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## CONTENTS

Two new species of *Tetratheca* (Tremandraceae),  
from the Coolgardie and Austin Botanical Districts,  
Western Australia.

By Jenifer J. Alford

**143**

Acacia Miscellany 13. Taxonomy of some Western  
Australian phyllocladinous and aphyllodinous taxa  
(Leguminosae: Mimosoideae).

By B.R. Maslin

**151**

Acacia Miscellany 14. Taxonomy of some Western  
Australian "Uninerves-Racemosae" species  
(Leguminosae: Mimosoideae: section *Phyllodineae*).

By B.R. Maslin

**181**

Acacia Miscellany 15. Five groups of microneurous species  
of *Acacia* (Leguminosae: Mimosoideae: section *Plurinerves*),  
mostly from Western Australia.

By R.S. Cowan and B.R. Maslin

**205**

New and priority taxa in the genera *Cryptandra* and  
*Stenanthemum* (Rhamnaceae) of Western Australia.

By B.L. Rye

**255**

*Cryptandra monticola* (Rhamnaceae), a new species from the  
Pilbara region of Western Australia.

By B.L. Rye and M.E. Trudgen

**307**

Conservation Codes for Western Australian Flora

**311**

Publication date of *Nuytsia* Volume 10 Number 1

**311**


Notes for Authors

**312**

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Department of Conservation and Land Management, Western Australia

## CONTENTS

	Page
Two new species of <i>Tetratheca</i> (Tremandraceae), from the Coolgardie and Austin Botanical Districts, Western Australia. By Jenifer J. Alford .....	143
<i>Acacia</i> Miscellany 13. Taxonomy of some Western Australian phyllocladinous and aphyllodinous taxa (Leguminosae: Mimosoideae). By B.R. Maslin .....	151
<i>Acacia</i> Miscellany 14. Taxonomy of some Western Australian "Uninerves-Racemosae" species (Leguminosae: Mimosoideae: section <i>Phyllodineae</i> ). By B.R. Maslin .....	181
<i>Acacia</i> Miscellany 15. Five groups of microneurous species of <i>Acacia</i> (Leguminosae: Mimosoideae: section <i>Plurinerves</i> ), mostly from Western Australia. By R.S. Cowan and B.R. Maslin .....	205
New and priority taxa in the genera <i>Cryptandra</i> and <i>Stenanthemum</i> (Rhamnaceae) of Western Australia. By B.L. Rye .....	255
<i>Cryptandra monticola</i> (Rhamnaceae), a new species from the Pilbara region of Western Australia. By B.L. Rye and M.E. Trudgen .....	307
Conservation Codes for Western Australian Flora .....	311
Publication date of <i>Nuytsia</i> Volume 10 Number 1 .....	311
Notes for Authors .....	312

Cover

*Nuytsia floribunda* (Labill.) R. Br. ex Fenzl (Loranthaceae) - the Western Australian Christmas Tree is one of the few arborescent mistletoes in the world. This endemic tree is a semi-parasite common in sandy soil from the Murchison River to Israelite Bay. The journal is named after the plant, which in turn commemorates Pieter Nuijts, an ambassador of the Dutch East India Company, who in 1627 accompanied the "Gulde Zeepard" on one of the first explorations along the south coast of Australia.

Cover design by Sue Marais

Photograph A.S. George

## Two new species of *Tetralthea* (Tremandraceae), from the Coolgardie and Austin Botanical Districts, Western Australia

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### Abstract

Alford, Jenifer J. Two new species of *Tetralthea* (Tremandraceae), from the Coolgardie and Austin Botanical Districts, Western Australia. Nuytsia 10 (2): 143-149 (1995). Two new species of *Tetralthea* (Tremandraceae), *T. chapmanii*, endemic to the Carnarvon Range in the Austin Botanical District, Eremaean Province and *T. paynterae*, endemic to one small range of hills north of Bullfinch in the Coolgardie Botanical District, South-Western Interzone, are described and illustrated. A key and a table of differences are provided to facilitate recognition of the two newly described species and the morphologically-similar species *T. aphylla* and *T. halmaturina*.

### Introduction

The endemic Australian genus *Tetralthea* (Tremandraceae) comprises 41 species, 23 of which are restricted to Western Australia. The conservation and taxonomic status of Western Australian *Tetralthea* is being investigated by the author.

Several Western Australian species of *Tetralthea* are very geographically restricted and appear to be relics. Three such species are *T. aphylla* F. Muell. and two new species described here. The distribution and habit of *T. aphylla* were unknown until it was rediscovered in 1980, and Thompson (1976) had access only to the holotype for her treatment of this species. Extensive surveys since 1980 have located seven small populations of these erect, almost leafless shrubs to 50 cm in height in the Coolgardie Botanical District (Beard 1980).

A collection from what was at first believed to be a new, disjunct population of *T. aphylla*, 55 km north-northwest of the species' known distribution, was brought to the author's attention in 1988 by Ms Ray Paynter. Subsequent collections of flowering and fruiting material in 1990 confirmed that this was a new species. In 1993, a second new species was collected by Mr Andrew Chapman 520 km beyond the previously known range of the genus. This represents a significant range extension for the family Tremandraceae and the first record from the Austin Botanical District. The two new species are here named in honour of their discoverers as *Tetralthea chapmanii* and *T. paynterae* respectively.

Although readily distinguished from one another and from other members of the genus, the two new species appear to be very closely related and also to be closely related to two named species, *T. aphylla* and *T. halmaturina* J.M. Black. The latter is a South Australian species found only on Kangaroo Island. As these four morphologically-similar species are allopatric, it is highly unlikely that pollen transfer or hybridization occurs between any of them.

The following description of *T. paynterae* is based on measurements obtained from 30 individual plants and that of *T. chapmanii* from four herbarium collections.

### Taxonomy

The primary distinguishing characters of *T. aphylla*, *T. chapmanii*, *T. halmaturina* and *T. paynterae* are summarized in Table 1. Some of the diagnostic characteristics of *Tetralthea aphylla* are also illustrated for comparison with the two new species. (Figure 1A,E,I)

#### Key to species in the *Tetralthea aphylla* group

- 1a. Ovules 2 (1/loculus) ..... 2  
 2a. Peduncles densely hispidulous ..... *T. aphylla*  
 2b. Peduncles glabrous ..... *T. halmaturina*  
 1b. Ovules 4 (2/loculus) ..... 3  
 3a. Peduncles 2.3-4.4 mm long. Calyx segments 1.9-2.3 mm long.  
 Stamens 2.7-2.9 mm long, pairs joined along bottom half of filament.  
 Seeds c. 4.7 mm long. Stems sparsely tuberculate with resin-tipped  
 hairs near flowers and in leaf axils ..... *T. chapmanii*  
 3b. Peduncles 5.1-11 mm long. Calyx segments 3.3-5.5 mm long.  
 Stamens 3.7-5.1 mm long, pairs share a common filament.  
 Seeds c. 3.6 mm long. Stems densely tuberculate, glabrous or with  
 resin-tipped hairs. .... *T. paynterae*

#### *Tetralthea chapmanii* Alford, sp. nov. (Figure 1C,D,G)

*T. paynterae* affinis a qua imprimis differt planta sparse tuberculata, pedunculo caule ovario et calyce pilis glandulosis rubro-apicibus ornatis, staminibus parvioribus (2.7-2.9 vs 3.7-5.1 mm longis), seminibus grandioribus (4.7 vs 3.6 mm).

*Typus*: Carnarvon Range, near Virgin Spring, 270 km north-east of Meekatharra, Western Australia, 25°06'14"S, 120°43'25"E, 24 October 1993, A. Chapman s.n. (*holo*: PERTH 03284085; *iso*: NSW, PERTH).



Small *shrub*, to 0.4 m high, erect to decumbent, stock not seen. *Stems* divaricate; branches alternate, often terminating in a brown slender point, terete, 0.7-1.9 mm diameter, longitudinally unevenly ridged, with sparse minute tubercles and resin-tipped hairs on leaf axils and flowering stems. *Leaves* early deciduous and often apparently absent; petiole 0.7 mm long; blade 1.3 mm long, 0.5 mm wide, hispid, also with some resin-tipped hairs on lower surface, pubescent on upper surface. *Flowers* usually occurring singly in axils of leaf-bases. *Bracts* clustered, fleshy, 0.6 mm long, 0.5 mm wide, with hairs resin-tipped outside, pubescent inside. *Peduncles* slightly recurved, 2.3-4.4 mm long, 0.3 mm in diameter gradually thickened towards apex, longitudinally striate, glossy green and red, with scattered resin-tipped hairs; receptacle 0.7-1.0 mm diameter. *Calyx* segments 5, persistent, 1.9-2.3 mm long, 1.3-1.7 mm wide, broadly elliptic, broadly acute; green but red near base and on margins, with sparse resin-tipped hairs outside, glabrous and shiny green inside except for *c.* 0.5 mm around edge which is scabrous. *Petals* 5, obovate to elliptic, acuminate, deciduous; 11-11.2 mm long and 6.3-6.5 mm (widest part being *c.* 1/4 from the apex), deep lilac-pink. *Stamens* 10, 2.7-2.9 mm long, pairs of stamens joined along bottom half of filament, strongly infolded together in bud; filament 0.3-0.6 mm long; body of anther 1.7-1.8 mm long; anther tube 0.6-0.7 mm long, almost straight, with a few minute stiff hairs. *Ovary* greenish yellow with red on junction of carpels and on margins, covered in resin-tipped hairs which become sparse as fruit develops; ovules 4, 2 per loculus. *Fruits* compressed obovoid; 5.8 mm long, 2.5-3.8 mm wide; green, almost glabrous but minutely puberulous on margin. *Seeds* 4.7 mm long, 1.2 mm wide, medium brown, covered in short antrorse hairs; elaiosome prominent, *c.* 1.2 mm long, cream-coloured; embryo narrowly elliptic, bright green.

*Specimens examined.* None other than type material.

*Distribution.* Occurs in the Austin Botanical District of Western Australia, known only from Carnarvon Range, near Virgin Spring, 270 km north-east of Meekatharra.

*Ecology.* This species occurs in crevices of vertical cliffs of sandstone massif and on the plateau surface of the range. Associated vegetation is limited to occasional *Ficus platypoda*.

*Flowering period.* July, October. Probably flowers opportunistically after rain, as do other species occupying these habitats.

*Conservation status.* Approximately 1000 individual plants have been recorded at the only known population of this species. Until further surveys are undertaken to ascertain its conservation status, this species has been recommended as Priority 1 for inclusion on the Priority Flora List of the Western Australian Department of Conservation and Land Management.

*Affinities.* This species is very similar to the other new species described below, *Tetratheca paynterae*, in that the two are almost identical in habit. Either they must be closely related relictual species or examples of convergent evolution, probably the former. Both species have four ovules (two in each loculus) which immediately differentiates them from *T. aphylla* and *T. halmaturina*. As indicated in the key, *T. chapmanii* can be readily distinguished from *T. paynterae* by its smaller peduncles, calyx and stamens (although its seeds appear to be larger), also it has more numerous resin-tipped hairs.

*Etymology.* The specific epithet honours the efforts of Mr Andrew Chapman, an ecologist from Kalgoorlie, who collected the original specimen and subsequent material of this species in the course of his biological survey work.

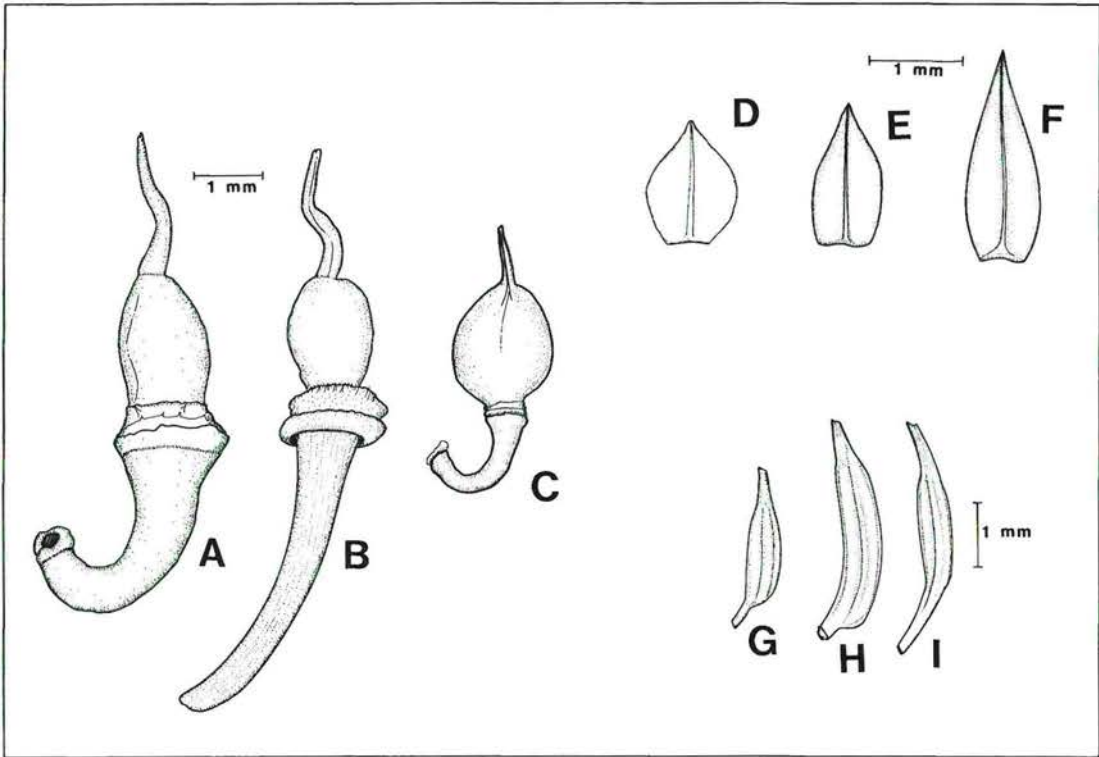


Figure 1. Peduncle and developing fruits (petals and calyx segments removed, hairs not illustrated) A - *T. aphylla*, B - *T. paynterae*, C - *T. chapmanii*. Calyx segments (hairs not illustrated) D - *T. chapmanii*, E - *T. aphylla*, F - *T. paynterae*. Stamens G - *T. chapmanii*, H - *T. paynterae*, I - *T. aphylla*.

***Tetratheca paynterae* Alford, sp. nov. (Figures 1B,F,H & 2)**

*Tetratheca paynterae* a *T. aphylla* F. Muell. caulis verrucosis, sepalis magis acutis, pedunculo sub-glabro, et ovulis 4 statim dignoscenda.

*Typus*: Unnamed hills, approximately 120 km north of Bullfinch [precise locality withheld], Western Australia, 8 November 1989, J.J. Alford 1360 (*holo*: PERTH 03284093; *iso*: CANB, NSW).

Small *shrub*, 0.15-0.4 m high, erect to decumbent with a woody stock. *Stems* divaricate; branches alternate, often terminating in a brown or silver slender point, terete, 0.7-2.3 mm diameter; irregularly longitudinally striate, glabrous but with dense minute tubercles; new growth densely hispid. *Leaves* sparse, early deciduous and often apparently absent, scattered along the stems, sessile, narrowly triangular, 1.7 mm long, 0.6 mm wide, both surfaces hispidulous; seedling and resprouting leaves elliptic to ovate, 5.1-8 mm long, 2.3-2.8 mm wide. *Flowers* with distinctive dank musky odour, occurring singly (occasionally paired) in axils of leaf-bases. *Bracts* clustered, fleshy, keeled, acuminate, 0.5-1.5 mm long, reddish, tuberculate, scabrous outside, pubescent inside. *Peduncles* often slightly recurved, 5.1-11.0 mm long, 0.3-0.5 mm in diameter gradually thickened towards apex, longitudinally striate, glossy green and red, sparsely tuberculate, scabrous with the hairs minute and occasionally resin-tipped; receptacle 1.0-1.5 mm diameter. *Calyx* segments 5(6), deciduous, 3.3-5.5 mm long, 1.1-1.7 mm wide, narrowly triangular, acute, green but red near base and on margins

Table 1. Morphological characters which distinguish *T. paynterae*, *T. chapmanii*, *T. aphylla* and *T. halmaturina*.

Morphological character	<i>Tetralthea paynterae</i>	<i>Tetralthea chapmanii</i>	<i>Tetralthea aphylla</i>	<i>Tetralthea halmaturina</i>
Number of specimens examined	30	4	15 (including holotype)	From literature Thompson (1976)
<b>Stem:</b> diameter	0.7-2.3 mm	0.7-1.9 mm	1.2-3.6 mm	1.1-1.8 mm
<b>Peduncle:</b> length	5.1-11 mm	2.3-4.4 mm	2.0-4.5 mm	5-8 mm
width	0.3-0.5 mm	0.3-0.4 mm	0.3-0.7 mm	not recorded
vestiture	almost glabrous few resin-tipped hairs	almost glabrous or numerous resin-tipped hairs	dense, minute stiff hairs and occasional resin-tipped hairs	glabrous
<b>Receptacle:</b> diameter	1.0-1.5 mm	0.7-1.0 mm	1.0-1.6 mm	1.5 mm
<b>Calyx segments:</b>				
number	5(6)	5	5	5
length	3.3-5.5 mm	1.9-2.3 mm	2.0-3.3 mm	2.5-3 mm
width	1.1-1.7 mm	1.3-1.7 mm	1.0-1.4 mm	not recorded
<b>Stamens:</b> number	10(12)	10	10	10
total length	3.7-5.1 mm	2.7-2.9 mm	3.5-4.1 mm	3.2-3.5 mm
filament	0.4-0.7 mm	0.3-0.6 mm	0.5-0.7 mm	<0.25 mm
anther body	2.5-3.4 mm	1.7-1.8 mm	1.7-2.4 mm	2.25-2.5 mm
tube	0.7-1.2 mm	0.6-0.7 mm	0.6-1.4 mm	0.75-1.5 mm
other	pairs joined along entire filament length	pairs joined along bottom half of filament	all free	not recorded
<b>Fruit:</b> length	5.6-8.4 mm	5.8 mm	6.9-7.8 mm	6-8 mm
width	4.0-6.0 mm	2.5-3.8 mm	3.4 mm	2.5-3 mm
widest point	upper third	centre	upper quarter	narrowly obovate
<b>Ovules:</b> number	4 (2 per loculus)	4 (2 per loculus)	2 (1 per loculus)	2 (1 per loculus)
<b>Seeds:</b> length	3.6 mm	4.7 mm	3.6-4.8 mm	3.5-4 mm
width	1.3 mm	1.2 mm	1.2 mm	not recorded

in fresh material, with short stiff hairs and strigose hairs on both surfaces, pubescent close to the margin on upper surface, the strigose hairs occasionally resin-tipped on lower surface. *Petals* 5(6), obovate to elliptic, acuminate, deciduous, 6.9-12.8 mm long and 4.1-7.8 mm wide (the widest point being *c.* 1/3 from the apex), deep pink with yellow spot at base. *Stamens* 10(12), 3.7-5.1 mm long, pairs of stamens share a common filament, strongly infolded together in bud; filament 0.4-0.7 mm long; body of anther 2.5-3.4 mm long; anther tube 0.7-1.2 mm long, slightly curved, sparsely hispidulous. *Ovary* tapered upwards to the stigma, green with red on margins of carpels, densely hispidulous and sparsely glandular pilose; ovules 4, 2 per loculus. *Fruits* compressed obovoid, 5.6-8.4 mm long, 4-6 mm wide, sparsely to densely hispid, with occasional resin-tipped hairs; rim of receptacle prominent and persistent; style persistent, 2-3 mm long. *Seeds* *c.* 3.6 mm long, 1.3 mm wide, pale to medium brown, silky with long simple hairs; elaiosome prominent, 0.9-1.8 mm long, cream-coloured; embryo narrowly elliptic, pale green.

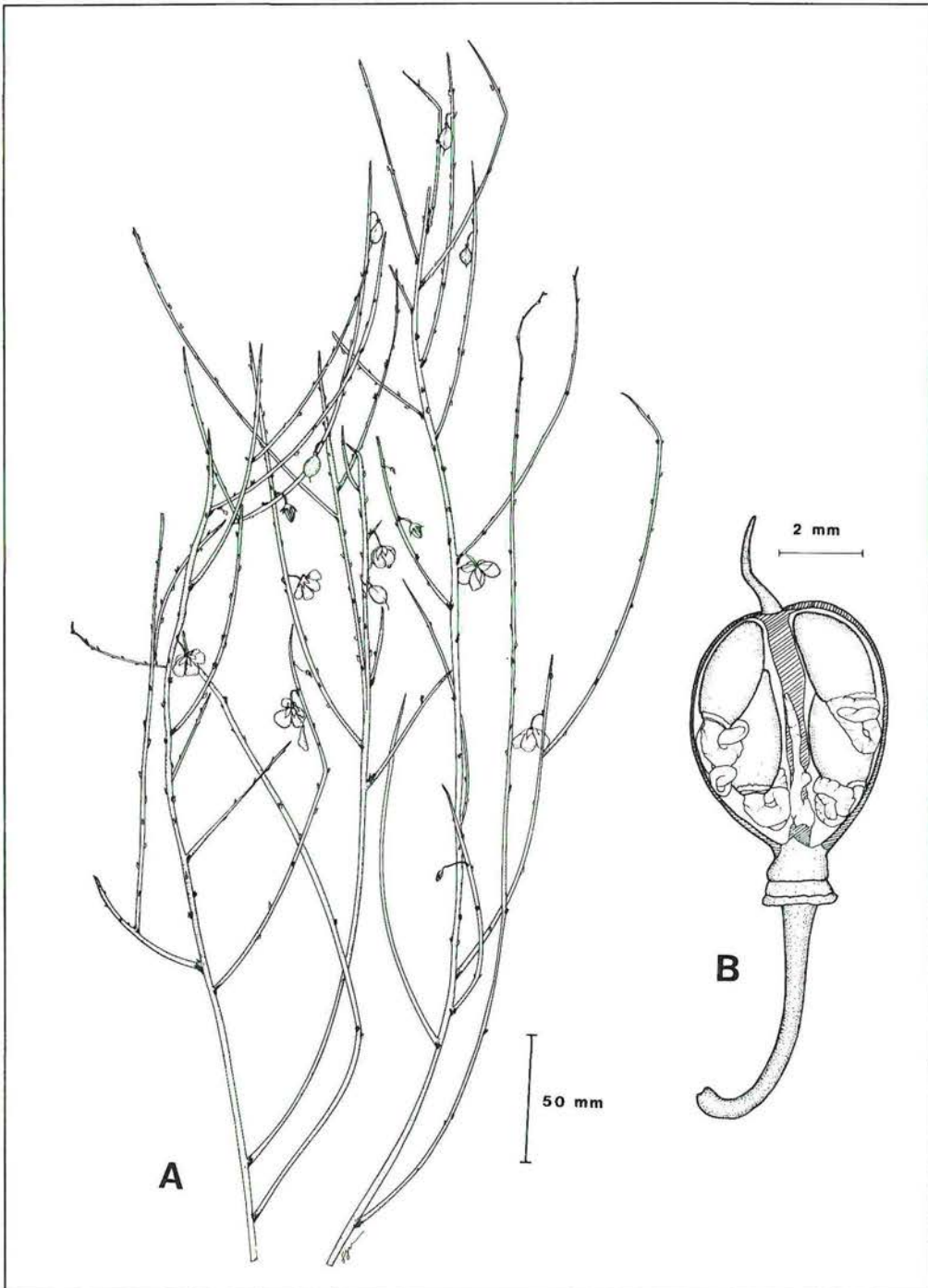


Figure 2. *Tetratheca paynterae*. A - habit, B - half of septicidal capsule showing seeds.

*Other specimens examined.* WESTERN AUSTRALIA: Type locality, 23 June 1990, F. & N. Mollemans 2967, 2972, 2973, 2975, 2976 (PERTH).

*Distribution.* Endemic to the Coolgardie Botanical District, South-Western Interzone of Western Australia, occurring approximately 120 km north of Bullfinch, Yilgarn Shire [precise location withheld].

*Ecology.* This species occurs in crevices of rich red loam amongst massive banded ironstone rock. The associated vegetation is an open shrubland of *Melaleuca filifolia*, *Exocarpos aphyllus*, *Alyxia buxifolia*, *Calycopeplus ephedroides*, *Acacia tetragonophylla* and *Dodonaea viscosa*, all to 3 m over a sparse understory of *Chenopodium*, *Ptilotus*, *Olearia stuartii* and *Isotoma petraea*.

*Flowering period.* April to November, flowering opportunistically after rain.

*Conservation status.* The habitat of this species has been surveyed extensively and to date approximately 1000 individual plants have been found at the only known location. Since this population is not within a conservation reserve, the species has been formally gazetted as Declared Rare Flora (Schedule of Declared Rare Flora, 1991).

*Affinities.* The affinities of this species are discussed under *Tetratheca chapmanii*, which appears to be its closest relative.

*Etymology.* The specific epithet honours the efforts of Ms Ray Paynter of Toodyay, who has contributed greatly to the conservation of the flora and vegetation of Western Australia.

### Acknowledgements

I wish to thank both Ms Ray Paynter and Mr Andy Chapman for collecting the original specimens and bringing them to my attention. I thank Mr Greg Keighery for his encouragement and for enabling me to pursue my studies of *Tetratheca*. I also thank Mr Paul Wilson for his Latin diagnoses and comments on the manuscript and Mr Francisco Neira for the illustrations. Mr Bruce Maslin and an anonymous referee kindly provided their constructive advice.

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- Thompson, J. (1976). A revision of the genus *Tetratheca* (Tremandraceae). *Telopea* 1:139-215.  
Beard, J. S. (1980). A new Phytogeographic map of Western Australia. *Western Australian Herb. Res. Notes* No. 3:37-58.  
Schedule of Declared Rare Flora (1991). *Government Gazette* 17<sup>th</sup> May, 70:2468-2473.

### **Acacia Miscellany 13. Taxonomy of some Western Australian phyllocladinous and aphyllodinous taxa (Leguminosae: Mimosoideae)**

B.R. Maslin

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PO Box 104, Como, Western Australia 6152

#### **Abstract**

B.R. Maslin. *Acacia* Miscellany 13. Taxonomy of some Western Australian phyllocladinous and aphyllodinous taxa (Leguminosae: Mimosoideae). *Nuytsia* 10 (2): 151-179 (1995). Descriptions are provided for eleven endemic Western Australian species of *Acacia* characterized by phyllodes which are either decurrent on the stems and forming prominent opposite wings, or which are reduced to scales or minute, horn-like projections. Seven new species and two new infraspecific taxa of *Acacia* are described, namely, *A. aemula* Maslin which comprises two subspecies, subsp. *aemula* and subsp. *muricata* Maslin (syn. *A. tetragonocarpa* var. *scabra* Benth.), *A. alata* var. *tetrantha* Maslin, *A. applanata* Maslin, *A. bifaria* Maslin, *A. carens* Maslin, *A. cerastes* Maslin, *A. cummingiana* Maslin and *A. pterocaulon* Maslin. The taxonomy of *A. alata* R. Br. is briefly assessed and the species is now viewed as comprising four varieties, namely, var. *alata*, var. *biglandulosa* Benth., var. *platyptera* (Lindl.) Meisn. and var. *tetrantha* Maslin. A description is provided for *A. volubilis* F. Muell.; this species is possibly extinct and seems related to *A. aemula*. *Acacia glaucoptera* Benth., a close relative of *A. bifaria*, and *A. willdenowiana* H. Wendl. (based on *A. diptera* Lindl.), a close relative of *A. applanata*, are lectotypified.

#### **Introduction**

The species included in this paper are endemic in Western Australian and most are characterized by phyllodes which are either decurrent on the stems and forming prominent opposite wings, or which are reduced to scales or minute, horn-like projections. Not all species with these characteristics are included here, only those that need to be formalized so that the names are available for inclusion in the forthcoming "Flora of Australia" treatment of *Acacia*.

Bentham (1864) recognized two series, *Continuae* Benth. and *Alatae* (Benth.) Benth., to accommodate the relatively few species of *Acacia* with continuous or decurrent phyllodes. The *Continuae* has long been recognized as an artificial group but the *Alatae* was accepted in Pedley's (1978 & 1986) classifications as a distinct section. Prior to 1978 Vassal (1972) had proposed a new classification of *Acacia* in which a number of new infrageneric taxa were recognized. One of these, section *Pulchelloidea* Vassal, was created to accommodate certain species from a number of Bentham's (1864) series (including the *Alatae* and *Continuae*). However, the results of preliminary

cladistic analyses of *Acacia* by Chappill and Maslin (1995) suggest that both the *Pulchelloidea* and *Alatae* are polyphyletic assemblages; decurrent phyllodes were interpreted as a highly homoplastic feature. This result is consistent with the findings of Pettigrew and Watson (1975) and indicate that it is unlikely the *Alatae* or *Continuae* will be recognized as formal, higher-order categories in future classifications.

There are six species included below under the heading "Phyllocladinous taxa". Although these species all have decurrent phyllodes that form prominent, opposite wings along the stems they are not all closely related to one another. *Acacia bifaria* sp. nov. and its close relative *A. glaucoptera* Benth. differ significantly from the others, particularly in carpological features; these two species are related to the *A. merrallii* F. Muell. group whose members do not have winged stems and only rarely have decurrent phyllodes. *Acacia applanata* sp. nov. is closely related to *A. willdenowiana* H. Wendl. and taxonomically not far from *A. alata* R. Br. The precise affinities of *A. pterocaulon* sp. nov. are not altogether clear.

Bentham's (1864) classification included three species where the phyllodes were reduced to scales; these were included in series *Pungentes* subseries *Aphyllae* Benth. (*A. spinescens* Benth.) and series *Calamiformes* subseries *Subaphyllae* Benth. (*A. tetragonocarpa* Meisn. and *A. restiacea* Benth.). Neither of these subseries has been recognized in the recent classifications of *Acacia* and there are no indications that aphyllodinous taxa (of which there are about five now recognized) represent a monophyletic group.

Of the five species included below under the heading "Aphyllodinous taxa" only *A. cummingiana* sp. nov. has all its phyllodes reduced to horizontally flattened scales (like those found in *A. tetragonocarpa*). It seems likely that in these two species at least the scales are homologous to fused phyllodes and stipules (see note under *A. cummingiana*). While *A. aemula* sp. nov. has for the most part normal phyllodes (which closely resemble the branchlets) a few terminal ones are sometimes reduced to horizontally flattened scales. In *A. carens* sp. nov. and *A. cerastes* sp. nov. the phyllodes are very rudimentary and are represented by minute, stipule-like or horn-like projections. *Acacia volubilis* F. Muell., which like *A. aemula* has distant, normal phyllodes which resemble the branchlets, is included within this group for comparative purposes because the name had until now commonly been misapplied to some of the new species described in this paper.

