: 128 (1939).

Spreading *shrubs* 0.5-2 m tall. *Branchlets* crispate-villose to puberulous or appressed-puberulous. *Stipules* persistent, elongate-triangular, c. 1 mm long, glabrous. *Phyllodes* elliptic to oval, mostly somewhat inequilateral, rounded to obtuse, micro-mucronulate, sometimes emarginate, pulvinus 0.25-0.5 mm long, crispate-puberulous, blades 10-22 mm long, 5-9 mm wide, rigid-coriaceous, patent, straight, crispate-villosulose to glabrous, dull green, 2- or 3-nerved on each face, main longitudinal nerves scarcely distinguishable from smaller nerves, forming an impressed reticulum. Gland situated on upper margin of phyllode 1-5 mm above pulvinus. *Raceme axes* 2-7 mm long, (1-)2-headed, golden pilosulose to sericeous; basal peduncular bracts ovate, 1-1.5 mm long, glabrous. *Peduncles* 3-6 mm long, golden pilosulose to sericeous. *Flower-heads* globular, golden, 28-35-flowered; bracteoles quadrate-ovate, ovate or lanceolate, exserted or not in bud. *Flowers* 5-merous. *Sepals* free, linear-oblanceolate, externally golden puberulous. *Petals* free, oblanceolate, apically golden puberulous externally. *Legumes* linear, 15-30 mm long, 3-4 mm wide, undulate, villose. *Seeds* not seen.

Distribution. South-west Western Australia in Avon and Roe Botanical Districts (1:250,000 maps H50-11, 15, 16; I50-3, 4; I51-5). Scattered from near Cadoux SE to near Dunn Swamp (c. 80 km NE of Ravensthorpe) but mostly found between Quairading and Hyden.

Affinities. This species and *A. chrysopoda* are similar in their habit, globular flower-heads, the number of flowers per head, and in floral details. They differ strongly in form of the phyllodia,

inflorescence form, and flower-head size. *A. flavipila* is also related, less closely, to *A. consobrina*, *A. cassicula*, *A. lanuginophylla*, *A. kingiana* and *A. loxophylla*. The two varieties differ in the relative proportions of the phyllodes, presence or absence of resin on the phyllodes and in details of the bracteoles.

Orthography. The original spelling of the specific epithet ("*flavopila*") has been corrected in accordance with Art. 73.8 and Rec. 73G of the International Code of Botanical Nomenclature (1988).

4a. **A. flavipila** var. **flavipila** (Figure 1, J)

Shrubs, not obviously resinous. *Phyllodes* elliptic to oblong-elliptic, mostly (10-)15-22 mm long, (4-)5-8 mm wide, 2-3 times as long as wide. *Bracteoles* ovate to lanceolate, long-stipitate, exserted in buds.

Other specimens examined. WESTERN AUSTRALIA: Westonia, 15 Feb. 1953, *S.C. Bennett* s.n. (PERTH 00698490); 37.75 km SW of Peak Eleanora, 33° 11' 27" S, 120° 52' 29" E, *M.A. Burgman* 1931 & *S. McNee* (PERTH); 2 km E of Kulin, 32° 40' S, 118° 10' E, *R.J. Hnatiuk* 770397 (PERTH); Holt Rock, May 1963, *J.S. Lamont* s.n. (PERTH 00661902); Emu Rock, *B.R. Maslin* 560 (MEL, NY, PERTH); Reserve 27584, 14 km NE of Merredin, *B.G. Muir* 817 (PERTH); 2 miles [3.2 km] SW of Kulin, *K.R. Newbey* 2608 (MO, PERTH); 5 miles [8 km] E of Kulin, *K.R. Newbey* 3222 (CANB, K, NY, PERTH); 15 km E of Dunn Swamp, c. 80 km NE of Ravensthorpe, *K.R. Newbey* 8131 (PERTH); Kulin, 12 May 1953, *J.B. Wilson* s.n. (PERTH 00698594).

Distribution. South-west Western Australia in Avon and Roe Botanical Districts (1:250,000 maps H50-15, 16; I50-3, 4; I51-5). Infrequent and known only from near Merredin, Kulin, Dunn Swamp, Holt Rock and Emu Rock, but locally common in the Kulin area.

Habitat. On poorly to well-drained clay-loam or brown sand.

Flowering and fruiting periods. Flowering July—August. Only one attached fruit-valve seen, on a February collection.

Conservation status. 3RC, using the criteria of Briggs & Leigh (1988).

5b. A. flavipila var. **ovalis** Cowan & Maslin, var. nov. (Figure 1, K-M)

A. var. *flavipila* phyllodiis brevioribus ad basem phyllodiorum et racemorum distincte resinosis, bracteolis quadrato-ovatis brevi-stipitatis in alabastro non exsertis differt.

Typus: c. 20 miles [32 km.] NW of Kondinin, Western Australia, 29 June 1970, *A.S. George* 9873 (holo: PERTH 00741523; iso: MEL, TLF).

Shrubs with phyllode bases, branchlet apices and inflorescences obviously resinous. *Phyllodes* oval to elliptic, mostly 10-14 mm long, 6-9 mm wide, less than twice as long as wide. *Bracteoles* quadrate-ovate with short stipe, not exserted in bud.

Other specimens examined. WESTERN AUSTRALIA: 2.5 miles [4 km] from Cadoux towards Kalannie, *R.J. Cumming* 1867 (CANB, PERTH); ± 23 miles [37 km] NW of Kondinin, *A.S. George* 9872 (CNRS-Montpellier, K, MEL, PERTH, TLF); Sorenson' Nature Reserve, 9 km W of Babakin on S side of Bee's Road, *S.D. Hopper* 5864 (MEL, PERTH); 3 miles [4.8 km] E of Corrigin on road to Bendering, *B.R. Maslin* 506 (K, PERTH); 2 miles [3.2 km] S of Gnarming on road to Kulin, *B.R. Maslin* 522 (BRI, PERTH); 15 miles [24 km] N of Bulyee, *K.R. Newbey* 3425 (PERTH); 64 km SSW of Marvel Loch, *K.R. Newbey* 8431 (PERTH); 62 km SSW of Marvel Loch, *K.R. Newbey*

8432 (PERTH); between Kokardine and Cadoux on roadside, *P. Roberts* 28 (PERTH); roadside halfway between Cadoux and Kokardine, *B.H. Smith* 218 (PERTH); 153[243] mile peg on Hyden Road [13 km SE of Corrigin on main road to Kondinin], *D. Young* 109 (PERTH).

Distribution. South-west Western Australia in Avon and Roe Botanical Districts (1:250, 000 maps H50-11, 16; I50-3, 4). Confined to an area bounded by Quairading E to near Gibb Rock and S to Kulin. One population occurs between Cadoux and Kokardine, c. 150 km N of Quairading, outside the main distribution.

Habitat. Well-drained sand or more often clay-loam on open undulating terrain.

Flowering and fruiting periods. Flowers May—September; only old fruit-valves seen.

Conservation status. 3RC, using the criteria of Briggs & Leigh(1988).

5. Acacia lanei Cowan & Maslin, sp. nov. (Figure 2, D-F)

Frutex effusus 2 m altus, ramulis teretibus, resinoso-costatis, albo-sericeis. *Stipulae* caducae vel per resinam albam obscurae, triangulares, c. 1 mm longae, glabrae. *Phyllodia* ligulata, complanata, obtuse-acuta, pulvino 1-1.5 mm longo, 43-60 mm longa, 3-5 mm lata, coriacea, ascendentia, recta vel leviter curvata, glabra albo-sericea et resinosa ad basem excepta, 3-nervata per superficiem, nervis secondariis paucis, glande parve, prope basem. *Racemorum* axis 1-3 mm longus, rare ad 7 mm longus, saepe nullus, 1- vel 2-capitulatus, albo-sericeus, resinosus ad basem; bracteis basalibus ovatis ad lanceolatis, c. 1 mm longis. *Pedunculi* 3-5 mm longi, micro-puberuli, pilis rubris et albo-sericeis sed versus apicem pilis per resinam obscuris. *Capitula* globularia, 4-6 mm diametro, 34-38-floribus. *Flores* 5-meri. *Sepala* c. dimidia quam longa petala, linearia, discreta, micro-puberula ad apicem. *Petala* oblanceolato-elliptica, discreta, glabra. *Legumen* arcuato-lineare, 8.5-12 cm longum, 2-3 mm latum, supra semina elevatum, glabrum, viscidum. *Semina* longitudinalia, oblonga, 3.5-4.5 mm longa, 1.5-2 mm lata, nitido-brunnea, pleurogramma 2.5-3 mm longa, arillo apicali.

Typus: 3.6 miles [5.7 km] E of Hyden on road to Holt Rock, Western Australia, 14 July 1970, *B.R. Maslin* 566 (holo: PERTH; iso: BRI, K).

Spreading *shrubs* 2 m tall. *Branchlets* terete with several resinous ridges, white sericeous but pubescence ± obscured by resin. *Stipules* caducous or obscured by white(dry) resin, triangular, about 1 mm long, glabrous. *Phyllodes* ligulate, bluntly acute, with a pulvinus 1-1.5 mm long, the blades 43-60 mm long, 3-5 mm wide, coriaceous, ascending, straight or weakly curved, glabrous except white-sericeous and resinous at base, with 2 or 3 distant, longitudinal main nerves on each face, secondary nerves numerous, finer than main nerves and parallel to them, anastomoses few, nearly longitudinal. Gland small, situated on the upper margin of phyllode just above pulvinus. *Raceme axes* 1-3 mm long, rarely to 7 mm, frequently absent, 1- or 2-headed, white-sericeous and resinous basally; basal peduncular bracts ovate to lanceolate, c. 1 mm long. *Peduncles* 3-5 mm long, with many red micro-hairs and white-sericeous basally, upper portion sericeous but hairs ± obscured by resin. *Flower-heads* globular, 4-6 mm diam., 34-38-flowered. *Bracteoles* spathulate, blade rounded, much shorter than filiform stipe. *Flowers* 5-merous. *Sepals* half as long as petals, linear, free, micro-puberulous apically. *Petals* oblanceolate-elliptic, free, glabrous. *Legumes* arcuate-linear, 8.5-12 cm long, 2-3 mm wide, raised over seeds, glabrous, viscid. *Seeds* longitudinal, oblong, 3.5-4.5 mm long, 1.5-2 mm wide, shining, brown; pleurogram 2.5-3 mm long; aril apical.

Other specimens examined. WESTERN AUSTRALIA: R.J. Lane's property, Kulin, 22 km S of Hyden, 21 Aug. 1985, *K. Atkins* s.n. (CANB, MEL, NSW, NY, PERTH 00336971); Hyden, July 1979, *R.J. Lane* s.n. (PERTH 00336963); approx. 12 km S of Hyden, 27 July 1982, *R.J. Lane* s.n.

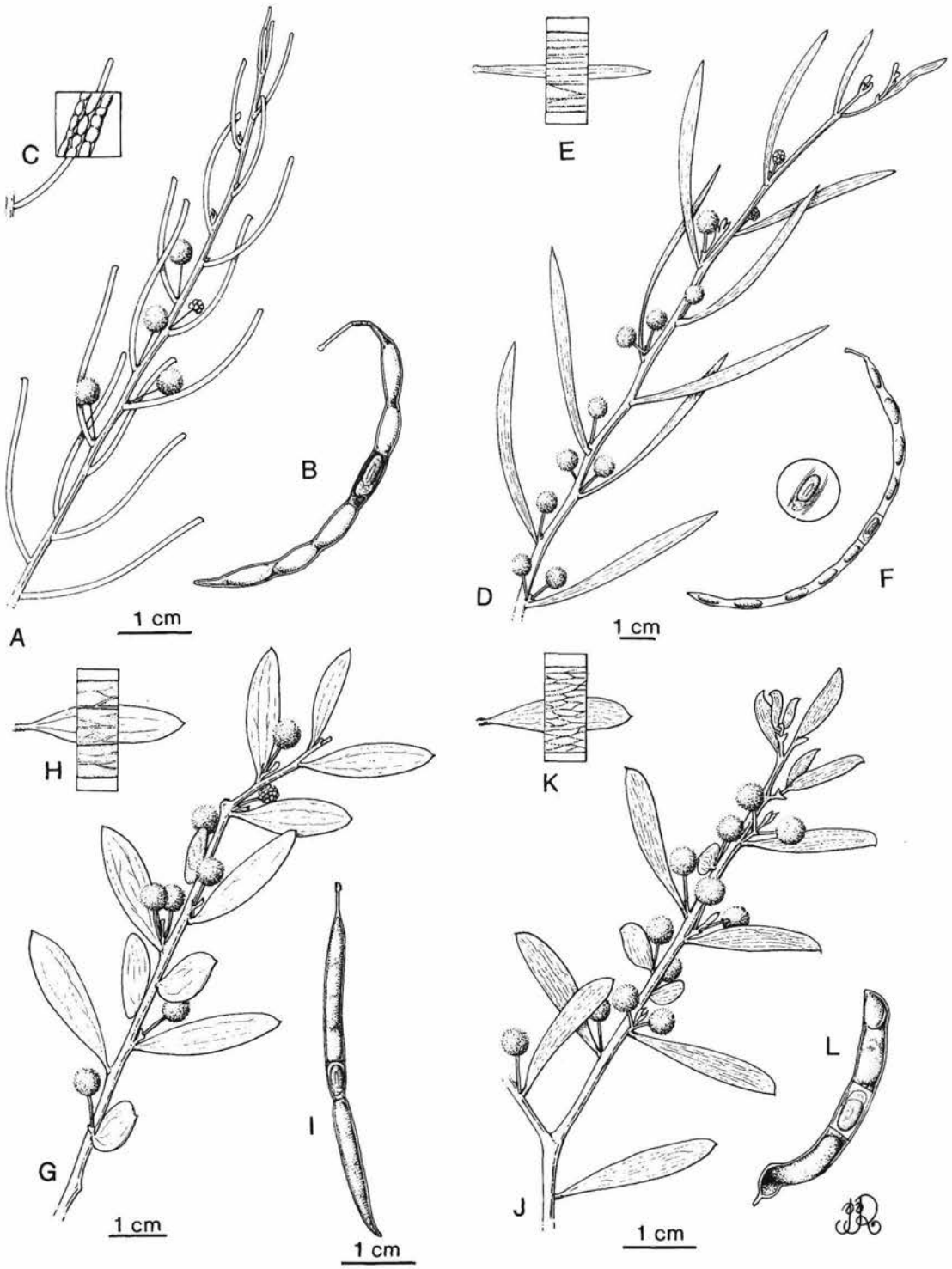

Figure 2. Flowering branchlet, enlarged portion of phyllode to show nervature and fruit of new species of *Acacia*. A-C - *A. lobulata*. D-F - *A. lanei*. G--I - *A. spongolitica*. J-L - *A. verricula*. A-C drawn from *S.D. Hopper* 6402 (flowering branchlet) and *J. Brown* 59 (fruit); D-F from *R.J. Lane* s.n.; G-I from *N. Stevens* KRN 9507-1; and J-L from *P. Pullen* 10050 (fruit) and *B.R. Maslin* 1771 (flowering branchlet).

(PERTH 00336947); Hyden, 1979, *R.J. Lane* s.n. (PERTH 00336955); near Hyden, 18 July 1988, *R.J. Lane* s.n. (AD, G, K, MO, PERTH 00884847).

Distribution. South-west Western Australia in Roe Botanical District (1:250,000 map I50-2, 4). Restricted to area south and east of Hyden within a 25 km radius.

Habitat. Growing in association with Salmon Gum (*Eucalyptus salmonophloia*) or York Gum (*E. loxophleba*) along creek and drainage lines at lower elevations on red or brown clay, clay-loam or gravelly loam (R.J. Lane, pers. comm., 28 Aug. 1987).

Flowering and fruiting periods. Flowering mainly in July—August, sometimes September or as early as mid-July (R.J. Lane, pers. comm., 28 Aug. 1987 and 18 July 1988). Fruiting mid-November to mid-December (R.J. Lane, pers. comm., 28 Aug. 1987).

Affinities. Closely allied to several species in the *A. ixiophylla* alliance; it differs from *A. ixiophylla* in having longer, strap-like phyllodes, all simple pubescence, and longer, glabrous legumes. *A. lanei* can be distinguished most readily from all related species (of which *A. spongolitica* is perhaps the closest) by the white patch at each node, at the base of the phyllodes, in the axils and at the base of the peduncles.

Conservation status. 2E[K], using the criteria of Briggs & Leigh (1988).

Etymology. Named for Richard J. Lane, the Western Australian farmer who called our attention to the plant in July 1986 as an excellent windbreak because it is vigorous in growth and is not browsed by livestock.

6. Acacia lanuginophylla Cowan & Maslin, nom. nov.

Based on *A. lanuginosa* C. Gardner, Hooker's Icon. Pl., pl. 3379 (1939) non Hort. ex Regel, Gartenflora 3: 155 (1854).