## Methods

The taxa included in this paper are arranged alphabetically under two headings, Phyllocladinous taxa and Aphyllodinous taxa. My approach to both typification and the application of rank are discussed elsewhere (Maslin and Cowan 1994a, Cowan and Maslin 1995).

### Phyllocladinous taxa

1. *Acacia alata* R. Br. in W.T.Aiton, Hortus Kew. ed. 2, 5: 464 (1813)

*Mimosa alata* (R. Br.) Poir. Encycl. Meth. (Bot.) Suppl. 5: 530 (1817), *nom. inval.* (combination not actually made); *Phyllodoce alata* (R. Br.) Link, Handbuch 2: 132 (1831); *Acacia alata* var. *genuina*

Meisn. in J.G.C. Lehmann, Pl. Preiss. 1: 4 (1844), *nom. inval.* *Lectotype* (see Maslin and Cowan 1995): "*Mimosa platycaulis*." Observatory Hill, Princess Royal Harbour, Albany, Western Australia, December 1801, R. Brown (BM - upper right hand flowering specimen on sheet titled "Iter Australiense, 1802-5" and bearing [Britten no.] 4314; *isolecto*: K, E. *Paralectotype*: sterile and fruiting specimens mounted with lectotype and isolectotype at BM, K and E.

*A. uniglandulosa* Seem. & J.A. Schmidt, Flora 27: 495 (1844). *Typus*: cultivated at Hanover botanic garden in 1844, as *A. latifrons*; *holo*: HBG, specimen ex herb. J.A. Schmidt.

?*A. alata* var. *glabrata* Hort. ex Seem., Verh. K.K. Gartenbauges. Wien 1846: 9 (1846). *Typus*: none cited (*n.v.*).

Much-branched *shrubs* to c. 2 m tall. Branchlets often flexuose. *Stipules* spinose to innocuous. *Phyllodes* continuous with branches, bifariously decurrent and forming opposite wings with each one extending to the next below, the wings usually 2-20 mm wide, narrowest on inflorescence-bearing region, thinly coriaceous, slightly undulate, green, glabrous to pilose or hirsute-hirsutellous, commonly tuberculate-scabridulous on margins; free portion of phyllodes 5-70 mm long, sometimes acuminate and/or uncinata, apical points spinose to innocuous, central nerve obvious. *Glands* 1-3 along adaxial margin of free portion of phyllode, prominent, each normally situated at apex of a triangular spur. *Peduncles* mostly 2 per axil, sometimes in racemes, 4-12 mm long, glabrous or hirsutellous to shortly pilose; *heads* globular, 4-15-flowered, white to golden. *Flowers* 5-merous, the buds obtuse to acute; *calyx* gamosepalous. *Pods* stipitate, 2-8 cm long, 5-11 mm wide, crustaceous, normally curved, flat, densely hairy, margins thick. *Seeds* transverse to oblique, oblong to elliptic, 2.5-4.5 mm long, arillate.

*Distribution.* Occurs from Port Gregory (c. 70 km north of Geraldton) south to Albany, southwest Western Australia.

*Affinities.* *Acacia alata* is related to *A. willdenowiana* from which it is most readily distinguished by the free portion of the phyllodes having one or more prominent gland-bearing angles along its upper margin and an obvious central nerve.

*Infraspecific taxa.* As defined here *A. alata* comprises four varieties; however, this should be viewed as an interim classification until further studies can be undertaken to ascertain if this is an appropriate rank for these taxa. Variety is used as a rank of convenience and has been adopted simply because two varieties had already been recognized within the species. The name var. *biglandulosa* Benth. has long been applied to the distinctive form of the species occurring in the Geraldton district. However, in preparing the "Flora of Australia" treatment of *A. alata* it became evident that plants with large, rather soft, ± innocuous phyllodes which occurred predominantly in areas just north of Perth cannot be easily accommodated within what remained as var. *alata*. Consequently, var. *platyptera* (Lindl.) Meisn. (restricted to near Mogumber) is here resurrected and var. *tetrantha* (Eneabba-Cervantes and Yanchep) is described as a new variety. Additionally, two informal variants are recognized, one allied to var. *platyptera* (restricted to the Tuttanning Flora Reserve near Pingelly) and the other allied to var. *biglandulosa* (restricted to a small area east of Mingenew); further studies are needed to confirm the status of these variants.



### Key to varieties of *A. alata*

1. Free portion of phyllodes with 2 or 3 gland-bearing angles, sharply pungent; heads 4-7-flowered ..... 1b. var. *biglandulosa*
- 1a. Free portion of phyllodes with 1 gland-bearing angle (rarely 2 or 3 in var. *tetrantha*) ..... 2
2. Heads 4-flowered; free portion of phyllodes 10-70 mm long, innocuous or scarcely pungent ..... 1d. var. *tetrantha*
- 2a. Heads more than 4-flowered ..... 3
3. Free portion of phyllodes 5-20 mm long, sharply pungent ..... 1a. var. *alata*
- 3a. Free portion of phyllodes 10-70 mm long, acuminate to caudate-acuminate, innocuous or slightly pungent ..... 1c. var. *platyptera*

#### 1a. *Acacia alata* R. Br. var. *alata*

*Illustrations.* H.L. Wendland, *Comm. Acac. Aphyll.* t. 1 (1820); A. Colla, *Hortus Ripul.* t. 17 (1824); H.G.L. Reichenbach, *Mag. Aesth. Bot.* [Mag. Gart.-Bot.] 2: pl. 88, fig. 1 (1825); R. Erickson *et al.*, *Fl. Pl. W. Australia* 2nd edn, 50 (1979); M. Simmons, *Acac. Australia* 1: 19 (1981), left hand illustration.

*Shrubs* 0.5-1.5 m tall. *Stipules* spinose or sub-spinose. *Phyllodes* on non-flowering region of stems 2-10 mm wide; free portion of phyllodes 5-20 mm long, apex spinose. *Peduncles* glabrous or hairy; *heads* 6-10-flowered, creamy white to lemon yellow, occasionally golden.

*Selected specimens examined.* WESTERN AUSTRALIA: Mount Clarence, Albany, *A.M. Ashby* 4325 (PERTH); c. 6 miles [c. 10 km] W of Three Springs, 27 June 1974, *C. Chapman* (MEL, PERTH 00723061); 6 miles [c. 10 km] W of Sullivan Rock, along track from picnic area on Albany Highway, *R.J. Cumming* 971 (PERTH, TLF); 26 miles [41.8 km] E of Irwin Inlet, near Denmark, 19 February 1913, *S.W. Jackson* (CANB, K, MEL, PERTH 00723622, TLF); Dingo Beach Track, West Cape Howe, 25 km W of Albany, *G.J. Keighery* 8755 (PERTH); Cape Leeuwin, *F. Lullfitz* L2052 (PERTH); c. 6 miles [c. 10 km] S of Mount Williams, *B.R. Maslin* 432 (MEL, PERTH); 1.6 km due S of Palgarrup, *B.R. Maslin* 2851 (MEL, PERTH); 2 km N of Mundijong township on Soldiers Road, *B.R. Maslin* 6157 (CANB, PERTH); NE of Yallingup, *S. Paust* 205 (PERTH); Canning River, *L. Preiss* 997 (LUND, MO, W); Cookernup, *R.D. Royce* 3842 (PERTH); Helena Valley, *J. Seabrook* 41 (CANB, PERTH); near Hamelin Bay, 13 August 1975, *R. Tinetti s.n.* (PERTH 00867470); between Cowaramup and Margaret River, *D.J.E. Whibley* 5064 (AD, PERTH). CULTIVATED: Kew Gardens, 1808, [*W. McNab*] (DBN, photo PERTH), see Maslin and Cowan 1995.

*Distribution.* Southwest Western Australia occurring mainly in the Darling Botanical District with an outlier in the Irwin Botanical District (1:250,000 maps H50-6,14; I50-2,5,6,9,10,11,15). This variety has a discontinuous distribution, occurring from Perth south to Collie, from Cape Naturaliste (c. 30 km west-northwest of Busselton) southeast to Manjimup, and from Denmark east to Albany, with an outlier at Three Springs (c. 200 km north of Perth).

*Habitat.* Grows in a variety of habitats but often along creeks with laterite or loam in forest and woodland in the Darling Range, and in sand over granite in coastal heath and low woodland near Albany.

*Flowering and fruiting periods.* Flowers have been recorded from May to December, with the main flush occurring between June and October. Pods with mature seeds have been collected in November and January.

*Variation.* Peduncles on specimens from Cape Naturaliste to Albany are hirsutellous to shortly pilose, further north they are normally glabrous. Smallest pods occur on plants from around Albany, i.e. 2-4 cm long and 5-6 mm wide.

*Hybrids.* Appears to hybridize with *A. applanata* in a few places in the Darling Range near Perth (see *A. applanata* below for discussion).

*Conservation status.* Widespread, not considered rare or endangered.

*Cultivation.* Widely cultivated in Europe last century, sometimes as *A. scolopendria* which is presumed to be a *nomen nudum*.

**1b. *Acacia alata* var. *biglandulosa* Benth., Fl. Austral. 2: 321 (1864)**

*Syntype:* Port Gregory, Western Australia, *A. Oldfield* (K, sheet stamped "Herbarium Hookerianum 1867"), see discussion below.

*Illustration.* M. Simmons, *Acac. Australia* 1: 19, pl. 15 (1981), right hand illustration.

*Shrubs* 0.5-1.5 m tall. *Free portion of phyllodes* to 5-20 mm long, apex spinose. *Glands* 2 or 3, normally shortly stipitate, sometimes becoming spinose. *Peduncles* usually hirsutellous; *heads* 4-7-flowered, cream to white; buds pink.

*Selected specimens examined.* WESTERN AUSTRALIA: near Nanson on Howatharra-Nanson road, *A.M. Ashby* 3804 (CANB, K, PERTH); c. 16 miles [c. 25.7 km] NNE of Geraldton on the road to Nabawa, *R. Coveny* 3049 (NSW, PERTH); 12.3 km N of junction of Yerina Springs road with Port Gregory-Northampton road, *R.S. Cowan* A845 with *R.A. Cowan* (CANB, K, MEL, NSW, NY, PERTH, US); 10 miles [16 km] S of Northampton, North West Coastal Highway, *R. Filson* 8684 (MEL, PERTH); Mount Michael on Walkaway-Nangetty road just E of Burma road junction, *S.D. Hopper* 4771 (PERTH); 30 miles [48 km] E of Geraldton, *J. Long* 290 (PERTH); Eradu turnoff on Mullewa Road, *R.D. Royce* 8025 (PERTH).

*Distribution.* Southwest Western Australia in the Irwin Botanical District (1:250,000 map H50-1). Occurs from Port Gregory south to Mount Michael (c. 35 km southeast of Geraldton).

*Habitat.* Grows in loam and sand on lateritic and sandstone hills and also in sometimes saline clay, usually in heath.

*Flowering and fruiting periods.* Flowers have been recorded from May to October, with the main flush occurring between June and September. Pods with mature seeds have been collected once, in October.

*Typification.* Bentham (1864: 321) based his brief description of this variety on material located "Amongst Oldfield's and other specimens." The only specimen I have seen which can be regarded

as original material is the syntype cited above. This sheet is annotated (? by Bentham) as "*Acacia alata* var." and was determined as holotype by A.B. Court on 24 November 1966. Judging from the type citation it is probable that further original material of var. *biglandulosa* will come to light in time.

*Variation.* Peduncles are glabrous on specimens from near Port Gregory (including the type), elsewhere they are hirsutellous.

A population from about 15 km east of Mingenew is treated here as a variant of var. *biglandulosa*, however, future studies may possibly show that it warrants formal status; this site is c. 70 km southeast of the most southerly known population of var. *biglandulosa*. These plants differ most obviously from var. *biglandulosa* in having a preponderance of phyllodes with only a single gland (although occasionally some have two glands) and light golden heads. Although the phyllodes have spinose tips and stipitate glands like var. *biglandulosa* the phyllode shape and size is sometimes very similar to var. *platyptera* which occurs much further south. Specimens examined: B.R. Maslin 6237 & 6237A and A. Carr 40 (all PERTH).

*Conservation status.* Typical var. *biglandulosa* is not known to be under threat.

**1c. *Acacia alata* var. *platyptera* (Lindl.) Meisn. in J.G.C. Lehmann, Pl. Preiss. 1: 4 (1844)**

*A. platyptera* Lindl., Edwards' Bot. Reg. 27: misc. 3 (1841). *Type citation:* "A greenhouse shrub from the Swan River, recently raised in the Exeter nursery, by Messrs. Lucombe Pince, and Co." (holo: CGE, sheet annotated "*A. platyptera*" by Lindley but without collection details).

*Illustration.* W.J. Hooker, Bot. Mag. 68: t. 3933 (1842), but not a good representation of the species in that the free portion of the phyllodes is shorter than normal.

*Shrubs* 0.5-1 m tall and forming dense clumps 1-2 m across. *Stipules* innocuous. *Phyllodes* 7-20 mm wide or occasionally 40 mm towards base of stems, narrower on inflorescence-bearing region; free portion of phyllodes acuminate to caudate-acuminate, 1-7 cm long, longest at base of stems, straight to shallowly recurved, apical points innocuous or slightly spinose and frequently recurved. *Glands* 1. *Peduncles* hirsutellous; heads 12-15-flowered, golden; *flower buds* obtuse. *Pods* 10 mm wide.

*Other specimens examined.* WESTERN AUSTRALIA: north of Mogumber [precise localities withheld for conservation reasons] C. Chapman 6 (PERTH), C. Chapman s.n., 1972 (PERTH 00723517), C. Chapman s.n., 20 July 1971 (PERTH 00723509), R.J. Cumming 1548 (PERTH) and B.R. Maslin 6557 (BRI, CANB, K, MEL, MO, NSW, NY, PERTH).

*Distribution.* Southwest Western Australia in the northern area of the Darling Botanical District (1:250,000 maps H50-10,14). Seemingly occurs in a very restricted area just north of Mogumber (c. 100 km north of Perth). The one collection recorded from outside this range (C. Chapman s.n., 23 August 1971 (PERTH 00617806)) is possibly erroneously labelled.

*Flowering and fruiting periods.* Few collections to hand; however, flowers have been recorded from June to August and although mature seed has been collected the specimen was not dated.

*Typification.* There is a sheet at herb. CGE which has been determined as holotype of *A. platyptera*. It is annotated "*A. platyptera*" by Lindley but there are no collection details given. The two specimens on this sheet are rather depauperate but accord with the description given in the protologue.

*Affinities.* Vegetatively this variety is rather similar to some forms of var. *tetrantha* in having broad phylloclades with the free portion of the phyllodes drawn out into long, innocuous or scarcely pungent points. Both varieties occur in regions north of Perth but they are not sympatric; var. *platyptera* is readily distinguished from var. *tetrantha* by its golden, 12-15-flowered heads.

*Variants.* A variant known only from the Tuttanning Flora Reserve east of Pingelly (c. 200 km southeast of Mogumber) is not included in the above description and probably represents an undescribed taxon. It keys out closest to var. *platyptera*, however, it differs in its very narrow (2-8 mm wide), glabrous or minutely hirsutellous phylloclades, shorter phyllodes (the free portions being 10-40 mm long), and glabrous, narrower pods (6-7 mm wide). Further study is needed to confirm the status of this entity. Specimens examined are the following: *M.L. Cody s.n.*, PERTH 00617792, *A.S. George 7781*, *K.F. Kenneally UWA567* and *B.R. Maslin 6759* (all PERTH)

A northern variant (from near Mingenew) is discussed under var. *biglandulosa* above.

*Conservation status.* A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

#### 1d. *Acacia alata* var. *tetrantha* Maslin, var. nov.

*Frutices* 0.3-0.6 m alti et 1.5 m extendentes. *Phyllodia* in ramis non-florentibus 3-10 mm lata sed interdum 15 mm lata, phyllodiorum parte discreta 1-7 cm longa acuminata recta usque ad recurvata apicaliter innocua usque ad vix spinosa et recta vel recurvata usque ad valde uncinata; angulus glandulifer saepe perprominens et normaliter solitarius sed raro 2 vel 3. *Stipulae* innocuae. *Pedunculi* glabri vel hirsutelli usque ad pilosi. *Capitula* tetramera alba, alabastris acutis usque ad subacutis. *Legumina* arcuata usque ad fere recta 7-11 mm lata.

*Typus:* Hill River crossing on Jurien-Cervantes road, 22 May 1978, *R.J. Cumming 81* (*holo:* PERTH 00724173).

*Shrubs* 0.3-0.6 m tall, spreading to 1.5 m across. *Phyllodes* on non-flowering region of stems 3-10 mm wide, occasionally 15 mm; free portion of phyllodes acuminate, 1-7 cm long, straight to recurved, apices innocuous to scarcely spinose and straight or recurved to strongly uncinata; gland-angle often very prominent, normally 1, rarely 2 or 3. *Stipules* innocuous. *Peduncles* glabrous or hirsutellous to shortly pilose. *Heads* 4-flowered, white; flower buds acute to sub-acute. *Pods* curved to almost straight, 7-11 mm wide.

*Selected specimens examined.* WESTERN AUSTRALIA: 9 km SSE of Eneabba, *R.J. Hnatiuk 770907* (PERTH); Yanchep National Park, *A.M. James 297* (PERTH); Hill River crossing, c. 10 miles [16 km] due E of Jurien Bay, *B.R. Maslin 2621* (BRI, CANB, PERTH), 2621A (K, PERTH) and 6570 (CANB, K, MEL, PERTH); Cockleshell Gully crossing on the Jurien-Leeman road, *B.R. Maslin 6571* (MEL, PERTH) and 6572 (K, MEL, PERTH); Cockleshell Gully, *R. Pullen 9684* (PERTH, also CANB but *n.v.*); Mount Lesueur, *N.H. Speck UWA561* (PERTH).

*Distribution.* Southwest Western Australia in the Darling Botanical District and southern area of the Irwin Botanical District (1:250,000 maps H50-5,9,14). Disjunct, occurring from Eneabba (c. 130 km north of Lancelin) south to Cervantes (c. 60 km northwest of Lancelin), also at Yanchep (c. 130 km south of Cervantes).

*Habitat.* Usually grows near watercourses on sand and sandy clay in eucalypt low open forest and woodland, also in Mallee and Paperbark (*Melaleuca* sp.) communities.

*Flowering and fruiting periods.* Flowers from April to July; in the other varieties flowering commences in June. Pods with mature seeds have been collected in November.

*Affinities.* The 4-flowered heads distinguish var. *tetrantha* from the other varieties of *A. alata* except var. *biglandulosa* which is readily recognized by the free portion of its phyllodes being shorter and possessing rigid, spinose tips. The flower buds on the new variety are acute to sub-acute (at least when seen dry) whereas in the other varieties they are obtuse or obtuse-apiculate. Vegetatively var. *tetrantha* it is similar to var. *platyptera*.

*Variation.* There appears to be clinal variation in the morphology of the free portion of phyllodes. Around Yanchep (the southern end of the geographic range) the free portion of the phyllodes are long, narrow, clearly recurved and have distinctly uncinat apices; around Eneabba (the northern end of the geographic range) they are shorter, broader and commonly straight. Most collections are from the Hill River district in the middle of the geographic range; the phyllodes here appear to be intermediate in form.

*Conservation status.* Not known to be under threat.

*Etymology.* From the Greek *tetra* - four, and *anthos* - flower, an allusion to the consistently 4-flowered heads.

## 2. *Acacia applanata* Maslin, sp. nov.

Suffrutices graminiformes 10-40 cm alti erecti vel aliquando decumbentes e basi pauci- vel multiramosi, ramis infirmis et plus minusve prostratis, aliquando per sarmentis extendentes. Phyllodia pauca cum ramulis continua, bifarie decurrentia alas oppositas formantes, utraque ala ad alam infra extendente, alis plerumque 0.5-3 mm latis, glabris vel pubescentibus vel hirsutis vel scabridulis et atro-viridibus; phyllodiorum pars discreta plerumque 1.5-5 mm longa, inflorescentias subtendentes vulgo dentiformia, acuta, nervo ad marginem adaxialem apposito. Glans nulla. Stipulae minutae. Racemi 0.5-10 mm longi 1-4 capitulis, axibus gracilibus, capitula globularia aurea 10-20-floribus, alabastris obtusis usque ad subacutis. Flores pentameri, calyce gamosepalo. Legumina stipitata usque 3 cm longa et 7-8 mm lata, tenuiter crustacea, arcuata, plana, villosa, seminibus transversalibus oblongis usque ad ellipticis, 3-4 mm longis, arillatis.

*Typus:* E side of Luyer Avenue, 75 m from junction with Station Street, East Cannington, Western Australia, 9 September 1992, R.S. & M.N.S. Cowan RSC A877 (*holo:* PERTH 02433699; *iso:* AD, CANB, K, G, MEL, MO, NSW, NY, PERTH 02568969).

*A. diptera* Lindl., Edwards' Bot. Reg. Sketch Veg. Swan R. xv (1839), *pro parte*, not as to lectotype, as to Vasse River, Mrs. Molloy paralectotypes at CGE and K (see discussion under *A. willdenowiana* below).

*A. diptera* var. *angustior* Meisn. in Lehm., Pl. Preiss. 1: 5 (1844); *A. benthamii* var. *angustior* (Meisn.) Heynh., Nom. Bot. Hort. 2: 2 (1846). *Lectotype* (*fide* Maslin and Cowan, 1994): In glareosis ad jugum montium Darlingsrange, haud procul a catarrhacta [i.e. Susannah Brook], 3 August 1839, legit. L. Preiss 993 (sphalm. "393" in protologue) (NY); *isolecto*: HBG, K, FI, G, GOET, L, LD, P, STR. *Paralectotype 1*: In asperis ad latus occidentale montis "Wuljenup" [i.e. Willyung Hill, near Albany], Western Australia, 14 October 1840, legit. L. Preiss 994 (sphalm. "394" in protologue) (G, LD, NY). *Paralectotype 2*: In arenosis subumbrosis silvae ad fluvium Cygnorum [Swan River] hinc inde, Western Australia, 23 July 1839, legit. L. Preiss s.n. (LD).

?*A. diptera* var. *eriocarpa* W. Fitzg., J. W. Austral. Nat. Hist. Soc. 1: 44 (1904). *Typus*: None cited; *n. v.*

Grass-like *sub-shrubs* 10-40 cm tall, erect or sometimes sprawling with weak, ± prostrate stems, few- or multi-stemmed from the base, sometimes spreading by subterranean runners. *Stipules* minute. *Phyllodes* few, continuous, bifariouly decurrent and forming opposite wings with each one extending to the next below, the wings usually 0.5-3 mm wide, sometimes 5-7 mm, glabrous, pubescent, hirsute or scabridulous and dark green; *free portion of phyllodes* 1.5-5 mm long, sometimes to 10 mm at base of stems, commonly tooth-like where subtending inflorescences, acute, main nerve near upper margin and often not prominent. *Gland* absent. *Racemes* 0.5-10 mm long with 1-4 heads; *raceme axes* slender and terete, rarely a few narrowly winged as in *A. willdenowiana*. *Peduncles* solitary or rarely the distal pair twinned, 5-12 mm long, slender, glabrous. *Heads* globular, golden, 10-20-flowered; *flower buds* obtuse to sub-acute. *Flowers* 5-merous. *Calyx* gamosepalous, 1/3-2/5 length of corolla, shortly divided, lobes triangular. *Petals* nerveless or very obscurely 1-nerved. *Pods* stipitate, to 3 cm long, 7-8 mm wide, thinly crustaceous, curved, flat, raised over seeds, villous, margins thickened. Seeds transverse in pods, oblong to elliptic, 3-4 mm long, dark brown; pleurogram continuous; aril once-folded below seed.

*Selected specimens examined.* WESTERN AUSTRALIA: Boonanarring Brook near Gingin, J.J. Alford 161 (PERTH); Albany, 9 miles [14.5 km] along Lower King Road from Emu Point turn-off, E.M. Bennett 1113 (PERTH); Jurien Bay Road, W.E. Blackall 3671 (PERTH); 38.3 miles [61.5 km] from Collie towards Williams, E.M. Canning WA/68 3790; Luyer Avenue between Station Street and Beckman Close, East Cannington, R.S. Cowan A.865 (PERTH); Darling Range, southern foot of Mount Cooke, M.G. Corrick 8362 (PERTH); Mount Barker hill, N. Hoyle 1046 (PERTH); "Caladenia Hill" farm, corner of Knight and Washpool roads, Woogenilup, c. 30 km ENE of Mount Barker, 30 September 1984, P. Luscombe s.n. (PERTH 00717401); 0.6 km W of Bussell Highway on Ruabon Road, between Bunbury and Busselton, B.R. Maslin 2812 (PERTH); c. 3.5 km due ENE of Bullsbrook East, B.R. Maslin 5583 (BRI, MEL, NSW, PERTH); Kent Road, 0.1 km S of Crawler Road, 25 km due SW of York, B.R. Maslin 6183 (CANB, G, PERTH); Great Northern Highway at intersection of North Road (between Bindoon and New Norcia), B.R. Maslin 6551 (CANB, K, MEL, NSW, PERTH); 20 km N of Dandaragan on Badgingarra Road, B.R. Maslin 6559 (NSW, PERTH); Yanchep National Park, 0.4 km N of Park Entrance on road to Lancelin, B.R. Maslin 6564 (B, NSW, PERTH); Bayswater, 10 July 1900, A. Morrison s.n. (PERTH 00723185); Cannington, 29 July 1909, A. Morrison s.n. (PERTH 00723193); Lower Helena Valley, J. Seabrook 52 (CANB, PERTH); 24 miles [38.5 km] S of Fremantle on Mandurah road, 1 mile [1.6 km] E on Serpentine road, C.L. Wilson 818 (PERTH).

*Distribution.* Southwest Western Australia occurring principally in the Darling Botanical District, but also adjacent Irwin, Avon and Eyre Botanical Districts (1:250,000 maps H50-9,10,14; 150-2,5,6,11,15). Sporadic from near Jurien (c. 80 km northwest of Lancelin) south to Albany. As

with *A. willdenowiana* many of the habitats of *A. applanata* around the Perth metropolitan area have probably been destroyed through urban development.

*Habitat.* Grows mostly in sand, loam and lateritic soils, often in winter wet depressions, usually in open woodland, woodland and forest or occasionally in shrubland.

*Flowering and fruiting periods.* Flowers have been recorded from June to October, however the main flush occurs in August and September. A single collection with mature fruit was collected in November.

*Typification.* A type was not cited by Fitzgerald (1904) when he described *A. diptera* var. *eriocarpa* and I have seen no original material of this entity. While it is probable that this name is referable to *A. applanata* it is curious that Fitzgerald described the flowers as 4-merous.

*Variation.* Plants from the Bindoon (c. 20 km east of of Gingin) to Jurien area are multi-stemmed at the base whereas elsewhere they are usually single-stemmed or few-branched at ground level. Compared with populations occurring further south these northern plants also tend to have a greater proportion of phyllodes exceeding 3 mm wide (they reach 5-7 mm) and with free portions greater than 5 mm long (sometimes reaching 10 mm at base of stems).

*Affinities.* Until now this species was included under *A. willdenowiana* with which it is closely related and sometimes sympatric or parapatric (see *A. willdenowiana* for discussion). Vegetatively resembling the very rare *A. anomala* C.A. Gardner ex Court but readily distinguished by its globular heads and its short, broad, curved pods with transverse seeds; the two species are sympatric near Bullsbrook East. *Acacia anomala* is fully described and illustrated in Court (1978).

*Hybrids.* Judging from herbarium material it appears that this species hybridizes with *A. alata* R. Br. var. *alata* in the Darling Range near Perth. Two such records exist, i.e. *R.J. Cumming* 1090 (PERTH) and *R. & M. Hamilton* 125 (PERTH). Label details for *Cumming* 1090 show that both *A. alata* and "*A. willdenowiana*" (I presume that this was a misidentification for *A. applanata*) were common in the area but only two plants of the putative hybrid were seen.

*Conservation status.* Widespread, not considered rare or endangered.

*Common name.* Grass Wattle.

*Etymology.* From Latin *applanatus*, flattened or horizontally spreading, referring to the winged stems.

### 3. *Acacia bifaria* Maslin, sp. nov.

*Frutices* prostrati vel semiprostrati ad 0.5 m alti et 2 m expansi, ramulis leviter ad manifeste flexuosis glabris. *Phyllodia* cum ramulis continua, bifarie decurrentia et alas oppositas formantes, utraque ala ad alam infra extendente, alis 1-3.5 longis et 4-10 mm latis, coriaceis glabris praeter axillas dense et minute pilosas resinosas, viridibus usque ad subglaucis, ad marginem interdum undulatis; phyllodiorum pars discreta 5-15 mm longa, marginem adaxialem manifeste rotundatum, excentrice mucronatum, nervo principali plus minusve obscuro vel ut videtur destituto. *Glans* non prominens. *Stipulae* persistentes. *Racemi* valde reducti monocephali 0.5-1.5 mm longi, *pedunculis* 2-12 mm

longis glabris, aliquando fructu descendente, *capitula* globularia dilute aurea 16-23-floribus. *Sepala* plus minusve discreta; *petala* enervia. *Legumina* valde curvata usque ad bispiralia, plus minusve teretia usque ad 2 cm longa et 2-3 mm lata, tenuiter crustacea plus minusve glabra nigra. *Semina* longitudinalia oblonga, circa 3 mm longa arillo terminali et conico.

*Typus*: near intersection of Old Newdegate Road and Floater Road, c. 2 km north of Ravensthorpe, Western Australia, 30 August 1980, B.R. Maslin 4771 (*holo*: PERTH 00713082; *iso*: CANB, K, NY, PERTH 00713074).