Type: Mount Holland, between Southern Cross and Ravensthorpe, Western Australia, Sept. 1929, *C.A. Gardner* 2046a (holo: PERTH; iso: BRI, CANB, K, MEL, MO, NSW).

Illustration. C. Gardner, loc. cit.

Affinities. A very distinctive Western Australian species related to *A. flavipila* and to *A. cassicula*, characterized by woolly vegetative parts, bracts, bracteoles and legumes.

Conservation status. 3E, using the criteria of Briggs & Leigh (1988).

7. Acacia lobulata Cowan & Maslin, sp. nov. (Figure 2, A-C)

Frutex apertus erectus 1-2 m altus, cortice laevi, ramulis leviter angulatis, plus minusve tuberculatis, glabris, resinosis. *Phyllodia* teretia, apice valde excentrice curvato, acuto, (15-)25-30(-35) mm longa, 0.7-0.8 mm diametro, incurvata, glabra, griseo-viridia, dictyophlebia, areolis salientibus, nervis atratis, impressis, resinosis, glande circulari, 0.5-2 mm supra pulvinum. *Pedunculi* (2.5-)3-4.5(-6) mm longi, solitarii, rare binati, puberuli; capitula globularia, 3.5-4.5 mm diametro, 15-17-floribus, bracteolis spathulatis, lamina ovata ad lanceolata. *Flores* 5-meri. *Sepala* petalis plus minusve dimidia breviora, 1/3-1/2-connata, oblonga. *Petala* anguste elliptica, c. 2-plo longiora quam sepala, discreta. *Ovarium* dense albo-pilosum. *Legumen* lineare, 40-60 mm longum, 3-4 mm latum, tenuiter chartaceum, valde curvatum, glabrum, resinosum. Semina longitudinalia, oblonga, compressa, 4-5.5 mm longa, 1.8-2.3 mm lata, hebetate atro-brunnea, arillo apicali.

Typus: Chiddarcooping Nature Reserve, Western Australia, 23 July 1989, *B.R. Maslin* 6385 (holo: PERTH; iso: AD, BRI, CANB, K, MEL, NSW, NY, US, Z).

Erect, open, often spindly *shrubs* 1-2 m tall. *Bark* smooth. *Branchlets* slightly angled, ± tuberculate, glabrous, resinous. *Stipules* not seen, apparently absent. *Phyllodes* terete with strongly, excentrically curved, acute tips and a 0.5 mm long pulvinus, (1-5)25-30(-35) mm long, 0.7-0.8 mm diam., ascending, incurved, glabrous, dull, grey-green; nerves resinous, impressed, forming a coarse, regular reticulum, areoles raised markedly. *Gland* circular, brownish, depressed in centre, situated on upper surface of phyllode 0.5-2 mm above pulvinus. *Peduncles* (2.5-)3-4.5(-6) mm long, solitary, occasionally in pairs, puberulous; basal peduncular bracts ovate, slightly concave, acute. *Flower-heads* globular, 3.5-4.5 mm diam., 15-17-flowered. *Bracteoles* spathulate to obovate-spathulate, blade ovate to lanceolate, puberulous, ciliolate. *Flowers* 5-merous. *Sepals* less than half to about half as long as petals, 1/3-1/2-united, oblong, ciliolate. *Petals* narrowly elliptic, acute, free, glabrous. *Ovary* densely white pilose. *Legumes* linear, raised over but not constricted between seeds, 40-60 mm long, 3-4 mm wide, thin-chartaceous, strongly curved, smooth, glabrous, resinous. *Seeds* longitudinal, oblong, compressed, 4-5.5 mm long, 1.8-2.3 mm wide, dull dark-brown; pleurogram narrowly oblong, 2/3 seed length; aril membranous, apical, more than half as long as seed.

Other specimens examined. WESTERN AUSTRALIA: Chiddarcooping Nature Reserve, *J. Brown* JBr59 *& A. Williams* (CANB, G, K, MEL, NSW, NY, PERTH), *S.D. Hopper* 6395, 6396, 6397, 6398, 6399, 6400, 6401, 6402, 6403, 6404 and 6417 (all PERTH), *A.S. Weston* 14262 (AD, BRI, PERTH), 14547 (AD, BRI, PERTH).

Distribution. South-west Western Australia in the north eastern part of the Avon Botanical District (1: 250 000 map H50-12). Known only from Chiddarcooping Nature Reserve.

Habitat. Common on gritty loam and sand on gradual slopes in woodland and low scrub in association with *Eucalyptus* spp., *Melaleuca* spp. and *Oxylobium parviflorum.* Also occurs occasionally in clayey soils in woodland dominated by *E. wandoo.*

Flowering and fruiting periods. Flowering specimens have been collected in July; specimens with mature legumes have been collected in November.

Affinities. Acacia lobulata is the only species of *Acacia* in Australia which has terete phyllodes with reticulate nervature. It is most closely related to *A. verricula* which has flat, reticulate-nerved phyllodes. From it the new species differs, in addition to phyllode form, in having solitary flower heads without any evidence of a relictual axis, fewer flowers per head, and partially united calyx but quite similar fruits, seeds and basal peduncular bracts.

Morphology. The most notable characteristic of *A. lobulata* is the impressed net-nervature of the phyllodes with the areoles raised, giving the phyllodes a regular cobblestone appearance or, perhaps better, the appearance of a slender sausage in a too-small net. The nerves are all of about the same degree of distinctness and there are no midnerves or laterals as is often seen in the *Plurinerves.*

Conservation status. 2RC[K] using the criteria of Briggs & Leigh (1988).

Etymology. The name is chosen to call attention to the most striking feature of the new species, the surface of the phyllodes.

8. Acacia spongolitica Cowan & Maslin, sp. nov. (Figure 2, G-I)

Frutex 1-2 m altus, cortice cinereo, ramulis versus apicem compressis, resinosis, saepe plus minusve minute glanduloso-puberulis. *Stipulae* caducae, anguste triangulares, circa 0.25 mm longae. *Phyllodia* lineari- ad oblongo-elliptica, complanata, obtusa ad acuta, apiculata, pulvino

1-1.5 mm longo, lamina 28-70(-80) mm longa, 4-7(-11) mm lata, coriacea, patentia, recta, glabra, hebetato-viridia, 2-nervata principalia per superficiem, nervis marginalibus interdum resinosis projecturis ornatis, glande usque ad 2 mm supra pulvinum, latiora quam phyllodiorum crassitudine. *Racemorum axis* 1-7 mm longus, 1- vel 2-capitulatus, bracteis basalibus c. ovatis, acutis, usque ad 1 mm longa. *Pedunculi* 5-9(-14) mm longi, glabri vel disperse glanduloso-micro-pilis, graciles. *Capitula* globularia vel brevi-oblongoidea, vivide atro-aurea, 4(-5) mm diametro, (24-)28-32-floribus, bracteolis lineari-oblanceolatis. *Flores* 4-meri. *Sepala* petalis dimidia breviora, 1/3-3/4-connata, glanduloso-ciliolata. *Petala* elliptica vel elliptico-oblanceolata, discreta. *Ovarium* granulosum. *Legumen* (submaturum) lineare, plus minusve inter semina constrictum, 50-65 mm longum, 2.5 mm latum, arcuatum, glabrum, resinosum.

Typus: Near West River Crossing, Western Australia, 11 Sept. 1966, *K.R. Newbey* 2472 (holo: PERTH; iso: BRI, CANB, K, MEL, PERTH).

Shrubs 1-2 m tall, spreading 1.5-2.5 m. *Branchlets* compressed apically, resinous, often more or less micro-glandular-puberulous. *Stipules* caducous, narrow-triangular, c. 0.25 mm long. *Phyllodes* linear- to oblong-elliptic, obtuse to acute, apiculate, pulvinus 1-1.5 mm long, blades 28-70(-80) mm long, 4-7(-11) mm wide, coriaceous, patent, straight, glabrous, dully dark-green, each face with 2 or 3 distant, longitudinal main nerves from pulvinus, secondary nerves nearly as distinct, parallel to main nerves, anastomoses infrequent, marginal nerves sometimes with small resinous projections. *Gland* situated on the upper margin of phyllode to 2 mm above pulvinus, broader than thickness of phyllode. *Raceme axes* 1-7 mm long, or much longer after apical vegetative growth, 1- or 2-headed, heads axillary, more numerous on elongated shoots; basal peduncular bracts c. ovate, acute, 1 mm long or shorter. *Peduncles* 5-9(-14) mm long, glabrous or with scattered glandular micro-hairs, slender. *Flower-heads* globular to short-oblongoid, bright deep-golden, 4(-5) mm diam., (24-)28-32-flowered. *Bracteoles* linear-oblanceolate. *Flowers* 4-merous. *Sepals* half as long as petals, 1/3-3/4-united, glandular-ciliolate. *Petals* elliptic or elliptic-oblanceolate, free. *Ovary* granulose. *Legumes* (submature) linear, 50-65 mm long, 2.5 mm wide, curved, glabrous. *Seeds* longitudinal, oblong-elliptic, 4 mm long, 2 mm wide, glossy, brown; areole 2.5 mm long, oblong; aril apical.

Other specimens examined. WESTERN AUSTRALIA: Hamersley River, Fitzgerald River National Park, 33° 45' S, 119° 40' E, *K. Bradby* KLB13 (PERTH); Fitzgerald River area, c. 70 miles [112.7 km] ESE of Ongerup, *R.G. Coveny* 3199, *T.E.H. Aplin & I. L. Lethbridge* s.n. (PERTH); junction of Fitzgerald and Susetta Rivers, Reserve No. 24048, 34° 01' S, 119° 27' E, 12 July 1970' *A.S. George* s.n. (PERTH 00190489); 30 miles [48 km] W of Ravensthorpe, *F. Lullfitz* L3520 (PERTH); Boat Harbour, *K.R. Newbey* 3258 (PERTH); 32 km SE of Ongerup, *K.R. Newbey* 4316 (PERTH); 22 km NNE of Ongerup, *K.R. Newbey* 4767 (AD, BRI, CANB, K, MEL, NSW, NY, PERTH); 11 km NE of Coompertup, c. 52 km WSW of Ravensthorpe, *K.R. Newbey* 5053 (PERTH); 32 km SE of Ongerup, *N. Stevens* KRN9507-1 (PERTH); Roe's Rocks, *R.D. Royce* 8996 (PERTH).

Distribution. South-west Western Australia in the Roe and Eyre Botanical Districts (1:250,000 maps I50-8, 12). Ranging from near Ongerup and Boat Harbour E to the West River (c. 30 km W of Ravensthorpe) with numerous collections within the Fitzgerald River National Park.

Habitat. Common in *Eucalyptus platypus* or *E. astringens* low woodland in skeletal to shallow soils (loam, sandy or loamy clay) on spongolite breakaways. Rare in *E. transcontinentalis* open shrub mallee in sand on plain. It is frequent and locally common throughout its range, often the dominant plant form; its presence may be detected by the strongly aromatic odour of its resinous foliage well before it is visible (K.R. Newbey, pers. comm., 31 Aug. 1987). (It is presumably the resin of, especially, the branchlets that is the substrate for a sooty mould frequently seen on slightly older branchlets).

Flowering and fruiting periods. Flowering collections in July—September. Mature legumes not seen; submature ones collected in early December.

Affinities. *A. spongolitica* is superficially very similar to several species in the *A. ixiophylla* complex but it is instantly separable by its tetramerous flowers, compressed branchlets, and connate, glandular-ciliolate sepals; it is perhaps most closely related to *A. lanei* and *A. ixiophylla.*

Conservation status. Not considered either rare or endangered.

Etymology. The specific epithet, proposed by the collector of the type material, refers to the substrate common for the species, very often soil derived from spongolite, a sedimentary rock rich in sponge spicules.

9. Acacia verricula Cowan & Maslin, sp. nov. (Figure 2, J-L)

Frutex multicaulis 0.5-3 m altus, late coronatus, caulium prope basin cortice fissurata, supra laevi, ramulis rufis, resinosis, parce puberulis, pilis simplicibus, antrorse curvatis, saepe aureis. *Stipulae* persistentes, triangulares, minores quam 0.5 mm longae. *Phyllodia* complanata, lenticularia ad anguste elliptica vel lineari-elliptica, obtusa ad acuta, aliquando brevi-mucronulato, pulvino minore quam 1 mm longo, lamina (11-)15-30(-38) mm longa, (2-)3-5(-6) mm lata, tenui-coriacea, leviter curvata, glabra vel ad marginem pilis antrorse curvatis, pallido-viridi, resinosa, nervis secondariis in reticulo junctis, glande (1-)2-6(-12) mm supra pulvinum. *Racemorum axis* 1-6 mm longus, plerumque bicapitulatus, puberulus, saepe resinosus, aliquando nullus, bracteis basalibus ovatis, persistentibus, glabris. *Pedunculi* (2-)3-6(-8) mm longi, puberuli, pilis praecipue antrorse declinatis. *Capitula* globularia, aurea, (3-)4-5 mm diametro, 25-35-floribus. *Flores* 5meri. *Sepala* petala plus quam dimidia longiora, discreta, linearia. *Petala* anguste elliptica, plus minusve discreta, glabra. *Ovarium* glabrum vel subglabrum. *Legumen* lineare, arcuatum, complanatum, 2.5-5 cm longum, 2-4 mm latum, saepe undulatum, glabrum vel subglabrum, valde nitido-resinosum. *Semina* longitudinalia, elliptica, 3-3.5 mm longa, 2 mm lata, nitido-brunnea, pleurogramma distincta, elongata, arillo apicali vel subapicali.

Typus: about halfway between Peak Charles and Peak Eleanora, Western Australia, 14 Aug. 1985, *B.R. Maslin* 5796 (holo: PERTH; iso: CANB, K, MEL, NSW).

? *A. glutinosa* F. Muell. (pro parte); nom. ambiguum. See Discussion below.

[*A. ixiophylla* auct., non Benth. (1842); W.E. Blackall & B.J. Grieve, How to Know Western Austral. Wildfl. 1: 194 (1954)]

Multiple-stemmed, spreading *shrubs* 0.5-3 m tall with crown 1-6 m diam., rarely a spindly 2 m tree. *Bark* grey, finely fissured at base of stems, smooth above. *Branchlets* reddish, resinous, sparingly puberulous with simple, antrorsely curved, often golden, hairs. Stipules persistent, triangular, less than 0.5 mm long. *Phyllodes* flat, lenticular to narrow- or linear-elliptic, somewhat inequilateral, obtuse to acute, mucro (when present) centric or excentric, very short, pulvinus less than 1 mm long, blades (11-)15-30(-38) mm long, (2-)3-5(-6) mm wide, thin-coriaceous, slightly curved, glabrous or with few antrorsely curved hairs marginally, pale green, resinous; main nerves and secondary nerves scarcely distinguishable from one another, anastomoses usually impressed and forming a fine, regular-meshed reticulum. *Gland* situated on the upper margin of phyllode (1-)2-6(-12) mm above pulvinus. *Raceme axes* 1-6 mm long, usually 2-headed, puberulous, often resinous, sometimes absent; basal peduncular bracts ovate, persistent, glabrous. *Peduncles* (2-)3-6(-8) mm long, puberulous, hairs mainly antrorsely declinate and golden. *Flower-heads* globular, golden, (3-)4-5 mm diam., 25-35-flowered. *Flowers* 5-merous. *Sepals* more than half as long as petals, free, linear. *Petals* narrowly elliptic, all free or some partly connate, glabrous. *Ovary* glabrous or with few papillae-like micro-hairs apically. *Legumes* linear, 2.5-5 cm long, 2-4 mm wide, mostly undulate, sometimes only arcuate, not constricted between seeds, glabrous or few marginal antrorsely curved micro-hairs, markedly nitid-resinous, especially when young. *Seeds* longitudinal, elliptic, 3-3.5 mm long, 2 mm wide, glossy brown; pleurogram distinct, elongate, narrowly U-shaped, c. 1.2-1.8 mm long; aril apical to subapical.

Selected specimens examined. Top of scarp, Madura, *T.E. H. Aplin & M.E. Trudgen* 5829 (AD, BM, BRI, G, PERTH); Muntadgin, *E.T. Bailey* 629 (PERTH); 5.8 km SSE of Mt Beaumont, *M.A. Burgman* 1751 and *S. McNee* (PERTH); 6.25 km SE of Mickinwobert Rock, *M.A. Burgman* 2089 and *S. McNee* (PERTH); Frank Hann National Park, *D. Butcher* 313 (MEL, PERTH); near Carracarrup Creek, 17 km S of Ravensthorpe, *G. Craig* 1523 (PERTH); 9 miles [14.5 km] NE of Kondinin, *A.S. George* 9876 (PERTH, TLF); Yate Swamp, 47 miles [75.5 km] W of Esperance, *I.L. Lethbridge* 34 (PERTH); c. 12 miles [19 km] SE of Kulin, *B.R. Maslin* 528 (NSW, PERTH); Nalyering Wells, 13 miles [21 km] N of Kellerberrin on road to Yelbeni, *B.R. Maslin* 595 (NSW, PERTH); c. 10 miles [16 km] NNW of Bruce Rock towards Doodlakine, *B.R. Maslin* 1785 (PERTH); 1 mile [1.6 km] W of Yellowdine on Great Eastern Highway, *B.R. Maslin* 1838 (PERTH) and 2395 (CANB, K, MEL, PERTH); 4.8 km E of Ravensthorpe towards Esperance, *B.R. Maslin* 3449 (BRI, MO, NSW, PERTH); near Hamersley River crossing in Fitzgerald River National Park, *B.R. Maslin* 4061 (PERTH); Lake Grace Golf Club, *R.F. Maslin* s.n. (PERTH 00699500); 1 km W of Lake Cronin, *K.R. Newbey* 5204 (PERTH); 29 km S of Tadpole Lake, Frank Hann National Park, *K.R. Newbey* 5501 (CBG, PERTH); 6 km S of Peak Charles, Peak Charles National Park, *K.R. Newbey* 6461 (PERTH); 3 km NW of Heartbreak Ridge microwave tower, *K.R. Newbey* 7053 (PERTH); 24 km SSW of Mt Malcolm, Fraser Range, *K.R. Newbey* 7638 (PERTH); 32 km SW of Buningonia Spring, c. 70 km SSW of Zanthus, *K.R. Newbey* 8255 (PERTH); c. 3 km NE of Howick Hill, *A.E. Orchard* 1135 (PERTH); 11 miles [17.6 km] N of Lake Grace towards Kulin, *S. Paust* 884 (PERTH); central west side of Chiddarcooping Hill Nature Reserve, *A.S. Weston* 14261 (CANB, K, PERTH).

Distribution. South-west Western Australia mainly in the Avon, Roe and Eyre Botanical Districts but with a few collections from the eastern part of the Coolgardie Botanical District and one outlier at Madura in the Nullabor Botanical District (1:250,000 maps H50-12, 15, 16; H51-15; H52-13; I50-3, 4, 7, 8, 12; I51-1, 2, 5, 6). Mainly scattered throughout an area bounded by Chiddarcooping Hill Nature Reserve and Trayning, south to the Fitzgerald River, east to near Sparkle Hill (c. 100 km NE of Esperance) and north to the Fraser Range and north-east to near Buningonia Spring; the Madura collection is from along the Eyre Highway within 175 km of the border with South Australia, if the collection data are correct.

Habitat. In open shrub mallee or low mallee woodland often in association with *Eucalyptus* spp. (*E. wandoo*, *E. platypus*, *E. salubris*, *E. transcontinentalis*, *E. longicornis*, *E. salmonophloia*, *E. redunca*), rarely in open savanna or along creek course, on soils of clay, sandy or gravelly loam or brown, red or white sand.

Flowering and fruiting periods. Flowers collected in late May to September; mature fruits with seeds collected in December and January.

Affinities. Material of the new species has usually been referred to the eastern *A. ixiophylla* which differs by its stellate hairs intermixed with simple ones on many parts, by its relatively well-marked main nerves, by the position of the phyllode-gland at the distal end of the pulvinus, pubescent ovary, and semiconstricted legumes which are dull and villose, at least marginally. *A. verricula* is also the nearest relative of *A. lobulata*.

Synonomy. Acacia glutinosa F. Muell. was published in Fragm. 4: 6 (1863) with the type indicated only as having been collected in Western Australia by G. Maxwell. Two sheets at Herb. MEL which we and others consider to comprise Mueller's type, each bears a flowering branchlet and a packet of fruits and seeds. We have checked the protologue, point by point, with the MEL sheets (1553911 and 1553912) and it is clear that Mueller had this material before him when he described the species. There is also a sheet at K, bearing only a flowering branchlet, annotated by Mueller as *A. glutinosa*, which is surely a part of the type collection. The flowering material at both K and MEL is labelled in Mueller's hand as being from the Melbourne botanical garden but one of the MEL sheets (1553911) is annotated by Mueller as "*Acacia ixiophylla* Benth.", the other (MEL 1553912) as "*Acacia glutinosa* F. M./ *A. ixiophylla* var. Benth.", also in Mueller's hand. Both MEL sheets bear packets containing mature pods and seeds, but only sheet 1553911 is annotated to suggest the contents were collected by Maxwell, the collector cited in the protologue. This packet

also has been annotated by Mueller as both A. ixiophylla and as *A. glutinosa.* Bentham (1864) synonymized *A glutinosa* under *A. ixiophylla*, explaining he could see no real differences between the two, one from the west, the other from the east. Certainly the flowering material on the type sheets is not *A. ixiophylla* nor does it have anything to do with *A. montana* as suggested by Maiden (1916) in his analysis of the confusion surrounding *A. glutinosa, A. ixiophylla, A. montana* and *A. fuliginea.*

Assuming that the flowers and fruits comprising the type of *A. glutinosa* represent the same taxon, we are at a loss to suggest what it might be. The fruits could be those of *A. verricula*, although the seeds of this species are smaller than those in the packets, and its phyllodes shorter, differently shaped and with totally different venation from the type of *A. glutinosa.* The phyllode-nerves of the *A. glutinosa* type are numerous, immersed and rarely with anastomoses, while *A. verricula* phyllodes have a fine, regular reticulum of secondary nerves.

In view of well-documented instances of Mueller's rather lax curatorial practices, we consider seriously the possibility that the MEL sheets bear material of two different taxa, the Maxwell seed collection from Western Australia (possibly *A. verricula* or close relative) and the cultivated flowering specimens from the botanical garden, representing a species we are unable to identify. Because of the uncertainties involved, we are not prepared to lectotypify the name and conclude that *A. glutinosa* must be considered a *nomen dubium.*

Conservation status. Not considered as either rare or endangered.

Etymology. A. verricula is so-named in allusion to the net-like appearance of the secondary nervature of the phyllodes.

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Acacia Miscellany 2. Species related to *A. deltoidea* (Leguminosae: Mimosoideae: Section *Plurinerves*) from Western Australia

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Abstract

Cowan, R.S. & B.R. Maslin. *Acacia* Miscellany — 2. Species related to *A. deltoidea* (Leguminosae: Mimosoideae: Section *Plurinerves)* from Western Australia. Nuytsia 7(2): 201-208 (1990). In addition to a key to distinguish the taxa, two of which are new *(A. vincentii* and *A. deltoidea* subsp. *ampla*), a new combination under *Acacia* of *Racosperma adenogonia* Pedley is effected.

Introduction

This group of species was treated by Pedley (1987) in a well-illustrated and well-documented review, so a further publication on the alliance so soon after Pedley's might appear redundant. The purpose of this paper, however, is to provide names for two new taxa in the group and to make available one of Pedley's names under *Acacia;* he treated the group as taxa of *Racosperma*, a course we are not yet prepared to follow. Because full, detailed descriptions are available in his paper, it is principally the new taxa that are described below; *A. deltoidea* is described in full because we have extracted from typical *A. deltoidea* a new species and a new subspecies whose character states alter Pedley's circumscription to some extent. *Acacia adenogonia* is described fully in order to take into account several additional collections beyond those cited by Pedley.

The taxa of this group are a close-knit assemblage with the possible exception of *A. sublanata* which differs in several respects from the other taxa comprising the group. All are from the north tropical and subtropical zones in the Kimberley region of Western Australia and in the Northern Territory.

There is a superficial resemblance of this group of taxa to *A. adnata* F. Muell. and *A. comans* W. Fitzg. in the *A. latipes* alliance, which differs from the *A. deltoidea* group by the presence of basal peduncular bracts, separate lateral stipules, and by the lack of a bract on the peduncle above the base. In form of the phyllodes there is also a superficial similarity to the uninerved, triangular phyllodes of some *Phyllodineae*, such as those of Maslin's "*A. biflora* group" (1978). Pedley

(1978) included *A. pravifolia* F. Muell. and *A. amblygona* Cunn. ex Benth. with the *A. deltoidea* group as "the *Triangulares* group of *Acacia* section *Plurinerves*" and there is more than a passing resemblance between these species and the *A. deltoidea* group. Both species, however, have separate, lateral stipules, a bract subtending the base of the peduncles which are otherwise ebracteate, the heads are few-flowered and the bracteoles are of very different structure and texture than those of the present group.

The *A. deltoidea* group is characterized by (1) small, inequilateral, pungent, sessile or sub-sessile phyllodes; (2) upwardly curving pairs of often partly connate (except *A. sublanata* and *A. froggattii*), persistent, subulate or acicular stipules located on the abaxial side of the phyllode base (except *A. sublanata* and *A. froggattii*), rather than laterally as in most species of *Acacia;* (3) all but *A. sublanata* have at least some of the hairs gland-tipped; (4) the peduncles are solitary, lacking a bract at their base but occasionally bearing one above their middle; (5) sepals and/or petals are partly united among themselves; and (6), most strikingly, some of the species have the staminal filaments united, up to one-fifth their length in *A. stipulosa* and basally in irregular fascicles in *A. adengonia.* Such union of filaments is known in the *A. lycopodifolia* group of species, which Pedley (1987) suggested as possible relatives, e.g., *A. lycopodifolia* Cunn. ex Hook. and *A. hippuroides* Heward ex Benth., as well as in other unrelated tropical species

All measurements are from herbarium specimens unless otherwise indicated. The un-numbered taxa in the following key are not treated herein and are included only to indicate relationships.

Key to taxa of *A. deltoidea* group

1. Most phyllodes broadest below the middle, ovate to ovate-elliptic

   2. Phyllodes mostly 5-10 mm long, inequilaterally ovate, acuminate, pungent, gland often extending beyond phyllode margin in tooth-like projection; seeds longitudinal in pods ..... 1. *A. adenogonia*

   2. Phyllodes 15-16 mm long, inequilaterally elliptic to elliptic-ovate, acute, not pungent, gland not extending beyond phyllode margin; seeds transverse ..... 2b. *A. deltoidea* subsp. *ampla*

1. Most phyllodes broadest at or above the middle

   3. Branchlets villose, hairs crisped, none gland-tipped; phyllodes broadly obdeltate ..... *A. sublanata*

   3. Branchlets other than villose, gland-tipped hairs always present; phyllodes of other shapes

      4. Calyx and corolla regularly 5-merous

         5. Branchlets with long, gland-tipped hairs and shorter, antrorsely curved hairs ..... *A. froggattii*

         5. Branchlets glandular-puberulous, hairs very short and patent sometimes with longer hairs intermixed

            6. Phyllodes 4-6 mm wide, inequilaterally elliptic or obdeltate ..... 2a. *A. deltoidea* subsp. *deltoidea*

            6. Phyllodes 1.5-2 mm wide, inequilaterally oblong-oblanceolate, the margin between gland and apex strongly rounded ..... 3. *A. vincentii*

      4. Calyx with up to 11 acuminate lobes, corolla 7- or 8-lobed ..... *A. stipulosa*

1. **Acacia adenogonia** (Pedley) Cowan & Maslin, comb. nov. (Figure 1, O-S)

Basionym: *Racosperma adenogonium* Pedley, Austrobaileya 2(4): 316 (1987), based on the following.

A. deltoidea Cunn. ex Don var.? *pungens* Benth., London J. Bot. 1: 333 (1842). *Type*: Greville Island, Western Australia, *A. Cunningham* s.n. (holo: K; iso: BM (probably), PERTH — fragment ex K).

Illustration. L. Pedley, loc. cit., p. 317, Figure 1, E-I (1987).

Erect to sprawling *shrubs* 1-2 m tall, spreading to 3 m. *Bark* smooth, dark red-brown with many pale lenticels. *Branchlets* terete, canescent-villose, scattered shorter gland-tipped hairs sometimes intermixed. *Stipules* persistent, subulate, 2.5-6.5 mm long, united to 1/3 length, curving upwardly, rigid, ciliolate, small subulate lobes sometimes present between primary ones. *Phyllodes* inequilaterally ovate to lanceolate, acuminate-pungent, sessile to subsessile, (3-)5-10(-15) mm long, 1.5-4.5 mm wide, coriaceous, crowded-imbricate, patent to inclined, subglabrous to villose,

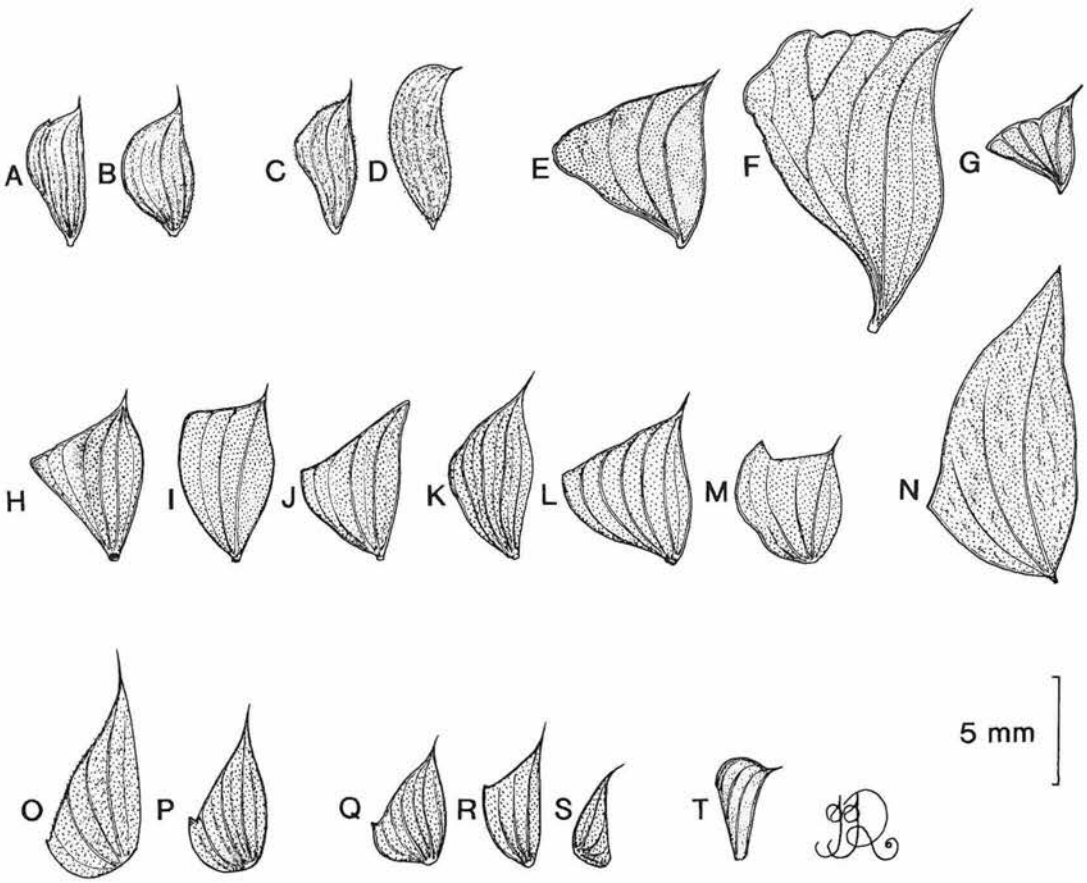

Figure 1. Some variation in phyllodes of taxa comprising the *A. deltoidea* alliance. A-B - *A. stipulosa*; C-D - *A. froggattii*; E-G - *A. sublanata*; H-M - *A. deltoidea* subsp. *deltoidea*; N - *A. deltoidea* subsp. *ampla*; O-P - Gibb River form of *A. adenogonia*; Q-S - coastal, typical form of *A. adenogonia*; T - *A. vincentii*. Phyllodes in most cases from several collections to illustrate intra- and inter-taxon variation in size and form; phyllode of *A. vincentii* from the type. All drawn at about 2x

scattered, short gland-tipped hairs sometimes present; nerves 3 or 4 on each phyllode face; gland 1, situated on upper margin of phyllodes, often projecting in short tube beyond phyllode-margin. *Peduncles* 7.5-14 mm long, solitary, villose, basally ebracteate, occasionally bracteate above middle; heads globular, 4-6 mm diam., 60-92-flowered; bracteoles exserted in bud, linear to narrowly lanceolate, acuminate, ciliate. *Flowers* 5-merous. *Sepals* less than 1/2 corolla-length, 1/2-united, ciliolate, lobes linear from ciliolate basal cup. *Petals* 3/4-united, lobes ovate, puberulous. *Filaments* united irregularly in fascicles at the base. *Legumes* linear, raised over and irregularly slightly constricted between seeds, 35-85 mm long, 5-6.5 mm wide, thin-coriaceous, curved, canescent-puberulous with intermixed longer, gland-tipped hairs. *Seeds* longitudinal, elliptic-oblong, 6-6.5 mm long, 3.5 mm wide, compressed, dull brown-black; pleurogram oblong, closed; aril apical.