Prostrate or semi-prostrate, commonly domed *shrubs* to 0.5 m tall and 2 m across. *Branchlets* slightly to prominently flexuose, glabrous, light brown to red. *New shoots* reddish. *Stipules* persistent, triangular to narrowly triangular or oblong-triangular, 1-5 mm long. *Phyllodes* continuous with branchlets, bifariously decurrent and forming opposite wings with each one extending to the next below, 1-3.5 cm long (measured along outer margin from mucro to point of attachment to branchlet), 4-10 mm wide, coriaceous, glabrous except axils invested with dense, minute, red-brown resin-hairs (sometimes intermixed with white, non-resinous, appressed hairs), green to sub-glaucous, flat or occasionally undulate along margins, marginal nerve reddish but aging yellow; *free portion of phyllodes* 5-15 mm long, 4-10 mm wide, adaxial margin obviously rounded, excentrically mucronate, main nerve  $\pm$  obscure or superficially absent. *Gland* not prominent, situated near or below middle of the rounded upper margin, c. 0.5 mm long. *Inflorescences* extremely reduced 1-headed racemes, 1-4 per axil; *raceme axes* 0.5-1.5 mm long, sometimes growing out at anthesis, glabrous except for minute resin hairs which rim the base of the peduncle. *Peduncles* 2-12 mm long, glabrous, straight and  $\pm$  erect except sometimes strongly recurved from the base when in fruit; receptacle glabrous to sub-glabrous; *basal peduncular bracts* solitary, caducous or persistent, 1-2 mm long, dark brown. *Heads* globular, light golden, 16-23-flowered. *Bracteoles* absent. *Flowers* 5-merous; *sepals* 1/3-1/2 length of petals, joined at extreme base, oblong to narrowly oblong, sparsely puberulous, slightly thickened adaxially at apex; *petals* 1.5 mm long, glabrous, nerveless. *Pods* strongly curved to twice-coiled,  $\pm$  terete, slightly constricted between seeds along the inner edge, to 2 cm long, 2-3 mm wide, thinly crustaceous, finely longitudinally rugulose, resinous (but not viscid) when very young, glabrous or sparsely strigulose, black, marginal nerves light brown and not thickened. *Seeds* longitudinal with aril facing apex of pod, oblong, c. 3 mm long and 1.5 mm wide, dark brown, dull; pleurogram very fine, oblong, open at hilar end; areole c. 1 mm long and 0.5 mm wide; *funicle* filiform, c. 1 mm long, abruptly expanded into a conical, terminal, yellow-brown (when dry) aril c. 1 mm long.

*Selected specimens examined*. WESTERN AUSTRALIA: Ravensthorpe, C. Davies 116 (PERTH); E side of Fitzgerald River, Ongerup-Ravensthorpe road, 4 September 1976, A.S. George s.n. (PERTH 00712094); 9 miles [14.4 km] NW of Ravensthorpe, J. Goodwin 229(3950) (PERTH); Fitzgerald River crossing on Jerramungup-Ravensthorpe road, B.R. Maslin 802 (AD, CANB, K, MEL, MO, NSW, PERTH); 2.5 km S of Ravensthorpe towards Hopetoun, B.R. Maslin 2559 (PERTH); c. 7 km from Ravensthorpe towards Lake King, B.R. Maslin 2577 (AD, B, BRI, MEL, PERTH); 10 km W of Ravensthorpe, K.R. Newbey 8052 (PERTH); c. 20 miles [32 km] W of Ravensthorpe, S. Paust 700 (PERTH); rest area on road to Lake King, 4 miles (6.4 km) NW of N.R.1 and NW of Ravensthorpe, T. & J. Whaite 4306 (PERTH, also CANB, K, NSW but n.v.).

*Distribution*. Southern Western Australia occurring in the Eyre Botanical District (1:250,000 maps I50-8,12; I51-5). Occurs from Ravensthorpe west-southwest to the Fitzgerald River (c. 30 km east of Jerramungup).



*Habitat.* Grows on clay, loam and sand in scrub, Mallee communities and woodland.

*Flowering and fruiting periods.* Flowering specimens have been collected from August to October and in December. Pods with mature seed have been collected in December.

*Variation.* The phyllodes on some specimens from around Ravensthorpe are occasionally undulate (e.g. *R.J. Cumming* 1072; *C. Davies* 117; *B. Barnsley* 500, all PERTH). A similar looking undulate phyllode variant occurs in *A. glaucoptera* near Bremer Bay (c. 110 km southwest of Ravensthorpe).

*Affinities.* Closely related to *A. glaucoptera* but *A. bifaria* is most readily distinguished by its green to sub-glaucous phyllodes and 16-23-flowered heads. Other characters useful in discriminating the new species include the following. The phyllode axils of the new species are densely resin-haired, the hairs are red-brown and minute (best observed at x10 mag., these hairs are sometimes intermixed with short, appressed non-resinous hairs) whereas in *A. glaucoptera* the phyllode axils are densely tomentulose by a tuft of white, erect, non-resinous hairs that are usually visible to the unaided eye. In *A. bifaria* the free portion of the phyllode is generally shorter and narrower than in *A. glaucoptera* and its upper margin is distinctly rounded and ends in an excentric mucro (while *A. glaucoptera* sometimes has similar phyllodes, they are more commonly narrowed to an elongated, acute or shortly acuminate,  $\pm$  centric point). The pods of *A. bifaria* often only strongly curved, and in the less common coiled condition they are not twisted as in *A. glaucoptera*. Furthermore, there appears to be habit differences between the two species: *A. bifaria* is a prostrate or semi-prostrate, commonly domed plant to c. 0.5 m tall and although *A. glaucoptera* may also have this habit it commonly grows to a taller shrub (reaching 1.5 m) with a discrete, single trunk and a somewhat open growth form with rather gangly branches. *Acacia bifaria* has a more restricted distribution than *A. glaucoptera* and although both are common around Ravensthorpe it is not known if they are ever sympatric.

The inflorescence and pod characters suggest that *A. bifaria* and *A. glaucoptera* are related to *A. excentrica* Maiden & Blakely and the *A. merrallii* F. Muell. and its allies; however, these relatives do not have bifarious, decurrent phyllodes which form prominent wings along the branchlets.

*Conservation status.* A Priority 3 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The epithet is derived from the Latin *bi-*, two and *-farius*, a multiplication in numbers of parts. It alludes to the phyllocladinous branchlets where the phyllodes are in two ranks on opposite sides of the branchlet axis.

#### 4. *Acacia glaucoptera* Benth., *Linnaea* 26: 604 (1855)

*Lectotype* (here selected): Swan River, Western Australia, *J. Drummond* 5: 1 (K, sheet stamped "Herbarium Benthamianum 1854", see discussion below; *isolecto*: BM, CGE - sheet labelled "Swan River to Cape Riche", K - sheet stamped "Herbarium Hookerianum 1867"). *?Paralectotype*: on clayey flats near the Gardner and Salt R., Western Australia, *G. Maxwell* (BM).

?*A. sinuata* Hort. ex Jacques, *J. Soc. Imp. Centr. Hort.* 6: 672 (1860), non (Lour.) Merrill (1935). *Typus*: cultivated in May 1860 in Paris by *Mr Rougier-Chauviere*; *n.v.*

[*A. bossiaeoides* auct. non *A. Cunn.* ex Benth.: *B. Seemann*, *Eur. Acac.* 7 tab. 1 (1852).]

*Illustrations.* B. Seemann, *loc. cit.*; R. Erickson *et al.*, *Flowers Pl. W. Australia* 2nd edn 94 (1979); M. Simmons, *Acacias of Australia* 1: 17 (1981).

Prostrate or semi-prostrate, mid-dense to moderately open *shrubs* to c. 1.5 m across, also growing single-stemmed and erect to 1.5 m tall, branches often somewhat gangling. *Branchlets* straight to slightly flexuose, glabrous. *New shoots* red. *Stipules* deciduous or persistent, triangular or oblong-triangular, 1-3 mm long. *Phyllodes* continuous with branchlets, bifariously decurrent and forming opposite wings with each one extending to the next below, usually 2.5-7 cm long (measured along outer margin from apex to point of attachment to branchlet) and 0.6-2 cm wide, coriaceous, glabrous except axils densely tomentulous, glaucous, occasionally undulate, main nerve evident, marginal nerve reddish but aging yellow; *free portion of phyllodes* usually 1-4 cm long and acute to shortly acuminate. *Gland* not prominent, situated near or below middle of the upper margin, 0.5-1 mm long. *Inflorescences* extremely reduced 1-headed racemes, 1-2 per axil; *raceme axes* to 0.5 mm long, glabrous; *peduncles* 3-18 mm long, glabrous,  $\pm$  erect except often strongly recurved from the base when in fruit so that the peduncle is patent or descending; *receptacle* sub-glabrous or tomentulous; *heads* globular, golden, 30-80-flowered. *Flowers* 5-merous; *sepals* c. 1/2 length of petals, free or joined at base, narrowly oblong to narrowly oblong-oblancoolate, sparsely puberulous; *petals* 2 mm long, glabrous, nerveless. *Pods* somewhat irregularly coiled and twisted, sub-terete to compressed, slightly constricted between seeds along the inner edge, to 2 cm long, 2-3 mm wide, thinly crustaceous, smooth or finely longitudinally rugulose, glabrous, black. *Seeds* longitudinal with aril facing apex of pod,  $\pm$  oblong, 2.5-3.5 mm long, 2 mm wide, dark brown, dull; pleurogram very fine, open at hilar end; areole 1-1.5 mm long, 0.5 mm wide; *funicle* filiform, c. 1 mm long, abruptly expanded into a  $\pm$  conical, terminal, yellow-brown (when dry) aril c. 1 mm long.

*Selected specimens examined.* WESTERN AUSTRALIA: Dunn Rock Nature Reserve, K.J. Atkins 108408 (PERTH); Swan River, J. Drummond 1 (BM, CGE, G, FI, OXF, P, TCD); Little White Lake Nature Reserve No. 26786 [Carmody Nature Reserve, 25 km SE of Narrogin], G. Durrell *s.n.* (PERTH 00870617); between Hamersley River and East Mount Barren, B.R. Maslin 810 (MEL, PERTH); 4 km NNE of Hawes Hill, Cape Arid National Park, c. 98 km E of Esperance, K.R. Newbey 7889 (PERTH); 45 km W of Grass Patch, K.R. Newbey 8114 (PERTH); 17 km W of Israelite Bay Telegraph Station towards Mount Ragged, R.A. Saffrey 1356 (CANB, K, PERTH); c. 5 km NE of Ravensthorpe towards Esperance, M.D. Tindale 3805 (PERTH, also BRI, CANB, K, L, MEL, US, but *n.v.*); 40 km ESE of Lake King township near No. 1 Vermin Proof Fence, P.G. Wilson 6875 (CANB, K, L, NT, PERTH, SP).

*Distribution.* Southern Western Australia occurring principally in the Eyre Botanical District, but also adjacent Avon, Darling and Roe Botanical Districts (1:250,000 maps I50-7,8,11,12; I51-5,6,7). Occurs from near Narrogin south to near Manypeaks (c. 35 km northeast of Albany) and east to Israelite Bay (c. 180 km east of Ravensthorpe).

*Habitat.* Grows in clay and gravelly soils in woodland, tall shrubland and Mallee communities.

*Flowering and fruiting periods.* Flowers have been recorded from August to December, however the main flush occurs from August to October. Pods with mature seeds have been collected in November and December.

*Typification.* When Bentham (1855) originally described *A. glaucoptera* he did not cite any specimens, however, in "Flora Australiensis" he listed a number of collections under this name, namely, "Towards Cape Riche, Drummond, 5th Coll. n. 1, and in leaf only, 4th Coll. n. 1; Clay flats,

Fitzgerald, Gardner and Phillips ranges, *Maxwell*." (Bentham 1864: 320). At herb. K there are four sheets determined as *A. glaucoptera* by Bentham; these support either sterile material of *Drummond* 4: 1 (specimens with broad phyllodes) and/or flowering material of *Drummond* 5: 1 (specimens with narrow phyllodes). There is no direct evidence that Bentham actually used this material to prepare the original description of *A. glaucoptera*, however, the *Drummond* 5: 1 specimens accord quite well with the (rather brief) protologue as to stipule, phyllode and flower characters. Therefore, the Kew specimen of *Drummond* 5: 1 on the sheet stamped "Herbarium Benthamianum 1854" has been selected as the lectotype; there is a duplicate of this collection on a sheet stamped "Herbarium Hookerianum 1867" at K. The *Drummond* 4: 1 collection is not regarded as a *type* because it is without stipules and flowers (these were described in the original description). Although there are duplicates of both *Drummond* gatherings at herb. BM and CGE no record was made of the handwriting on these, therefore, I am not sure if they have been seen by Bentham. The CGE specimen of *Drummond* 5: 1 is labelled "Swan River to Cape Riche" which accords with the designation given by Bentham (1864: 320). I have seen a *Maxwell* specimen at herb. BM which is annotated "on clayey flats near the Gardner and Salt River". This is probably the gathering cited by Bentham (*loc. cit.*) under *A. glaucoptera*, however, I did not record the morphological characteristics of this specimen or whether Bentham actually annotated the sheet; this specimen is here regarded as a probable paralectotype of *A. glaucoptera*.

*Synonymy.* Judging from Jacques' original description of *A. sinuata* it appears as though this name is synonymous with *A. glaucoptera*. Between 1837 and 1863 Jacques published a number of new names referable to Australian taxa of *Acacia*, based on plants cultivated in Paris. However, I have been unsuccessful in locating the types of any of these names, despite having searched for them at herb. P.

*Variation.* Specimens from the western extremity of the range (Pingrup, Broomehill, Borden, Ongerup, Manypeaks areas) differ from those elsewhere in having smaller phyllodes (1.5-3 cm long; free portion of phyllodes 5-15 mm long and (3)4-6 mm wide). The phyllodes appear to be glaucous (colour determined from herbarium specimens) and have obviously tomentulose axils, the free portion of the phyllodes is usually acute but in some specimens (from Ongerup and Pingrup) it is rounded and excentrically mucronate as in *A. bifaria*. Field and laboratory studies are needed to assess the status of these western populations. Typical *A. glaucoptera* occurs along the south coast from Bremer Bay east to Israelite Bay but there are a few records from inland localities, e.g. near Lake King, Narrogin and the Stirling Range; it also occurs at Broomehill (same locality as the variant). Selected specimens examined: 95 mile peg, Borden - Pingrup road [c. 32 km N of Borden towards Pingrup], A.M. Ashby 4316 (PERTH); 6 miles [9.6 km] SE of Broomehill, K. Newbey 3586 (CANB, K, MEL, NY, PERTH); 1 mile [1.6 km] N of Ongerup, K.R. Newbey 462 (PERTH); c. 20 miles [32 km] NE of Albany towards Jerramungup, S. Paust 507 (PERTH); 34 km SE of Ongerup, N. Stevens KRN9514 (MELU, PERTH) and KRN9514-1 (MELU, PERTH); 2 km S of Borden along Chester Pass Road, J. Taylor and P. Ollerenshaw JT 1870 (PERTH, also CBG, NSW but *n.v.*).

A seemingly rare but distinctive variant with very undulate phyllodes is recorded from north of Bremer Bay (Bremer Bay is c. 65 km southeast of Jerramungup). Specimens examined. WESTERN AUSTRALIA: Swamp Road, N of Bremer Bay, September 1958, J.M. Laws *s.n.* (PERTH 00713139 & PERTH 00713120); road between Bremer Bay Road and Gairdner River, S. Paust 653 (MO, PERTH).

*Affinities.* Closely related to *A. bifaria* (see this species for discussion).

*Conservation status.* Widespread, not considered rare or endangered.

*Common names.* Clay wattle; Flat wattle.

### 5. *Acacia pterocaulon* Maslin, sp. nov.

*Frutex* multiramis erectus vel decumbens ad 1.3 m altus, ramulis glabris. *Phyllodia* cum ramulis continua, bifarie decurrentia alas oppositas formantes, utraque ala ad alam infra extendente, alis 2-6 mm latis coriaceis glabris subglaucis, nervo marginali prominenti, phyllodiorum pars discreta 1-5.5 mm longa lanceolata usque ad triangularis erecta recta vel pervadose incurva, nervo principali centrali. *Glans* basalis. *Racemi* 1-10 cm longi, axibus normaliter sub anthesi angusto-alatis; *pedunculi* 10-15 mm longi, glabri, *capitulis* globularibus, 10-15 mm diametro (sub anthesi sicco) confertim 60-70-floribus aureis. *Flores* pentameri, sepalis plus minusve discretis lineari-spathulatis. *Legumina* linearia ad 12 cm longa et 4-5 mm lata, coriaceo-crustacea glabra, plus minusve pruinosa. *Semina* longitudinalia oblona 4.5-5 mm longa, arillo subconico.

*Typus:* W of Morawa [precise locality withheld for conservation reasons], Western Australia, 1 September 1976, B.R. Maslin 4273 (*holo:* PERTH 00719978; *iso:* CANB, K, MEL, NY).

Much-branched, intricate, erect or sprawling *shrubs* to 1.3 m tall, occasionally 2 m; *terminal branches* sparingly divided and often gangling, shallowly sinuous to slightly flexuose, glabrous, furnished with a fine yellow medial nerve. *Stipules* often caducous, 1-2 mm long. *Phyllodes* continuous with branchlets, bifariously decurrent and forming opposite wings with each one extending to the next below, the wings 2-6 mm wide, coriaceous, glabrous, sub-glaucous, marginal nerves prominent and yellow or light brown; *free portion of phyllodes* 1-5.5 cm long, shortest on inflorescence-bearing portion of branches, lanceolate to narrowly triangular, erect, straight or very shallowly incurved, acute, main nerve central, lateral nerves absent or very obscure. *Gland* not prominent, situated on upper margin of free portion of phyllode near the base, oblong-elliptic, 0.5-1 mm long. *Racemes* 1-8(10) cm long, usually branch-like at anthesis by axes becoming narrowly winged through the development of decurrent phyllodes, 1 or 2 per axil; *raceme axes* glabrous, with 2, small, semi-persistent, alternate, supra-basal bracts. *Peduncles* 10-15 mm long, alternate, usually to c. 5 per raceme; *basal peduncular bracts* caducous. *Heads* globular, densely 60-70-flowered, golden, 10-15 mm diam. at anthesis (dry). *Bracteoles* resembling the sepals. *Flowers* 5-merous. *Sepals* 2/3 length of petals, ± free, linear-spathulate, fimbriolate apically otherwise ± glabrous. *Petals* 3-3.5 mm long, glabrous, midrib obscure. *Pods* linear, to 12 cm long, 4-5 mm wide, coriaceous-crustaceous, pendulous, straight to very slightly curved, slightly raised over seeds and not or scarcely constricted between them, glabrous, purplish brown and pruinose or faintly pruinose, margins not thick. *Seeds* longitudinal with aril facing apex of pod, oblong, obliquely truncate on margin adjacent to aril, 4.5-5 mm long, 3 mm wide, dark brown to black, ± shiny; *pleurogram* obscure with narrow opening at hilar end; *areole* 1.5-2 mm long, c. 0.5 mm wide; *funicle* minute, abruptly expanded into the aril; *aril* sub-conical, oblique at end of seed, white (drying yellow), dull greyish green at hilum (drying brownish).

*Other specimens examined.* WESTERN AUSTRALIA: type locality, A.M. Ashby 4884 (PERTH, also AD but *n.v.*) and 5202 (PERTH), R.J. Cranfield & P.J. Spencer 7855 (PERTH), R.J. Cumming 1655 (PERTH), 2194 (MELU, NSW, PERTH), B.R. Maslin *s.n.* (PERTH 00719943) and 6597 (PERTH), K. Newbey 2126 (PERTH), Morawa School 1 (PERTH).

*Distribution.* Southwest Western Australia occurring in the northern area of the Avon Botanical District (1:250,000 map H50-6). Seemingly restricted to a small area within a range of hills west of Morawa. Further survey is needed to determine the frequency and geographic range of the species; it is currently known that several hundred plants exist.

*Habitat.* Grows in rocky (chert) clay-loam on slopes of hills in *Eucalyptus* woodland or dense casuarina scrub.

*Flowering and fruiting periods.* Flowers in August and September. Pods with mature seeds have been collected in late November.

*Affinities.* The precise affinities of *A. pterocaulon* are not altogether clear. Although its vegetative characters resemble those of the more southerly distributed *A. glaucoptera* and *A. willdenowiana*, the new species is readily distinguished by its long, linear,  $\pm$  straight pods. *Acacia glaucoptera* has a similar habit to *A. pterocaulon* but has much smaller heads (5-6 mm diam. at anthesis when dry even though the number of flowers is 30-80 per head), much shorter racemes and is densely tomentulous in the axils of its phyllodes. Although *A. willdenowiana* often has long, branch-like racemes and heads that can reach *c.* 10 mm when dry, it differs significantly from *A. pterocaulon* in its rush-like growth habit, twinned peduncles, pale yellow to white heads with 13-21 flowers, gamosepalous calyx and transverse seeds.

*Conservation status.* A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* From the Greek, *pteron* - winged, and *kaulos* - stem, an allusion to the prominently winged branches.

## 6. *Acacia willdenowiana* H.L. Wendl., Verz. Berggart. Hannover 5 (1845)

*Typus:* Based on the following.

*A. diptera* Lindl., Sketch Veg. Swan R. xv (1839), non Humb. & Bonpl. ex Willd. (1809); *A. benthamii* Heynh. (as "*benthami*"), Nom. Bot. Hort. 2: 2 (1846), non Meisn. (1844). *Lectotype* (here selected, see discussion below): Swan River, Western Australia, 1839, *J. Drummond s.n.* (CGE; *isolecto*: CGE, K; *?isolecto*: CGE, K, see discussion below). *Paralectotypes:* see *A. applanata* above.

*A. diptera* var. *erioptera* Graham, Bot. Mag. 68: t. 3939 (before May 1842), non Bentham (about June 1842). *Typus:* Cultivated plant received in 1840 at Royal Botanic Gardens, Edinburgh, from Glasgow, where it was raised from Swan River seeds sent by *J. Drummond*; *n.v.*, see note below.

*A. diptera* var. *erioptera* Benth., London J. Bot. 1: 325 (about June 1842), *nom. illeg.* (later homonym). *Syntype* 1. Swan River, Western Australia, *J. Drummond* 182 (K). *Syntype* 2. Swan River, Western Australia, *J. Drummond s.n.* (K).

*A. diptera* var. *laticor* Meisn. in J.G.C. Lehmann, Pl. Preiss. 1: 4 (1844); *A. benthamii* var. *laticor* (Meisn.) Heynh. (as '*Benthami*'), Nom. Bot. Hort. 2: 2 (1846). *Lectotype* (see Maslin and Cowan 1994): near Halfwayhouse [Halfway House, 31° 54'S, 116° 20'E], Western Australia, 12 September

1839, *L. Preiss* 996 (NY; *isolecto*: G, GOET, HBG, L, LD, STR). *Paralectotype*: near Perth, Western Australia, 8 May 1839, *L. Preiss* 995 (B, FI, G, GOET, HBG, K, L, LD, NY - sphalm. "595", P, STR).

*Illustrations*. W.J. Hooker, *Icon. Pl. ser. 1*, 4: t. 369 (1841); R. Graham, *loc. cit.*; M. Simmons, *Acac. Australia* 2: 11, pl. 36 (1988).

Erect *shrubs* 30-60 tall, sometimes to 1 m tall or stems scrambling, few- or multi-stemmed from the base. *Stipules* minute. *Phyllodes* continuous with branchlets, bifariouly decurrent forming opposite wings with each one extending to the next below, the wings variable in width but commonly 1-5 mm wide, sometimes to 15 mm, glabrous, rarely pilose, pubescent or puberulous, grey-green to glaucous; *free portion of phyllodes* 5-20(50) mm long, acute, nerve close to upper margin and usually not prominent. *Gland* absent. *Racemes* 2-11 cm long, commonly patent and 2 per axil; *raceme axes* normally very narrowly winged (through development of decurrent phyllodes) at antheses, if wings expand the peduncles appear simple and axillary. *Peduncles* 6-15 mm long, twinned, slender, glabrous. *Heads* globular, 10-12 mm diam. (fresh), white to cream, sometimes pale lemon yellow, 13-21-flowered; *flower buds* normally acute to sub-acute (when dry). *Flowers* 5-merous. *Calyx* gamosepalous, 1/5-1/3 length of petals, shortly lobed, lobes triangular. *Petals* nerveless or very obscurely 1-nerved. *Pods* to 6 cm long, 10-15 mm wide, thinly crustaceous, curved, flat, raised over seeds, often lightly pruinose, glabrous, rarely pilose on the thick margins. *Seeds* transverse in the pods, ± oblong, 5-6 mm long, dark brown, arillate.

*Selected specimens examined*. WESTERN AUSTRALIA: Boonanarring Brook near Gingin, J.J. Alford 391 (PERTH); Subiaco, May 1901, C. Andrews s.n. (PERTH 00723118); Bibra Lake, W.M. Carne, 16 June 1923 (PERTH 00725145); c. 40 miles [c. 64 km] SW of Winchester on Coorow-Green Head road, 12 June 1974, C. Chapman s.n. (CANB, K, MEL, NSW, NY, PERTH 00720011); 4.8 km W of Great Northern Highway along North road, 15 km SW of New Norcia, R.J. Cranfield 4263 (PERTH); Leederville, June 1897, Col. Goadby s.n. (PERTH 00725110); Stirling Range, T. Hales for A.M. Ashby 4592 (PERTH); Cottesloe, 22 July 1897, R. Helms (PERTH 00718416); "Caladenia Hill" farm, corner of Knight and Washpool roads, Woogenilup, c. 30 km ENE of Mount Barker, 25 May 1983, P. Luscombe s.n. (K, PERTH 00717428); 16 km W of Harvey, B.R. Maslin 443 (MEL, PERTH); Kent Road, 0.1 km S of Crawler Road, 25 km due SW of York, B.R. Maslin 6183 (CANB, G, NY, PERTH); 12 km due E of The Lakes roadhouse, Inkpen Road 0.5 km N of Perth-York road, B.R. Maslin 6525 (PERTH); 24 miles [38.5 km] S of Fremantle on Mandurah road, 1 mile [1.6 km] E on Serpentine road, C.L. Wilson 817 (PERTH).

*Distribution*. Southwest Western Australia occurring in Irwin and Darling Botanical Districts and adjacent area of the Eyre Botanical district (1:250,000 maps H50-6,9,10,14; I50-2,6,11). Sporadic from near Coorow south to near Stirling Range (Stirling Range is east of Cranbrook). Judging from herbarium records *A. willdenowiana* was formerly common around Perth, however, many of its habitats have been destroyed through urban development.

*Habitat*. Grows in sand, loam and lateritic soils, often in winter wet depressions, usually in open woodland and woodland.

*Flowering and fruiting periods*. Flowers have been recorded from May to October, however, the main flush occurs June to September. A single collection with mature fruit was collected in November.

*Typification*. The type sheet of *A. diptera* at herb. CGE and is annotated by Lindley "*Acacia diptera* m" and supports a number of elements, not all of which are labelled. The specimens appear to represent

both *A. diptera sensu lectotypico* and *A. applanata* and there are duplicates of most of them at herb. K.

1. Left hand specimen on the CGE sheet is without collecting details; the probable duplicate of this at Kew is also without collecting details. It is likely that these specimens form part of the lectotype gathering of *A. diptera* (see no. 2 below) and are therefore regarded as probable isolectotypes.

2. Central specimens on the CGE sheet are labelled "Swan River, 1839, *Drummond*"; there are duplicates of these at Kew. One of the CGE specimens has been selected as the lectotype of *A. diptera* (originally chosen by A.B. Court, 18 June 1969); the K specimens are regarded as isolectotypes. These specimens accord well with the protologue.

3. Upper right hand specimen on the CGE sheet is labelled "Sandy light soil dry above" (probably in *Mrs G. Molloy's* hand); the Kew duplicate of this is labelled "Vasse River, *Mrs. Molloy*". These specimens appear to be *A. applanata* (but with unusually broad phyllodes, i.e. 3-7 mm wide) and are regarded as paralectotypes of *A. diptera*.

4. Lower right hand specimen on the CGE sheet is labelled "Swan River, *Capt. James Mangles*"; there are no specimens at herb. K which are attributed to Mangles. This specimen may possibly be part of the *Molloy* collection (see no. 3 above), it is *A. applanata* and is regarded as a paralectotype of *A. diptera*.

The type of *A. diptera* var. *erioptera* Graham seems not to be extant, however, there is a specimen at herb. E (a probable duplicate at herb. K) which was probably taken from the type plant. The specimen is annotated by R. Graham "Acacia *diptera* var. *erioptera* Grah. Greenhouse R. Bot. Gard. Edin. 24 Decb. 1842."

*Bibliographic note.* The name *A. diptera* var. *erioptera* was published separately by both R. Graham and G. Bentham in 1842; the two descriptions were identical. Ascertaining the precise dates of publication for the respective works is difficult, however, it seems probable that Graham's appeared before May 1842 (Chapman 1991) and Bentham's in about June 1842 (Staffleu and Cowan 1979). Additional evidence that Graham's name was published first is seen from Bentham (1864) where var. *erioptera* is attributed to Graham.

*Variation.* Phyllode width is very variable, e.g. 1-6 mm and 5-13 mm wide respectively on two plants from the population where *B.R. Maslin* 6525 was collected. The free portion of the phyllodes on specimens from the north of the range sometimes reach 50 mm long, elsewhere they are rarely exceed 20 mm. Specimens from the southern end of the range have pale lemon yellow heads, elsewhere they are white to creamy white.

*Affinities.* Until recently *A. willdenowina* was commonly called *A. diptera* (Court 1972) and has long been confounded with *A. applanata* (see above). Confusion between these two species occurred because both are low shrubs with winged stems and globular heads, furthermore, they are sometimes sympatric or parapatric. As discussed above even the type collection of *A. diptera* contained elements of both species. Meisner (1844) recognized the differences between the two, describing *A. willdenowiana* as *A. diptera* var. *latior* and *A. applanata* as *A. diptera* var. *angustior*.

*Acacia willdenowiana* is distinguished from *A. applanata* by inflorescence, vegetative and carpological features. Its racemes are long (2-11 cm) with twinned peduncles and white to pale yellow, larger heads; furthermore, at anthesis the raceme axes are commonly very narrowly winged through the development of decurrent phyllodes which sometimes expand considerably before flowering is finished so that the peduncles appear to be simple and axillary. In *A. applanata* the racemes do not exceed 1 cm in length and the axes are slender and terete (only very rarely winged), the peduncles are singular (except occasionally the distal pair is twinned) and the heads are a rich golden colour. Vegetatively *A. willdenowiana* tends to be a taller, more robust plant than *A. applanata* and has grey-green to glaucous (not green) phyllodes. Also, its phyllodes are only rarely hairy (includes the types of *A. diptera* var. *erioptera* Graham and var. *erioptera* Benth.), are commonly broader and have a longer free portion. The pods and seeds of *A. willdenowiana* are larger than those of *A. applanata*, also, its pods are usually glabrous. Otherwise the carpological features of the two species are very similar except that *A. applanata* is apparently a more shy seeder.