Other specimens examined. WESTERN AUSTRALIA: Gibb River Road, 1.5 km W of Lennard River Gorge turn-off, *G.W. Carr* 4115 & *A.C. Beauglehole* 47893 (BRI, CANB, K, MEL, PERTH); Napier Broome Bay, 7 km S of West Bay, *E.A. Chesterfield* 313 with *S.J. Forbes* & *J.H. Willis* (PERTH); Pim Hill, *E.A. Chesterfield* 385 (PERTH); [Prince] Regent River, Voyage of Bathhurst in 1821-2, *A. Cunningham* 323 (PERTH, photograph of Herb. BM specimen); "Naturalist Island" in Prince Frederick Harbour at mouth of Hunter River, *M. Evans* 9 (PERTH); 0.5 km N of Pim Hill between Napier Broome Bay and Vansittart Bay, 17 km NNW of Kalumburu Mission, *S.J. Forbes* 2176 with *J.H. Willis* (PERTH); Plain Creek near Beverley Springs Homestead, NE of Derby, *K.F. Kenneally* 1988 (PERTH); "Naturalist Island" in Prince Frederick Harbour, W of entrance to Hunter River, *K.F. Kenneally* 9926 (PERTH); Gibb River Road, c. 17 miles [27.4 km] N from turnoff to Mt House Homestead, 24 July 1974, *J.H. Willis* & *A.C. Beauglehole* s.n. NSW, PERTH 00709255); Augustus Island, Bonaparte Archipelago, *P.G. Wilson* 10702 (PERTH) and 18 May 1972, *P.G. Wilson* s.n. (PERTH 00709263); Uwins Island, Brunswick Bay, *P.G. Wilson* 11445 (PERTH).

Distribution. Northern Western Australia in north-west and southern extremity of Gardner Botanical District and north central Fitzgerald Botanical District (1:250,000 maps D51-16, D52-9 and E51-4, 8). Occurs in scattered populations in West Kimberley, in the Bonaparte Archipelago and Napier Broome Bay areas and inland at Kimberley Downs Station, Beverley Springs Station and Phillips Range. The available material appears to indicate two populations comprising the species, one along the north coast of Western Australia and the nearby offshore islands, the other along the Gibb River road in the area of Beverley Springs Homestead, about 150 km southward.

Habitat. Grows on sandy soil usually on sandstone in woodland.

Flowering and fruiting periods. Flowering specimens have been collected between May and August, and legumes with mature seeds have been collected in July and August from plants still in flower.

Conservation status. The wide distribution of this species suggests that it is probably neither rare nor endangered.

Affinities. Superficially, *A. adenogonia* appears very similar to *A. deltoidea* and they are clearly related but *A. adenogonia* has phyllodes that are widest below their middle, different branchlet pubescence (hairs shorter and mostly gland-tipped in *A. deltoidea*; villose with only scattered gland-tipped hairs in *A. adenogonia*), often exserted phyllode glands and narrower legumes with longitudinally oriented seeds. It is closer to *A. froggattii* and *A. sublanata* with respect to orientation of the seeds in the pods. Bentham described it as a variety of *A. deltoidea* questionably, saying it might represent a distinct species.

Variation. The southern population has somewhat larger phyllodes which are villose, rather than obscurely puberulous as in the coastal form. We have not recognized infraspecific taxa largely because collections from the region between the two populations are infrequent and we expect future collecting to show that these are extremes in a north to south cline, unworthy of formal recognition.

2. **Acacia deltoidea** Cunn. ex Don, Gen. Hist. 2: 401 (1832).

Type: Montague Sound, Western Australia, 1820, *A. Cunningham* 293 (lecto: BM, fide L. Pedley, Austrobaileya 2(4): 315 (1987); iso: K, US).

Racosperma deltoideum (Cunn. ex Don) Pedley, Austrobaileya 2(4): 315 (1987).

Illustrations. F. Mueller, Iconogr. Austral. *Acacia*, dec. 7, pl. [1] (1887), as *A. stipulosa*; J.H. Maiden, J. & Proc. Roy. Soc. New South Wales 53, pl. 13, figs. 7-17 (1920); L. Pedley, loc. cit., p. 319, Figure 2, J-N (1987).

Shrubs 1.5-3 m tall. *Bark* grey to dark brown, fissured. *Branchlets* glandular puberulous with intermixed longer hairs, sometimes ± resinous. *Stipules* persistent, subulate, partly united, 1.5-4 mm long, upwardly curving, ciliolate or glandular ciliolate. *Phyllodes* subsessile, inequilaterally cuneate, elliptic, ovate or broadly obdeltate, with a gland-bearing angle on the upper margin, ± mucronate-pungent, 6-16 mm long, 4-7 mm wide, thinly coriaceous to coriaceous, congested, imbricate, patent to ascending, glabrous or ± glandular puberulous on faces, and generally on margins, bright green; 3 or 4 longitudinal main nerves on each phyllode face inconspicuous to prominulous; gland 1, situated on upper margin of phyllode, rarely projecting beyond margin. *Peduncles* (6-)10-25 mm long, solitary, glandular puberulous, basally ebracteate, rarely with a median peduncular bract; heads globular, dark golden, 5-6 mm diam., (30-)56-73-flowered, compact; bracteoles ± exserted in bud, spathulate with blade lanceolate and long-acuminate. *Flowers* 5-merous. *Sepals* 1/2-2/3 corolla length, 1/3-1/2-united, lobes linear, glandular-puberulous apically. *Petals* 2/3-3/4-united, lobes ovate. *Stamens* free. *Legumes* oblong, slightly raised over but not constricted between seeds, 28-42 mm long, 9-12 mm wide, thinly coriaceous, straight, obliquely reticulate-nerved, base rounded, apex rostriform. *Seeds* obliquely oriented, 5 mm long, 2.5 mm wide, compressed, dull dark-brown; pleurogram closed; aril apical.

2a. **Acacia deltoidea** Cunn. ex Don subsp. **deltoidea**. (Figure 1, H-M).

Phyllodes coriaceous, inequilaterally cuneate, elliptic or triangular, excentrically mucronate-pungent, 6-8.5 mm long, 4-6 mm wide, glandular-puberulous, often obscurely. *Peduncles* 10-12 mm long, glandular-puberulous, rarely with a bract about the middle; bracteoles ± exserted in bud.

Other specimens examined. WESTERN AUSTRALIA: 3.7 km NW of Mt Daglish, *J.J. Alford* 558 (PERTH); near Manning Gorge, Mt Barnett Station, *I. Cowie* 330 (PERTH); Fitzroy River, 1879, *A. Forrest* s.n. (NSW, PERTH 00698172); creek entering inlet of Talbot Bay, 23 km SE of Cockatoo Island, *P.A. Fryxell & L.A. Craven* 3893 (CANB, PERTH); Plain Creek, c. 10 km W of Beverley Springs Homestead, *A.S. George* 12228 (PERTH); Manning Gorge, *A.S. George* 15176 (PERTH); above the headwaters of the Helby River, *T.G. Hartley* 14819 (PERTH); Prince Regent River Reserve, *K.F. Kenneally* 2081 (K, MEL, PERTH); Euro Gorge, Drysdale River National Park, *K.F. Kenneally* 4363 (BRI, PERTH, TLF); Steep Island off Raft Point at entrance to Doubtful Bay, *K.F. Kenneally* 9681 (BRI, K, PERTH); 5.7 km NW of Gibb River-Kalumburu Road intersection, travelling along old Mitchell River Station Road, *B.L. Koch* 568 (CANB, K, PERTH); Boomerang Bay, Bigge Island, *N.G. Marchant* 72/116 (PERTH); High Cliffy Islands, E of Montgomery Island, 24 May 1987, *L.M. Marsh* s. n. (PERTH 00870021); Galvans Gorge, 14.8 km S of Barnett River on Gibb River - Derby road, *J.G. & M.H. Simmons* 1901 (PERTH); Stewart River valley, c. 82 km NNE of Derby, 13 km NNW of "Kimbolton" Homestead, *I.R. Telford* 6310 & *G. Butler* (PERTH).

Distribution. Northern Western Australia through most of the Gardner Botanical District and adjoining north-west part of the Fitzgerald Botanical District (1:250,000 maps D51-12, 15, 16; D52-10, 13; and E51-3, 4, 8). Occurs in scattered populations in the Kimberley in Buccaneer and Bonaparte Archipelago areas and near Cambridge Gulf extending inland to Mt Barnett and Drysdale River National Park. The *A. Forrest* collection cited above extends the range southward;

the precise locality is not known but from his journal we deduce the collection was made in grid-cell E51-8, not actually on the Fitzroy River but in its general area.

Habitat. Grows in sandy soil usually on sandstone in open scrub and, where the soil is deeper, in woodland.

Flowering and fruiting periods. Flowering specimens have been collected in March and between May and August; legumes with mature seeds have been collected in May, June and August from plants still in flower.

Conservation status. Not considered rare or endangered.

2b. **Acacia deltoidea** Cunn. ex Don subsp. **ampla** Cowan & Maslin, subsp. nov. (Figure 1, N).

Phyllodia firme chartacea, inaequilateraliter elliptica ad elliptico-ovata, contracto-acuta, mucronata, 15-16 mm longa, 5.5-7 mm lata. *Pedunculi* 18-25 mm longi, glandulari-puberuli, plerumque supra medium bracteam ferenti, bracteolis non exsertis in alabastro maturo.

Typus: Lawley R. gorge, Western Australia, 29 July 1921, *C.A. Gardner* 996 (holo: PERTH; iso: NSW, PERTH - *C.A. Gardner* "1496").

Phyllodes thinly coriaceous, inequilaterally elliptic to elliptic-ovate, acute, mucronate, 15-16 mm long, 5.5-7 mm wide. *Peduncles* 18-25 mm long, glandular-puberulous, usually with a narrowly lanceolate bract above its middle; bracteoles not exserted in bud.

Other specimens examined. WESTERN AUSTRALIA: base of Bougainville Peninsula on E shore of Admiralty Gulf, *P.A. Fryxell, L.A. Craven & J. McD. Stewart* 4782 (CANB, PERTH).

Distribution. Northern Western Australia in northern part of the Gardner Botanical District (1:250,00 maps D51-12 and D52-9). Known only from two localities separated by 60 km in the Admiralty Gulf area.

Habitat. Grows in woodland on sandstone.

Flowering and fruiting periods. Flowering specimens have been collected in June (with legumes with sub-mature seeds) and in July.

Conservation status. 2K, following the criteria of Briggs & Leigh (1988). This is a poorly known taxon that may be rare, but the area is very poorly collected and difficult of access.

Discussion. The differences separating subsp. *ampla* from the typical subspecies are mostly quantitative but they combine to produce quite a different appearing plant. Pedley (1987) considered it to be only a large-phyllode form of this species but it is so different, especially in phyllode form and size, that we prefer recognizing it as a subspecies, thereby calling it to the attention of future monographers.

Note. Gardner's collection numbers 1496 and 996 do refer to the same collection, as Pedley (1987) presumed; the first is the Western Australian Forest Department number, the second Gardner's own herbarium number.

Etymology. The subspecies name refers to the size of the phyllodes which are much larger than those of the typical subspecies.

3. **Acacia vincentii** Cowan & Maslin, sp. nov. (Figure 1, T).

Frutex 3 m altus, ramis longis, arcuatis. *Stipulae* persistentes, setaceae, connatae basaliter, 2-2.5 mm longae, glandulari-puberuli sursum. *Phyllodia* inaequilateraliter oblongo-oblanceolata, apice mucronato-pungenti, circa lateralibus ad axem longum, 4.5-5 mm longa, 1.5-2 mm lata, ascendentia ad erecta, parce puberula. *Pedunculi* 9-9.5 mm longi, solitarii; capitulae oblongoideae, circa 5.5 mm diametro, 41-floribus, bracteolis longo-exsertisin alabastris maturis. *Flores* pentameri, sepalis petalis 3/4 longioribus quam 1/2-connata corolla, connatis, lobis linearibus, ciliolatis. *Legumen* anguste oblongum, marginibus crenatis, 25-55 mm longum, 5-10 mm latum, arcuatum, dense glandulo-puberulum.

Typus: 6 miles NE of F. B./33 [c. 10 km WSW of Mt Blythe], Edkins Range, West Kimberley Region, Western Australia, Aug. 1905, *W.V. Fitzgerald* 1421 (holo: NSW 104428; iso: NSW, PERTH).

Illustration: L. Pedley, Austrobaileya 2(4): 317, Figure 1, J, K (1987).

Shrubs 3 m tall with long, arching branches. *Branchlets* terete, glandular-puberulous, slender. *Stipules* persistent, setaceous, united basally, often a setaceous lobe on each stipule between primary lobes, 2-2.5 mm long, curved upwardly, not rigid, sparingly glandular-puberulous to glabrous. *Phyllodes* inequilaterally oblong-oblanceolate, upper margin conspicuously rounded between apex and gland, apex mucronate-pungent and ± perpendicular to long axis of phyllode, pulvinus 0.3-0.4 mm long, blades 4.5-5 mm long, 1.5-2 mm wide, coriaceous, ascending to erect, sparingly puberulous; 2 or 3 nerves on each phyllode face prominulous; gland 1, minute, situated on upper margin above middle of phyllode. *Peduncles* 9-9.5 mm long, solitary, ebracteate throughout, puberulous with many hairs gland-tipped; heads oblongoid, c. 5.5 mm diam., 41-flowered; bracteoles long-exserted in bud, spathulate with blade lanceolate, acuminate, puberulous and ciliolate. *Flowers* 5-merous. *Sepals* 3/4 length of petals, 1/2-united, linear lobes and margin of basal cup ciliolate. *Petals* 1/2-united, lobes puberulous. *Stamen filaments* free. *Legumes* narrowly oblong, not constricted between seeds, one or both margins crenate, 25-55 mm long, 5-10 mm wide, curved, obliquely reticulate transversely, densely glandular puberulous. *Seeds* (immature) oblique, black, shiny; pleurogram U-shaped, 1/2 as long as seed; aril small, apical.

Distribution. Northern Western Australia in the south-west of the Gardner Botanical District (1:250,000 map E51-4). Known only by the type collection from the Edkins Range, West Kimberley.

Habitat. Collected from a sandstone plateau. No other data available.

Flowering and fruiting periods. Flowering specimens were collected in August along with immature legumes.

Conservation status. 1X, using the criteria of Briggs & Leigh (1988) but its status cannot be reliably determined until more information is available.

Affinities. The type collection of *A. vincentii* has been variously treated: Fitzgerald himself called it *A. stipulosa* on his labels; then Maiden (1920) treated it as *A. deltoidea* (incorrectly and inexplicably, citing April 1905 as the collecting date, although Fitzgerald gave August as the date in his field diary), at least partly because he considered *A. stipulosa* to be conspecific with *A. deltoidea*; finally, Pedley (1987) viewed the material of the new species as an "aberrant individual" of *A. deltoidea.* While related to *A. deltoidea*, *A. adenogonia* and *A. froggattii*, the new species is really quite distinct. Its obliquely transverse seeds and glandular-puberulous vegetative parts relate it most closely to *A. deltoidea* subsp. *deltoidea.* From all elements of the "*A. deltoidea* group", *A. vincentii* differs in its setose stipules, the shape and size of the phyllodes, its

long-exserted bracteoles in bud, oblongoid flower heads and in its legume having one or both margins crenate.

The new species is described, admittedly on less than the sort of complete data one hopes to have at hand when describing new taxa, because it is very distinct and a name is needed for it in the account of the Kimberley flora being prepared at PERTH, as well as for the Flora of Australia.

Note. The type locality data have been augumented beyond those on the label itself, by notes from Fitzgerald's diary/field book of the Kimberley Trigonometric Expedition of 1905.

Etymology. This species is named for the collector of the only known material, William Vincent Fitzgerald, to perpetuate the memory of a keen field observer and one of Western Australia's most respected early taxonomists.

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Acacia Miscellany 3. Some new microneurous taxa of Western Australia related to *A. multilineata* (Leguminosae:Mimosoideae: Section *Plurinerves*) from Western Australia

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Abstract

Cowan, R.S. & B.R. Maslin. *Acacia* Miscellany — 3. Some new microneurous taxa of Western Australia related to *A. multilineata* (Leguminosae:Mimosoideae: Section *Plurinerves*, from Western Australia. Nuytsia 7(2): 209-219 (1990). Five new species and one new variety are described (*A. caesariata*, *A. mimica*, *A. mimica* var. *angusta*, *A. patagiata*, *A. torticarpa* and *A. unguicula*) and *A. multilineata* W. Fitzg. is re-described. A key is included to enable users to distinguish the taxa.

Introduction

Acacia multilineata W. Fitzg. is a species of Western Australia with "microneurous" phyllode nervature (cf. Maslin & Pedley 1988 for definition). We use this term to refer informally to groups characterized by phyllodes with numerous, fine, closely parallel, longitudinal nerves, lacking anastomoses between them. Members of the '*Acacia multilineata* group' have persistent stipules and the main longitudinal nerves, as well as usually the lesser nerves, are clearly defined and raised, often strongly so. The closest relative of this group of species is *A. lineolata* and the taxa related to it; the '*A. lineolata* alliance' differs in having phyllode nervature that is less strongly raised, sometimes scarcely visible, and most of the taxa in the group have more or less linear phyllodes. Both groups are native to the south-western region of Western Australia. In the following key, *A. ancistrophylla* and *A. lineolata* are included because of their close relationship to *A. multilineata*, but not described.