*Acacia willdenowiana* is also related to *A. alata* (see above).

*Common name.* Two-winged *Acacia*.

*Conservation status.* Not known to be under threat.

### Aphyllodinous taxa

#### 7. *Acacia aemula* Maslin, sp. nov.

*Suffrutex* aperto-ramosus junceus 0.2-0.4 m altus, plerumque plus minusve prostratus, ramulis teretibus striatis cum costis prominentibus, laevibus vel muricatis glabris. *Phyllodia* rami simulantem remota quinquangulo-teretia usque ad plus minusve plana et linearia mucronata, pulvino obscuro, 1-11 mm longa, 1-2 mm lata, laevia vel muricata glabra, quinqinerva (in quoque facie uninervata et cum phyllodiis plana margine superiore nervoidea. *Stipulae* 2-3 mm longae. *Glans* non prominens, super basem 1-3 mm disposita. *Pedunculi* 5-15 mm longi saepe reflexi glabri vel appresso-puberuli, *capitulis* globularibus cremeis vel aureis laxae 6-11-floribus. *Flores* tetrameri, alabastris ovatis usque ad ellipticas acutis, *calyce* gamosepalo parvo; *petala* flabellato-striata glabra. *Legumina* 3-6 cm longa, 4-5 mm lata stipitata acuminata, plus minusve tenuiter coriaceo-crustacea, arcuata, acute quadrangularia marginibus alatis circa 2 mm latis, glabra, rubello-brunnea. *Semina* longitudinalia oblonga 4-5 mm longa, arillo terminali et conico.

*Typus:* Rawlinson Road, Munglinup area east of Ravensthorpe, Western Australia, 1 June 1979, B.R. Maslin 4483 (*holo:* PERTH 00724262; *iso:* MEL, distributed as *A. tetragonocarpa*).

Openly branched, rush-like *sub-shrubs* 0.2-0.4 m tall, stems commonly prostrate or semi-prostrate. *Branchlets* terete, striate, sulcate and green between the yellow ribs, smooth or muricate, glabrous. *Stipules* triangular to lanceolate, 2-3 mm long, 0.5-1 mm wide at base, glabrous. *Phyllodes* resembling branchlets, occasionally continuous with branchlets or a few terminal ones reduced to horizontally flattened scales as in *A. tetragonocarpa*, distant, pentagonal-terete to  $\pm$  flat and linear, mucronate, pulvinus indistinct, 1-11 cm long, 1-2 mm wide, smooth or muricate, glabrous; 5-nerved in all (2 adaxial, 2 lateral and 1 abaxial), nerves rather prominent, 1-nerved on each face and upper margin flattened, c. 0.5 mm wide and nerve-like when phyllodes flat. *Gland* not prominent, situated



1-3 mm above base of phyllode. *Peduncles* 1 or 2 per axil, rarely more, 5-15 mm long, often reflexed, glabrous or appressed-puberulous; *basal peduncular bracts* solitary, usually caducous, minute; *heads* globular, cream or golden, loosely 6-11-flowered; *bracteoles* 0.5-1 mm long,  $\pm$  navicular, acute to shortly acuminate, sub-sessile, glabrous or sometimes margins ciliolate. *Flowers* 4-merous; *buds* ovate to elliptic, occasionally narrowly elliptic, 1.5 mm wide, acute; *calyx* 1/4-1/3 length of corolla, gamosepalous, divided for 1/4-1/3 its length into oblong-rounded or more commonly triangular lobes, calyx tube nerveless or obscurely nerved; *petals* 2-3 mm long, flabellate-striate, glabrous, acute. *Pods* stipitate, 3-6 cm long, 4-5 mm wide, acuminate,  $\pm$  thinly coriaceous-crustaceous, curved, not raised over the seeds, acutely quadrangular due to broad, flat, "winged" margins which are c. 2 mm wide on each valve, glabrous, reddish brown, finely longitudinally reticulate on the faces. *Seed* longitudinal, oblong, 4-5 mm long, 3 mm wide, very dark brown to blackish, rather dull, finely rugulose; *pleurogram* not prominent, with a narrow opening at hilar end; *areole* 2-3.5 mm long, 1-2 mm wide; *funicle* filiform, c. 1 mm long; *aril* terminal, conical, 2-2.5 mm long, 1-2 mm wide.

*Distribution.* Southern Western Australia in the Eyre, Darling and Roe Botanical Districts. Occurs from Stirling Range (Stirling Range is east of Cranbrook) east to Cape Arid (c. 110 km east of Esperance).

*Affinities.* Until now the new species has been confused with *A. tetragonocarpa* Meisn. and it is probable that Bentham's (1864: 336) description and specimen citations under the latter name included elements of both species. *Acacia aemula* appears most closely related to *A. tetragonocarpa* and *A. cummingiana* Maslin but is readily distinguished from them both by the presence of phyllodes. These three species share a number of unusual inflorescence and carpological characters, for example, flowers 4-merous, petals striate, pods acutely quadrangular ("winged") and seeds with a terminal, conical aril. In its phyllode nervature, few-flowered heads and striate petals *A. aemula* appears to be also related to the more northerly distributed species, *A. volubilis* F. Muell. from which it is distinguished by  $\pm$  straight stems, generally longer phyllodes and 4-merous flowers. As discussed below, *A. volubilis* is a possibly extinct species known only from the type.

*Etymology.* The specific epithet is derived from the Latin *aemulus*, meaning rivalling or more or less equalling. It alludes to the fact that the branchlets and phyllodes are superficially very similar and at first glance difficult to distinguish. However, upon inspection the (short) phyllodes are seen to have a gland on their upper surface and usually (indistinctly) pulvinate at their base.

#### Key to subspecies

- Stems and phyllodes smooth ..... 7a. subsp. **aemula**  
 Stems and phyllodes muricate ..... 7b. subsp. **muricata**

#### 7a. *Acacia aemula* Maslin subsp. **aemula**

*Stems and phyllodes* smooth and slender. *Heads* golden.

*Other specimens examined.* WESTERN AUSTRALIA: base of Mondurup, near car park, Stirling Range, R.J. Cumming 998 (PERTH); Condingup, T.C. Daniell 11 (PERTH); Pfeiffer Road, South Stirling, A.S. George 6304 (PERTH); W of race course, c. 4 miles [6.4 km] N of Esperance, A.S. George 9862 (PERTH); Cape Arid Point, G.J. Keighery 7831 (PERTH); West Mount Barren, E & S. Pignatti 1092 (PERTH).

*Distribution.* Southwest Western Australia throughout Eyre and adjoining Avon Botanical District (1:250,000 maps I50-11,12; I51-5,6,11). Scattered from Stirling Range (base of Mondurup Peak) east to Cape Arid.

*Habitat.* Grows on sand and sandy clay flats, also on rocky outcrops, in scrub and Mallee shrubland.

*Flowering and fruiting periods.* Flowers in late May to mid-June. Pods with mature seeds have been collected in late November.

*Conservation status.* A Priority 4 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

**7b. *Acacia aemula* subsp. *muricata* Maslin, subsp. nov.**

A subsp. *aemula* ramis crassioribus et plus manifeste costatis, muricatis (interdum excrementosa sparsis), *phyllodiis* muricatis subrigidis. *Capitulis* cremeis differt.

*Typus:* 16 miles [25.7 km] south of Jerramungup towards Albany, Western Australia, 2 October 1970, B.R. Maslin 1017 (*holo:* PERTH 00724254; *iso:* MEL, distributed as *A. tetragonocarpa*).

*Acacia tetragonocarpa* var. *scabra* Benth., Fl. Austral. 2: 336 (1864); *A. tetragonocarpa* forma *scabra* (Benth.) E. Pritzel, Bot. Jahrb. Syst. 35: 292 (1904). *Typus:* without locality, *A. Oldfield* s.n. (*iso:* PERTH-fragment, presumably ex K).

*Stems* thicker and more prominently ribbed than on the typical subspecies, muricate, excrescences sparse on plants east of Jerramungup. *Phyllodes* muricate, sub-rigid. *Heads* cream.

*Other specimens examined.* WESTERN AUSTRALIA: Stirling Range, A.M. Ashby 5001 (PERTH); locality unknown, 19 November 1972, T. Hales for A.M. Ashby Tag no. 45 (PERTH 00725250); SW of Peak Donnelly, Stirling Range, R.J. Cumming 985 (PERTH); 26 miles [41.8 km] E of Jerramungup, A.S. George 4406 (PERTH); Scaddan, H.E. Knox 1 (PERTH); c. 30 km ENE of Mount Barker, ?June 1984, P. Luscombe s.n. (PERTH 00725242); Stirling Range, Chester Pass, B.R. Maslin 4015 (PERTH); 11 miles [17.7 km] E of Ongerup, K. Newbey 241 (PERTH); West Kalgan, Albany District, R.D. Royce 6392 (PERTH).

*Distribution.* Southern Western Australia in the western part of the Eyre and adjoining Darling and Roe Botanical Districts (1:250,000 maps I50-8,11,12; I51-6). Disjunct, occurring from Stirling Range (southwest of Donnelly Peak) to midway between Jerramungup and Ravensthorpe, with one collection from Scadden (c. 50 km north of Esperance).

*Habitat.* Usually white sand, sometimes near watercourses, in open Mallee shrubland dominated by *Eucalyptus tetragona* or stunted *E. marginata*.

*Flowering and fruiting periods.* Flowers occur in late May and in June. Pods with mature seeds have been collected in mid-November and mid-December.

*Conservation status.* Not considered rare or endangered.

### 8. *Acacia carens* Maslin, sp. nov.

*Frutex* diffusus scopiformis usque ad 0.6 m altus. *Ramis* teretibus striatis vulgo glabris et viridibus praeter costas prominentes luteas. *Phyllodia* pauca et remota cum ramis continua rudimentaria stipuliformia 0.5-1 mm longa redacta sed interdum phyllodia subteretia usque ad compressa mucronata 1-2 mm longa expansa. *Stipulae* anguste triangulares usque ad angusto-oblongae, 1.5-3 mm longae. *Pedunculi* vulgo solitarii, 2-5 mm longi, plus minusve appresso-tomentoso-pubescentes; *capitulis* globularibus, 8 mm diametro, subconferim 13-14-floribus, bracteolis tomentosus. *Flores* vulgo 5-meri, alabastris obovatis apiculatis; *sepala* discreta ad circa 1/4-connata oblonga, marginibus tomentosus; *petala* flabellato-striata. *Legumina* linearia usque 10 cm longa et circa 4 mm lata, arcuata acuminata crustacea usque ad sublignea, plus minusve quadrangularia marginibus prominentibus planis vel leviter convexis 2 mm latis, glabra vel appresso-puberula. *Semina* (parum immatura) longitudinalia oblonga, 5 mm longa, arillo terminali et conico.

*Typus*: Cockleshell Gully area, Western Australia, 28 May 1973, *C. Chapman s.n.* (*holo*: PERTH 00722103; *iso*: CANB, K, MEL).

Open, broom-like, sub-erect, *shrubs* to 0.6 m tall. *Branches* terete, striate, deeply sulcate and green between the yellow ribs, smooth, glabrous except appressed-puberulous in axils at flowering nodes and sometimes at base of branchlets. *Stipules* narrowly triangular to narrowly oblong, acute, 1.5-3 mm long, *c.* 0.5 mm wide at base, glabrous or sub-glabrous. *Phyllodes* few and distant, continuous with branches, rudimentary and commonly represented as a minute, stipule-like appendages 0.5-1 mm long with a swollen base, sometimes expanded to minute, sub-terete to compressed, mucronate phyllodes 1-2 mm long with a gland on the adaxial surface. *Peduncles* mostly solitary, 2-5 mm long, tomentose to pubescent, hairs  $\pm$  appressed; *basal peduncular bract* solitary; *receptacles* tomentose-pubescent; *heads* globular, 8 mm diam. (when dry), sub-densely 13-14-flowered; *bracteoles* persistent, 1-2 mm long, oblong to lanceolate, acute to acuminate, sub-sessile, shallowly concave, conspicuously tomentose adaxially, hairs sometimes partially wearing away with age. *Flowers* mostly 5-merous, petals occasionally 6 on some flowers; buds obovate-apiculate, *c.* 1.5 mm wide; *sepals* 1/4-1/3 length of corolla, free or united for *c.* 1/4 their length, oblong, sub-acute,  $\pm$  glabrous except for conspicuously tomentose margins, dark brown, obscurely 1-nerved; *petals* *c.* 3 mm long, flabellate-striate, the central nerve slightly more pronounced than the rest and thickened at its apex. *Pods* linear, to 10 cm long, *c.* 4 mm wide, curved, acuminate, straight-edged or shallowly constricted between seeds, crustaceous to sub-woody,  $\pm$  quadrangular due to prominent, flat or shallowly convex, glabrous margins which are 2 mm wide on each valve, faces of pod somewhat obscurely longitudinally nerved and glabrous or appressed-puberulous. *Seeds* (slightly immature) longitudinal in pod, oblong, 5 mm long, 2 mm wide, brown; *pleurogram* open at hilar end; areole 3 mm long, 1 mm wide; *funicle* minute, abruptly expanded into a thick, conical, terminal aril.

*Other specimens examined*. WESTERN AUSTRALIA: Cockleshell Gully area [precise localities withheld for conservation reasons], *C. Chapman s.n.*, 23 October 1977 (MEL, PERTH 00722065) and 27 April 1979 (MEL, PERTH 00722138), *C. Chapman s.n.*, 28 May 1973 (CANB, K, MEL, PERTH 00722103), *R.J. Cranfield & P.J. Spencer* 7995 (PERTH), *E.A. Griffin* 2437 (PERTH), *B.R. Maslin* 6573 (PERTH) and *M. Simmons* 514 (PERTH).

*Distribution*. Southwest Western Australia on the border of the Darling and Irwin Botanical Districts (1:250,000 map H50-09). Known only from a very restricted area between Jurien (*c.* 200 km northwest of Perth) and Eneabba (*c.* 60 km northeast of Jurien).

*Habitat.* Lateritic uplands on gravel or sandy gravel in low heath.

*Flowering and fruiting periods.* The only two flowering specimens were collected in late April and early May. Pods with immature seeds have been collected in late September and late October.

*Affinities.* Until now, specimens of *A. carens* were referred to as *A. volubilis* F. Muell., presumably because both species have large, globular, few-flowered heads and 5-merous flowers with striate petals. Furthermore, *A. volubilis* has very reduced phyllodes which resemble the striate branches, thus rendering it vegetatively superficially similar to *A. carens*. Although *A. volubilis* is known only from the type (a flowering specimen) it can be distinguished from *A. carens* by its tortuous branches, recurved, sub-spinose stipules c. 0.5 mm long (only the thickened basal portions remaining, as blunt tooth-like projections, at most nodes), better developed and usually longer phyllodes, and gamosepalous calyx dissected to c. 1/2 its length into triangular lobes. As discussed below *A. volubilis* is a possibly extinct species known only from the type.

*Acacia carens* can be confused with short peduncle forms of *A. cummingiana* Maslin (see below), another species formerly confused with *A. volubilis* and which occurs a little to the southeast of the range of *A. carens*. Superficially *A. carens* and *A. cummingiana* have a similar habit, furthermore, they both possess rather large, globular, few-flowered heads, flowers with striate petals and rather large seeds with an open pleurogram and a terminal, conical aril. The differences between them are discussed below under *A. cummingiana*.

*Conservation status.* A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. This species is known from only the four collections cited here.

*Etymology.* The specific epithet is derived from the Latin - *carens*, meaning lacking, and refers to the characteristic absence of normal phyllodes on this species.

#### 9. *Acacia cerastes* Maslin, sp. nov.

*Frutex* glaber intricatus multiramis usque ad 1.5 m altus, *ramulis* tortuosis viridibus vel brunneis teretibus et striatis. *Phyllodia* rudimentaria vel projecturas minutas continuas cornuatas 1 mm longas redacta, teretia plerumque recurvata, nervis non manifestis vel in utroque latere glandis perobscuris, a glande obliquo prominente abaxialiter terminata, mucrone 0.5-1 mm longo, rigido et subulato sed non pungente. *Racemi* maxime redacti uncapitati ad basem bracteis brunneis persistentibus; *pedunculi* 3-4 mm longi; *capitulis* globularibus 30-floribus aureis, bracteolis atro-brunneis in alabastro leviter exsertis. *Flores* 5-meri; *sepalis* discretis vel partialiter connatis linearibus usque ad lineari-spathulatis, interdum inaequalibus. *Leguminum* valvae (fructi aperti) lineares, ad 4.5 cm longae, 3-4 mm latae, tenuiter coriaceae, inter semina constrictae et supra semina manifeste elevatae. *Semina* non visa.

*Typus:* Mount Gibson Station, between Wubin and Paynes Find, Western Australia, 29 August 1976, B.R. Maslin 4226 (*holo:* PERTH 00137634; *iso:* CANB, K).

Erect, intricate *shrubs* to 1.5 m tall, single-stemmed but much-branched from c. 0.5 m above ground level. *Bark* smooth, grey on main stems, green on upper branches. *Branchlets* terete, finely striate-ribbed (ribs yellow and tuberculate), tortuous, glabrous, olive green or brown. *Stipules* semi-persistent, triangular, to c. 1 mm long, scarious, dark brown. *Phyllodes* rudimentary, reduced to

minute, horn-like projections to 1 mm long, continuous with branchlets, terete, usually recurved, nerves not evident or very obscure on either side of the gland, terminated on adaxial side by a prominent, oblique gland; mucro 0.5-1 mm long, rigid and subulate but not pungent. *Inflorescences* extremely reduced 1-headed racemes; *raceme axes* < 0.5 mm long, subtended at base by 2, dark brown, scarious, oblong bracts 1 mm long and 1 mm wide, a vegetative shoot sometimes arising from apex of axis at anthesis; *peduncles* 3-4 mm long, glabrous; *basal peduncular bracts* 1 or 2, obliquely oblong-elliptic, dark brown, scarious, 1.5-2 mm long, 1-1.5 mm wide; *heads* not prolific, globular, 30-flowered, golden; *bracteoles* spatulate, 1.5 mm long, slightly exerted in mature buds, dark brown; claws to c. 0.5 mm long and gradually expanded into the lamina; lamina 0.4-0.6 mm wide, concave, scarious, ciliolate, sometimes puberulous abaxially at base otherwise glabrous, acute. *Flowers* 5-merous, few 4-merous interspersed; *sepals* free or partially fused, 1/2-2/3 length of petals, linear to linear-spathulate, dark brown on upper half, ciliolate at apex otherwise glabrous, sometimes the abaxial pair (subtended by the bracteole) smaller and/or shape different than the rest; *petals* 2.5 mm long, glabrous, obscurely 1-nerved. *Pod valves* (dehisced) linear, to 4.5 cm long, thinly coriaceous, 3-4 mm wide, slightly to moderately constricted between seeds, obviously rounded over seeds, glabrous, dark brown; margins 0.5 mm wide, not thickened. *Seeds* not seen.

*Other specimens examined.* WESTERN AUSTRALIA: Mount Gibson Station, November 1952, C.A. Gardner s.n. (PERTH 00137626, PERTH 00719536 and MEL) and B.R. Maslin 6638 (PERTH); Ninghan Station, S. Patrick 1111 (PERTH).

*Distribution and habitat.* Western Australia near the border of the Austin and Avon Botanical Districts (1:250,000 map H50-7). Known only from Mount Gibson Station where it occurs in skeletal soil pockets on rocky hills, and at Ninghan Station (c. 40 km northeast of Mount Gibson Station) in a gully on brown sandy loam in woodland.

*Flowering periods.* Of the four flowering collections known, two were gathered in August and the other two in November. It is noted, however, that the plants of B.R. Maslin 6638 which were collected in early October, had finished flowering.

*Affinities.* *Acacia cerastes* is a most distinctive species on account of its tortuous branchlets and minute phyllodes (which are probably the smallest recorded for the genus). It is closely related to *A. daviesioides* C. Gardner on account of its continuous phyllodes and globular heads arranged in very short racemes which are usually bracteate at their base. *Acacia daviesioides* is most readily distinguished from *A. cerastes* by its glaucous to sub-glaucous, non-tortuous branches and its longer (2-10 mm, sometimes 20 mm), pungent, 5-nerved phyllodes. Also, its bracteoles are usually inconspicuous and its calyx is gamosepalous, shallowly to deeply dissected, and often < 1/2 length of the petals. Pods and seeds may show additional differences, however, carpological material of *A. cerastes* seen to date is very inadequate (comprising old, dehisced pod valves). The branches on *A. daviesioides* are normally  $\pm$  straight, however, in some specimens (including the type) they are flexuose and have minutely tuberculate ribs as in *A. cerastes*. *Acacia daviesioides* occurs mainly between Mingenew southeast to Ballidu-Kalannie in the South-West Botanical Province, some 80 km to the west of Mount Gibson Station. It also has outliers in the Eremaean Botanical Province, one on Jingemarra Station about 200 km north of Mount Gibson Station, another north of Mount Jackson about 200 km southeast of Mount Gibson Station.

Superficially the new species may be mistaken for *A. restiacea* Benth., however, the latter is easily distinguished by its straight branches, absence of phyllodes (except occasionally at the base of the stems where they are 7-25 mm long), long racemes (1-6 cm) with 4-12 heads and very short calyx

(c. 1/6 length of corolla). *Acacia restiacea* mainly occurs from the north of the Murchison River south to Chidlow and east to near Merredin, also at Hospital Rocks (c. 90 km west of Menzies) and an early collection from Mount William in the Darling Range.

*Conservation status.* A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. Although further survey is required to accurately ascertain the conservation status of *A. cerastes*, current indications are that it is very localized.

*Etymology.* From the Greek - *cerastes*, a horned serpent. An allusion to the serpentine branches supporting extremely reduced phyllodes.

#### 10. *Acacia cummingiana* Maslin, sp. nov.

*Suffrutex* decumbens effusus junceus usque ad 0.4 m altus. *Ramis* teretibus striatis viridibus glabris praeter costas luteas. *Phyllodia* ad squamas continuas tenues applanatas horizontaliter anguste oblongas usque ad anguste triangulares 1.5-4 mm longas redacta. *Pedunculi* squamarum in axilla solitarii vel geminati, 4-15 mm longi, glabri; *capitulis* globularibus, circa 8 mm diametro (in sicco), vivide pallido-aureis, plus minusve apertis 8-12-floribus. *Flores* tetrameri, alabastris obovatis apiculatis, 2 mm latis; *calyx* gamosepalus, petala circa duplo brevior; *petalis* flabellato-striatis. *Leguminum* valvae (fructi aperti) 4-7 cm longae et 8-10 mm latae, stipitatae acuminatae coriaceo-crustaceae leviter curvatae, acute quadrangulares marginibus alatis planis 3-4 mm latis, glabrae. *Semina* apparenter obliqua oblongo-elliptica, 5.5 mm longa, arillo terminali et conico.

*Typus:* NE of Dandaragan, Western Australia, 24 May 1979, *R.J. Cranfield* 1261 (*holo:* PERTH 00722049).

Sprawling, straggly, rush-like *sub-shrubs* to 0.4 m tall, the wiry stems to 1 m long and commonly entangled in associated vegetation. *Branches* straight to shallowly curved, terete, green except striate with yellow,  $\pm$  raised ribs 0.2-0.5 mm apart, glabrous. *Stipules* (see discussion below). *Phyllodes* reduced to continuous, thin, horizontally flattened, narrowly oblong to narrowly triangular scales 1.5-4 mm long. *Stipular traces* running into the scales. *Peduncles* 1 or 2 in axil of scales, 4-15 mm long, occasionally recurved from the base, glabrous, finely longitudinally sulcate; *basal peduncular bract* solitary, persistent,  $\pm$  triangular, 1-1.5 mm long, glabrous or sparsely puberulous, dark brown, thickened at base; *heads* globular, c. 8 mm diam. (when dry), bright light golden, somewhat loosely 8-12-flowered; *bracteoles* persistent,  $\pm$  navicular, 1-1.5 mm long, fimbriolate otherwise glabrous, dark brown. *Flowers* 4-merous; *flower buds* obovate-apiculate, 2 mm wide; *calyx* c. 1/2 length of petals, gamosepalous, divided for 1/3-1/2 its length into  $\pm$  broadly triangular, fimbriolate lobes; *calyx tube* glabrous, brown, rather obscurely striate; *petals* 3 mm long, glabrous, flabellate-striate. *Pod valves* (dehisced) stipitate, 4-7 cm long, 8-10 mm wide, acuminate, coriaceous-crustaceous, shallowly curved, scarcely raised over seeds, acutely quadrangular by broad (3-4 mm wide), flat "winged" margins, glabrous. *Seeds* (one old seed seen) obliquely placed in pod (judging from empty seed chambers), oblong-elliptic, 5.5 mm long, 4 mm wide, chestnut brown, dull; pleurogram obscure, open at hilar end; *areole* 4 mm long, 2 mm wide, *funicle* not seen; *aril* terminal and conical.

*Other specimens examined.* WESTERN AUSTRALIA: NE of Badgingarra, *T.E.H. Aplin* 3150 (CANB, PERTH); NE of Dandaragan, *R.J. Cranfield* 1261 (PERTH); 4 km from Brand Highway on West Wannamal Road, *R.J. Cumming* 715 (K, PERTH); 3.3 km W of Barberton West Road on Wandawulla Road, *R. Cumming* 3572 (PERTH); farm N of North West Road, W of Moora,

*E.A. Griffin* 5101 (PERTH); 8 miles [13 km] E of Dinner Hill, *R.T. Lange* 60 (PERTH); 8 miles [13 km] W of Barberton, 26 September 1971, *A.H. Popplewell s.n.* (PERTH 00725277); Watheroo National Park, *R.D. Royce* 9637 (PERTH); 10 miles [16 km] W of Moora, *E. Wittwer* W832 (PERTH).

*Distribution.* Southwest Western Australia at the northern extremity of the Darling Botanical District and the adjacent southern extremity of the Irwin Botanical District (1:250 000 maps H50-10,14). Restricted to a small area from Watheroo National Park (c. 40-60 km northwest of Moora) south to Wannamal (c. 25 km northeast of Gingin).

*Habitat.* Grows in sand or lateritic gravel in closed heath or low open woodland (of *Banksia prionotes* and *Eucalyptus todtiana*) over heath. Collectors notes accompanying *R.J. Cumming* 715 show the species confined to a creek line, halfway up the slope of a small breakaway.

*Flowering and fruiting periods.* Flowers mainly in May and June, but also recorded for August. Specimens with immature pods (sometimes with flowers persisting) have been collected in late September and early October.

*Affinities.* Until now this new species was confounded with *A. volubilis* F. Muell., a rare (perhaps extinct) species. Because of past confusion surrounding the application of the name *A. volubilis* a number of taxa, including *A. cummingiana*, had been referred to it. It is not surprising that *A. volubilis* and *A. cummingiana* were confused because they share some distinctive floral features, namely, large, globular, few-flowered heads and striate petals. Furthermore, *A. volubilis* has very reduced phyllodes which resemble the striate branchlets, thus rendering it vegetatively superficially similar to *A. cummingiana*. In addition to possessing phyllodes, *A. volubilis* is distinguished from *A. cummingiana* by its tortuous branchlets, appressed-puberulous peduncles and 5-merous flowers. Furthermore, *A. volubilis* has a pair of stipules flanking the base of its phyllodes. Each stipule, as well as the phyllode, is served by a vascular trace. In *A. cummingiana* (and *A. tetragonocarpa*), however, the equivalent three traces enter the scale. This suggests that the scales in these species are homologous to fused phyllodes and stipules.

*Acacia cummingiana* is closely related to *A. tetragonocarpa* Meisn. on account of its habit, phyllodes reduced to continuous scales, 4-merous flowers with gamosepalous calyces and striate petals, and quadrangular pods with wide, flat margins. However, *A. tetragonocarpa* is distinguished from the new species by its narrower pods (4-5 mm wide) with longitudinal seeds and by its floral characters, i.e. heads 1-4-flowered, flower buds cylindrical to narrowly obovate and 1 mm wide, and calyx c. 1/3 length of corolla. *Acacia tetragonocarpa* occurs in swampy or seasonally wet habitats in forest regions to the south of *A. cummingiana* (i.e. Perth to Margaret River and Albany).

Also related to *A. aemula* (see above).

Specimens of *A. cummingiana* with short peduncles can be confused with *A. carens* (see above), however, *A. cummingiana* is most readily distinguished in the following ways: phyllodes reduced to flattened scales 1.5-4 mm long, stipules seemingly fused with the scales, peduncles glabrous, flowers 4-merous, calyx gamosepalous with triangular lobes, pods 8-10 mm wide, stipitate, acutely quadrangular with margins 3-4 mm wide and seeds seemingly oblique.

*Conservation status.* A Priority 3 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* Named after Russell Cumming in recognition of his valuable contribution to the taxonomy of southwest acacias through his perceptive field observations and numerous, well-preserved collections.

**11. *Acacia volubilis* F. Muell., Fragm. 10: 98 (1877)**

*Typus:* Boxvale, Western Australia, *Julia Wells s.n.* (*holo:* MEL; *iso:* K, PERTH).

*Branchlets* tortuous, having the appearance of *Alexgeorgea nitens* (Restionaceae), terete, glabrous or sparsely appressed-puberulous, obscurely and finely tuberculate, striate, ribs slightly raised. *Stipules* c. 0.5 mm long, recurved, sub-spinose, only the thickened basal portions remaining as blunt tooth-like projections at most nodes. *Phyllodes* distant, resembling branchlets but not continuous with them, the basal articulation difficult to observe, pulvinus absent, rudimentary (<1 mm long) to 9 mm long, 1 mm wide, pentagonal-terete, thick, straight or shallowly curved, mucronate; 5-nerved in all, midrib prominent and raised on each face, upper margin 2-nerved, flat and 0.5 mm wide, lower margin 1-nerved. *Gland* not prominent, circular, situated on upper margin of phyllode between the two adaxial nerves, c. 2 mm above the base on longest phyllodes. *Inflorescences:* see discussion below.