This is the third in a series of papers by one or more of the PERTH Wattle Team. The series is designed to give full descriptions and/or notes concerning new or previously described taxa, to present new combinations, lectotypifications, etc. in advance of their more abbreviated treatment in the Flora of Australia. Measurements are from dried material unless otherwise stated. In the text, taxa that are described are arranged alphabetically.

Key to the taxa

1. Stipules spinescent ..... 6. *A. unguicula*

1. Stipules not spinescent

2. Phyllodes with yellow marginal nerves

3. Heads pedunculate; flowers 4-merous; phyllode blade c. equally thick at centre of phyllode and at marginal nerve ..... 4. *A. patagiata*

3. Heads sessile; flowers 5-merous; phyllode blades about twice as thick as marginal nerves ..... (2. *A. mimica*)

4. Phyllodes (18-)20-30(-35) mm long, 3-8 times longer than wide. Seeds mottled, usually light grey-brown on dark tan ..... 2a. *A. mimica* var. *mimica*

4. Phyllodes (25-)40-80(-105) mm long, 12-45 times longer than wide, ± compressed. Seeds mottled, usually dark tan on light grey-brown ..... 2b. *A. mimica* var. *angusta*

2. Phyllodes lacking yellow marginal nerves

5. Stipules subulate or caudate-subulate, 24 mm long

6. Flower heads sessile, bracteate basally; sepals and petals ± 2/3 united ..... 5. *A. torticarpa*

6. Flower heads shortly pedunculate, non-bracteate, sepals and petals free ..... 1. *A. caesariata*

5. Stipules not subulate, much shorter

7. Phyllodes 1.5-2 cm long with stomata obscure or at least not obviously raised; stipules caducous ..... *A. ancistrophylla*

7. Phyllodes about 3 cm long with raised stomata between the nerves (x10 magnification)

8. Apex of phyllodes recurved, not at all ± pungent, phyllodes straight or shallowly curved ..... *A. lineolata*

8. Apex of phyllodes straight, pungent, phyllodes mostly strongly incurved ..... 3. *A. multilineata*

1. **Acacia caesariata** Cowan & Maslin, sp. nov. (Figure 1)

Frutices densi rotundato-triangulari vel plano-coronati 0.6-1.3 m alti, ramulis tomentosis. *Stipulae* persistentes, subulatae, 2-4 mm longae, pilosae. *Phyllodia* anguste oblongo-oblanceolata, rotundato-obtusa et mucronata, versus basim attenuata, 20-45 mm longa, 3-10 mm lata, erecta, recta ad leviter incurvata, tomentosa, tandem glabrescentia, 1-3 nervis primariis in quoque superficie et nervis secondariis numerosis, salientibus, glande plus minusve 2 mm super pulvino. *Pedunculi* (1.5-)3-4 mm longi, 2 in quoque axilla, tomentosi. *Capitula* globularia, 4 mm diametro, 18-20-floribus. *Flores* 5-meri. *Sepala* petalis plus minusve dimidia breviora, linearia, discreta. *Petala* discreta, glabra. *Legumina* anguste oblonga, 12-25 mm longa, 2.5-3 mm lata, chartacea, arcuata ad irregulariter flexuosa, pilosa. *Semina* longitudinalia, ovalia, elliptica vel oblonga, 2.5-3 mm longa, 1.2-1.8 mm lata, nitida, nigra; pleurogramma arcuata, 0.3-0.5 mm long; arillo apicali, galeato.

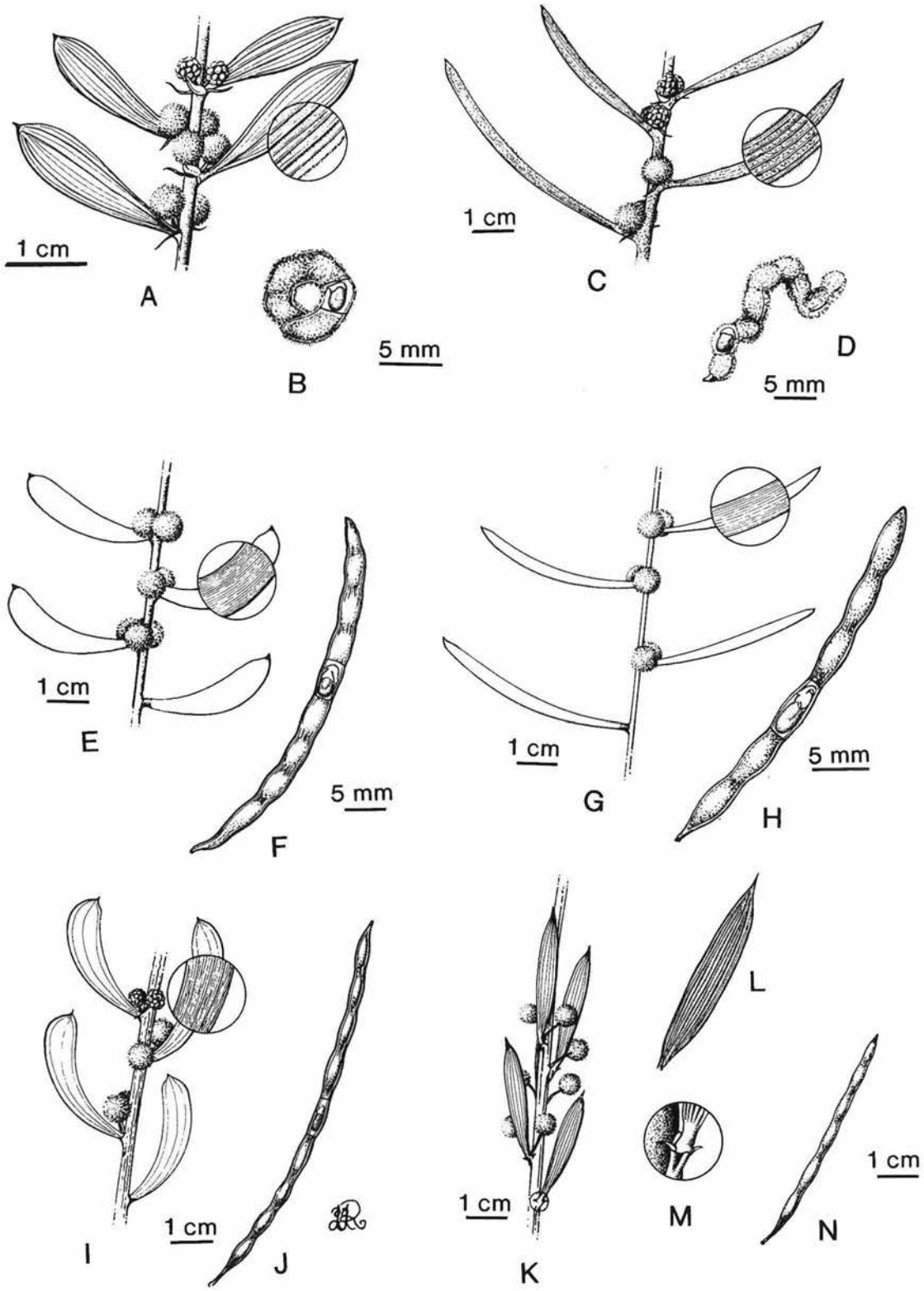

Figure 1. Flowering branchlet, englarged portion of phyllode to show nervature and fruit of new taxa of *Acacia*. A-B - *A. caesariata*. C-D - *A. torticarpa*. E-F - A. mimica var. *mimica*. G-H *A. mimica* var. *angusta*. I-J - *A. patiagiata*, K-N - A. unguicula. A-B drawn from *M.D. Tindale* 3720; C-D from *C.A. Gardner* 7621; E-F from *S. Paust* 677 (flowering) and *B.R. Maslin 4065 (fruiting); G-H from P.G. Wilson* 5417 (flowering) and *K.R. Newbey* 1614 (fruiting); I-J from *B.R. Maslin* 3460 (flowering) and *G. Craig* 1675 (fruiting); K-N from *B.R. Maslin* 4240.

Typus: 30.5 km W of Kununoppin towards Wyalkatchem, Western Australia, 26 August 1973, *B.R. Maslin* 3405 (holo: PERTH; iso: AD, CANB, K, MEL, NSW, NY).

Dense, rounded-triangular- or flat-crowned *shrubs* 0.6-1.3 m tall, spreading 2-3 m diam. *Bark* grey, rough at stem bases, smooth on branches. *Branchlets* ± terete, slightly ribbed, tomentose. *New growth* white-tomentose. *Stipules* persistent, subulate, 2-4 mm long, straight, chartaceous, pilose or puberulous. *Phyllodes* narrowly oblong-oblanceolate, rounded-obtuse, mucronate, mucro short, straight or slightly curved, brown, hard, ± coarsely pungent, base attenuate, pulvinus 0.5-1 mm long, blades 20-45 mm long, 3-10 mm wide, coriaceous, ascending to erect, straight to slightly incurved, tomentose, tardily glabrescent, dark green or grey-green; 1-3 main nerves on each face strongly salient, light-coloured, distant, the inter-nerve spaces 5 or more times wider than width of main nerves, occasionally a few anastomoses evident, stomata not visible, numerous secondary nerves less raised or all nerves about equally raised. *Gland* one, situated on upper margin of phyllode ± 2 mm above pulvinus. *Peduncles* (1.5-)3-4 mm long, 2 per axil, tomentose; basal peduncular bracts ovate, acute, scarious, c. 2 mm long, brown, glabrous except sometimes lightly appressed puberulous on abaxial surface along midnerve. *Flower-heads* globular, dark lemon-yellow, 4 mm diam., 18-20-flowered. *Bracteoles* linear-fusiform to narrowly oblong. *Flowers* 5-merous. *Sepals* c. 1/2 petal length, linear, slightly expanded at apex, free. *Petals* free, glabrous. *Legumes* narrowly oblong, 12-25 mm long, 2.5-3 mm wide, scarcely raised over and not constricted between seeds, chartaceous, arcuate to irregularly flexuose (old valves coiled), pilose, light brown. *Seeds* longitudinal, oval, elliptic or oblong, 2.5-3 mm long, 1.2-1.8 mm wide, compressed, glossy black; pleurogram arcuate, 0.3-0.5 mm long; aril apical, 1/2 as long as seed, galeate, white.

Other specimens examined. WESTERN AUSTRALIA: 16.5 km E of Korrelocking on road to Kununoppin, *R.S. Cowan* A738 & *B.R. Maslin* (PERTH); N of Bungulla towards Wyalkatchem, *B.R. Maslin* 3399 (AD, BRI, CANB, G, K, MEL, NSW, PERTH); E of Korrelocking, *B.R. Maslin* 4453 (PERTH); W of Kununoppin towards Wyalkatchem, *M.D. Tindale* 100 and *E.M. Bennett* (PERTH); 3.2 km SW of Yelbini on Wyalkatchem-Kununoppin road, *M.D. Tindale* 3720 (AD, B, BRI, CANB, L, MEL, MO, NSW, PERTH, US).

Distribution. South-west Western Australia in Avon Botanical District (1:250,000 map H50-15). Geographically restricted and poorly collected species of the Bungulla-Kununoppin area.

Habitat. In mallee scrub and eucalypt woodland on hard gritty loam or clay.

Flowering and fruiting periods. Flowers in August—September; mature legumes with seed collected in January.

Affinities. Most closely allied to *A. torticarpa* which has partly united sepals and pubescent petals, sessile flower heads, spathulate bracteoles, and usually narrower, differently shaped phyllodes; the different shape may well be only a function of the width. Superficially, *A. caesariata* resembles *A. multilineata* but the tomentose branchlets and phyllodes of the new species readily separate the two taxa. There is a very superficial similarity to *A. consobrina* but phyllodes of the latter have conspicuous anastomoses between the primary nerves, in addition to other differences.

Conservation status. 2E [K], using the criteria of Briggs & Leigh (1988).

Etymology. The specific name refers to the general "hairiness" of the plant (from *caesariatus*, Latin for covered with hair or long-haired).

2. **Acacia mimica** Cowan & Maslin, sp. nov.

Frutices 0.3-2.5 m alti, 0.6-3 m diametro extendentia, ramulis appresso-puberulis, glabrescentibus, saepe nodosis. *Phyllodia* anguste elliptica usque ad oblanceolato-oblonga vel linearia usque ad oblanceolato-linearia, acuta, obtusa vel rotundato-obtusa, plerumque mucronulata,

mucrone atro-brunneo crasso et obtuso, ad basem acuta, pulvino 1-1.5 mm longo, puberulo, lamina 2-10 cm longa, 2-7 mm lata, coriacea vel rigido-coriacea, patentia usque ad erecta, leviter ad valde incurvata, plus minusve glauca, subtiliter et uniformiter multinervia, nervis salientibus, leviter pravis, lucidis, nervo marginali luteo, prominenti, glande basali. *Capitula* sessilia, globularia vel subglobularia, 7-8 mm diametro in vivo, pedunculi bractea basalis ovata ad triangulari-ovata, abaxialiter puberula, (9-)15-20(-27)-floribus, bracteolis unilaterale peltatis, abaxialiter puberulis, cum pilis glandularibus rubris. *Flores* 5-meri. *Sepala* petalis 1/2-2/3 breviora, saltem 3/4-connata, lobis rotundatis vel truncatis, rubro-ciliolatis. *Petala* discreta, glabra. *Legumina* linearia, 25-65 mm longa, 2-4 mm lata, recta usque ad valde curvata, glabra. *Semina* longitudinalia, ovalia, elliptica vel oblongo-elliptica, 2-3.5 mm longa, 1.5-2 mm lata, nitida, maculata, pleurogramma oblonga, 0.5 mm longa; areola cinerea; arillus apicalis.

Typus: 11.2 km SW of Dowerin towards Goomalling, Western Australia, 13 August 1971, *B.R. Maslin* 2015 (holo: PERTH; iso: CANB, K, MEL, NSW, NY).

Dense, rounded, obconic, erect or semi-prostrate *shrubs* 0.3-2.5 m tall, spreading 0.6-3 m diam. *Branches* often gnarled, peripheral ones horizontal, central ones erect. *Bark* on young branchlets red-brown, becoming light-grey, smooth except lightly fissured or fibrous from main branches to base. *Branchlets* appressed puberulous, glabrescent. *Phyllodes* flat but blades thicker than at the marginal nerve, narrowly elliptic to oblanceolate-oblong, or linear to oblanceolate-linear, acute to obtuse to rounded-obtuse, mucronulate, mucro dark-brown, thick and blunt, base acute, pulvinus 1-1.5 mm long, blades 2-10 cm long, 2-7 mm wide, coriaceous to rigid-coriaceous, patent to erect, glabrous except puberulous at least on upper surface of pulvinus, slightly to strongly incurved, usually subglaucous to glaucous, or only green, finely and uniformly multinerved, nerves salient, not straight, occasionally anastomosing, ± shiny on surface, inter-nerve spaces about 3 times as wide as nerves, marginal nerve narrow, prominent, yellow, especially towards apex. *Gland* one, situated on upper margin of phyllode at distal end of pulvinus. *Flower-heads* sessile, globular to subglobular, light- to mid-golden, 8 mm long, 7 mm diam. (fresh), subtended by a series of bract-like bracteoles and the larger basal peduncular bract, this ovate to triangular-ovate, puberulous abaxially, ciliolate with at least some glandular, red micro-hairs, (9-)15-20(-27)-flowered. *Bracteoles* unilaterally peltate, stipitate, blade oblate, ciliolate, puberulous abaxially with glandular, red micro-hairs. *Flowers* 5-merous. *Sepals* 1/3-2/3 petal length, 3/4 to completely united, lobes rounded or truncate, often puberulous on central nerve, ciliolate, mostly with red micro-hairs. *Petals* free, glabrous. *Ovary* papillate-puberulous. *Legumes* linear, only slightly raised over and weakly constricted between seeds, 25-65 mm long, 2-4 mm wide, suberect, crustose, straight to weakly curved, glabrous. *Seeds* longitudinal, sometimes somewhat obliquely, oval to elliptic or oblong-elliptic, 2-3.5 mm long, 1.5-2 mm wide, 1.5 mm thick, glossy, mottled with small, paler markings on dark-tan, or darker markings on lighter background; pleurogram U-shaped, 0.5 mm long; areole grey; funicle/aril in two loose loops over apex of seed.

Affinities. This wide-ranging species (Avon, Roe and Eyre Botanical Districts) has yellow marginal nerves on the phyllodes, a character shared with the closely related *A. patagiata* which has impressed nerves and tetramerous flowers.