*Distribution and habitat.* Known only from the type collection which is annotated by Mueller as having been collected by Julia Wells from "Boxvale" (in the protologue Mueller gives the type locality as "Ad Boxvale trans urbem York"). The precise location of "Boxvale" is unknown, however, current indications are that it is probably somewhere in the vicinity of Quairading, about 70 km east-southeast of York. According to Erickson (1988) "Boxvale" was the name of a property owned by John R.F. Wells, and it is assumed that it is here where his unmarried sister, Julia, resided during the late 1870's when she collected plants for Mueller. There is circumstantial evidence to suggest that "Boxvale" may have been an earlier name for a property known as "Coraling", located near Coalling Hill, about 12 km southeast of Quairading. This assumption is based on the following quotation from Eaton (1979: 42): "It was during 1860 that John Wells selected land at Coraling Springs. He built a small hut and grazed a few sheep on his holding. .... It was in 1883 therefore that Charles Heal bought "Coraling" a block of 640 acres, from John Wells." The property is owned to this day by descendants of the Heal family. That "Boxvale" was probably located somewhere near Quairading is supported by the fact that Julia Wells was reported by Mueller (1878: 3) as having collected *Comesperma volubile* Labill. from the Cubbine Hills which are located 15 km north of Quairading towards Cunderdin. Furthermore, *Acacia anarthros* Maslin which was originally collected by Julia Wells from "Boxvale" (*vide* Maslin 1979) is an uncommon species known only from two general areas, namely, about 40 km south of Quairading and in the New Norcia district.

*Typification.* Both the holotype at MEL and the isotype at K are annotated "*Acacia volubilis* F. v. M. Boxvale. Julia Wells" by Mueller and comprise a single sheet supporting a number of small pieces of sterile stems together with detached flowers in a packet. While the stems appear to represent the same taxon, the flowers on these two sheets are significantly different and most probably represent different species. On both specimens the heads were probably globular and c. 10-flowered (judging from the receptacles), the flowers 5-merous and rather large, the calyx divided to c. 1/2 its length into triangular, fimbriate lobes, and the calyx tube is glabrous. They differ, however, in the following ways.

(a) MEL specimen. *Peduncles* appressed-puberulous, the hairs short and shallowly curved; *calyx* scarcely 1/2 length of corolla, tube obscurely 5-nerved; *petals* 2.5 mm long, sparsely puberulous at apices, flabelliform-striate.



(b) The K specimen flowers. *Peduncles* densely hispidulous, hairs spreading, rather long and straight; *calyx* slightly exceeding 1/2 length of corolla, tube rather prominently 5-nerved; *petals* 3 mm long, glabrous, with a single, thickened, central nerve.

The protologue clearly describes the flowers of the MEL specimen and it seems most likely that the flowers on the K specimen belong to a species other than *A. volubilis*.

*Affinities.* In the past many apparently aphyllodinous taxa with few-flowered heads and striate petals (including *A. carens* and *A. cummingiana*) were referred to *A. volubilis*, however, it is now known that this is a rare, possibly extinct, species currently known only from the type collection. In the absence of pods for *A. volubilis* it is difficult to be certain as to its true affinities. Nevertheless, it seems likely that it is less closely related to *A. carens* and *A. cummingiana* than it is to *A. aemula* (see discussion above under this species).

*Conservation status.* The species is currently gazetted a Declared Rare Flora-Extant Taxa on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. If *A. volubilis* is not extinct then relocating it could prove troublesome even if the plants are in flower because I suspect that the species will be an insignificant sub-shrub, perhaps with a scandant or sedge-like habit, and may well grow  $\pm$  concealed within dense heath. It is unfortunate that the type does not include a collecting date because without it the flowering period is unknown. A further complication is the uncertainty concerning the location of "Boxvale", currently the only locality known for the species (see discussion under *Distribution and habitat* above).

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**Acacia Miscellany 14. Taxonomy of some Western Australian  
"Uninerves-Racemosae" species (Leguminosae: Mimosoideae:  
section *Phyllodineae*)**

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**Abstract**

Maslin, B.R. *Acacia* Miscellany 14. Taxonomy of some Western Australian "Uninerves-Racemosae" species (Leguminosae: Mimosoideae: section *Phyllodineae*). *Nuytsia* 10 (2): 181-203 (1995). Eight new species of *Acacia* section *Phyllodineae* from Western Australia are described, namely, *A. anthochaera* Maslin, *A. brumalis* Maslin, *A. chamaeleon* Maslin (syn: *A. stowardii* S. Moore non Maiden, and provisionally *A. leiophylla* var. *microcephala* Meissner), *A. dorsenna* Maslin, *A. gelasina* Maslin, *A. scleroclada* Maslin, *A. subrigida* Maslin and *A. wilcoxii* Maslin. Lectotypes are selected for *A. stowardii* S. Moore, *A. harveyi* Benth. and *A. leptopetala* Benth. The ten species included in the paper have racemose inflorescences and are referable to series *Uninerves* subseries *Racemosae* as defined by Bentham (1864).

**Introduction**

The ten species included here belong to *Acacia* section *Phyllodineae* DC. and are characterized by having "1-nerved" phyllodes (i.e. one nerve on each face when phyllodes are flat, or, a total of usually four nerves when phyllodes are terete, quadrangular, etc.) and globular or sometimes oblongoid heads arranged in elongated racemes. The term "Uninerves-Racemosae" is an often-used and convenient term applied to species having this combination of characters. However, the "Uninerves-Racemosae" comprises disparate groups of taxa (see below) and is probably polyphyletic (see Figure 2 in Chappill & Maslin, 1995); it was not recognized as a natural taxonomic entity in the classifications of Vassal (1972) and Pedley (1978 & 1986).

A number of discrete clusters of closely related taxa have been recognized within the "Uninerves-Racemosae", for example, the "*Acacia bivenosa* Group" (Chapman and Maslin 1992), the "*Acacia victoriae* Group" (Maslin 1992), the "*Acacia myrtifolia* Group" (Maslin 1995) and the "*Acacia microbotrya* Group", "*Acacia prainii* Group" and "*Acacia murrayana* Group" which are discussed below. The phylogenetic relationships between these Groups, and their relationships to other taxa within subgenus *Phyllodineae*, have not been fully resolved. In one case, however, a number of independent lines of evidence have shown that some "Uninerves-Racemosae" species are closely

related to certain bipinnate-leaved species of section *Botrycephalae* (Benth.) Taub. (see Tindale & Roux 1969 & 1974, Anderson *et al.* 1971 & 1984, Anderson 1978, Vassal 1972, Chappill & Maslin 1995, Brain 1987, and Brain & Maslin in prep.).

While phyllode nerve number and inflorescence form are useful characters for recognizing "Uninerves-Racemosae" species these are not completely reliable characters for ascribing taxa to this (artificial) group. For example, *A. difformis* R. Baker has 2 longitudinal nerves on each face of its phyllodes yet its inflorescence and carpological characters suggest its inclusion in the "*Acacia microbotrya* Group"; similarly, *A. binervata* DC. and *A. wardellii* Tind. have prominently 2- or 3-nerved phyllodes but are clearly related to *A. bancroftii* (1-nerved phyllodes) which is placed in the "*Acacia microbotrya* Group" (see notes below under *A. brumalis* sp. nov). There are also a number of taxa, especially from southwest Western Australia, with 2 nerves along the (often thickened) upper margin of the phyllodes, thus making a total of 5 nerves per phyllode (2 along the upper margins, 1 on each face and 1 along the lower margin); these taxa uncommonly have racemose inflorescences (e.g. *A. scleroclada* sp. nov. below). Similarly there are some cases where species with simple inflorescences are closely related to racemose taxa, e.g. *A. synchronicia* Maslin in the "*Acacia victoriae* Group" (Maslin 1992). The length of the raceme varies considerably but within section *Phyllodineae* there seems to be a significant taxonomic discontinuity between those taxa having very reduced racemes (the axes generally not above about 1 mm long and supporting 1 or 2 heads) and those having more elongated racemes with more numerous heads. A recent study by Brain and Maslin (in prep.) using serological data suggests that species with very reduced racemes are most closely related to non-racemose species and that there is little or no relationship between this combined group and the "Uninerves-Racemosae". These relationships based on biochemical data were an unexpected result of the Brain and Maslin study, however, if they are corroborated by other evidence then a major rearrangement of the classification of section *Phyllodineae* will be needed.

This paper is not a revision of the "Uninerves-Racemosae"; the intention here is simply to describe new species and lectotypify names ahead of their inclusion in the forthcoming "Flora of Australia" volumes.

### Methods

The taxa included in this paper are arranged alphabetically by species name. Unless otherwise stated all plant measurements are taken from dried herbarium material. Botanical Districts referred to under the Distribution of each new species are defined by Beard (1980). Species distributions are also expressed by 1: 250 000 map number (see Maslin and Pedley 1982 for maps of the Australian *Acacia* flora published in this same format).

My approach to both typification and the application of rank are discussed elsewhere (Maslin & Cowan 1994a and Cowan & Maslin 1995 respectively).

### New species and lectotypifications

#### 1. *Acacia anthochaera* Maslin, sp. nov.

*Frutex* densus, plerumque rotundatus, multicaulis glaber 2-5 m sed interdum 7 m altus. *Cortice* saepe albo in truncos et ramos principalibus fissurato. *Ramulis* ad extremas angulatis vel compressis cuticula alba. *Phyllodia* anguste linearia acuta, 9-15 cm longa, 2-5(6) mm lata, tenuia flexilia, plerumque ascendunt ad erecta, recta ad leviter incurvata et ad apicem saepe leviter recurvata, viridia vel subglauca uninervata, nervis lateralibus obscuris vel nullis. *Racemi* (4)7-15(22) mm longi, 4-9 capitulis, juventute a bracteolis imbricatis inclusi. *Pedunculi* (5)7-12(15) mm longi graciles. *Capitulis* permultis aromaticis globularibus vivide diluto-aureis, 25-35-floribus, sine bracteolis. *Flores* 5-meri sepalis discretis. *Legumina* anguste oblonga usque ad 8.5 cm longa et 5-8 mm lata chartacea diluto-brunnea. *Semina* longitudinalia oblonga ad elliptica vel ovata, 4-5 mm longa, obscura atro-brunnea ad nigra sed centro luteola, exarillata.

*Typus*: 104.5 km S of Paynes Find on Great Northern Highway, Western Australia, 3 September 1984, B.R. Maslin 5584 (*holo*: PERTH 00137340; *iso*: AD, CANB, G, K, MEL, NSW, NY - all distributed as *A. hemiteles*, long phyllode variant).

Glabrous *shrubs* or *trees* 2-5 m tall, sometimes 7 m, trunks 30-40 cm diam. at base, rounded or obconic with a rounded crown, 2-6 (or more)-branched at ground level, crowns dense. *Bark* grey, longitudinally fissured on trunks and main branches otherwise smooth, smooth and light brown or green on young plants. *Branchlets* angled or flattened at extremities, soon terete, finely ribbed, green, yellow or light brown, cuticle often white. *Stipules* early caducous, present only on very young shoots. *Phyllodes* narrowly linear, (7.5)9-15(20) cm long, 2-5(6) mm wide, length to width ratio 20-60, rather thin and flexible, smooth, mostly ascending to erect, sometimes spreading, straight to shallowly incurved, often shallowly recurved at apices, green or subglauous, cuticle sometimes white; midrib and marginal nerves yellow or light brown, sometimes resinous (but not viscid), lateral nerves obscure or superficially absent; apex acute, not pungent; pulvinus 2-3 mm long, finely transversely wrinkled. *Gland* on upper margin of phyllode 0-6(10) mm above the pulvinus, not prominent, c. 0.5 mm long. *Racemes* 1 or 2 per axil, (4)7-15(22) mm long with 4-9 heads, enclosed when young by conspicuous, brown, scarious, imbricate bracts, bract scars evident at base of raceme axes where bracts have fallen; *raceme axes* straight, slender, sometimes beginning to grow out at anthesis. *Peduncles* (5)7-12(15) mm long, slender; *basal peduncular bracts* caducous, conspicuous in buds where they completely enclose the heads, c. 4 mm long, brown, scarious, concave. *Heads* prolific, fragrant, globular, bright light golden, 25-35-flowered. *Bracteoles* absent. *Flowers* 5-merous. *Sepals* free, c. 1/2 length of petals, linear-spathulate, brown towards apices. *Petals* 2 mm long, nerveless. *Pods* narrowly oblong, to 8.5 cm long, 5-8 mm wide,  $\pm$  straight, chartaceous, flat, rounded over seeds, straight-edged or slightly constricted between seeds, light brown, obscurely transversely reticulate. *Seeds* longitudinal in the pod, oblong to elliptic or ovate, 4-5 mm long, 3-3.5 mm wide, dull, dark brown to blackish, yellowish at centre; pleurogram obscure, open at hilar end, shallowly "U"-shaped; areole small; *funicle* filiform, 2 mm long, dark reddish, exarillate.

*Selected specimens examined*. WESTERN AUSTRALIA: 18 km N of Pindar, A.M. Ashby 5041 (AD, PERTH); Wubin, September 1934, E.M. Barker s.n. (PERTH 00131563); W of Kalannie (intersection of Warren and Dalwallinu North roads), G. Craig 1614 (MEL, PERTH); 14 km SSW of Mount Gibson, R.J. Cranfield 8499 (PERTH); 13.5 km E of road to Burakin at Kalannie towards Kulja, R. Cumming 3663 (PERTH); 24 km N of Murchison River on North West Coastal Highway, B.R. Maslin 3149 (PERTH); 7.5 km from Morawa towards Three Springs, B.R. Maslin 4270 (CBG, MO, NT, PERTH);

2.5 km NW of Carnamah on Midlands Road to Three Springs, *B.R. Maslin* 6583 (MEL, PERTH); Mouroubra Station, 68.5 km S of Paynes Find, *B.R. Maslin* 6666 (PERTH); East Yuna Reserve, A28415, 29231, c. 70 km NE of Geraldton, *B.G. Muir* 158(2.7) (PERTH); 5 km E of Karroun Hill, *P. Roberts* 223 (PERTH); Cowcowing, *F. Stoward* 310 (PERTH).

*Distribution.* Southwest Western Australia in the Irwin and Avon Botanical Districts with one collection from the extreme northwest of the Coolgardie Botanical District (1:250,000 maps G50-13, H50-1,2,6,7,10,11). Occurs from near Yuna (which is c. 35 km east of Northampton) southeast to Cowcowing (c. 20 km north-northeast of Wyalkatchem), also near Galena (which is c. 35 km northwest of Yuna) and Karroun Hill (c. 75 km northwest of Cowcowing).

*Habitat.* Grows in flat, low-lying areas on red-brown sand or loam in woodland or shrubland.

*Flowering and fruiting periods.* Flowering has been recorded from August to December, however, the main flush occurs in September. Pods with mature seeds have been collected from November to January.

*Conservation status.* Widespread, not known to be threatened.

*Etymology.* From the Greek, *anthos* - flower, and *chairo* - rejoice. Alluding to the bright golden heads clustered in short terminal racemes. The name is also a very appropriate commemoration of the birth of my daughter, Kimberly Sarah, in March 1991, around the time that the original draft of this description was prepared.

*Affinities.* *Acacia anthochaera* belongs to the "Acacia prainii Group" (see discussion under *A. dorsenna* sp. nov. below) and until now was regarded as a long phyllode variant of *A. hemiteles* Benth. While these two species have very similar inflorescence and carpological features they are readily distinguished by their growth habit, bark characteristics and phyllode proportions. The principal characters which set *A. hemiteles* apart from the new species are the following: shrub 0.5-2(3) m tall; bark smooth, sometimes grey and fissured at the extreme base of the relatively thin stems; phyllodes narrowly elliptic to  $\pm$  narrowly oblong or linear, 4-10 cm long, 4-9(11) mm wide, length to width ratio 5-15, coriaceous and somewhat rigid, straight to recurved, rarely shallowly incurved, mucro commonly coarsely pungent. The distributions of the two species overlap in the region between about Beacon (c. 55 km northeast of Koorda) and Morawa, and the morphology of a few herbarium specimens suggest that hybridization may occur (e.g. c. 15 km NW of Kalannie towards Dalwallinu, *B.R. Maslin* 3977, PERTH; 13 km E of Coorow towards Latham, *B.R. Maslin* 4128 & 4128A, PERTH).

Like *A. prainii* Maiden, *A. anthochaera* grows to a beautiful, shapely tree with a dense canopy and masses of fragrant, bright golden heads. Occasionally the two are sympatric, for example, on Mouroubra Station, c. 70 km south of Paynes Find: *B.R. Maslin* 6666 (*A. anthochaera*) and *B.R. Maslin* 6667 (*A. prainii*). At this locality the general facies of the two species was similar, however, *A. anthochaera* occurred as a tree 7 m tall (which seems to represent the maximum height attained by the species) whereas *A. prainii* reached only 4 m; *A. prainii* was further distinguished by its shorter (to c. 5 cm long), pungent phyllodes.

In phyllodes and sometimes in habit *A. anthochaera* may resemble *A. aestivalis* E. Pritz. which has light-golden, appressed-puberulous raceme axes, united sepals and has seeds with a long, red-brown (brittle) funicle and a thick aril.

## 2. *Acacia brumalis* Maslin, sp. nov.

*Frutex* vel *arbor* 2-3 m alta ramulis glabris, interdum rubris. *Phyllodia* magnitudine et forma variabilia, plerumque oblanceolata ad anguste elliptica vel oblongo-elliptica sed interdum late linearia et versus basem angustata, (3.5)5-13 cm longa, (3)4-20 mm lata, aliquantum firma et coriacea patentia ad adscendentia glabra, in utraque superficie uninervata nervis lateralibus obscuris; glans non prominens, plerumque 1 vel 2, infima plerumque supra pulvinam 2-30 mm disposita. *Racemorum axes* (3)6-25(40) mm longi appresso-puberuli pilis aureis vel albis, in fructo interdum glabri. *Pedunculi* plerumque 3-5 mm longi appresso-puberuli cum pilis aureis vel albis. *Capitula* globularia ad oblongoidea, sub anthesi 5-8 mm diametro, aurea 17-45-floribus. *Flores* 5-meri. *Calyce* gamosepalo. *Legumina* linearia, plerumque marginibus rectis ad inter semina leviter constrictis, ad 10 cm longa et 5-6 mm lata, tenuiter coriacea ad firme chartacea glabra fusca. *Seminibus* longitudinalibus oblongis ad elliptica 4-5 mm longis, obscuris atris, funiculo semen cingente uniplicato dilute rubello-brunneo sed vivo luteo, arillo crasso.

*Typus*: Mortlock River, about 12 km S of Goomalling towards Toodyay, Western Australia, 27 August 1976, B.R. Maslin 4198 (*holo*: PERTH 00743089; *iso*: CANB, K, MEL, NY).

[*A. leiophylla auct. non* Benth.: C.F.Meissn. in J.G.C.Lehmann, Pl. Preiss. 2: 203 (1848)]

*Shrubs* or *trees* 2-3 m tall, bushy or somewhat openly branched, sometimes infundibular. *Bark* smooth or (at least at base of main trunks) finely fissured, grey, red or sometimes (? new bark) bronze-green. *Branchlets* terete but angled at extremities, finely ribbed, glabrous, yellow-brown or red, rarely moderately pruinose. *Stipules* caducous. *Phyllodes* variable in shape and size, oblanceolate to narrowly oblanceolate, elliptic to narrowly elliptic or narrowly oblong-elliptic, sometimes broadly linear, narrowed at base, rather abruptly or somewhat gradually narrowed at the uncinat or sub-uncinat apex, (3.5)5-13 cm long, (3)4-20 mm wide, length to width ratio 5-27, rather firm and coriaceous, mostly patent to ascending, never pendulous; straight or very shallowly incurved or recurved, glabrous, light green to glaucous; midrib rather prominent, central or slightly towards upper margin, marginal nerves narrow but evident, lateral nerves very obscure; pulvinus 1-2 mm long, transversely wrinkled. *Glands* not prominent, 1 or 2, rarely 3, the lowermost situated 2-30(50) mm above pulvinus, occasionally at distal end of pulvinus. *Racemes* (3)6-25(40) mm long with (1-2)4-12(17) heads; *raceme axes* ebracteate at base, the indumentum of appressed pale yellow or silvery white hairs, sometimes glabrous in fruit. *Peduncles* (2)3-5(7) mm long, 0.4-0.7 mm diam. (dry), 0.6-1 mm diam. (reconstituted), indumentum as on raceme axes. *Heads* showy and prolific, globular to oblongoid, 5-8 mm diam. at anthesis (reconstituted), bright mid-golden to deep golden, 17-45-flowered. *Bracteoles* spatulate to sub-peltate, c. 1 mm long, claws linear; laminae more or less circular to transversely elliptic, 0.4-0.5 mm wide, pale yellow- or white-fimbriolate, otherwise glabrous, brown and observable between flowers in unexpanded heads. *Flowers* 5-merous. *Calyx* gamosepalous, 1/2-3/4 length of corolla, divided for c. 1/6 its length, lobes often pale golden puberulous, tube drying brown. *Petals* 1.5-1.8 mm long, glabrous to moderately appressed-hairy, hairs pale yellow to white. *Pods* linear, to 10 cm long, 5-6 mm wide, slightly to obviously rounded over seeds, slightly or sometimes moderately constricted between the seeds, usually straight-edged to slightly (rarely moderately, see note under Variant 1 below) constricted between seeds with a few random deep constrictions sometimes occurring, pendulous, thinly coriaceous to firmly chartaceous, more or less straight, not reticulate, glabrous, dark purplish brown to blackish. *Seeds* longitudinal, oblong to elliptic, 4-5 mm long, 2-3 mm wide, dull but sometimes sub-shiny bordering the pleurogram,

black; pleurogram continuous or with a narrow opening at hilar end; areole 2.5-3 mm long, c. 1 mm wide; *funicle* filiform, yellow when fresh but drying light brown to light reddish brown, sometimes with a fold near attachment to pod then encircling the seed in a single fold and terminating in a thick, dull yellow-brown (dry) aril.

*Distribution.* Southwest Western Australia, principally in the Avon Botanical District but extending to peripheries of the adjoining Roe and Darling and Irwin Botanical Districts (1:250,000 maps H50-1,2,6,10,11,14,15,16 and I50-4). Most common in the region from Regans Ford (on the Moore River north of Perth) and Wubin (c. 20 km north of Dalwallinu) south to near Hyden, but also extending north to near Morawa and near Northampton.

*Flowering and fruiting periods.* Flowers from late May to September. Pods with mature seeds have been collected from late November to early January.

*Conservation status.* Not considered rare or endangered.

*Etymology.* The epithet *brumalis* (Latin for wintry) refers to the predominantly winter flowering phenology of the species.

*Affinities.* *Acacia brumalis* is a member of a large Australia-wide group of species within section *Phyllodineae* which is informally referred to here as the "*Acacia microbotrya* Group". The following characters are found in species of the Group but not all characters are present in all species. Phyllodes 1-nerved per face (occasionally 2-nerved, e.g. *A. difformis*), glabrous; inflorescences normally racemose; heads globular, sometimes shortly oblongoid; bracteoles peltate or sub-peltate, commonly golden-fimbriolate; pods normally firmly chartaceous to thinly coriaceous; seeds normally black; pleurogram commonly continuous; *funicle* filiform, normally partially or completely encircling the seed in a single or double fold, usually dark red-brown to light brown, occasionally pale yellow (e.g. *A. jenerae*, *A. steedmanii* and *A. validinervia*). A provisional list of species referred to the Group includes the following: *A. aestivalis* E. Pritz. (W.A.), *A. alcockii* Maslin & Whibley (S.A.), *A. amblyophylla* F. Muell. (W.A., perhaps better treated as an infraspecific taxon under *A. microbotrya*), *A. amoena* H.L. Wendl. (N.S.W.), *A. angusta* Maiden & Blakely (Qld), *A. araneosa* Whibley (S.A.), *A. anceps* DC. (W.A., S.A.), *A. attenuata* Maiden & Blakely (Qld), *A. bancroftii* Maiden (Qld), *A. brumalis* Maslin (W.A.), *A. calamifolia* Sweet ex Lindley (S.A., Vic., N.S.W.), *A. chamaeleon* Maslin (W.A., see below), *A. chalkeri* Maiden (N.S.W.), *A. chrysellae* Maiden & Blakely (W.A.), *A. confluens* Maiden & Blakely (S.A.), *A. cretacea* Maslin & Whibley (S.A.), *A. deuteroneura* Pedley (Qld), *A. difformis* R. Baker (N.S.W., Vic.), *A. falcata* Willd. (Qld, N.S.W.), *A. flocktoniae* Maiden (N.S.W.), *A. forsythii* Maiden & Blakely (N.S.W.), *A. gillii* Maiden & Blakely (S.A.), *A. gladiiformis* Cunn. ex Benth. (N.S.W.), *A. x grayana* J.H. Willis (S.A., Vic., a hybrid involving *A. brachybotrya* and *A. calamifolia*), *A. harveyi* Benth. (W.A.), *A. jenerae* Maiden (W.A., S.A., N.T., N.S.W.), *A. kydrensis* Tind. (N.S.W.), *A. leichhardtii* Benth. (Qld, precise affinities unknown but the *funicle* encircling the seeds suggests inclusion in the "*A. microbotrya* Group"), *A. leiophylla* Benth. (S.A.), *A. leptopetala* Benth. (W.A.), *A. mabellae* Maiden (N.S.W.), *A. meisneri* Lehm. ex Meissn. (W.A.), *A. merrickiae* Maiden & Blakely (W.A.), *A. microbotrya* Benth. (W.A.), *A. nematophylla* F. Muell. ex Benth. (S.A.), *A. notabilis* F. Muell. (S.A., N.S.W., Vic.), *A. quornensis* J. Black (S.A.), *A. retinodes* Schldl. (S.A., Vic.), *A. rivalis* J. Black (S.A., also recorded for N.S.W. but possibly not native in this State), *A. rubida* Cunn. (Qld, N.S.W., Vic.), *A. steedmanii* Maiden & Blakely (W.A.), *A. subulata* Bonpl. (N.S.W.), *A. validinervia* Maiden & Blakely (W.A., N.T., S.A.) and *A. wattiana* F. Muell. ex Benth. (S.A.). *Acacia binervata* DC. (N.S.W., Qld) and *A. wardellii* Tind. (Qld) appear to be closely related to certain members of this Group (e.g. *A. bancroftii*) on account of their seeds having encircling funicles, however, they are readily distinguished by their 2-3-nerved



phyllodes. Further studies are needed to ascertain whether the “*A. microbotrya* Group” is monophyletic (I have been strongly influenced by the character of the funicle in ascribing species to this Group). In particular, its relationship to species (primarily from eastern Australia) having seeds with non-encircling funicles needs critical examination, for example, *A. hakeoides* Cunn. ex Benth. (related to *A. difformis*), *A. penninervis* Sieb. ex DC. and *A. falciformis* DC. (perhaps close to *A. falcata*).

In Western Australia all members of the “*A. microbotrya* Group”, except the following, have glabrous raceme axes and peduncles at anthesis: *A. aestivalis*, *A. amblyphylla*, *A. brumalis*, *A. chamaeleon*, *A. chrysellia*, *A. harveyi* and *A. microbotrya*. In these eight species the racemes and/or peduncles are invested with minute, appressed, golden to white hairs which are frequently shed by the time the pods are formed.

The species with which *A. brumalis* is most likely to be confused is *A. microbotrya* which is distinguished in the following ways: pods wider (6-8 mm) and more obviously moniliform; seeds larger (5.5-8 mm long, 4-5 mm wide); heads usually paler coloured (cream to pale yellow, rarely mid-golden) and reaching anthesis earlier in the season (March-June); glands often fewer (usually 1 per phyllode, very rarely a second gland occurs on a few phyllodes). Although the phyllodes of *A. microbotrya* are somewhat variable they differ from those of *A. brumalis* in being more thinly textured, frequently pendulous and usually falcately recurved. As discussed below Variant 2 of *A. brumalis* may resemble *A. chamaeleon* and Variant 3 may resemble *A. chrysellia*.

*Variation.* As circumscribed here *A. brumalis* is a very polymorphic species and almost certainly comprises more than one taxon. As a basis for future studies much of the observed variation is here accommodated in three informal variants, however, not all specimens of this species can be satisfactorily accounted for by these variants.

#### **Variant 1** (the typical variant)

*Phyllodes* variable, oblanceolate to narrowly oblanceolate or narrowly elliptic to narrowly oblong-elliptic, usually 5-9 cm long and 5-10 mm wide with length to width ratio 6-17, straight or sometimes very shallowly incurved or (especially near apices) very shallowly recurved, subglaucous to glaucous. *Gland* 10-30(40) mm above pulvinus. *Heads* mid-golden, 5-7 mm diam. at anthesis, 17-25-flowered.

*Distribution.* Occurs from the Regans Ford, Goomalling and Pithara areas east to the Koordawalkatchem area, also near Northampton and southeast of Hyden.

*Habitat.* Usually grows on clay or loam in low-lying saline flats or creeklines with saltbush; sometimes occurs on sand or loam in low woodland or scrubland. Like many species of this genus this variant grows well on disturbed sites, particularly gravelly road verges.

*Selected specimens examined.* WESTERN AUSTRALIA: 2 miles [3.2 km] N of Wyalkatchem, T.E.H. Aplin 508 (CANB, K, MEL, PERTH); 1 mile [1.6 km] N of Dowerin towards Cadoux, R. Cumming 1844 (PERTH); 16.3 miles [26.2 km] W of Mogumber towards Regans Ford, R. Cumming 2092 (CANB, PERTH); Swan River, J. Drummond 2:142 (BM, K, LUND, OXF, P, W) and 291 (BM, G, K, MEL, OXF, P, W); Dragon Rocks Reserve, S.D.Hopper 5244 (PERTH); 8.8 km SW of Goomalling towards Toodyay, B.R. Maslin 2017 (CANB, K, MEL, NY, PERTH); c. 8 km S of Pithara on the road to Wongan Hills, B.R. Maslin 4972 (G, PERTH); c. 25 km W of Northampton, P.C.Ryan 101 (PERTH); 130 mile peg on Great Northern Highway, 8 km N of Miling, R.A. Saffrey 871 (K, MEL, MO, NY, PERTH).

*Variation.* Specimens from near Northampton have pods which are a little more constricted between the seeds than normal but otherwise they seem typical of this variant.

### Variant 2

*Bark* dark red throughout or only on upper branches. *Branchlets* sometimes pruinose. *Phyllodes* narrowly oblanceolate, 5-10 cm long, 6-20 mm wide, length to width ratio 5-15, straight or sometimes very shallowly recurved, glaucous to subglaucous. *Gland* usually 2-10 mm above pulvinus, occasionally to 20 mm or at distal end of pulvinus. *Heads* globular or oblongoid, 6-8 mm diam. at anthesis, (26)30-45-flowered.

*Distribution.* Most common from Cowcowing (c. 20 km north-northeast of Wyalkatchem) southeast to near Merredin, but also occurring further southeast to the Hyden area.

*Habitat.* Loam, sand or clay, sometimes with laterite in low woodland or open shrubland.

*Selected specimens examined.* WESTERN AUSTRALIA: 11.6 km E of Merredin on Great Eastern Highway to Kalgoorlie, *N. Hall* H76/41 (PERTH); 8.5 miles [13.6 km] E of Hyden on the Lake Varley road, *B.R. Maslin* 535 (AD, PERTH); 4.5 miles [c. 7 km] W of Rabbit Proof Fence No. 1 on the Narembeen to Southern Cross Road, *B.R. Maslin* 573 (PERTH, NSW, NT); 10 km N of Wyalkatchem towards Koorda, *B.R. Maslin* 4103 (CANB, K, MEL, PERTH); Cowcowing, *E. Wittwer* 1211 (PERTH).

*Affinities.* This variant resembles Variant 2 of *A. chamaeleon* (see below for discussion). It may also resemble *A. jennerae* which is distinguished by its broader pods (6-8 mm wide), glabrous to subglabrous raceme axes and peduncles, frequently obviously acuminate phyllodes and smaller seeds.

### Variant 3

*Phyllodes* broadly linear to narrowly oblanceolate, 8-13 cm long, 4-8 mm wide, length to width ratio 12-27, usually shallowly and uniformly incurved, green to  $\pm$  subglaucous. *Gland* 10-30(50) mm above pulvinus. *Heads* globular, deep golden, 5-6 mm diam. at anthesis, 18-30-flowered. *Pods* and *seeds* not seen.

*Distribution.* Occurs mainly in the Wubin-Pithara-Kalannie area (near Dalwallinu), but also north to near Morawa.

*Habitat.* Usually in loam, sometimes sand or clay in shrubland.

*Selected specimens examined.* WESTERN AUSTRALIA: along rabbit-proof fence, 15 miles [24 km] NNW of Kalannie, *T.E.H. Aplin* 543 (MO, NSW, PERTH); 6 km N of Wubin towards Latham, *B.R. Maslin* 4131 (CANB, K, MEL, PERTH); 10.5 km SW of Pithara on the road to Miling, *B.R. Maslin* 6128 (PERTH); Gutha, *K.W. McLean*, 5 April 1934 (PERTH 00861693); 35 km E of Perenjori, *A.A. Mitchell* 1532 (PERTH); Buntine Reserve, 10.5 km N of Wubin, *B.G. Muir* 188 (PERTH).

*Affinities.* This variant is closely related to *A. chrysellae*, especially the form that occurs between Wyalkatchem and Holt Rock (c. 60 km southeast of Hyden), which is distinguished by its shorter, narrower phyllodes (5-7 cm long and 1.5-3 mm wide).

### 3. *Acacia chamaeleon* Maslin, sp. nov.

*Frutex* effusus glaber 2-3 m altus *Phyllodia* magnitudine et forma variabilia, anguste linearia ad filiformia vel oblanceolata, subteretia ad quadrangularia ubi filiformia, uncinata ad subuncinata vel (in phyllodiis latis) excentrice rostellata, 6-21 cm longa et 1-12 mm lata, subdistantia recta vel interdum leviter curvata, costa plus minusve prominenti sed nervis ceteris obscuris. *Glans* supra pulvinam (1)3-10(15) mm disposita. *Racemi* plerumque 10-42 mm longi et 4-7 capitulis, axibus glabris ad subglabris; *pedunculi* 4-6(9) mm longi, plus minusve appresso-puberuli pilis diluto-luteis vel albis; *capitula* globularia, plus minusve aurea 23-37-floribus. *Flores* 5-meri; *calyce* gamosepalo. *Legumina* linearia usque ad 10 cm longa et 4-5 mm lata, inter semina vix constricta firme chartacea ad tenuiter coriacea. *Semina* longitudinalia oblongo-elliptica, 4-5 mm longa, funiculo filiformi rubro-brunneo, semen cingente vel 3/4-cingente uniplicato, arillo crasso.

*Typus*: about 8 km N of Ongerup towards Pingrup, Western Australia, 21 December 1971, B.R. Maslin 2585 (*holo*: PERTH 00690503; *iso*: K, MEL, NY).

?*A. leiophylla* var. *microcephala* Meissn. in J.G.C. Lehmann, Pl. Preiss. 1: 15 (1844). *Lectotype* (*fide* Maslin & Cowan, 1994): interior of southwest Western Australia, October 1840, L. Preiss 921 (NY; *isolecto*: G-DC, LD, MEL, NAP, PERTH 02484684-fragment ex MEL, W).

*A. stowardii* S. Moore, J. Linn. Soc. Bot. 45: 173 (1920), non J.H. Maiden (1917: 269). *Type citation*: "East of Katanning, Western Australia, F. Stoward 177". *Lectotype* (here selected): E of Katanning, Western Australia, 1916, F. Stoward 177 (BM - right hand, flowering specimen on sheet; *iso*: BM, PERTH 00772690). *Paralectotype*: BM - fruiting specimen mounted on sheet with *lectotype* (BM, PERTH 03626091-fragment ex BM).

*Shrubs* 2-3 m tall, canopy not dense, single-stemmed or sparingly branched near ground level, main trunks and branches rather straight. *Bark* smooth, grey at base of trunks on mature shrub, often red-brown to light brown higher up, dark (purplish) red towards ends of branches. *Branchlets* terete but somewhat angular towards extremities, very finely ribbed, very slightly flexuose, glabrous, leaf bases raised and rather evident especially at base of branchlets where phyllodes have fallen. *Stipules* insignificant, deltate, 0.5 mm long. *Phyllodes* variable in shape and size, narrowly linear (but narrowed at base) to filiform or oblanceolate to narrowly oblanceolate, flat or (filiform phyllodes) subterete to quadrangular, 6-21 cm long, frequently 2-5 mm wide but ranging from 1 mm (filiform phyllodes) to 12 mm (narrowly oblanceolate phyllodes), length to width ratio usually 20-50 but 6-14 on oblanceolate phyllodes or to 130 on filiform phyllodes, not rigid, when narrow often finely longitudinally wrinkled when dry, sub-distant (internodes *c.* 10-20 mm long), patent to ascending or erect, straight or sometimes shallowly incurved or recurved, glabrous, dull, dark green; midrib central, usually rather prominent, yellowish to light brown when dry; lateral nerves absent or few and scarcely evident; marginal nerves not thickened, yellowish to light brown when dry; apices uncinata to subuncinate or (broad phyllodes) with a short laterally positioned, innocuous, brown apical point; *pulvinus* rather coarsely transversely wrinkled, 1.5-2.5 mm long, dark brown when dry. *Gland* on upper margin of phyllode usually 3-10 mm above the pulvinus, rarely 1 mm or to 15 mm, occasionally a few phyllodes with 2 glands, laminae often very slightly swollen about the gland, circular or oblong, 0.3-0.6 mm long. *Racemes* 1 per axil, occasionally a few paniculate, variable in length even on a single specimen, usually 10-42 mm long but occasionally interspersed with longer (to 60 mm) or shorter (to 5 mm) ones, with (2)4-7 heads the lowermost inserted 5-15 mm above the base; *raceme axes* straight to slightly or moderately flexuose, somewhat angular especially towards the apex, frequently finely longitudinally sulcate when dry, glabrous or appressed-hairy, hairs white or pale yellow, minute,

usually sparse and confined to extremity of rachides, base ebracteate; *peduncles* 4-6 (rarely 9) mm long, solitary or occasionally twinned, sparsely to densely  $\pm$  appressed puberulous with pale yellow to white hairs which are sometimes confined to the upper half of the peduncle; *basal peduncular bracts* 2, triangular, c. 0.5 mm long, brown, glabrous or ciliate; *heads* globular, 4-5 mm diam. just prior to anthesis, 7-8 mm diam. at anthesis (fresh), 5.5-7 mm diam. (dry), light to medium golden, 23-37-flowered but mostly 25-35, the flowers not very densely arranged; *bracteoles* spatulate to subpeltate, 1-1.5 mm long; claws linear but dilated at apex, glabrous to glabrescent; laminae broadly ovate, 0.4-0.6 mm diam., minutely fimbriolate (hairs golden or white) otherwise glabrous, light brown when dry. *Flowers* 5-merous; *calyx* 1/2-2/3 length of corolla, gamosepalous, divided for 1/6-1/4 its length into broadly triangular, not or very slightly thickened, sparsely hairy, slightly inflexed lobes; calyx tube glabrous and not obviously nerved; *petals* 1.5-2 mm long, joined for 1/2-2/3 their length but readily splitting to the base upon dissection, narrowly elliptic with acute, very slightly thickened apices, glabrous to glabrescent (hairs white or light golden, antrorsely appressed); *ovary* glabrous to minutely and densely white-villous, minutely stipitate. *Pods* linear, obviously raised over but normally only slightly constricted between the seeds although a few random rather deep constrictions can occur, to 10 cm long, 4-5 mm wide, with up to 12 seeds per pod, pendulous, firmly chartaceous to thinly coriaceous, more or less straight, glabrous, not reticulate, very dark brown (almost black), not pruinose, interior of valve red-brown, basal stipe c. 5 mm long, apex acute; *margins* not thickened, light brown. *Seed* longitudinal in pod, oblong-elliptic but obliquely truncate along margin adjacent to aril, 4-5 mm long, c. 2.5 mm wide, slightly compressed (c. 2 mm thick), dull, black; *pleurogram* obscure, continuous or more commonly with a narrow opening at hilar end, often bordered by a diffuse and obscure band of slightly shiny tissue; *areole* c. 2 x 1 mm; *funicle* flattened-filiform, c. 20 mm long (expanded), 0.5-0.6 mm wide, very brittle when dry, red brown, 3/4 to wholly encircling the seed in a single fold and terminating in a brownish yellow, clavate aril 3-4 mm long which extends nearly 1/2-way down one side of the seed.

*Distribution.* Southwest Western Australia, confined to the southwest part of the Roe Botanical District and the southern extremity of the adjacent Avon Botanical District (1:250,000 maps 150-7,8,11). Restricted to a small area bounded by Broomehill, Nyabing (c. 60 km northeast of Broomehill) and Jerramungup.

*Habitat.* Grey-brown, (gravelly) clay or loam over clay in eucalypt shrubland.

*Biology.* A fast-growing pioneer species which regenerates well from seed following fire and also along disturbed road verges. It has a life-span of 10-15 years (K. Newbey, pers. comm.).

*Flowering and fruiting periods.* Flowering specimens collected throughout the year with a predominance in May and December. Pods with mature seeds collected in December.

*Conservation status.* Not considered rare or endangered.

*Etymology.* The epithet is derived from the Greek word - *chamaileon* (a lizard that is changeable with respect to its colours) and alludes to the phyllodes which are very variable in shape and size.

*Typification.* The type collection of *A. stowardii* at BM consists of both flowering and fruiting specimens. Although these undoubtedly represent the same taxon it seems probable that they were gathered from different plants. The lectotype is one of the two flowering specimens.

*Affinities.* *Acacia chamaeleon* is a member of the "Acacia microbotrya Group" (see discussion under *A. brumalis* above) and appears to be most closely related to *A. harveyi* and *A. brumalis*. The distinguishing features between these taxa are discussed below under the variants.

*Variation.* The phyllodes of *A. chamaeleon* are extremely variable in shape and size. The range of variation is accommodated by the three variants which are discussed below and further studies may show that some or all of these may warrant formal status.

#### **Variant 1** (typical variant)

*Phyllodes* linear (but narrowed at base), 2-5 mm wide, flat.

*Distribution.* Confined to the Ongerup area.

*Selected specimens examined.* WESTERN AUSTRALIA: near 94 mile peg on Borden-Pingrup road [c. 32 km N of Borden], *A.M. Ashby* 4315 (PERTH) and 4719 (PERTH 00163678 and 00163716); 83.5 miles from Albany on Borden-Pingrup road [c. 16 km N of Borden], *A.M. Ashby* 4725 (CANB, K, PERTH); about 11 km due NW of Ongerup on Foster Road, *B.R. Maslin* 3489 (PERTH); 22.5 km W of Jerramungup on the road to Ongerup, *B.R. Maslin* 5556 (PERTH); 6 miles [9.7 km] NW of Ongerup, *K. Newbey* 19D (AD, BM, BRI, CANB, G, K, MEL, MO, NSW, PERTH); 12 miles [19.2 km] E of Ongerup, *K. R. Newbey* 3022 (PERTH); 6 miles [9.6 km] NW of Ongerup, *K. Newbey s.n.* (PERTH 00163201); 26 km NE of Ongerup, *N. Stevens* for *K.R. Newbey* 9524-1 (MELU, PERTH); 5 km S of Broomehill along main road to Borden, *A. Strid* 22487 (B, C, CANB, K, MEL, NY, PERTH); Forster Road, c. 10.4 km NNW of Ongerup, *M. Tindale* 3891 (PERTH).

*Affinities.* This variant often closely resembles the more southerly distributed *A. harveyi* but is distinguished by its sub-distant phyllodes (internodes 10-20 mm long), light- to mid-golden, subdensely flowered heads measuring 7-8 mm diam. at anthesis (when fresh), and its normally open pleurogram. (*Acacia harveyi*: phyllodes rather crowded with internodes 0.5-1 cm apart, heads cream or sometimes lemon yellow, densely flowered and c. 4.5 mm diam. at anthesis, and pleurogram usually continuous).

#### **Variant 2**

*Phyllodes* oblanceolate to narrowly oblanceolate, to 12 mm wide.

*Distribution.* Occurs in the Broomehill-Borden area (Borden is c. 65 km east-southeast of Broomehill).

*Selected specimens examined.* WESTERN AUSTRALIA: Laurier [siding] near Gnowangerup, *W.B. Alexander* B.1529 (PERTH); 81 mile peg on Gnowangerup-Ongerup road, *F.W. Humphreys* 4 (PERTH); 0.5 miles [0.8 km] E of Broomehill, *K. Newbey* 3665 (CANB, PERTH).

*Affinities.* Resembling the more northerly distributed Variant 2 of *A. brumalis* (see above) but is distinguished by its presumably green phyllodes (colour judged from dry specimens), pruinose branchlets, usually white-haired peduncles and globular heads which reach anthesis in summer (December-February). Variant 2 of *A. brumalis* has glaucous to subglaucous phyllodes, sometimes pruinose branchlets, golden or pale yellow hairs on its peduncles and globular or oblongoid heads that reach anthesis in the winter/spring period (late May-August).

*Note.* The type of *A. leiophylla* var. *microcephala* Meissner seems referable to this entity.

### Variant 3

*Phyllodes* filiform, 1-2 mm wide, drying sub-terete to  $\pm$  quadrangular.

*Distribution.* Found mostly around Nyabing.

*Selected specimens examined.* WESTERN AUSTRALIA: 3.3 miles [5.3 km] N of Nyabing Hotel towards Kukerin, R.J. Cumming 2697 (CANB, K, PERTH); 11 miles [17.6 km] SE of Nyabing, K.R. Newbey 744 and 744D (both PERTH); 12 miles [19.2 km] E of Ongerup, K.R. Newbey 3003 (PERTH); 24 miles [38.5 km] NE of Ongerup, K. Newbey 3663 (CANB, K, PERTH); 5 km S of Broomehill along main road, A. Strid 21858 (AD, BM, C, MEL, NY, PERTH).

*Note.* This variant includes the type of *A. stowardii* S.Moore.

### 4. *Acacia dorsenna* Maslin, sp. nov.

*Frutex* densus tholiformis glaber usque ad circa 1.5 m altum. *Phyllodia* inaequilateraliter elliptica ad obovatos, margine superno valde convexo, rotundato et mucronulato cum mucrone plus minusve laterali, 10-15 mm longa et 5-9 mm lata, subcarnosa laevia subglaucous demum hebeti-viridia, costa et nervis lateralibus nullis vel obscuris, nervis marginalibus brunneolis. *Glans* parva, supra pulvinam 0.5-2 mm. *Racemi* 1-2.5 cm longi, capitulis 7-10 juventute a bracteolis imbricatis parvis inclusi sed saepe ultra crescentibus cum pedunculis ultimis a phyllodiis secundariis subtentis; *pedunculi* 4-16 mm longi graciles; *capitula* globularia vivide medio-aurea, 15-21-floribus, bracteolis nullis. *Flores* 5-meri; *sepalis* discretis. *Legumina* (immatura) anguste oblonga, supra semina secus medio-lineam conspicue rotundata alternatim in uterque lato, usque 6 cm longa et 11 mm lata, firme chartacea brunnea. *Semina* (immatura) transversalia oblongo-elliptica, usque ad 4 mm longa, vix arillata.

*Typus:* north of Norseman [precise locality withheld for conservation reasons], 31 August 1986, B.R. Maslin 6112 (*holo:* PERTH 00769096; *iso:* CANB, K, MEL, NY).

Dense, domed, glabrous *shrubs* to c. 1.5 m tall and to 3 m diam. *Bark* smooth, light grey. *Branchlets* terete, slightly angled at extremities, finely ribbed, ribs not resinous, light brownish to yellowish green at extremities, cuticle often grey-white. *Stipules* early caducous, linear, to 2 mm long, scarious. *Phyllodes* inaequilaterally elliptic to obovate, abaxial margin more or less straight, upper margin convex and abruptly rounded at apices with a  $\pm$  lateral, minute (0.3-0.4 mm long), innocuous, brown mucro, 10-15 mm long, 5-9 mm wide, length to width ratio 1.5-2, sub-fleshy, smooth but sometimes very finely wrinkled when dry, somewhat crowded, subglaucous and slightly pruinose at ends of branchlets, ageing dull green; midrib very obscure and situated near abaxial margin, sometimes a less prominent second nerve diverging from near the pulvinus, lateral nerves absent or few and obscure, marginal nerves light brown to yellow-brown and  $\pm$  shiny; pulvinus 0.5 mm long, finely wrinkled when dry. *Gland* not prominent, situated on upper margin of phyllode 0.5-2 mm above pulvinus, c. 0.5 mm long. *Racemes* confined to upper axils, 1-2.5 cm long with 7-10 heads, enclosed when very young by small, scarious, commonly caducous, brown bracts, often growing out at anthesis with secondary phyllodes subtending the peduncles; *raceme axes* slender and straight; *peduncles* 4-16 mm long, slender; *basal peduncular bracts* absent (normally replaced by minute resin hairs); *heads* globular, 9 mm diam. at anthesis (fresh), 5-6 mm diam. (dry), bright mid-golden, 15-21-flowered;

*bracteoles* absent. *Flowers* 5-merous; *flower buds* dull reddish brown when young; *sepals* c. 1/2 length of petals, free, linear or linear-spathulate, membranous, glabrous or sparsely hairy; *petals* 1.8 mm long, nerveless. *Pods* (slightly immature) narrowly oblong, conspicuously rounded over seeds alternately on each side along the midline, to 6 cm long, 11 mm wide, firmly chartaceous, brown, slightly shiny, finely and somewhat sparingly transversely reticulate, stipitate, marginal nerve narrow. *Seeds* (slightly immature) transverse, oblong-elliptic, to 4 mm long and 2.3 mm wide, funicle filiform and scarcely arillate.

*Other specimens examined* (all PERTH). WESTERN AUSTRALIA: between Norseman and Coolgardie [precise localities withheld for conservation reasons], *E.M. Canning* WA/68 2652 and 2662 (both ex CBG), *G.F. Craig* 2477, *B. Maloney* 1/69 (ex NSW), *D.J.E. Whibley* 5455 (ex AD).

*Distribution and habitat.* Southwest Western Australia in the Coolgardie Botanical District (1:250, 000 map I51-02). Known only from two populations located between Norseman and Coolgardie where it grows on red-brown, rocky, sandy loam or clayey loam.

*Flowering and fruiting periods.* The paucity of collections makes it difficult to accurately assess the phenology of this new species. However, flowering specimens have been collected from late August to late September and a specimen with partially mature seeds has been collected in mid-November.

*Conservation status.* A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. See end of this issue.

*Etymology.* From the Latin *dorsennus* - humpbacked, alluding to the prominently rounded upper margin of the phyllodes.

*Affinities.* *Acacia dorsenna* belongs to a group of closely related taxa which is informally referred to here as the "*Acacia prainii* Group". Members of the Group include *A. anthochaera* Maslin (see above), *A. camptoclada* C.R.P. Andrews, *A. hemiteles* Benth. and *A. prainii* Maiden. The more important characters shared by these glabrous species include the following: inflorescences in short racemes which are enclosed, when young, by scarious brown bracts, sepals free, bracteoles absent, pods thinly textured (usually chartaceous) and funicles exarillate. *Acacia suaveolens* (Smith) Willd. and its allies, *A. iteaphylla* F. Muell. and *A. subcaerulea* Lindley, have similar inflorescences but the funicles are clearly arillate. Superficially *A. dorsenna* might be mistaken for a large phyllode form of *A. camptoclada* which grows in the general region of the new species but it is not known whether the two are ever sympatric. *Acacia camptoclada* is readily distinguished from *A. dorsenna* in the following ways: branchlets often slightly viscid or vernicose, phyllodes smaller (7-17 mm long, 2-5 mm wide, length to width ratio 2-4), mucro  $\pm$  pungent, gland near or above the middle of the phyllode, racemes <1-4 mm long with 2-5 heads, pods once- or twice-coiled and 4-5 mm wide, and seeds longitudinal in the pod.

In phyllode shape and size *A. dorsenna* resembles some forms of *A. merrallii* F. Muell. which occurs within the geographical range of the new species but which is distinguished by its small, curved or coiled pods, conspicuous yellow or orange arils, extremely reduced, 1-3-headed racemes, and phyllodes with a  $\pm$  pungent mucro. Some forms of the eastern Australian species, *A. cultriformis* A. Cunn. ex Benth. and *A. furfuracea* Don also resemble *A. dorsenna* in phyllode shape and size but are not especially closely related to the new species.

### 5. *Acacia gelasina* Maslin sp. nov.

*Frutex* glaber 1-2.5 m altus. *Phyllodia* oblanceolata ad lineari-oblanceolata versus basem angustata obtusa mucronata, 4-10 cm longa et (3)5-8(10) mm lata, coriacea subrigida erecta glauca ad subglauca, costa et nervis marginalibus luteis, nervis lateralibus obscuris. *Glans* obscura sed plerumque supra pulvinam 1-3 mm et etiam mucronis ad basem ornata. *Racemi* (1)2-20 mm longi; *pedunculis* 1-2 cm longis; *capitula* globularia dense 35-50-floribus. *Flores* 5-meri; *sepalis* plus minusve discretis, aliquando 2 ve 3 connatis. *Legumina* anguste oblonga plana, supra semina rotundata et inter semina leviter constricta, usque 15 cm longa et 12-14 mm lata, firme chartacea ad tenuiter coriacea, plerumque luteo-brunnea. *Semina* longitudinalia circularia ad late elliptica vel late ovata, 7-8 mm longa, aliquantum compressa leviter lucida atro-brunnea ad nigra sed in centro leviter depressa pallida, exarillata.

*Typus*: 46.5 km north of Murchison River, North West Coastal Highway, Western Australia, 23 July 1972, A.M. Ashby 4638 (*holo*: PERTH 00992844; *iso*: CANB, PERTH 00167975).

Dense, spreading, *shrubs* 1-2.5 m tall, much-branched at ground level. *Bark* smooth or finely fissured, grey. *Branchlets* terete, angled at extremities, finely ribbed, glabrous, reddish or light brown, yellow on new growth. *Stipules* insignificant, <0.5 mm long, early caducous. *Phyllodes* oblanceolate to linear-oblanceolate, narrowed at base, obtuse, mucronate, 4-10 cm long, (3)5-8(10) mm wide, l:w = (6)8-15(25), thickly coriaceous, sub-rigid, erect, straight, glabrous, glaucous to subglauous, midrib and marginal nerves yellow, lateral nerves not prominent, two nerves on upper margin coalescing just above the gland; pulvinus 0.5-1 mm long, dilated at base, smooth or with a few coarse wrinkles. *Glands* not prominent, situated on upper margin of phyllode normally 1-3 mm above pulvinus, usually a second gland at base of mucro. *Racemes* 1 or 2 per axil, (1)2-20 mm long with (1)2-6 heads, rarely growing out; raceme axes glabrous, lightly pruinose, base ebracteate but occasionally a solitary supra-basal bract is present; *peduncles* 1-2 cm long, rarely a few twinned, glabrous, lightly pruinose when young; *basal peduncular bract* persistent or deciduous, 0.5-1 mm long, brown, thickened at base, solitary, occasionally on uppermost peduncles replaced by a pair of stipules with prophyll arising between them, the prophyll presumably expands with age; *heads* globular, densely 35-50 flowered; *bracteoles* 0.5-1 mm long, claws linear and ciliolate, abruptly expanded into a dark brown, commonly inflexed, sparsely ciliolate lamina which is thickened in its lower half. *Flowers* 5-merous; *sepals* usually variable within a single flower, free or sometimes 2 or 3 united, spatulate to oblong, 1/3-1/2 length of petals; *petals* 2.5-3 mm long, free, glabrous, nerveless. *Pods* narrowly oblong, flat but obviously rounded over seeds, convexities rugulose and not extending to the margins, shallowly constricted between seeds, occasionally deeply constricted, to 15 cm long, to 12-14 mm wide, up to 10 seeds per pod, pendulous, firmly chartaceous to thinly coriaceous, straight to slightly curved, sometimes sparingly and obscurely transversely nerved, glabrous, yellow-brown, sometimes mid-brown, commonly lightly pruinose, marginal nerves c. 1 mm wide. *Seeds* longitudinal in the pod, circular to widely elliptic or widely ovate, 7-8 mm long, 6-7 mm wide, somewhat flattened (c. 3 mm thick), slightly shiny, dark brown to blackish except for the shallow, circular depression in centre of seed which is usually yellow or light brown; *pleurogram* obscure, open at hilar end; areole widely to transversely elliptic, 1-1.5 mm wide; *funicle* filiform, c. 5 mm long, exarillate.

*Other specimens examined*. WESTERN AUSTRALIA: type locality, A.M. Ashby 3874 (K, MEL, PERTH) and 19 November 1972, *s.n.* (PERTH 00993298, CANB: fruiting collection from the type plant); 15 km N of Murchison River on North West Coastal Highway, H. Demarz 10490 (PERTH); 48.5 km N of Murchison River on North West Coastal Highway, B.R. Maslin 2786 (NSW, PERTH); 48 km S of Billabong Roadhouse, B.R. Maslin 4330 (PERTH); 45 km N of Murchison River on North West Coastal Highway, B.R. Maslin 3346 (BRI, G, NY, PERTH).



*Distribution.* Western Australia in the Irwin Botanical District (1:250 000 map G50-13). Restricted to a small area along the North West Coastal Highway north of the Murchison River (east of Kalbarri). It is possible that future collecting from the extensive sand plains north of the Murchison River will extend the range of this species.

*Habitat.* Grows on yellow sand in closed scrub.

*Flowering and fruiting periods.* Flowers from early June to September. Mature pods have been collected from mid-November to January.

*Conservation status.* A Priority 2 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. See end of this issue.

*Etymology.* The specific epithet is derived from the Latin - *gelasinus*, a dimple, referring to the shallow, circular depression on the lateral faces of the seeds.

*Affinities.* *Acacia gelasina* is a member of the "Acacia murrayana Group" (see discussion under *A. subrigida* below) and appears to be most closely related to *A. murrayana* F. Muell. ex Benth. which is a widespread and common species of the Australian Arid Zone. Characters shared by the two species include the following. Plants mostly glabrous, phyllodes long and 1-nerved on each face, gland situated near the pulvinus and also adjacent to the mucro, inflorescences short racemes, heads globular and densely many-flowered (up to 50), sepals  $\pm$  free, pods broad, flat but obviously rounded over seeds, thin-textured, seeds with shallow central depression on both faces, and funicle filiform and not arillate. *Acacia murrayana* is most readily distinguished from *A. gelasina* by its thin, pliable phyllodes and its transverse to oblique, smaller seeds (4-5.5 mm long, 3-4 mm wide). Other characters useful in recognizing *A. murrayana* include its commonly arborescent habit (to 5 m tall), often pruinose branchlets, phyllodes with the gland situated at the distal end of the pulvinus, generally shorter peduncles (4-10 mm long, infrequently 15 mm) and chartaceous pods to 9 cm long and 8-12 mm wide.

## 6. *Acacia harveyi* Benth., Fl. Austral. 2: 368 (1864)

*Lectotype* (here selected): between King George's Sound and Cape Riche, Western Australia, March 1854, *W.H. Harvey s.n.* (K; iso: K, MEL, PERTH 01941046-fragment ex K).

*Typification.* Bentham's (1864) original description of *A. harveyi* was based on two collections, one in flower (*W.H. Harvey s.n.*) and one in fruit (*J. Drummond* 4: 130). These gatherings represent different taxa and the lectotype has been selected from among the flowering specimens. The fruiting paralectotype is *A. aestivalis* E. Pritzel, a closely related species recognized by its golden heads (cream to lemon yellow in *A. harveyi*) and broader pods (12-22 mm wide compared with 5-6 mm in *A. harveyi*). *Acacia aestivalis* occurs from near Mingenew southeast to Corrigin and east to Bullfinch (c. 35 km northwest of Southern Cross); *A. harveyi* has a more southerly distribution, occurring principally in the Fitzgerald River National Park (southwest of Ravensthorpe) but extending west to near the Stirling Range (east of Cranbrook) and east to Munglinup (c. 75 km east-southeast of Ravensthorpe).

In his discussion under *A. harveyi* Bentham (*loc. cit.*) referred to a specimen of *Priess* 941 of whose identity he was unsure. I have examined a specimen of *Priess* 941 at herb. G and it is *A. cupularis* Domin, a species which is sometimes sympatric with *A. harveyi* and which resembles it in having

linear, 1-nerved phyllodes and racemose inflorescences. *Acacia cupularis*, however, is readily distinguished from *A. harveyi* by its glabrous (not appressed puberulous) raceme axes, golden heads and its crustaceous, ± erect pods containing seeds with short funicles and scarlet arils (pods coriaceous and pendulous in *A. harveyi*, the long funicle 1/2-3/4 encircles the seed in a single fold and ends in a cream-white aril). *Acacia cupularis* is described and illustrated in Chapman & Maslin (1992).