Variation. The two varieties comprising *A. mimica* are most obviously different in their phyllode proportions. The northern, broad-phyllode form (var. *mimica*) extends south and actually into the range of var. *angusta* which follows an east/west line just N of Albany to Mt Burdett, east of Esperance. The seed difference noted is interesting but may not be sustained by additional fruiting collections.

Etymology. The specific name refers to the considerable similarity in phyllode morphology of this species and *A. patagiata*: i.e., *A. mimica* mimics its relative in respect to several morphological character states (from *mimicus*, latinized form of Greek *mimikos*, for imitative).

2a. **Acacia mimica** var. **mimica** (Figure 1)

Phyllodes narrowly elliptic to oblanceolate-oblong, usually obtuse to rounded-obtuse, (18-)20-30(-35) mm long, (3-)4-6(-7) mm wide, 3-8 times longer than wide. *Seeds* oval to elliptic, 2-3 mm long, mottled light grey-brown on dark tan.

Selected specimens examined. WESTERN AUSTRALIA: Bruce Rock, Sept. 1933, *E.T. Bailey* s.n. (PERTH 00188093); North Bungalla Reserve, 11 km N of Bungalla on road to Yorkrakine, *R.S. Cowan* A743 & *B.R. Maslin* (PERTH); Kukerin, Sept. 1934, *C.A. Gardner* s.n. (PERTH 00188107); about 29 km due NW of Bruce Rock, *B.R. Maslin* 2365 (K, PERTH); 4 mi [6.4 km] E of Nyabing, *K. Newbey* 414 (PERTH); 10 mi [16 km] E of Jerramungup, *K. Newbey* 783 (CANB, PERTH); 1 mi [1.6 km] N of Bendering, *K. Newbey* 3224 (BM, PERTH); between Lake Grace and Lake Biddy near Buniche, *N. Perry* 539 (PERTH); 7.7 km E of Goomalling, *P. Roberts* 112A (PERTH).

Distribution. South-west Western Australia in Avon, Roe and Eyre Botanical Districts (1:250,000 maps H50-14, 15; I50-3, 7, 8). Occurs sporadically from near Goomalling SSE to near Jerramungup.

Habitat. Yellow to brown sand and sandy loam, gravel or pale brown clay on hillsides and sand plains.

Flowering and fruiting periods. Flowers in August—September. The only mature legumes with seeds collected in December.

Conservation status. 3C, using criteria of Briggs & Leigh (1988).

2n3b. **Acacia mimica** var. **angusta** Cowan & Maslin, var. nov. (Figure 1)

A var. *mimica* phyllodiis linearibus ad oblanceolato-linearibus, (25-)40-80(-105) mm longis, 2-3.5(-4.5) mm latis, 12-45-plo longioribus quam latioribus, seminibus oblong-ellipticis, 3-3.5 mm longis differt.

Typus: 8 km S of Ravensthorpe on road to Hopetoun, Western Australia, 13 August 1968, *P.G. Wilson* 7060 (holo: PERTH; iso: CANB, K, NSW, NY).

Phyllodes linear to oblanceolate-linear, usually acute, (25-)40-80(-105) mm long, 2-3.5(-4.5) mm wide, 12-45 times longer than wide. *Seeds* oblong-elliptic, 3-3.5 mm long, mottled dark-tan on pale grey-brown.

Selected specimens examined. WESTERN AUSTRALIA: 28 mi [45 km] NW of Fitzgerald River Inlet, *K.M. Allan* 329 (BM, BRI, PERTH); 31.25 km SE of Mt Burdett, *M.A. Burgman* 1690 and *S. McNee* (K, PERTH); 5 km S of Borden, *P.E. Conrick* 1661 (PERTH); 0.4 km E of Ravensthorpe-Hopetoun road on Elvertdon Rd., *R.S. Cowan* A758 & *B.R. Maslin* (PERTH); Susetta River above junction with Fitzgerald River, 34° 00' S, 119° 27' E, *A.S. George* 10007 (K, PERTH); Esperance Location 1762 near Scaddan, *H.E. Knox* 13 (PERTH); 4 km S of Ravensthorpe towards Hopetoun, *B.R. Maslin* 2562 (AD, BRI, CANB, NY, PERTH); near West River crossing, 37 km W of Ravensthorpe towards Jerramungup, *B.R. Maslin* 2579A (PERTH); 21 km W of Ravensthorpe towards Jerramungup, *B.R. Maslin* 3468 (AD, BRI, MEL, NSW, NY, PERTH); 12 mi [19 km] SE of Ongerup, *K. Newbey* 1295 (CANB, PERTH); 16 km SW of Ravensthorpe, *K. Newbey* 9458 (B, G, MELU, MO, PERTH, Z).

Distribution. South-west Western Australia in Roe and Eyre Botanical Districts (1:250,000 maps I50-8, 11, 12; I51-5, 6). Variety *angusta* occurs to the south of the typical variety (except for one population of var. *mimica* from near Jerramungup). Most of the collections are from the Borden-Ravensthorpe area but there are two from farther east, near Scaddan and near Mt Burdett (c. 100 km and 140 km east of Ravensthorpe respectively).

Habitat. Often on clay, sandy clay or gravelly clay but also on sandy or stony loam, in open areas in low shrub mallee or tall shrubland.

Flowering and fruiting periods. Flowering July—September (early October); legumes with mature seeds collected in December.

Conservation status. 3C, using the criteria of Briggs & Leigh (1988).

3. **Acacia multilineata** W. Fitzg., J. Western Australian Nat. Hist. Soc. 1: 13 (1904). *Type*: Arrino, Western Australia, September 1903, *W.V. Fitzgerald* s.n. (holo: NSW 216915; iso: PERTH).

Dense, rounded or obconic *shrubs* 1-1.7 m tall. *Branchlets* appressed puberulous. *New shoots* silvery grey sericeous, arising within axil of paired peduncles at anthesis. *Stipules* persistent, minute, triangular. *Phyllodes* narrowly to broadly oblong-oblanceolate to oblong-elliptic, acute, mucronate, the mucro hard and sub-pungent or pungent, base attenuate, pulvinus 1-2.5 mm long and appressed puberulous adaxially, blades 30-65 mm long, 3-5 mm wide, rigid-coriaceous, ascending, usually ± incurved to nearly straight, appressed puberulous, glabrescent, olive-green; nerves numerous, yellowish, strongly salient, inter-nerve spaces about twice as wide as nerves and with raised stomata clearly evident. *Gland* 1-3, situated on upper margin of phyllode, the lowest in the basal 1/3 of phyllode. *Peduncles* 5-6.5 mm long, rarely to 11 mm long, 2 per axil, glabrous to appressed puberulous; basal peduncular bract cucullate, caducous, appressed-puberulous. *Flower-heads* globular to slightly oblongoid, 4.5-6 mm diam., 25-35-flowered, rarely fewer. *Bracteoles* linear, ciliolate. *Flowers* 5-merous. *Sepals* c. 1/2 petal length, free, linear, ciliolate. *Petals* free, glabrous. *Legumes* linear, raised over and slightly constricted between seeds, 55-80 mm long, 2-3 mm wide, thin-coriaceous, straight to slightly curved, appressed puberulous. *Seeds* longitudinal, oblong-elliptic, 3-3.5 mm long, 1.7-2 mm wide, glossy brown; pleurogram small, c. 0.8 mm long, U-shaped, somewhat raised, paler coloured than rest of seed; aril and funicle yellow, apical, 2/3 as long as seed.

Other specimens examined. WESTERN AUSTRALIA: On Mullewa road, *I.B. Armitage* 276 (PERTH); half-way between Pindar and Mullewa, *A.M. Ashby* 1571 (PERTH); east of Yuna on Tenindewa road, *A.M. Ashby* 4515 (PERTH), 4516 (CANB, PERTH) and 4645 (PERTH); 4 mi [6.4 km] W of Mullewa, *A.M. Ashby* 4646 (PERTH); Dartmoor turnoff on road from Yuna to Tenindewa, *G. Phillips* GP42 (PERTH); 12.8 km E of Mullewa towards Yalgoo, *B.R. Maslin* 3637 (K, MEL, PERTH); 13 km E of Mullewa towards Yalgoo, *B.R. Maslin* 5077 (PERTH).

Distribution. South-west Western Australia in Irwin and Avon Botanical Districts (1:250,000 maps H50-1,2,6). Known only from a few localities between Yuna and Arrino.; the type collection was made in the vicinity of Arrino which is considerably south and west of most of the other collection localities.

Habitat. On sandplains or on rocky clay.

Flowering and fruiting periods. Flowering June—August; mature legumes with seeds in November and December.

Affinities. Related to the widespread, variable *A. lineolata*, the taxonomy of which is currently under review; *A. multilineata* is most readily distinguished by the straight, rather than recurved, apex of its strongly incurved phyllodes. It is not inconceivable that the two species will in the final analysis prove to be best treated as infraspecific taxa of one species.

Conservation status. 2K, using criteria of Briggs & Leigh (1988).

4. **Acacia patagiata** Cowan & Maslin, sp. nov. (Figure 1)

Frutices 0.5-2.5 m alti, cortice cinerea, laevi versus basim aspri excepta, ramulis glabris vel subglabris, rubro-brunneis. *Phyllodia* anguste elliptica ad anguste oblongo-oblanceolata, acuta vel obtusa et oblique mucronata, versus basim attenuata, pulvino 1-1.5 mm longo, glabro, lamina 25-55 mm longa, 3-8 mm lata, plus minusve valde incurvata, glabra, subglauca ad glauca, nervis totis pariter distinctis vel 1-3 elevatioribus in quoque superficie, venulis pravis, tenuibus, incompletis, nervo marginale valido, luteo, glandibus 2 vel 3 phyllodiorum juxta basem, medium et apicem. *Pedunculi* (2-)3-6(-7) mm longi, plerumque glabri et glauci, 2-4 in quoque axilla. *Capitula* globularia, 3-5 mm diametro, 16-24-floribus. *Flores* tetrameri. *Sepala* petalis minus quam dimidia breviora, 1/4-3/4-connata, lobis plus minusve ovalibus. *Petala* discreta, glabra. *Ovarium* dense appresso-puberulum. *Legumina* linearia, 40-95 mm longa, 2-3.5 mm lata, pendentia, subrecta ad valde curvata, saepe glauca, suturis anguste incrassatis, luteis ad diluto-brunneis. *Semina* longitudinalia, oblonga ad elliptico-oblonga, 3.5-4.5 mm longa, 2-2.5 mm lata, nitide atro-brunnea ad nigra; pleurogramma 2-2.5 mm longa, peranguste; arillo pallido, apicali, galeato.

Typus: 7 km S of Mount Madden towards Ravensthorpe, Western Australia, 28 August 1973, *B.R. Maslin* 3446 (holo: PERTH; iso: AD, B, BM, BRI, CANB, G, K, MEL, MO, NSW, NY, W).

Rounded *shrubs* 0.5-2.5 m tall, spreading 1-2 m diam. *Bark* grey, smooth, except more or less roughened at extreme base of main trunks. *Branchlets* slightly angled at tips, soon terete, glabrous or sparingly appressed-puberulous, glabrescent, red-brown. *Stipules* caducous. *Phyllodes* narrowly elliptic to narrowly oblong-oblanceolate, acute to obtuse, more or less excentrically mucronate, the mucro straight or curved, dark brown, hard, coarsely pungent, tapering to pulvinus 1-1.5 mm long, glabrous, blades 25-55 mm long, 3-8 mm wide, rigid-coriaceous, ascending to erect, rather strongly incurved, glabrous, subglaucous to glaucous; all nerves equally distinct but most often one mid-nerve or 3 main longitudinal nerves more strongly raised, yellowish, numerous finer venules appearing as irregularly parallel, commonly incomplete, dark lines in the blade, inter-nerve spaces many times wider than the main nerves, strong marginal nerves yellow, about equally thick as the blade. *Glands* 2 or 3, situated near base, middle and apex on upper margin of phyllode. *Peduncles* (2-)3-6(-7) mm long, 2(-4) per axil, glabrous or occasionally with few appressed hairs, sometimes more or less glaucous; basal peduncular bract caducous, cucullate, broadly ovate, glabrous except ciliolate. *Flower-heads* globular, golden, (3-)4-5 mm diam., 16-24-flowered. *Bracteoles* spathulate-obovate, ciliolate. *Flowers* 4-merous. *Sepals* less than 1/2 length of petals, 1/4-3/4-united, lobes ± oval, ciliolate. *Petals* free, glabrous. *Ovary* densely appressed puberulous. *Legumes* linear, somewhat raised over and constricted between seeds, 40-95 mm long, 2-3.5 mm wide, pendent, crustose, nearly straight to curved (old valves coiled and twisted), glabrous, sometimes slightly glaucous, dark-brown with narrow, yellow to light brown marginal nerves. *Seeds* longitudinal, oblong to elliptic-oblong, 3.5-4.5 mm long, 2-2.5 mm wide, compressed, glossy, dark brown to black; pleurogram 2-2.5 mm long, very narrowly U-shaped; areole more or less depressed; aril apical, about 1/3 as long as seed, galeate.

Selected specimens examined. WESTERN AUSTRALIA: Jerramungup, 40.3 km E of Ongerup, *T.E.H. Aplin, I. Lethbridge* and *R. Coveny* 3330 (PERTH); Pingrup, *W.E. Blackall* 3082 (PERTH); 37.5 km NNW of Mt Ney, *M.A. Burgman* 1848 and *S. McNee* (PERTH); 19.5 km due SE of Muckinwobert Rock, *M.A. Burgman* 4030 (PERTH); near Carracarrup Creek, 15 km S of Ravensthorpe, *G. Craig* 1526C (MEL, PERTH); approx. 9 km E of Scaddan on Scaddan Road, *G. Craig* 1675 (PERTH); 31.6 mi [50.6 km] E of Lake King towards Norseman, *R. Cumming* 2588 (AD, BRI, PERTH); Phillips River crossing, 17 km W of Ravensthorpe towards Jerramungup, *B.R. Maslin* 3460 (AD, B, BM, BRI, CANB, G, K, MEL, NSW, PERTH); Munglinup area, east of Ravensthorpe, *B.R. Maslin* 4480 (MEL, PERTH); 6 km NW of Boxwood Hill, *K. Newbey* 4267 (PERTH); 25 km ESE of Mt Gibbs, Frank Hann National Park, *K. Newbey* 5421 (PERTH); gate at rabbit-proof fence, Mt Madden, *R.A. Saffrey* 316 (BM, NSW, NY, PERTH, W); Phillips River Crossing, Ravensthorpe-Jerramungup road, *M.D. Tindale* 3820 (BRI, CANB, K, MEL, MO, US).

Distribution. South-west Western Australia in Roe and Eyre Botanical Districts (1:250,000 maps I50-8, 12; I51-1, 5, 6). Common throughout its range, from Pingrup E to near Mt Ney with a northern limit in the Frank Hann National Park, 60 km N of Ravensthorpe.

Habitat. Usually along salt creeks and rivers, as well as at margin of salt pans and salt lakes, often on small rises above *Holosarcia/Arthrocnemum* zone, on soils of fine or coarse sands to clay and loam. (Much of the habitat information is based on Gill Craig's study of salt-tolerant plants and we are indeed grateful for this use of her data.)

Flowering and fruiting periods. Flowering in July-September; fruiting November to January.

Affinities. The new species resembles *A. multilineata* especially and to a lesser extent *A. unguicula* but it is very distinct from both by virtue of its tetramerous flowers and by features of the phyllode nervature: the main nerves (when they are identifiable as such) are continuous from base to apex, yellowish and broader than the irregularly parallel venules; and the marginal nerves are strongly developed and yellow. In addition, the phyllodes are subglaucous to strongly glaucous and lack obvious stomata. *Acacia mimica* is also a close relative but it has 5-merous flowers, uniformly distinct nerves in the phyllodes, sessile flower heads and mottled seeds.

Conservation status. 3C, using the criteria of Briggs & Leigh (1988).

Etymology. The specific epithet refers to the yellow border of the phyllodes (a *patagium* was the golden border around the hem of the robe of Roman ladies, hence, *patagiatus* or bordered).

5. **Acacia torticarpa** C. Gardner ex Cowan & Maslin, sp. nov. (Figure 1)

Arbuscula (?). *Ramuli* villoso-tomentosi, valde sulcati. *Stipulae* persistentes, caudato-subulatae, 3-4 mm longae, tomentosae. *Phyllodia* anguste linearia, oblanceolato-linearia vel elliptico-linearia, obtuso-mucronulata, pulvino 1 mm longo, tomentoso, lamina 37-55 mm longa, 2-3.5 mm lata, incurvata, villoso-tomentosa, nervis principalibus 3 vel 4 in quoque superficie, valde salientibus, nervis secondariis 3 vel 4, fere quam salientibus. *Pedunculi* deficientes vel perbreves, 2 in quoque axilla. *Capitulae* involucratae, pedunculari bractea basali ovata usque ad elliptica, globulares, circa 5 mm diametro, 17- vel 18-floribus; bracteolae plus minusve spathulatae, laminis ellipticis vel ovatis. *Flores* 5-meri. *Sepala* petalaque 1/2-2/3-connata, puberula ciliolataque, sepala petalis dimidia breviora. *Legumina* flexuoso-linearia, plus minusve 20 mm longa, 2 mm lata, villoso-tomentosa. *Semina* longitudinalia, ovalia vel elliptica, 1.5-2 mm longa, 1.2 mm lata; pleurogramma parva, arco-formata, arillo apicali, elongato.