### 7. *Acacia leptopetala* Benth., *Linnaea* 26: 619 (1855)

*Lectotype* (here selected): south-western Australia, *J. Drummond* 52 (K, upper right-hand specimen on herb. Hooker sheet; *isolecto*: BM, K - other specimens on lectotype sheet, MEL, OXF, P, PERTH 00763144 and 01941070-fragment ex MEL and 01941089-fragment ex K).

*Typification*. There are four specimens mounted on the lectotype sheet of *A. leptopetala* at Kew, all representing the species and apparently part of the same collection. The sheet is labelled "52 *J. Drummond*. S.W. Australia 1850" [this date presumably being when the specimen was received at Kew], stamped "Herbarium Hookerianum 1867" and annotated "*Acacia leptopetala*", in pencil, by Benth. Another sheet at K is labelled "Swan River (Suppl. to 5th coll.) Drummond", is stamped "Herbarium Benthonianum 1854" and supports a single specimen of *A. leptopetala* which Benth. has annotated "cf. *leptopetala*". As the phyllode dimensions on this specimen slightly exceed those given in the protologue, I do not regard it as a type of *A. leptopetala*.

The type of *A. leptopetala* was presumably collected on Drummond's 1847 expedition to Mounts Caroline and Stirling which are situated about 15 km south of the present-day township of Kellerberrin. The specimens collected on this trip were sent to Hooker and subscribers as "Supp. to 5th Coll." (see Erickson 1969). During the journey from Toodyay (where Drummond lived) he would most probably have crossed the quite limited geographic range of the conspicuously pruinose element of *A. leptopetala* which accords well with the type (i.e. the Bungalla-Kellerberrin area).

*Nomenclature*. The "Murchison river, *Oldfield*" specimen cited by Benth. (1864: 370) under *A. leptopetala* is *A. murrayana*. This error led Benth. (1875: 472) and Mueller (1887) to misapply the name *A. leptopetala* to *A. murrayana* and Maiden (1916: 495) to regard the two names as synonymous.

### 8. *Acacia scleroclada* Maslin, sp. nov.

*Frutex* aliquantum effusus et diffusus 0.5-1 m altus, ramulis +/- rectis et ascendentes striatocostatis glabris subglaucis, interdum grosse spinosis. *Phyllodia* distantia anguste linearia ad lineari-elliptica, ad basem et apicem angustata, pungentia, 2-7 cm longa et plerumque 1-3 mm lata, subrigida ascendente ad erecta recta vel incurvata glabra subglauca 5-nervata, costa paulo prominenti et plus minusve excentrica, margine supero binervato et leviter incrassato. *Racemi* 1-20(30) mm longi capitulis 1-4, praecoci juventute a bracteolis imbricatis inclusi sed aliquando ultra crescentibus, axibus glabris; *pedunculis* 7-12 mm longis glabris; *capitula* globularia vivide aurea 25-40-floribus; *bracteolis* nullis. *Flores* plerumque 5-meri; *sepalis* plus minusve discretis. *Legumina* supra semina rotundata et inter semina leviter ad profunde constricta, usque 11.5 cm longa et 4-6 mm lata, coriacea glabra brunnea. *Semina* longitudinalia elliptica, 5-6 mm longa, turgida lucida atro-brunnea arillo longitudine 1/2-2/3 seminum partes aequantia.

*Typus*: 9.6 km E of Edah towards Mount Magnet, Western Australia, 1 August 1974, *B.R. Maslin* 3618 (*holo*: PERTH 00168939; *iso*: CANB, G, K, MEL, NSW, NY).

Spreading, somewhat straggly *shrubs* 0.5-1 m tall, dividing at ground level into few to many spreading to erect, rather rigid branches with sparse foliage. *Bark* smooth, light grey on main branches. New shoots dull, maroon, drying blackish. *Branchlets* rather rigid, sometimes entangled, more or less straight and ascending, sometimes coarsely pungent, glabrous, terete, finely yet evidently striate-ribbed, the ribs yellowish and 0.3-0.5 mm apart, intercostal region subglaucous. *Stipules* caducous, present on very young new shoots, narrowly oblong to triangular, to 5 mm long, shallowly concave, striate, fimbriolate otherwise glabrous, bright green but drying yellowish or light brown. *Phyllodes* narrowly linear to linear-elliptic but gradually narrowed to a slender, straight, brown cusp c. 1 mm long, 2-7 cm long, 1-3(4) mm wide with length to width ratio 15-30, sub-rigid, distant (nodes c. 15-25 mm apart), ascending to erect, straight to shallowly (moderately) incurved, flat, glabrous, subglaucous; 5-nerved in all, nerves yellow, the upper 2 forming a slightly thickened adaxial margin, midrib rather prominent on each face and somewhat excentric (situated towards the solitary abaxial marginal nerve), lateral nerves absent or scarcely visible; pulvinus not prominent, c. 0.5 mm long, slightly dilated at base. *Glands* not prominent, 1-3 on upper margin, the lowermost 2-5 mm above phyllode base, circular or oblong, 0.2-0.5 mm long. *Racemes* 1(2) per axil, 1-20(30) mm long with 1-4 heads; *raceme axes* variably flexuose, sometimes striate and resembling branchlets, glabrous, sometimes growing out and/or becoming leafy (i.e. a phyllode developed at base of peduncles) so peduncles appear simple, enclosed when very young by scarious, brown, imbricate, caducous bracts, bract scars visible below lowermost peduncle at anthesis; *peduncles* 7-12 mm long, glabrous, basal bract absent at anthesis (? present in buds); *heads* globular, bright golden, 25-40-flowered; *bracteoles* absent. *Flowers* mostly 5-merous (but sepals occasionally 6-7); *sepals* c. 2/5 length of petals, free or shortly united at base, linear or linear-spathulate, often slightly unequal in length, usually sparsely ciliolate at apex; *petals* 2.5-2.8 mm long, joined for 2/3-3/4 their length, glabrous, nerveless, slightly thickened at apices; ovary sessile, glabrous. *Pods* to 11.5 cm long, 4-6 mm wide, rounded over seeds and slightly to deeply constricted between them, coriaceous to slightly crustaceous, more or less straight, finely reticulate, glabrous, brown, marginal nerve narrow and yellow to light brown. *Seeds* longitudinal in the pod, elliptic but obliquely truncate on margin adjacent to aril, 5-6 mm long, 3-3.5 mm wide, turgid (3 mm thick), glossy, dark brown; *pleurogram* very obscure, open at hilar end; areole c. 0.5 mm long and 0.3 mm wide; *funicle* c. 1 mm long, reflexed below and gradually expanded into the large aril which extends 1/2-2/3 down one side of seed and thickened near the hilum.

*Other specimens examined.* WESTERN AUSTRALIA: 100 yards W of 172 mile peg from Geraldton on Mount Magnet road, A.M. Ashby 4780 (AD, BRI, CBG, MO, PERTH); Weiragoo Range, A.M. Ashby 5058 (PERTH, also AD but *n.v.*); 30 miles [48 km] W of Yalgoo, W.E. Blackall 501 (PERTH); 20 km NE of Mount Hope, Wooleen Station, R.J. Cranfield 5135 (CANB, PERTH); 3 km NE of Anzac Bore, Koonmarra Homestead, R.J. Cranfield 5930 (PERTH); 12 km S of Jingemarra Homestead, R.J. Cranfield 6047 (PERTH); 25 miles [40.2 km] N of Yalgoo, C.A. Gardner 2519 (PERTH); 8 miles [12.8 km] from Paynes Find on Yalgoo road, A.R. Main 2 (PERTH); 9.6 km E of Edah on road to Mount Magnet, B.R. Maslin 4508 (MO, PERTH); Meka Station, A.A. Mitchell 838 (PERTH); Geraldton district, A. Williams 670 (PERTH).

*Distribution.* Western Australia in the Austin Botanical District (1:250,000 maps G50-10,11,14,15; H50-2,3,7). Occurs from Weiragoo Range (c. 170 km west of Meekatharra) and Koonmarra Station (c. 80 km northwest of Meekatharra) south to near Paynes Find.

*Habitat.* Grows in shallow sand or clayey sand, normally on low granite outcrops, in open scrub. The type plant grew in association with *Acacia acuminata*, *A. quadrimarginea*, *A. ramulosa* and *A. tetragonophylla*.

*Flowering and fruiting periods.* Flowers from mid-June to early September. The single fruiting specimen was collected in December.

*Conservation status.* Not known to be under threat.

*Etymology.* The name is derived from the Greek - *skleros*, tough or hard, and *klados* - branch.

*Affinities.* *Acacia scleroclada* is perhaps most closely allied to *A. wiseana* C. Gardner on account of the following characters which are shared by the two species: foliage rather sparse; branchlets glabrous and striate; phyllodes distant, 5-nerved with the upper two close together and forming a slightly thickened upper margin; racemes short and sometimes resembling the branchlets; peduncle bases ebracteate (at least at anthesis); heads globular; sepals  $\pm$  free; bracteoles absent; pods long; seeds longitudinal. *Acacia wiseana* is more widely distributed than the new species (see Maslin & Pedley 1982) and is clearly distinguished in the following ways: it is a larger, intricate shrub to 4 m tall and has divaricate, light green branchlets; phyllodes 5-20 mm long, 1-1.5 mm wide and patent to deflexed; pods 6-12 mm wide; seeds globose, 5-9 mm diam.

The general facies of *A. scleroclada* often resembles that of the typical variant of *A. inaequiloba* W. Fitzg. which grows on sand in "spinifex" country between Queen Victoria Spring and Streich Mound (well to the southeast of the range of the new species, c. 200 km east-northeast of Kalgoorlie). This variant of *A. inaequiloba* is most readily distinguished from the new species in the following ways: branchlets less prominently ribbed and  $\pm$  pruinose; upper margin of the phyllodes 2-nerved below the gland and 1-nerved above it (2-nerved throughout in *A. scleroclada*); inflorescences comprising very short, 1-headed, racemes subtended by conspicuous, more or less persistent bracts; heads 12-21-flowered with caducous bracteoles that are conspicuous in the buds; calyx irregularly dissected; pods undulate; seeds c. 3 mm long and mottled black and brown.

### 9. *Acacia subrigida* Maslin, sp. nov.

*Frutex* usque ad 2.5 m altum, ramulis glabris. *Phyllodia* saepe sectione rhombica subsessilia mucrone indurato atro-brunneo recto et erecto, 8-15 cm longa et 1-1.5 mm lata, plana subrigida erecta plus minusve recta ad leviter incurvata glabra viridia ad subglauca 4-nervata sed nervo adaxiali prope glandem basalem bifurcato, nervis aureis. *Glans* supra pulvinam perdiminutam 3-17 mm et etiam ad basem mucronis glans obscura. *Racemi* plerumque 2-10 mm longi capitulis 2-4, axibus glabris; *pedunculi* 1-2 cm longi glabres; *capitula* globularia aurea 15-30-floribus. *Flores* 5-meri; *sepalis* discretis et lineari-spathulatis. *Legumina* anguste oblonga, supra semina elevata, 6-11 cm longa et 7-10 mm lata, chartacea glabra diluto-brunnea. *Semina* longitudinalia usque ad longitudinaliter obliqua ovata, aliquando oblonga vel elliptica, 5.5-7 mm longa, in centro vadose depressa, paulo lucida nigra exarillata.

*Typus:* 20.5 km E of Mukinbudin towards Bullfinch, Western Australia, 13 October 1975, B.R. Maslin 3965 (*holo:* PERTH 00167444; *iso:* CANB, G, K, MEL, NSW, NY).

Erect *shrubs* to 2.5 m tall, single-stemmed or with 2-4 main stems from ground level. *Bark* grey, fissured on main stems, smooth on branches. *Branchlets* glabrous, not pruinose, terete but often slightly angled at the usually brown to red-brown extremities, penultimate branchlets usually invested with a light grey cuticle which becomes longitudinally fissured and flaking with age; ribs often yellow, fine, scarcely evident on penultimate branchlets. *Stipules* caducous. *Phyllodes* rhombic in section, rarely flat, 8-15 cm long but interspersed with a few shorter ones (to c. 5 cm long), 1-1.5 mm wide,

smooth, sub-rigid, erect, more or less straight to shallowly incurved, glabrous, green to subglaucous, with 4 yellow longitudinal nerves (one at the apex of each angle), nerve on adaxial angle bifurcating at or near the gland, lateral nerves absent; mucro somewhat thick and indurate, minute (0.5-0.8 mm long), straight and erect or almost so, dark brown, acute; pulvinus very reduced (0.2-0.5 mm long), slightly dilated at base, transversely rugose, yellowish. *Gland* situated on upper angle of phyllode 3-17 mm above the pulvinus, not prominent, circular or sometimes oblong, 0.2-0.4 mm long, a second less prominent gland situated at base of the mucro. *Racemes* 1 per axil, (1)2-10(15) mm long with (1)2-4(5) heads, the lowermost peduncle inserted 0.5-2 mm above the base; *raceme axes* glabrous, faintly pruinose at least near the ebracteate base; *peduncles* 10-20 mm long, glabrous; *basal peduncular bract* solitary, *c.* 1 mm long, frequently early caducous but sometimes persisting to anthesis on lowermost peduncle; *heads* globular, mid-golden, 15-30-flowered, 7 mm diam. at anthesis (reconstituted heads); *bracteoles* sub-peltate, claws linear, 0.6-0.8 mm long; the laminae  $\pm$  normal to claws, widely ovate to almost circular, *c.* 0.5 mm wide, slightly thickened and sparsely ciliolate near attachment to claw otherwise glabrous. *Flowers* 5-merous; *sepals* 2/5-3/5 length of petals, free, linear-spathulate, claws puberulous abaxially, laminae more or less glabrous and slightly incurved; *petals* 2.3-2.5 mm long, glabrous, midrib very obscure. *Pods* narrowly oblong, 6-11 cm long, 7-10 mm wide, flat but raised over seeds and scarcely to moderately constricted between them but random deep constrictions do occur especially where seeds fail to develop, chartaceous, more or less straight, glabrous, light brown, slightly shiny, with a few obscure transverse nerves. *Seeds* longitudinal to longitudinally oblique, ovate or sometimes oblong or elliptic, 5.5-7 mm long, 3.2-4.8 mm wide, black, slightly shiny except centre of seed surrounding and including the areole which is more shiny, centre of seed shallowly depressed; *pleurogram* widely "U"-shaped with the broad opening at hilar end; *areole* 0.2-0.5 mm long, 0.4-1 mm wide; *funicle* filiform, 4 mm long, reddish brown, exarillate.

*Other specimens examined.* WESTERN AUSTRALIA: 20 km E of Mukinbudin towards Bullfinch, B.R. Maslin 4470 (CANB, K, PERTH); 99.5 km SE of Sandstone on the road to Menzies, B.R. Maslin 5032 (PERTH); 1.5 km NE of Walyahmoning Rock, *c.* 60 km NW of Bullfinch, K. Newbey 9552 (PERTH).

*Distribution.* Southwest Western Australia in the Avon and Austin Botanical Districts (1:250,000 maps H50-4, 11, 12). Occurs in the Mukinbudin-Bonnie Rock (*c.* 45 km north-northeast of Mukinbudin) area and near Maynard Hills (*c.* 100 km southeast of Sandstone and *c.* 320 km northeast of Mukinbudin). A variant from Shark Bay with flat phyllodes is discussed below.

*Habitat.* From the few collections at hand, the species has only been recorded from deep yellow sand on plains in *Acacia coolgardiensis* tall shrubland.

*Flowering and fruiting periods.* Flowers in September and October. Pods with mature seeds have been collected in January.

*Affinities.* *Acacia subrigida* is most closely allied to *A. murrayana* F. Muell. ex Benth. and *A. pachyacra* Maiden & Blakely on account of the following characters. Plants essentially glabrous; phyllodes with a total of 4 longitudinal main nerves (i.e. one at apex of angles when phyllodes rhombic, one on each face and along each margin when phyllodes flat); glands present at base and apex of phyllodes; heads globular and arranged in short axillary racemes; sepals free or almost so; pods flat and chartaceous; funicles exarillate. The principal distinguishing features between these three species are given in Table 1 where it is seen that *A. subrigida* is most readily recognized by its phyllodes which possess a  $\pm$  erect apical mucro and a basal gland which is well removed from the pulvinus; additionally, its peduncles are usually longer and its seeds are differently orientated within the pod. *Acacia subrigida* is further readily distinguished from *A. murrayana* by its phyllodes which are

rhombic in section. Although the phyllodes of *A. pachyacra* are normally  $\pm$  rhombic they are narrower and less rigid than those of *A. subrigida*. Also, upon drying the phyllodes of *A. pachyacra* are slightly longitudinally wrinkled or grooved whereas in *A. subrigida* they are perfectly smooth. *Acacia subrigida* is more southerly distributed than either *A. murrayana* or *A. pachyacra* except for the Shark Bay variant referred to below which occurs in the same general region as *A. murrayana*. *Acacia gelasina* Maslin (see above) and *A. praelongata* F. Muell. from Northern Territory are also closely related to the above taxa and together these five species comprise the informal "Acacia murrayana Group". This Group is related to the "A. victoriae Group" (see Maslin 1992) but most readily distinguished by non-spinose stipules and peduncles which lack a supra-basal bract.

*Conservation status.* A Priority 2 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. See end of this issue.

*Etymology.* The epithet is derived from the Latin *subrigidus* and refers to the texture of the phyllodes which is one of the characters distinguishing the new species from its close relatives, *A. pachyacra* and *A. murrayana*.

*Variation.* A variant from Shark Bay and known only from the three collections cited below has not been included in the above description. These specimens were in late flower and one (*B.R. Maslin* 3682) possessed old pods and seeds collected from the ground under the plant. Better material and additional field studies are required in order to ascertain the status of this variant. It differs from typical *A. subrigida* in the following ways. *Phyllodes* 11-21 cm long, 2 mm wide,  $\pm$  flat but the midrib prominently raised (and sometimes rendering the phyllodes transversely rhombic in section), occasionally with a few, obscure, longitudinally trending lateral nerves (observe when dry). *Racemes* (4-7)9-30(35-40) mm long with (2)3-6(9) pedunculate heads, sometimes the peduncle fails to develop within axil of lowermost bract on raceme axes; *peduncles* sometimes subtended by a minute phyllode at anthesis; *heads* 24-39-flowered, 10 mm diam. at anthesis (reconstituted); *claws of bracteoles* and *sepals* sparsely puberulous. *Pods* c. 13 mm wide. *Seeds* widely oblong-elliptic, 8 mm long, 7 mm wide; *pleurogram* almost continuous.

*Specimens examined.* WESTERN AUSTRALIA: c. 6 km W of Overlander-Denham road towards Tamala, Shark Bay area, *B.R. Maslin* 3682 (CANB, K, MEL, PERTH); c. 9 km from Denham-Overlander road towards Tamala, *B.R. Maslin* 3714 (BRI, CANB, K, MEL, NSW, PERTH); 7 km W of Denham-Overlander road on road to Tamala Station, *B.R. Maslin* 6296 (PERTH).

*Distribution and habitat.* Western Australia in the northern extremity of the Irwin Botanical District (1:250,000 map G49-12). Known only from the Shark Bay area (south of Carnarvon) from the collections cited above. Occurs on red-brown sandy loam in tall shrubland.

#### 10. *Acacia wilcoxii* Maslin, sp. nov.

*Frutex* glaber per ramosus 2-4 m altus, habito *Templetoniae egenae* simili, ramulis ascendentibus ad erectos teretibus, obscure nervatis, juventute diluto-viridibus sed aetate cinereis, saepe spinosis. *Phyllodia* ramulosa simulans teretia acuta grosse pungentia, plerumque 5-14 cm longa et 1.5-2 mm diametro, crassa erecta, juventute diluto viridibus sed aetate cinereis, per obscure 4-nervatis. *Pedunculi* 5-25 mm longi, plerumque geminati, alteruter in racemis vel phyllodiorum in axillis in surculis novis; *capitula* globularia 24-27-floribus. *Flores* 5-meri; *calyce* gamosepalo et plus minusve truncato. *Legumina* linearia, usque ad 10.5 cm longa et 5 mm lata, tenuiter coriacea atro-brunnea. *Semina* (leviter immatura) longitudinalia late elliptica usque late ovata, circa 4 mm longa, arillo diluto-luteo.

Table 1. Principal morphological features distinguishing *A. subrigida* (excluding the Shark Bay variant), *A. pachyacra* and *A. murrayana*

	<i>A. subrigida</i>	<i>A. pachyacra</i>	<i>A. murrayana</i>
<b>Branchlets</b>	Not pruinose	Sometimes faintly (rarely markedly) pruinose	Often markedly pruinose
<b>Phyllodes</b>			
- length	Mostly 8-15 cm	8-20 cm	5-15 cm
- width	1-1.5 mm	0.5-1 mm	1.5-8(12) mm
- shape in T.S.	Rhombic (flat in Shark Bay variant)	Rhombic to subterete, rarely flat	Flat
- texture	Sub-rigid	Not rigid	Not rigid
- surface when dry	Smooth	Sparingly and shallowly longitudinally grooved or wrinkled	Finely longitudinally wrinkled
- apical mucro	± erect	Recurved	Recurved
<b>Basal gland</b>	3-17 mm above pulvinus	At distal end of pulvinus	At distal end of pulvinus, rarely absent
<b>No. heads per raceme</b>	(1)2-4(5)	Usually 5-10	2-10
<b>Peduncle length</b>	10-20 mm	4-7 mm	4-10(15) mm
<b>Seed orientation in pods</b>	Longitudinal to longitudinally oblique	Transverse to oblique	Transverse to oblique

*Typus*: Landor Station, Western Australia, August 1970, *D.G. Wilcox* 168 (*holo*: PERTH 00168440; *iso*: PERTH 168459).

Much-branched, more or less rounded *shrubs* 2-4 m tall, habit resembling *Templetonia egena*. *Bark* grey and slightly roughened on trunks and main branches, becoming smooth and brownish on upper branches. *Branchlets* ascending to erect, straight to very slightly flexuose, somewhat rigid, often terminating in very coarsely pungent points, terete, very obscurely nerved, glabrous, pale green when young but ageing greyish (due to a whitish, often flaking cuticle). *Stipules* very early caducous, c. 1.5 mm long, fused for most of their length, scarious, brown. *Phyllodes* resembling the branchlets, terete, narrowed at base, length variable, (3)5-14 cm long, 1.5-2 mm diam., smooth, rigid, thick, brittle when dry, erect, more or less straight, glabrous (except mucro), colour as on branchlets except the apical region brown but turning whitish as cells deteriorate, very obscurely 4-nerved (nerves yellowish

and not or barely raised); *pulvinus* c. 2 mm long, slightly dilated at base, usually orange-brown; *apices* on young phyllodes variably hooked and possessing a glabrous or sparsely hairy mucro c. 1 mm long with a gland-like structure at its base on the upper surface, mucro lost with age resulting in straight, coarsely pungent apices (the gland-like structure rarely observable on mature phyllodes). *Gland* on upper surface of phyllode to 3 mm above pulvinus, circular to oblong, c. 0.5 mm long, a minute gland-like structure at base of mucro (see above). *Peduncles* 5-25 mm long, commonly twinned, either 2-5 pairs in determinate racemes 1-3 cm long or axillary and arising synchronously with young phyllodes on new shoots, glabrous, base ebracteate; *raceme axes* with 4-5 minute caducous bracts at its base, sometimes growing out at apex; *heads* globular, 24-27-flowered; *receptacle* papillose; *bracteoles* widely spatulate, c. 1 mm long, concave, sub-sessile. *Flowers* 5-merous, glabrous; *calyx* 2/5 length of corolla, gamosepalous, very shallowly divided (for c. 1/6 or less its length), into broadly triangular, non-thickened lobes); *petals* c. 2 mm long, nerveless. *Pods* linear, to 10.5 cm long, 5 mm wide, with up to 9 seeds per pod, rounded over seeds and slightly to moderately constricted between them, thinly coriaceous, more or less straight, nerveless, glabrous, dark brown, margins narrow and yellowish. *Seeds* (slightly immature) longitudinal with aril facing apex of pod, widely elliptic to widely ovate, c. 4 mm long and 3.5 mm wide, brown; *pleurogram* open at hilar end; *areole* c. 0.7 mm long and 0.5 mm wide; *funicle* straight to shallowly curved, pale-yellow, reflexed above a somewhat thickened aril of the same colour.

*Other specimens examined.* WESTERN AUSTRALIA (precise localities withheld for conservation reasons): Erong Springs Station, R.J. Cranfield 5347 (PERTH); Tangadee Station, B.R. Maslin 5287 (CBG, BRI, K, PERTH) and B.R. Maslin 5288 (CANB, G, MEL, NSW, PERTH), A.A. Mitchell 268 (PERTH); Dalgety Downs Station, A.A. Mitchell 1552 (CANB, PERTH).

*Distribution.* Western Australia in the Ashburton Botanical District (1:250,000 maps G50-4, 6). Known only from Tangadee, Landor, Erong Springs and Dalgety Downs Stations, c. 250 km north to northwest of Meekatharra.

*Habitat.* Grows along watercourses and adjacent stony plains and low stony hills, in open or closed scrub.

*Flowering and fruiting periods.* The few specimens to hand have been collected August and September. Slightly immature pods have been collected in early October.

*Conservation status.* A Priority 1 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List. See end of this issue.

*Etymology.* Named in honour of David G. Wilcox, formerly of the Western Australian Department of Agriculture, who has collected extensively since 1952 in the pastoral shrubland zone of W.A. between the Ashburton River and the Nullarbor Plain.

*Affinities.* *Acacia wilcoxii* is very distinctive by its thick, terete, relatively long, erect phyllodes which closely resemble the branchlets and is not likely to be confused with any other *Acacia* within its known geographic range. It does, however, resemble both *A. exocarpoides* W. Fitzg. and *A. microcalyx* Maslin in habit and in having coarsely pungent, ascending to erect branchlets which are frequently invested with a whitish flaking cuticle. These two related species occur south and west of *A. wilcoxii* (see Maslin and Pedley 1982). Although *A. exocarpoides* has terete phyllodes they are much shorter than those of *A. wilcoxii*, i.e. 8-18 mm long, and unlike the new species are frequently shed upon



collection. Additionally, the racemes on *A. exocarpoides* are usually 1-headed and extremely reduced (the raceme axes to *c.* 1 mm long) and its calyx is dissected for at least half its length. Pods on the two species are rather similar. Although *A. microcalyx* has racemose inflorescences similar to the new species it is readily distinguished by its shorter (20-40 mm long), flat phyllodes which (like *A. exocarpoides*) are often shed upon collection, its fewer flowers per head (i.e. 14-16) and its much larger pods (to 20 cm long and *c.* 10 mm wide).

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**Acacia Miscellany 15. Five groups of microneurous species of *Acacia*  
(Leguminosae: Mimosoideae: section *Plurinerves*),  
mostly from Western Australia**

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**Abstract**

Cowan, R.S. and B.R. Maslin. *Acacia* Miscellany 15. Five groups of microneurous species of *Acacia* (Leguminosae: Mimosoideae: section *Plurinerves*), mostly from Western Australia. Nuytsia 10 (2): 205-254 (1995). Five informal groupings of new and previously described species are reviewed, including a key to the taxa of each group and descriptions or re-descriptions of each taxon. The "*A. densiflora* Group" includes *A. densiflora* Morrison, *A. eremophila* W. Fitzg. and *A. mackeyana* Ewart & Jean White in addition to the following new taxa: *A. dissona* R.S. Cowan & Maslin, *A. dissona* var. *indoloria* R.S. Cowan & Maslin, *A. hadrophylla* R.S. Cowan & Maslin, *A. kalgoorliensis* R.S. Cowan & Maslin, *A. papulosa* R.S. Cowan & Maslin and *A. undosa* R.S. Cowan & Maslin. The "*A. ancistrophylla* Group" comprises two new species (*A. amyctica* R.S. Cowan & Maslin and *A. whibleyana* R.S. Cowan & Maslin), in addition to *A. ancistrophylla* C.R.P. Andrews which is treated here as consisting of three varieties (the typical variety, var. *perarcuata* R.S. Cowan & Maslin, var. nov. and var. *lissophylla* (J.M. Black) R.S. Cowan & Maslin). The "*A. enervia* Group" is made up of *A. enervia* Maiden & Blakely with two subspecies (the typical subspecies and subsp. *explicata* R.S. Cowan & Maslin), *A. lineolata* Benth. with two subspecies (the typical one and subsp. *multilineata* (W. Fitzg.) R.S. Cowan & Maslin, comb. et stat. nov.) and *A. inceana* Domin with two subspecies (the typical one and subsp. *conformis* R.S. Cowan & Maslin). The "*A. fragilis* Group" includes three new species (*A. aulacophylla* R.S. Cowan & Maslin, *A. consanguinea* R.S. Cowan & Maslin and *A. ophiolithica* R.S. Cowan & Maslin) in addition to *A. assimilis* S. Moore with two subspecies (subsp. *assimilis* and subsp. *atroviridis* R.S. Cowan & Maslin, subsp. nov.), *A. fragilis* Maiden & Blakely and *A. uncinella* Benth. Finally, the "*A. dielsii* Group" comprises two new species (*A. nivea* R.S. Cowan & Maslin and *A. obesa* R.S. Cowan & Maslin) in addition to *A. dielsii* E. Pritz. itself. Selection of lectotypes is recorded for the following taxa: *A. eremophila* W. Fitzg. var. *variabilis* Maiden & Blakely, *A. ancistrophylla* C.R.P. Andrews var. *lissophylla* (J.M. Black) R.S. Cowan & Maslin, *A. lineolata* Benth., *A. mackeyana* Ewart & Jean White and *A. assimilis* S. Moore.

## Introduction

The principal aims of this paper are to describe new taxa ahead of their inclusion in the "Flora of Australia" treatment of *Acacia*, and to present re-descriptions of some previously described taxa related to the new ones; we have also lectotypified names where necessary.

## Methods

*Arrangement of the text.* The taxa included here are all referable to *Acacia* section *Plurinerves* (Benth.) Maiden & Betche and are treated in five groups, the "*A. densiflora* Group", the "*A. ancistrophylla* Group", the "*A. enervia* Group", the "*A. fragilis* Group" and the "*A. dielsii* Group". Apart from their globular heads on axillary peduncles these taxa have in common only their microneurous phyllodes (*cf.* Maslin & Pedley 1988 for definition), having usually numerous, closely parallel, longitudinal nerves with anastomoses absent or rare. It should be noted that these "Groups" are simply mnemonic devices adopted to bring together taxa that are considered to be most closely related to one another for purposes of communication. These are informal groupings and not all the taxa which could be referred to them are necessarily included herein. Furthermore, the "Groups" are sometimes separated by only small differences, especially in the case of the first three, and future classifications may well combine these into a single infrageneric taxon.