Typus: Yorkrakine, Western Australia, 19 July 1946, *C.A. Gardner* 8043 (holo: PERTH; iso: AD, BM, BRI, CANB, G, K, MEL, NSW, NY, PERTH, W, Z).

Shrubs (?). *Branchlets* villose-tomentose, strongly sulcate. *New growth* pale golden at tips, becoming grey. *Stipules* persistent, caudate-subulate, 3-4 mm long, tomentose. *Phyllodes* narrowly linear to oblanceolate-linear or elliptic-linear, acute, mucronate, often bluntly mucronulate later by loss of mucro apex, mucro brown, straight, hard, ± coarsely pungent, base attenuate, blades 37-55 mm long, 2-3.5 mm wide, coriaceous, patent to inclined, slightly to moderately incurved, villose-tomentose at first, somewhat glabrescent; 3 or 4 main nerves per face strongly salient, 3 or 4 secondary nerves nearly as raised, inter-nerve spaces much wider than nerves, stomata not evident. *Gland* one, slightly raised, situated on upper margin of phyllode 1-3.5 mm above the very short (1 mm) pulvinus. *Peduncles* absent or very short, 2 per axil, tomentose; basal peduncular bract narrowly ovate, acute, puberulous, ciliate, this and 4 bract-like bracteoles encircling base of head. *Flower-heads* globular, ± 5 mm diam., 17- or 18-flowered. *Bracteoles* ± spathulate, the blade elliptic to ovate, acute, puberulous, ciliate, exserted in bud. *Flowers* 5-merous. *Sepals* half as long as petals, both sepals and petals 1/2-2/3-united, puberulous, ciliolate. *Ovary* densely villose, principally on margins, hairs directed antrorsely. *Legumes* flexuose-linear, c. 20 mm long, 2 mm wide, coriaceous, villose-tomentose. *Seeds* longitudinal in the legumes, oval to elliptic, 1.5-2 mm long, 1.2 mm wide, glossy tan, compressed; pleurogram a small arc, c. 0.5 mm long and wide; areole in shallow depression, pale brown; aril apical, extending down one side more than half seed length.

Other specimens examined. WESTERN AUSTRALIA: N of Yorkrakine, *C.A. Gardner* 7621 (PERTH); E of South Kumminin, *C.A. Gardner* 9485 (PERTH).

Distribution. South-west Western Australia in Avon Botanical District (1:250,000 maps H50-15; I50-3). Only three collections are known of this species, all from near Yorkrakine and South Kumminin. Numerous attempts to re-collect the species in any of the localities have been in vain.

Habitat. No details available.

Flowering and fruiting periods. Flowers collected in July; legumes with mature seeds collected in September.

Affinities. The new species is part of the '*A. multilineata* group' and is most similar to *A caesariata*, differing in having sessile flower heads with a subtending row of bract-like bracteoles, partly connate perianth parts, sulcate branchlets and flexuose legumes.

Conservation status. 3E[K], using the criteria of Briggs & Leigh (1988).

Etymology. C.A. Gardner coined the specific epithet in allusion to the strongly flexuose fruits, but never published it. We have adopted his herbarium name, rather than another, to avoid any possible confusion with duplicates the collector may have distributed bearing this name.

6. **Acacia unguicula** Cowan & Maslin, sp. nov. (Figure 1)

Frutices 1-2 m alti vel arbores usque ad 3 m altae, cortice cinereo, fibroso et truncorum versus basem plus minusve fissurato, ramulis angularibus, glabris appresso-puberulis in phyllodiorum axillas exceptis. *Stipulae* persistentes, spinescentes, recurvatae, 0.7-1.2 mm longae. *Phyllodia* anguste oblonga ad oblongo-oblanceolata vel elliptica, abrupte et breve angusto-cuspidata, attenuata versus basem, (14-)20-40 mm longa, 3-4 mm lata, rigida, recta vel leviter curvata, glabra, 14-16 nervis principalibus valdissime salientibus; glande 1 vel 2. *Pedunculi* 7-11 mm longi, binati, glabri; pedunculi bractea basalis cucullata, rostrata. *Capitulae* globulares, atro-aureae, 5-6 mm diametro, 24-34-floribus; bracteolis linearibus vel lineari-spathulatis. *Flores* 5-meri. *Sepala* petala minus quam 1/2 breviora, discreta, linearia ad lineari-spathulata. *Petala* discreta, glabra. *Legumen* lineare, ad 60 mm longum, 2 mm latum, parce appresso-puberulum. *Semina* non vidi.

Typus: Mount Singleton, Ninghan Station, Western Australia, 6 August 1969, *R.A. Saffrey* 829 (holo: PERTH; iso: CANB, K, MEL, NY).

Openly branched *shrubs* 1-2 m or tree (?) to 3 m tall. *Bark* grey, fibrous and somewhat fissured at base of trunks, smooth on branches. *New shoots* sparsely appressed puberulous, hairs white, shoots arising from within axil of paired peduncles at anthesis. *Branchlets* with several low ridges, glabrous except appressed puberulous in axils of phyllodes. *Stipules* persistent, spinescent, more or less recurved, 0.7-1.2 mm long. *Phyllodes* narrowly oblong to oblong-oblanceolate or elliptic, abruptly and often excentrically short-cuspidate, pungent, (14-)20-40 mm long, 3-4 mm wide, rigid, erect, straight or slightly curved, glabrous except appressed puberulous basally on adaxial surface, olive-green; 14-16 main nerves strongly salient, few strong anastomoses evident, stomata distinct, not strongly raised. *Glands* 1 or 2 on upper margin of phyllode, lowest one in basal half of phyllode, upper one (when present) near apex. *Peduncles* 7-11 mm long, 2 per axil, glabrous; basal peduncular bract caducous, cucullate, rostrate. *Flower-heads* globular, deep golden, 5-6 mm diam., 24-34-flowered. *Bracteoles* linear or linear-spathulate. *Flowers* 5-merous. *Sepals* less than 1/2 petal length, free, linear-spathulate. *Petals* free, glabrous. *Legumes* (immature) linear, to 60 mm long, 2 mm wide, slightly raised over and scarcely constricted between seeds, old valves coiled, sparsely appressed puberulous. *Seeds* not seen.

Other specimens examined. WESTERN AUSTRALIA: Mt Singleton, *J.S. Beard* 6454 (PERTH), *C.A. Gardner* 12012 (PERTH), *B.R. Maslin* 4240 (CANB, K, MEL, PERTH), and *B.H. Smith* 614 (BRI, MEL, PERTH).

Distribution. South-west Western Australia in Austin Botanical District (1:250,000 map H50-7). Known only from Mt Singleton between Wubin and Paynes Find.

Habitat. Rocky clay or loam in open scrub on upper slopes and summit of mountain.

Flowering and fruiting periods. Flowering August—September; no mature legumes seen.

Affinities. Related to *A. multilineata* but differing most obviously in its persistent, more or less recurved, spinescent stipules and very strongly salient nerves; its peduncles are also longer. The new species is restricted to Mt Singleton, W.A.

Conservation status. 2V, using the criteria of Briggs & Leigh (1988).

Etymology. The specific epithet, refers to the stipules as small claws (the diminutive of *unguis*, Latin for nail, claw or talon).

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Acacia Miscellany 4. Three new Western Australian species with affinities to *A. wilhelmiana* (Leguminosae:Mimosoideae: Section *Plurinerves*) from Western Australia.

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Abstract

B.R. Maslin, *Acacia* Miscellany — 4. Three new Western Australian species with affinities to *A. wilhelmiana* (Leguminosae:Mimosoideae: Section *Plurinerves*) from Western Australia.. Nuytsia 7(2): 221-228 (1990). Descriptions are provided for three new Western Australian species of *Acacia*, namely, *A. ascendens*, *A. brachypoda* and *A. cowaniana*. These species, together with seven close relatives, are referred to the informal "*A. wilhelmiana* group". A key is presented to the ten species of this group.

Introduction

The main purpose of this paper is to describe three new Western Australian species for inclusion in the forthcoming *Acacia* volume of *Flora of Australia*. These species, together with seven close relatives, are here referred to informally as the "*Acacia wilhelmiana group*". The 10 species assigned to this group are: *A. abrupta* Maiden & Blakely, *A. ascendens* Maslin sp. nov., *A barattensis* J. Black, *A. brachypoda* Maslin sp. nov., *A. cowaniana* Maslin sp. nov., *A. gracilifolia* Maiden & Blakely, *A. helmsiana* Maiden, *A. menzelii* J. Black, *A. viscifolia* Maiden & Blakely and *A. wilhelmiana* F. Muell.

Most species of the "*A. wilhelmiana* group" occur in the semi-arid areas of south-west Western Australia and south-east South Australia. However, *A. wilhelmiana* ranges from South Australia into Victoria and New South Wales. Also, *A. abrupta* and *A. helmsiana* occur in the Arid Zone of Western Australia and Northern Territory, with the latter species extending to South Australia. Distributions for the above species, except the three new ones, are shown in Maslin & Pedley (1982).

Species of the "*A. wilhelmiana* group" are shrubs or small trees which share most or all of the following characters: (1) plants resinous and/or viscid to some degree; (2) phyllodes excentrically mucronulate, often incurved, longitudinal nerves distant and commonly obscure, lateral nerves

absent; (3) peduncles 1 or 2 per axil and often inserted on very short racemes (axes 1-5 mm long); (4) basal peduncular bracts solitary and persistent or (in *A. abrupta* and sometimes in *A. ascendens* and *A. helmsiana*) absent; (5) flower-heads globular or almost so; (6) flowers 5-merous (4-merous in *A. barattensis*); (7) calyx gamosepalous (although deeply dissected in *A. ascendens, A. helmsiana* and *A. menzelii*); (8) legumes usually firmly chartaceous; (9) seeds longitudinal.

The "*A. wilhelmiana* group" is not readily accommodated in either Bentham's (1864) or Pedley's (1978) classifications of *Acacia*. This is because for phyllodinous species with globular flower-heads, these systems rely on the number of nerves per phyllode to ascribe species to either section *Phyllodineae* or *Plurinerves*. In the "*A. wilhelmiana* group" this is a variable character with the number of nerves varying from two to more than seven per phyllode, i.e.

2 nerves per phyllode: *A. helmsiana*

4 nerves per phyllode: *A. abrupta, A. ascendens, A. brachypoda*

3 to 7 nerves per phyllode: *A. cowaniana*

5 or more nerves per phyllode: *A. wilhelmiana*

5 or 7 nerves per phyllode: *A. viscifolia*

6 nerves per phyllode: *A. menzelii*

8 nerves per phyllode: *A. barattensis*

This is but one of many examples that demonstrates the need to reassess the classification of *Acacia* subgenus *Phyllodineae* in order to produce a scheme which better reflects natural groupings of taxa.

Key to species of "*A. wilhelmiana* group"

1. At least some phyllodes 5-10 cm long

   2. Flowers 4-merous; phyllodes compressed, obscurely 3-nerved per face (S.A.) ..... *A. barattensis*

   2. Flowers 5-merous

      3. Peduncles glabrous; phyllodes terete, 4-nerved (W.A., N.T.)

         4. Gland at base of phyllode 0-2 mm above the pulvinus; sepals united; legumes 2.5-3 mm wide (W.A., N.T.) ..... *A. abrupta*

         4. Gland absent from base of phyllode; sepals ± free; legumes 5 mm wide (W.A.) ..... *A. ascendens*

      3. Peduncles puberulous; phyllodes ± compressed, >4-nerved in all (including marginal nerves)

         5. Peduncle indumentum not prominent, hairs white; some or all phyllodes >6.5 cm long, phyllodes longitudinally grooved on each face (S.A.) ..... *A. gracilifolia*

         5. Peduncle indumentum prominent, hairs light golden; few phyllodes to 6.5 cm long, the remainder shorter (S.A.) ..... *A. wilhelmiana* (Flinders Range variant)

1. All phyllodes 1-5 cm long

   6. Phyllodes flat (although often somewhat thick)

7. Phyllodes 2-nerved or more per face

8. Heads ± cream; peduncle indumentum obscure; phyllodes (2)3-5 cm long, 1-2.5 mm wide. (W.A.) ..... *A. cowaniana*

8. Heads golden (S.A., Vic., N.S.W.)

9. Peduncles with a conspicuous, dense, light golden pubescence; phyllodes 1-3 cm long, 1-4(6) mm wide ..... *A. wilhelmiana*

9. Peduncles glabrous; phyllodes 1.5-4 cm long, 0.5-1 mm wide ..... *A. menzelii*

7. Phyllodes 1-nerved per face

10. Peduncles 2-3 mm long; flowers 8 or 9 per head; phyllodes 2-5 cm long (W.A.) ..... *A. brachypoda*

10. Peduncles 5-15 mm long; flowers 20-30 per head; phyllodes 0.5-2 cm long (W.A., N.T., S.A.) ..... *A. helmsiana*

6. Phyllodes terete to sub-terete

11. Flowers 8 or 9 per head; peduncles 2-3 mm long; phyllode apices eglandulose (W.A., rare) ..... *A. brachypoda*

11. Flowers >10 per head; peduncles usually >3 mm long

12. Flowering peduncles glabrous

13 Phyllodes 6-nerved, apices eglandulose; branchlet apices sparsely puberulous (S.A.) ..... *A. menzelii*

13. Phyllodes (obscurely) 2- or 4-nerved, with a small gland adjacent to mucro (observe at x10 mag); branchlets glabrous

14. Phyllodes 0.5-2 cm long, 2-nerved, base eglandulose. (W.A., N.T., S.A.) ..... *A. helmsiana*

14. Phyllodes 2-5 cm long, 4-nerved

15. Gland at base of phyllode 0-2 mm above the pulvinus; sepals united; legumes 2.5-3 mm wide (W.A., N.T.) ..... *A. abrupta*

15. Gland absent from base of phyllode; sepals ± free; legumes 5 mm wide (W.A.) ..... *A. ascendens*

12. Flowering peduncles and branchlet apices puberulous (indumentum sometimes minute, sparse and imbedded in resin)

16. Peduncles with a prominent, dense, light golden pubescence; branchlets commonly with prominent yellow ribs at extremities (S.A.,Vic., N.S.W.) ..... *A. wilhelmiana*

16. Peduncles sparsely pubescent, hairs white and/or golden; branchlets not obviously ribbed (W.A.) ..... *A. viscifolia*

Taxonomy

Acacia ascendens Maslin, sp. nov.

Frutices glabri ad 2(3) m alti, apicibus vegetativis novis resinosis et leviter viscidis. *Phyllodia* teretia, 2-4 cm longa, 1 mm diametro, incurvata vel solum ad basem incurvata et aliter recta, saepe truncata vel obliquo-truncata, excentrice mucronulata, inclinata ad ascendens, viridia, 4-nervata, nervis brunneolis, leviter impressis viscidisque, exsudata saepe cristam angustam translucidam formanti; glande juxta mucronem. *Pedunculi* 5-14 mm longi, plerumque 1 vel 2 in racemis axillaribus vel terminalibus ad 5(10) mm longis dispositis; capitula globularia, dense 20-25-floribus, aurea, resinosa. *Flores* pentameri, sepalis ad basem connatis. *Legumina* (submatura) angusto-oblonga, ad 7 cm longa, 5 mm lata, plana, leviter undulata, resinosa. *Semina* (submatura) longitudinalia, oblongo-elliptica, arillo clavato.

Typus: Chiddarcooping Nature Reserve, Western Australia, 23 July 1989, *B.R. Maslin* 6382 (holo: PERTH; iso: AD, B, BM, BRI, CANB, G, K, MEL, MO, NSW, NY, PERTH, Z).

Moderately dense, ± obconic *shrubs* to 1.5-2 m tall, sometimes 3 m, single-stemmed or several-branched at ground level. *Bark* mid-grey, smooth except furrowed at base of old stems. *New shoots* resinous, slightly viscid, pale green or light bronze. *Branchlets* terete, obscurely ribbed, glabrous, resinous and brown at extremities. *Stipules* semi-persistent, narrowly triangular, inconspicuous, c. 0.5 mm long, 0.1-0.2 mm wide, dark brown. *Phyllodes* ± terete, (1)2-4 cm long, a few to 6 cm long, c. 1 mm wide, inclined to ascending, erect when young, incurved or ± straight but incurved at base, occasionally ± sigmoid, glabrous, green, stomata numerous (observe at x10 mag.); *4-nerved*, nerves brownish and slightly impressed, resinous, the exudate commonly forming a narrow translucent ridge; *apices* often uncinate to subuncinate, excentricallly mucronulate, often obliquely truncate; *pulvinus* obscure, ≤ 0.5 mm long, ± smooth, yellow to pale orange. *Gland* situated on upper margin of phyllode adjacent to the mucro, circular, 0.3-0.4 mm diameter, base eglandulose. *Inflorescences* situated at ends of branchlets, comprising short terminal and/or axillary racemes or axillary peduncles. *Terminal racemes* growing out at anthesis, the peduncles subtended abaxially by a terete, acute prophyll which is c. 1 mm long and flanked by a pair of stipules. *Axillary racemes* to 5(10) mm long, 1- or 2-headed, terminated by a vegetative bud which occasionally grows out during anthesis, base of raceme axis ebracteate, the peduncles subtended abaxially by a minute persistent, triangular, brown bract c. 0.5 mm long or with prophyll and stipules as on terminal racemes. *Peduncles* 5-14 mm long, glabrous; *basal peduncular bracts* absent (when inflorescences are non-racemose) or solitary (on axillary racemes) or replaced by a prophyll (on terminal and axillary racemes). *Flower-heads* globular, 12 mm diam. (fresh), 6 mm diam (dry), golden, resinous, densely 20-25-flowered. *Bracteoles* ± spathulate, 1 mm long, glabrous. *Flowers* 5-merous. *Sepals* united at base, narrowly oblong to broadly spathulate, claws translucent, laminae yellow, ± concave and slightly thickened abaxially. *Petals* 1.7 mm long, glabrous, very obscurely nerved. *Legumes* (slightly immature) narrowly oblong, to 7 cm long, 5 mm wide, straight, flat, slightly undulate, not reticulate, resinous, glabrous. *Seeds* (slightly immature) longitudinal in the legume, oblong-elliptic; *areole* open towards hilum; *funicle* 12 mm long, expanded into a clavate *aril*.

Other specimens examined. WESTERN AUSTRALIA: Chiddarcooping Nature Reserve, *S.D. Hopper* 6405, 6407, 6408-6412, 6414 (all PERTH) and *A.S. Weston* 14029 (BM, G, NT, PERTH), 14103 (AD, BRI, CANB, K, MEL, NSW, PERTH), 14170 (PERTH), 14263 (PERTH, MO, NY), 14263A (PERTH), 14546 (PERTH).

Distribution. South-west Western Australia in the Avon Botanical District (1:250,000 map H50-12). Known only from the Chiddarcooping Nature Reserve, about 70 km NE of Merredin.

Habitat. Scree slopes of granitic breakaways in woodland or low scrub.

Flowering and fruiting. Flowers June—September. Legumes with slightly immature seeds occur in early November.

Affinities. On account of its short, terete, 4-nerved phyllodes with an apical gland and its overall inflorescence characters, *A. ascendens* is most closely related to the widespread southern Arid Zone

species *A. abrupta*. Both species are glabrous, resinous shrubs. *Acacia abrupta* is readily distinguished from the new species in the following ways: phyllode nerves lacking ridges of translucent, viscid material; gland present at base of phyllode as well as the apex; sepals united for c. 2/3 their length; legumes 2.5-3 mm wide, arcuate, biconvex, shallowly constricted between seeds, longitudinally reticulate.

Conservation status. 2RC using the criteria of Briggs & Leigh (1988). The species is locally abundant in suitable habitats within the Chiddarcooping Nature Reserve.

Etymology. The specific epithet refers to the characteristic phyllode orientation.

Acacia brachypoda Maslin, sp. nov.

Frutices densi leviter resinosi-aromatici ad 2 m alti. *Ramuli* glabri, nervis latis, luteis vel viridibus. *Phyllodia* teretia ad plana, 2-5 cm longa, 1 mm lata, oblique truncata et excentrice mucronulata, viridia, glabra, obscure 4-nervata, 1-nervata ubi plana, pulvino minuto sed distincta, glande obscura, circa 0.5 mm supra pulvinum, phyllodiorum apicibus eglandulosis. *Pedunculi* 2-3 mm longi, 2 in quoque axilla, aliquando in racemo ad 1 mm longo, appresso-puberuli, bractea basali lutea, capitulis globularibus, aureis, 8- vel 9-floribus. *Flores* pentameri, calyce gamosepalo, petalis uninervatis. *Legumina* arcuata et undulata ad irregulariter circinnata vel non arcuata, ad 8 cm longa, 7-8 mm lata, tenuiter coriaceo-crustacea. *Semina* longitudinalia, oblonga ad oblongo-ovata, 4 mm longa, arillo crasso.

Typus. 13.5 km N of Brookton on the road to Beverley, Western Australia, 26 May 1976, *B.R. Maslin* 4088 (holo: PERTH; iso: CANB, K, NY).

Dense, round, slightly aromatic *shrubs* to 2 m tall, dividing near ground level into many spreading to erect stems. *Bark* fissured at base of old stems otherwise smooth and grey except upper branches which are often brownish. *New shoots* resinous, slightly viscid, pale green. *Branchlets* glabrous, terete except angled at extremities, roughened by raised stem-projections where phyllodes have fallen, marked with broad (0.3-0.4 mm wide) flat, shiny nerves, at branchlet apices the nerves green (drying yellow) and close together, with age turning brown, widely spaced and more prominent. *Stipules* caducous, triangular, minute, 0.3-0.5 mm long, thick. *Phyllodes* terete, sub-terete or flat, 2-5 cm long, 0.7-1 mm wide, finely longitudinally sulcate when dry, patent to inclined or ascending to erect, straight to shallowly incurved, slightly shiny, glabrous, green; *4-nerved*, 1-nerved per face when flat, nerves impressed and obscure, brownish when dry, sometimes overlaid by an irregular narrow ridge of translucent resin; *apices* not uncinate, obliquely truncate, ending in a very short, acute, excentric mucro; *pulvinus* very reduced, 0.2-0.5 mm long, narrower than phyllode width, yellowish. *Gland* not prominent, situated on a slight, rounded angle c. 0.5 mm above pulvinus, apices eglandulose. *Inflorescence* parts resinous, not viscid. *Peduncles* 2-3 mm long, 2 per node with a vegetative bud (enveloped by resin) arising from within their angle, sometimes inserted on an extremely short raceme to 1 mm long, antrorsely appressed puberulous, hairs white and partially or wholly enveloped by resin; *basal peduncular bract* solitary, persistent, triangular, c. 0.5 mm long, somewhat thickened, yellow. *Flower-heads* prolific, globular, resinous, mid-golden, 8- or 9-flowered. *Bracteoles* sub-sessile; laminae triangular-ovate, c. 0.5 mm long and the same across, resinous, slightly auriculate at base, sparsely appressed puberulous abaxially, hairs light golden. *Flowers* slightly resinous, 5-merous. *Calyx* c. half length of corolla, gamosepalous, turbinate, shortly divided into broadly triangular lobes; *calyx tube* $\pm$ obscurely 5-nerved, antrorsely appressed-puberulous, hairs white on lower half, light golden on upper half. *Petals* c. 2.5 mm long, free, sparsely appressed-puberulous (hairs obscured by resin), midribs rather prominent. *Legumes* (mostly dehisced) to c. 8 cm long (expanded length), 7-8 mm wide, narrowly oblong, curved and/or undulate to irregularly circinnate, valves commonly irregularly coiled and twisted following dehiscence, not or scarcely constricted between seeds and somewhat raised over them, firmly chartaceous to thinly coriaceous-crustaceous, resinous, glabrous, mid-brown. *Seeds* (few seen) longitudinal in the legume, oblong to oblong-ovate, 4 mm long, 2.5-3 mm wide, compressed (1-1.5 mm thick), dark brown, moderately shiny, *pleurogram* obscure; *areole* elongated "U"-shaped, open

towards the hilum, 2-2.5 mm long, c. 0.8 mm wide; *funicle* filiform c. 1 mm long, expanded into a thick terminal yellow-brown (when dry) *aril* c. 2 mm long.

Other specimens examined. WESTERN AUSTRALIA: Darkin Swamp, *J.S. Beard* 8130 (PERTH), *R.J. Edmiston* 2 (PERTH) and *B.R. Maslin* 6331 (PERTH); between Beverley and Brookton, *B.R. Maslin* 6342 (AD, BRI, CANB, CBG, G, K, MEL, MO, NSW, NY, PERTH, Z)

Distribution. South-west Western Australia on the border of the Darling and Avon Botanical Districts (1:250,000 map I5O-2). Known only from two populations between Brookton and the headwaters of the Darkin River.

Habitat. Low-lying seasonal swampy areas on sandy clay or loam in Open Scrub (Darkin Swamp), or low sandy loam rises in Open Woodland adjacent to slightly saline flats (near Brookton).

Flowering and fruiting period. Flowering commences in late May near Brookton but about a month later at Darkin Swamp. Because of the paucity of collections it is not known when flowering ends. Neither is it known when seed first matures, however, some legumes (a few with seeds remaining) can be found on the plants during at least May and June. Judging from the large quantity of dehisced legume valves on the ground under the plants, this species has a high fecundity.

Affinities. The new species is readily distinguished from other members of the "*A. wilhelmiana* group" by its very short peduncles and few-flowered heads. Other characters useful in recognizing *A. brachypoda* include the following: branchlet nerves broad and flat, phyllodes (obscurely) 4-nerved, pulvinus narrower than the width of phyllode, calyx turbinate and very shortly dissected, petals rather prominently 1-nerved, legumes broad.

Conservation status. 2V using the criteria of Briggs & Leigh (1988).

Etymology. The specific epithet refers to the characteristic short peduncles.

Acacia cowaniana Maslin, sp. nov.

Frutices vel arbores ad 5(8) m alta, ramulis glabris vel subglabris. *Phyllodia* linearia, attenuata versus basem, uncinata ad subuncinata et excentrice rostellata, (2)3-5 cm longa, 1-2.5 mm lata, 1: w = 10-46, patens ad inclinata, leviter incurvata, plana nervis aliquibus appresso-puberula vel laminis omnino glabris, viridia, in quoque superficie obscure 3-7 nervata, glande basali. *Racemi* 2-3 mm longi, pedunculis (1)2 in quoque axilla 5-7 mm longis, sparse ad parce appresso-puberulis; capitula globularia, cremea ad diluto-citrina, 20-floribus. *Flores* pentameri; calyce gamosepalo. *Legumina* linearia, ad 8 cm longa, 4.5-6 mm lata, firme chartacea, leviter undulata, villosa vel puberula, maturitate pilis decrescentibus. *Semina* longitudinalia, oblongo-elliptica ad oblongo-ovata, c. 3.5 mm longa, interdum ad 5 mm longa, arillo clavato.

Typus. Mount Caroline (eastern slopes), 21 km due SSW of Kellerberrin, Western Australia, 10 April 1986, *B.R. Maslin* 6015 (holo: PERTH; iso: CANB, K, NY).

Shrubs or small *trees* to 5 m tall, occasionally to 8 m, dividing at or near ground level into a few main trunks. *Bark* grey, fibrous and longitudinally fissured on main trunks (at least at their bases), smooth and grey-red or reddish brown on upper branches. *Branchlets* terete, angled at extremities, obscurely ribbed, glabrous or sparsely antrorsely puberulous, hairs white or golden and mainly confined to the ribs, ribs commonly flanked by an irregular, slightly raised line of yellowish sub-epidermal material (? resin) which is ± continuous at first but breaking into irregular tubercles with age. *Stipules* caducous, inconspicuous, triangular, c. 0.3 mm long. *Phyllodes* narrowly linear, narrowed at base, (2)3-5 cm long, 1-2.5 mm wide, 1:w = 10-46, flat, patent to inclined, mostly shallowly incurved, a few straight or shallowly sigmoid, resinous, glabrous or sparsely appressed-puberulous, hairs white or golden and confined to some nerves, green; obscurely

3-7-nerved per face, nerves distant, brownish and slightly impressed when dry, uniformly obscure (scarsely visible when fresh) or 2 per face yellowish and more pronounced than the rest, lateral nerves absent; *apices* sub-uncinate, rounded or occasionally obliquely truncate, excentrically rostellate; *pulvinus* c. 0.5 mm long, yellow or orange-brown and slightly transversely rugose when dry. *Gland* situated on upper margin of phyllode at distal end of pulvinus, circular or elliptic, c. 0.5 mm long, apices eglandulose. *Racemes* resinous, (1-)2-headed; *raceme axes* 2-3 mm long, compressed, shallowly channelled above, sparsely appressed-puberulous, hairs white or golden, base ebracteate, terminated by a vegetative bud. *Peduncles* 5-7 mm long, sparsely to moderately appressed-puberulous, hairs white or pale golden and commonly enveloped in resin; *basal peduncular bract* persistent, triangular-ovate, c. 0.5 mm long, light brown. *Flower-heads* globular, cream to very pale lemon yellow, 10 mm diam. (fresh), 4.5-7 mm diam. (dry), 20-flowered, resinous. *Bracteoles* spathulate, 1 mm long; *claws* linear, glabrous; *laminae* ± ovate, acute, inflexed, slightly thickened, sparsely appressed-puberulous. *Flowers* 5-merous, resinous. *Calyx membranous, c.* half length of corolla, gamosepalous, variably dissected to c. half its length into oblong or triangular, sparsely appressed-puberulous lobes, calyx tube glabrous. *Petals 1.5-2 mm long, joined for* 1/2–2/3 their length, glabrous or sparsely appressed-puberulous, obscurely 1-nerved. *Legumes* linear, to 8 cm long, 4.5-6 mm wide, firmly chartaceous, ± straight to slightly curved, slightly undulate, rounded on opposite sides over alternate seeds, slightly resinous, light brown to mid-brown, villous or puberulous, hairs rather sparse with age. *Seeds* (few seen) longitudinal to longitudinally oblique in the legume, oblong-elliptic to oblong-ovate, mostly c. 3.5 mm long and 2 mm wide (perhaps slightly immature) but one measuring 5 mm long and 3 mm wide, tan, dull (small seeds) or sub-shiny (large seeds); *pleurogram* obscure; *areole* open towards the hilum, 1 mm long (small seeds) or 2 mm long (large seeds), 0.4-0.5 mm wide; *funicle* filiform, c. 1 mm long, expanded rather abruptly into a clavate, presumably white (commonly yellowish-brown when dry) *aril* extending c. 1/3 seed length.

Other specimens examined. WESTERN AUSTRALIA: Jilakin Rock, 2 May 1986, *K.J. Atkins* s.n. (PERTH); Mt Caroline, 15 May 1961, *W.H. Butler* s.n. (PERTH); Kellerberrin Hill, 2 July 1936, *C.A. Gardner* s.n. (PERTH); Mooranoppin Rock, *C.A. Gardner* 13887 (PERTH); Mt Caroline 5 April 1986, *J. Kinnear* s.n. (PERTH); Kellerberrin, September 1897, *R.B. Leake*, (PERTH); Jilakin Rock, 24 October 1959 and 10 August 1960, *C.V. Malcolm* s.n. (both PERTH); 8 km NE of Kellerberrin on "Shark Mouth" Rd, *B.R. Maslin* 589 (BRI, PERTH) and *B.R. Maslin* 589A (MEL, NSW, PERTH); Mt Caroline (eastern slope), *B.R. Maslin* 6015A (PERTH).

Distribution and habitat. South-west Western Australia in the Avon Botanical District (1:250,000 maps H50-15 and I5O-03). Restricted to a few granite outcrops around Kellerberrin and Kulin. Besides the localities listed above, the species is also known from Nangeen Hill, south-east of Mt Caroline (B. Bromilow, pers. comm.).

Flowering and fruiting period. Flowers April—July. Legumes (slightly immature) in October.

Affinities. Related to the eastern Australian species *A. wilhelmiana* which is most readily distinguished by its flower heads goldencoloured, peduncle indumentum denser and more conspicuous, phyllodes usually shorter (1-3 cm long, rarely a few to 6.5 cm), gland 1-2 mm above pulvinus and legumes 2-3 mm wide and glabrous.

Conservation status. 3R using the criteria of Briggs & Leigh (1988).

Etymology. Named in honour of Richard Cowan in recognition of his major contribution to botanical bibliography through co-authorship (with F. Stafleu) of "Taxonomic Literature II" and in appreciation of the enjoyable collaboration since 1987 on the study of Australian acacias.

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Correction to 'New taxa and notes on *Banksia* L.f. (Proteaceae)' by A.S. George, Nuytsia 6(3): 309-317 (1988)

In the above paper a new variety of *Banksia leptophylla* was described. In a heading on p. 314, the spelling 'var. *mellitica*' was printed, but this was a typographical error and should have read 'var. *melletica*'. The latter spelling was used elsewhere in the paper (map caption, abstract). Article 75.2 of the "International Code of Botanical Nomenclature" allows for correction where orthographic variants appear in the original publication. The spelling *'Banksia leptophylla* var. *melletica*' is here designated as correct and the spelling 'var. *mellitica*', rejected.

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