*Taxonomic rank.* Our approach to the application of rank is briefly discussed in Cowan & Maslin (1995).

*Typification.* Our approach to typification is discussed in Maslin & Cowan (1994b).

*Conservation status.* We have assessed conservation status of each taxon included in this treatment. In the case of Western Australian taxa we have used the Conservation Codes for Western Australian Flora (see end of this issue). For taxa occurring elsewhere in Australia we have used the conservation codings of Briggs and Leigh (1988).

*Measurements.* All measurements and observations were made from dried specimens unless stated otherwise.

## The "*Acacia densiflora* Group"

Although they have no unique distinguishing characters, the species of this "Group" can be recognized in section *Plurinerves* by a combination of their tomentulose branchlets (except glabrous in *A. papulosa* and appressed-puberulous in *A. dissona* and some material of *A. eremophila*) with the indumentum often extending to the adaxial surface of the pulvinus, cucullate basal peduncular bracts and their small heads on short peduncles. The taxa referred to this Group include the following: *A. densiflora* Morrison, *A. dissona* R.S. Cowan & Maslin sp. nov. (including var. *dissona* and var. *indoloria* R.S. Cowan & Maslin var. nov.), *A. eremophila* W. Fitzg. (including var. *eremophila* and var. *variabilis* Maiden & Blakely), *A. hadrophylla* R.S. Cowan & Maslin sp. nov., *A. kalgoorliensis* R.S. Cowan & Maslin sp. nov., *A. mackeyana* Ewart & Jean White, *A. papulosa* R.S. Cowan & Maslin sp. nov. and *A. undosa* R.S. Cowan & Maslin sp. nov.

Key to taxa of "*A. densiflora* Group"

1. Phyllodes terete to sub-terete
  2. Branchlets glabrous ..... 7. *A. papulosa*
  2. Branchlets hairy
    3. Sepals united for at least 1/4 their length
      4. Phyllodes with sharply to coarsely pungent,  $\pm$  straight tips; peduncles hairy; pods hairy, not undulate ..... 1. *A. densiflora*
      4. Phyllodes with non-pungent, uncinata to sub-uncinate (sometimes straight) tips; peduncles glabrous or hairy
        5. Nerves c. 10, depressed below broad (several times width of nerves), raised inter-nerve spaces
          6. Pods glabrous, not undulate; phyllodes 2-6 cm long ..... 3a. *A. eremophila* var. *eremophila*
          6. Pods hairy, undulate; phyllodes 5-11 cm long ..... 3b. *A. eremophila* var. *variabilis*
        5. Nerves numerous, inter-nerve spaces scarcely wider than nerves ..... 3. *A. eremophila* (numerous-nerved variant)
    3. Sepals free or almost so
      7. Phyllodes not sharply pungent
        8. Pulvinus expanded at base, 0.5-2 mm long; mature phyllodes with raised nerves commonly paler than inter-nerve spaces ..... 2b. *A. dissona* var. *indoloria*
        8. Pulvinus terete, 1-3 mm long; nerves  $\pm$  depressed, nerves and inter-nerve spaces uniform in colour
        9. Pods glabrous, not undulate; phyllodes 2-6 cm long ..... 3a. *A. eremophila* var. *eremophila*
        9. Pods hairy, undulate; phyllodes 5-11 cm long ..... 3b. *A. eremophila* var. *variabilis*
      7. Phyllodes sharply pungent
        10. Phyllode blades abruptly separated from both pulvinus and apex, commonly recurved, 7-30 mm long; heads 7-12-flowered ..... 6. *A. mackeyana*
        10. Phyllodes gradually tapered to pulvinus and/or apex, straight, 20-70 mm long; heads 15-22-flowered
        11. Phyllodes 3-7 cm long with the apex protracted into long spinose points; peduncles normally 0.5-1.5 mm long ..... 5. *A. kalgoorliensis*
        11. Phyllodes 2-4 cm long with the apex contracted to short pungent tips; peduncles 2-5 mm long ..... 2a. *A. dissona* var. *dissona*
1. Phyllodes flat
  12. Peduncles hairy ..... 1. *A. densiflora*
  12. Peduncles glabrous
    13. Pods not undulate; phyllodes oblong-elliptic, 5-25 x 2.5-5.5 mm ..... 4. *A. hadrophylla*
    13. Pods undulate; phyllodes linear to linear-oblongate, 20-45 x 1-4 mm ..... 8. *A. undosa*

**1. *Acacia densiflora*** Morrison, Scott. Bot. Rev. 1: 96 (1912); Trans. & Proc. Bot. Soc. Edinburgh 26: 51 (1917)

*Typus*: Kellerberrin, E Avon district, Western Australia, September 1897, R.B. Leake (iso: K, NSW, PERTH 01017489-fragment ex E).

Dense, rounded or obconic *shrubs* (0.2)0.5-1.2(1.7) m tall, few- to many-stemmed from ground level. *Bark* grey, smooth, sometimes fissured basally. *Branchlets* tomentulose with short, dense, crisped white hairs, sometimes reddish resin-hairs intermixed. *New shoots* with grey,  $\pm$  matted pubescence and with many rust-coloured resin-hairs. *Stipules* persistent, subulate to triangular, 0.5-2.5 mm long,  $\pm$  puberulous. *Phyllodes* terete, sub-terete or compressed to flat and linear, 25-50(60) mm long, 1-2 mm wide, rigid, inclined to ascending, straight, glabrous except tomentulose on pulvinus and base of phyllodes, sometimes sparingly appressed-puberulous but glabrescent, dark green; apex ending in a straight or slightly curved, sharply to coarsely pungent point;  $\pm$  16 nerves plane to slightly raised, closely parallel, sometimes irregularly verruculose, stomata raised; *gland* small, located on adaxial margin near the middle of blade, occasionally a second gland on upper 1/2 of blade. *Peduncles* 2 per axil, 0.5-1.5 mm long, crisped-tomentulose; *basal peduncular bract* caducous, cucullate, 1.5-3 mm long, villose; heads globular, 4-5 mm diam., (11)15-18(25)-flowered; bracteoles oblanceolate to obovate, arcuate, puberulous and ciliolate. *Flowers* 5-merous. *Sepals* less than half as long as petals, 1/2-3/4 united. *Petals* 1/2 united. *Pods* linear, raised over and slightly constricted between seeds, to 4.5 cm long and 2.5 mm wide, thin-crustaceous, slightly curved, sometimes slightly flexuose, tomentulose and with many red resin hairs. *Seeds* longitudinally arranged in pods, elliptic, c. 3 mm long, 2 mm wide, 1 mm thick, glossy black; *pleurogram* U-shaped; *areole* small; *aril* terminal, short-tubular with scalloped margin, 2 mm long, white.

*Selected specimens examined*. WESTERN AUSTRALIA: 30 km W of 90 mile Tank, Frank Hann National Park, T.E.H. Aplin and M.E. Trudgen 5918 (K, MO, NY, PERTH); about 0.5 miles [0.8 km] N of Bending on road to Narembeen, B.R. Maslin 517 (MEL, PERTH); 18 miles [28.9 km] W of Pederah on road to Kulin, B.R. Maslin 532 (K, MEL, PERTH); 8 km due W of Merredin, B.R. Maslin 2352 (CANB, K, NY, PERTH); 10 km due SW of Chiddarcooping Hill, B.R. Maslin 6379 (CANB, K, PERTH); 15 km SSW of Queen Victoria Rocks, c. 60 km SSW of Coolgardie, K. Newbey 5681 (PERTH); 4.6 km E of Graham Rocks turn-off on Hyden-Newdegate road, J.G. and M.H. Simmons 1325 (PERTH); 97 miles [156 km] E of Southern Cross, E. Wittwer 1298 (PERTH).

*Distribution*. Southwest Western Australia from near Wyalkatchem and Chiddarcooping Nature Reserve (c. 80 km north-northeast of Merredin) south to Ongerup and Frank Hann National Park (which is located 30-110 km east-northeast of Lake King). A few collections have been made east of the main distribution in the Coolgardie area (near Coolgardie and Queen Victoria Rocks).

*Habitat*. In sand and loam, occasionally clay, mostly in open mallee shrubland.

*Flowering and fruiting periods*. Flowers from June-September; pods with mature seeds have been collected in December.

*Affinities*. *Acacia densiflora* differs from most of its relatives in its partly united sepals and petals; other characters useful in recognizing the species include its very short, tomentulose peduncles, densely tomentulose branchlets and many-nerved phyllodes with commonly straight, sharply pungent points.

*Discussion.* The gradual progression in phyllode shape within the species from completely terete (as in the type) through sub-terete to flat makes recognition of infraspecific taxa impractical, at least on this basis, even though the extremes look rather different. Several collections from east of the main distribution, i.e. around Coolgardie and in the Frank Hann National Park, have phyllodes with coarser-appearing nervature and often some of the nerves are tuberculate. In both respects, however, these populations intergrade with the typical ones.

*Conservation status.* Widespread, not known to be under threat.

## 2. *Acacia dissona* R.S. Cowan & Maslin, sp. nov.

*Frutex* 0.5-2 m altus, ramis ± contortis, ramulis appresso-puberulis. *Stipulae* persistentes, triangulares. *Phyllodia* sub-teretia vel teretia, gradatim contracta ad apicem plus minusve acuto-pungentia vel mucronata et non-pungentia, pulvino 0.5-2 mm longo, ad basem expanso, 2-4 cm longa, 1-1.5 mm lata, ratione horum 15-30, rigida, recta vel fere recta, glabra, nervis numerosis, elevatis, arcte parallelis, stomatibus elevatis, interdum tuberculiformibus. *Pedunculi* 2 in quoque axilla, 1-4 mm longi, glabri; *capitulis* globularibus, 5-6 mm diametro, 15-20-floribus; bracteolis linearibus. *Flores* pentameri; *sepalis* petalisque discretis, sepalis petalis circa dimidia brevioribus, linearibus ad lineari-spathulatis, apicaliter ciliolatis. *Legumina* linearia, supra semina elevata et inter semina plus minusve constricta, ad 60 mm longa et 2.5 mm lata, tenuiter crustacea ad tenuiter coriacea, leviter arcuata, plus minusve appresso-puberula. *Semina* longitudinalia, oblongo-elliptica, 2.5-4.5 mm longa, 1.5 mm lata, 1 mm in crassitie, nitida vel sub-nitida, brunnea, arillo seminibus 1/2-1/3 brevioribus, conico vel obtuso et cristato, dilute luteo.

*Typus:* 14 km N of Lake Grace, Western Australia, 5 October 1975, B.R. Maslin 3843 (*holo:* PERTH 00194824; *iso:* CANB, G, K, MEL, NSW, NY).

Low-domed to narrowly obconic, dense *shrubs* 0.5-2 m tall, branches often ± contorted. *Bark* light grey, finely longitudinally fissured at base of trunk, smooth on branches. *Branchlets* more or less ridged, with very short, appressed, straight to shallowly-curved hairs. *Stipules* persistent, triangular. *Phyllodes* sub-terete or terete, 2-4 cm long, 1-1.5 mm wide, l:w = 15-30, rigid, inclined to erect, straight or nearly so, green, glabrous or pulvinus often puberulous adaxially; apex more or less sharply pungent or only mucronate to mucronulate; *nerves* numerous, closely parallel, raised, sometimes paler than inter-nerve spaces; stomata raised in inter-nerve spaces, sometimes appearing as tubercles; *pulvinus* 0.5-2 mm long, sometimes not well differentiated, usually expanded at base; *gland* small, near middle of blade on adaxial surface. *Peduncles* 2 in each axil, 2-4(5) mm long, glabrous; *heads* globular, golden, 5-6 mm diam. (fresh), 3-4 mm diam. (dry), 15-20-flowered; *bracteoles* linear. *Flowers* 5-merous. *Sepals* c. 1/2 as long as petals, free, linear, ciliolate apically. *Petals* free, elliptic, glabrous. *Pods* linear, raised over and variably constricted between seeds, to 6 cm long and 2.5 mm wide, thin-crustaceous or thin-coriaceous, moderately curved, somewhat loosely and irregularly reticulate-nerved, ± appressed-puberulous. *Seeds* longitudinally arranged in pods, oblong-elliptic, 2.5-4.5 mm long, 1.5 mm wide, 1 mm thick, dark-brown, glossy or semi-glossy; *aril* terminal, conical or broadly rounded and crested, 1/2-2/3 as long as seed, pale yellow.

*Distribution.* Discontinuous in southwest Western Australia in an area bounded by Coorow, Ongerup, Norseman and Southern Cross.

*Affinities.* In several respects the new species resembles *A. mackeyana* Ewart & Jean White (which is described below): the branchlets are appressed-puberulous, the pulvinus is expanded at its base, the

peduncles are glabrous and the perianth parts are free. *Acacia mackeyana*, however, has phyllodes which are commonly recurved and abruptly contracted at both the apex and pulvinus, as well as having 7-12-flowered heads and sub-terete, thick-walled, crustaceous pods.

There is considerable similarity also between *A. dissona*, particularly the typical variety, and *A. kalgoorliensis* R.S. Cowan & Maslin (see below) which has generally longer phyllodes with the apex drawn out into a long spinose tip, mostly shorter peduncles, pods with appressed, red resin-hairs and seeds with an aril that does not invest the seed apex.

*Infraspecific taxa.* The differences separating the two varieties comprising the species are mostly to be found in the pods and seeds. There are, however, qualitative differences in the degree of pungency of the phyllodes and the colour of the nerves.

*Etymology.* The name given refers to its discordant nature, in relation to its close relatives (from *dissonus*, Latin for discordant or different).

#### **2a. *Acacia dissona* R.S. Cowan & Maslin var. *dissona*.**

*Phyllodes* 2-4 cm long, sub-terete, contracted to short, more or less sharply pungent tips, nerves and inter-nerve spaces uniform in colour, stomata sometimes tuberculate. *Peduncles* 2-5 mm long. *Pods* distinctly constricted between the seeds, sparingly appressed-puberulous. *Seeds* 4.5 mm long; *aril* long-conical.

*Selected specimens examined.* WESTERN AUSTRALIA: 45 km E of Norseman, *T.E.H. Aplin* 1811 (PERTH); Muntadgin, *E.T. Bailey* 690 (PERTH); 21.6 km ENE of Merredin by road, *R. Coveny* 8340 and *B. Haberley* (PERTH); 5 km SE of Coorow, *A. Doley* 4 (PERTH); Rabbit Proof Fence, Wanarra, *C.A. Gardner* 13897 (PERTH); New Zealand Gully, Southern Cross, *S. Grayling* 1 (PERTH); 14 km N of Lake Grace towards Kulin, *B.R. Maslin* 4067 (PERTH); c. 4 km S of Karlgarin on Pederah Road, *B.R. Maslin* 6738 (PERTH); 9 km WSW of Lake Cairlocup, *K. Newbey* 4333 (PERTH); 4.1 km from Hyden on road to Dragon Rocks, *J.G. and M.H. Simmons* 1319 (PERTH); between Hyden and Kondinin, *D.J.E. Whibley* 3355 (PERTH).

*Distribution.* Discontinuous in southwest Western Australia in the Merredin-Southern Cross area south to near Ongerup with outliers in the Coorow-Wanarra area (c. 250 km northwest of Merredin) and in the Norseman area (c. 350 km northeast of Ongerup).

*Habitat.* Grows on clay, loam, and sandy soils in eucalypt woodland or mallee, sometimes dominated by *Eucalyptus salmonophloia*.

*Flowering and fruiting periods.* Most flowering specimens have been collected in September and October, but the northern ones (from the Coorow-Wanarra area) were collected in July and August. Pods with mature seeds have been collected in December.

*Conservation status.* Not considered rare or endangered.

**2b. *Acacia dissona* var. *indoloria* R.S. Cowan & Maslin, var. nov.**

A var. *dissona* phyllodiis teretibus mucronatis et innocuis ad grosse pungentibus, *leguminibus* inter semina non-constrictis vel solum leviter constrictis et sparse appresso-puberulis, *seminibus* 2.5-3.5 mm longis arillo lato-obtusio cristato differt.

*Typus*: 12 km E of Kulja towards Mollerin, Western Australia, 9 January 1979, B.R. Maslin 4448 (*holo*: PERTH 00153168; *iso*: CANB, K, NY).

*Phyllodes* terete, mucronate, innocuous to coarsely pungent, mature phyllodes with raised nerves commonly paler than inter-nerve spaces (less clear on juvenile phyllodes), pulvinus expanded at base, 0.5-2 mm long. *Pods* scarcely constricted between seeds, sparsely appressed-puberulous, at least between seeds. *Seeds* 2.5-3.5 mm long with a broadly obtuse, crested aril.

*Selected specimens examined*. WESTERN AUSTRALIA: Bruce Rock, October 1932, E.T. Bailey (PERTH 00195294); 3 miles [4.8 km] NW of Muntadgin, J. Goodwin 67 (PERTH); Caiguna to Southern Cross, C. Herscovitch CH10 (PERTH); 25 km ESE of Tadpole Lake, Frank Hann National Park, K. Newbey 5538 (PERTH); 6 miles [9.7 km] E of Ballidu, R.D. Royce 2103 (PERTH).

*Distribution*. Scattered in inland southwest Western Australia in the Ballidu-Mollerin area (c. 75-145 km east of Moora), Bruce Rock-Muntadgin area (Muntadgin is c. 45 km northeast of Bruce Rock) and the Frank Hann National Park (located 30-110 km east-northeast of Lake King).

*Habitat*. Grows on sand and loam mostly in open mallee shrubland.

*Flowering and fruiting periods*. Flowering occurs from August to September with most specimens collected in September. Pods with mature seeds have been collected in January.

*Variation*. Typically the pulvinus is terete in the upper part but flares basally; however, in one instance (the Newbey collection cited above) it is completely terete.

*Conservation status*. A Priority 3 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology*. The name for this taxon alludes to the non-pungent nature of the phyllodes (from *indolorius*, Latin for painless).

**3. *Acacia eremophila* W. Fitzg., J. Bot. 50: 19 (1912)**

*Lectotype* (*vide* Maslin & Cowan 1994a): Cowcowing sandplain, Western Australia, August 1904, M. Koch 1024a (BM); *isolecto*: NSW, PERTH 00838292, 01505246 & 00763136). *Paralectotype*: Cowcowing, September 1904, M Koch 1024a (NSW, PERTH 00750980).

*A. leptoneura* Benth. var. *eremophila* W. Fitzg. ex Ewart & Jean White, Proc. Roy. Soc. Victoria n. ser. 23: 286, pl. 50, figs 1-4 (1911). *Typus*: Cowcowing, Western Australia, August 1904, M. Koch 1024a (*holo*: presumably MEL, *n.v.*, *vide* Maslin & Cowan, *loc. cit.*).



Dense, rounded to obconic *shrubs* usually 0.4-2 m tall and about the same across. *Bark* grey, smooth. *Branchlets* terete, slightly ribbed, white- or grey- sub-appressed-tomentulose (often with dark resin-hairs intermixed), appressed-puberulous or crispate-sericeous. *Stipules* persistent, subulate-triangular, 0.4-0.8 mm long. *Phyllodes* terete, 2-11 cm long, 0.6-1.5 mm diam., rigid, patent to erect, straight, glabrous except tomentulose on pulvinus and phyllode base, green to greyish-green or yellowish green, sometimes  $\pm$  viscid when young; *apex* commonly reflexed uncinata, rarely straight or sub-uncinate; *pulvinus* terete, 1-3 mm long; nerves mostly 9 or 10, closely parallel, depressed below raised inter-nerve spaces bearing raised stomata; *gland* small, mostly at or below middle of phyllode. *Peduncles* 2 per axil, 1-2 mm long,  $\pm$  tomentulose, sometimes also with red resin-hairs; *basal peduncular bracts* caducous, cucullate, 1-2 mm long, glabrous or hairy, red resin-hairs present or absent; *heads* globular, light-golden, 3-4 mm diam., 10-25-flowered; *bracteoles* spatulate, ciliolate. *Flowers* 5-merous. *Sepals* more or less united to 1/2 their length but sometimes only basally, or some even free, narrowly oblong, ciliolate. *Petals* free, oblanceolate to obovate. *Pods* linear, raised over and somewhat constricted between seeds, 2-5 cm long, 1.5-3 mm wide, thinly crustaceous, straight or undulate, tomentulose, appressed-puberulous or glabrous, marginal nerve distinct. *Seeds* longitudinally arranged in pods, elliptic to oblong-ovate, 2.5-3 mm long, 1.5-2 mm wide, dark brown; *aril* white, terminal, to 2/3 length of seed.

*Distribution.* Widely distributed throughout southern inland Western Australia.

*Notes.* When Ewart & Jean White published *A. leptoneura* Benth. var. *eremophila*, they cited *A. eremophila* W.V. Fitzg. as being in manuscript; at the varietal rank we would cite Ewart & Jean White as the publishing authors but the first available name at the specific rank is Fitzgerald's name.

As is often the case with Max Koch collections, there is some confusion because the numbers he attached to collections were taxon numbers, not collection numbers. Although the protologue lists Koch 1024 and 1024a as the basis for *A. eremophila*, this is clearly an error; Koch's own notes in archives of the Western Australian Herbarium lists a *Grevillea* species for 1024 and *A. eremophila* for 1024a. Further discussion may be found in the paper on Fitzgerald types by Maslin & R.S. Cowan (1994a).

*Affinities.* Related to *A. densiflora* Morrison (see above) which has c. 16-nerved phyllodes and 1/2- to 3/4-united perianth parts. *Acacia eremophila* occurs as two varieties, separated on pod shape and hairiness as well as phyllode length, peduncle pubescence and number of flowers per head.

*Variation.* This species is reasonably constant morphologically, although there is a variant, not encompassed by the above description, which differs from typical *A. eremophila* in having phyllodes with more numerous nerves and consequently narrower inter-nerve spaces. This "numerous-nerved variant" has a sporadic distribution and has been recorded from Edjudina Station (c. 130 km northeast of Kalgoorlie) (*M. Blackwell* 47 - PERTH), the Great Victoria Desert between Neale Junction and Plumridge Lakes (*B.R. Maslin* 5701 - K, MO, NSW, PERTH) and from between Norseman and Balladonia (*K. Newbey* 7429 - PERTH). It was treated as *A. rigens* Cunn. ex Don by Maslin (1981) in the "Flora of Central Australia" and specimens were distributed as such.

### 3a. *Acacia eremophila* W. Fitzg. var. *eremophila*

*Shrubs* 0.4-2 m tall. *Phyllodes* (20)27-45(60) mm long, 0.6-1 mm diam., the tip reflexed or rarely straight. *Peduncles* 1-2 mm long, glabrous to sparsely puberulous, red resin-hairs present or absent,

rarely densely tomentulose; heads less than 20-flowered. Pods 2-6 cm long, 1.5-2 mm wide, straight, glabrous or with minute red resin hairs. Seeds elliptic.

*Selected specimens examined.* WESTERN AUSTRALIA: Cundeelee, P. Boswell A28 (PERTH); 7 miles [11.2 km] N of Cadoux towards Kalannie, R. Cumming 1869 (PERTH); Peak Charles area, 10 September 1972, T. Daniell s.n. (PERTH 00666661); Bending, September 1923, C.A. Gardner s.n. (PERTH 00667161, 00665614 & 00667153); 1.7 miles [2.7 km] N of Kalgoorlie, 1 September 1954, A.R. Main s.n. (PERTH 00702668); 1 mile [1.6 km] W of Rabbit Proof Fence No. 1 on Norseman-Hyden road, B.R. Maslin 554 (NSW, PERTH); about 16 km due NW of Bruce Rock, B.R. Maslin 2371 (PERTH); 29 km N of Kondinin towards Naremben, B.R. Maslin 3423 (CANB, K, PERTH); 3.5 km S of Wubin on road to Dalwallinu, B.R. Maslin 4974 (CANB, K, PERTH); 23 km N of Pioneer Tank, c. 80 km S of Zanthus, K. Newbey 7168 (MEL, PERTH); near Lake Dundas, I.V. Newman 771 (PERTH); Wongan Hills, 9 August 1949, E. Salisbury s.n. (PERTH 00665622); railway crossing, S of Dundas Rocks on Highway 1, M.H. Simmons 297 (PERTH); 33 km W of Balladonia on Eyre Highway, M.H. Simmons 1160 (PERTH); 2 km SW of Manmanning, 14 Aug. 1978, B. and M. Smith s.n. (PERTH 00665649); 5 km W of Kitchener, J. Taylor 545, M.D. Crisp and R. Jackson (NSW, PERTH).

*Distribution.* Southern Western Australia, scattered over a wide area bounded by Wubin (c. 20 km north of Dalwallinu), Menzies (c. 125 km north-northwest of Kalgoorlie), Kitchener (c. 160 km north-northeast of Balladonia), Balladonia and Kondinin.

*Habitat.* Commonly in loam or sand in low eucalypt woodland and mallee or mixed scrubland.

*Flowering and fruiting periods.* Flowers in July-September; pods with mature seeds have been collected in December.

*Variation.* In the Peak Charles (c. 100 km southwest of Norseman) to Dundas (c. 22 km south of Norseman) area, there are populations with all the characteristics of this variety except that the phyllode tip is straight instead of reflexed as is typical. The Gardner collection from Bending is unusual in having densely tomentulose peduncles.

*Affinities.* In addition to its close relationship with var. *variabilis*, the typical variety is superficially similar to *A. papulosa* R.S. Cowan & Maslin which has glabrous, papulose branchlets, smaller heads, longer, glabrous peduncles, linear to fusiform bracteoles, resinous pods and oblong seeds.

*Conservation status.* Widespread, not under threat.

**3b. *Acacia eremophila* var. *variabilis*** Maiden & Blakely, J. & Proc. Roy. Soc. Western Australia 13: 6, pl. 4, figs 12-20 (1928).

*Lectotype* (here selected): Comet Vale, Western Australia, October 1916, J.T. Jutson 84 (NSW 216944); *isolecto*: K, MEL (p.p.). *Paralectotype*: (1) Comet Vale, Western Australia, December 1916, J.T. Jutson 91 (NSW, PERTH 01017535-fragment ex NSW); (2) Comet Vale, 22 October 1916, J.T. Jutson 203 (NSW); (3) Comet Vale, 11 November 1916, J.T. Jutson 208 (NSW, PERTH 00751057); (4) Comet Vale, 27 November 1916, J.T. Jutson 208A (K, NSW, PERTH 01017950-fragment ex NSW).

*Shrubs* 1-1.6 m tall. *Phyllodes* 5-11 cm long, 1-1.5 mm diam. *Peduncles* 2 mm long, sparsely to densely tomentulose or appressed-puberulous, resin hairs rarely present; *heads* 20-25-flowered. *Pods* to 5 cm long, 1.5-3 mm wide, distinctly constricted between seeds, loosely undulate, tomentulose or appressed-puberulous. *Seeds* oblong-ovate.

*Other specimens examined.* WESTERN AUSTRALIA: 94 miles [151 km] E of Norseman on Eyre Highway, *I. Armitage* 562 (PERTH); between Balladonia and Norseman, 20.3 km E of turnoff to Newman Rocks, *R.J. Chinnock* 3002 (PERTH); 20 miles [32 km] S of Menzies, 1975, *N. Pratt s.n.* (PERTH 00700541); 34.4 km W of Balladonia on Eyre Highway, *M.H. Simmons* 1162 (PERTH); 5 km E of Zanthus, *P.G. Wilson* 7623 (PERTH).

*Distribution:* This poorly collected variety of southern Western Australia is known from only three widely separated localities, near Balladonia, near Zanthus (c. 160 km north of Balladonia) and Comet Vale (c. 85 km north-northwest of Kalgoorlie).

*Habitat.* Probably grows in sand or sandy loam in low woodland or scrub.

*Flowering and fruiting periods.* Flowers in September; pods with mature seeds have been collected in December. Additional fruiting collections are needed to confirm the separation of this variety from the typical one.

*Typification.* Choice of a lectotype is made because several collections were cited in the protologue, some in flower, others in fruit, even though all apparently represent the same taxon.

*Variation.* One specimen of this variety (*Pratt s.n.* from south of Menzies - PERTH) records a maximum height of 3-4.5 m for the taxon, which is considerably larger than is typical.

*Conservation status.* A Priority 3 taxon in the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

#### 4. *Acacia hadrophylla* R.S. Cowan & Maslin, sp. nov.

*Frutex* (20)30-50(70) cm altus, ramulis tomentulosis et cum micro-piliis nigris, interdum plus minusve sericeis. *Stipulae* persistentes, anguste triangulares, 0.5-0.8 mm longae. *Phyllodia* plana, oblongo-elliptica, obtusa vel subobtusa et cum parvo mucro, pulvino 0.8-1.5 mm longo, a lamina abrupte separata, valde crassa, rigida, (5)7-25 mm longa, 2.5-5.5 mm lata, patentia ad inclinata, saepe leviter incurvata, glabra praeter pulvinum tomentulosum, uniglandulosa, in quoque superficie 5-7 nervata, nervis valde elevatis, distantibus. *Pedunculi* binati, glabri, 0.5-2 mm longi, pedunculorum bracteis basalibus cucullatis, rostratis, 2.5-4 mm longis; capitula 3-3.5 mm diametro in sicco, 14-25-floribus, *flores* 5-meri, *sepalis* discretis vel partim connatis, *petalis* plus minusve discretis. *Legumina* linearia, inter semina plus minusve constricta, 12-22 mm longa, 2 mm lata, puberula, plus minusve curvata. *Semina* longitudinalia, oblongo-elliptica, 2.5-3 mm longa, 1-2 mm lata, brunneo-nigra, arillo terminali.

*Typus:* between Bremer Range and Lake King-Kumarl Road, Western Australia, 23 September 1983, *B.R. Maslin* 5430 (*holo:* PERTH 00194913; *iso:* CANB, K, MEL, NSW, NY).

Dense to moderately open, domed to obconic *shrubs* (20)30-50(70) cm tall, spreading 40-150(270) cm across. *Branchlets* tomentulose, sometimes more or less sericeous, and with many black micro-hairlets. *Stipules* persistent, narrowly triangular, 0.5-0.8 mm long. *Phyllodes* oblong-elliptic, (5)7-25 mm long, 2.5-5.5 mm wide, rigid, thick, patent to inclined, often shallowly incurved, glabrous except for the tomentulose pulvinus and phyllode-base, green; apex obtuse or sub-obtuse with small mucro; pulvinus 0.8-1.5 mm long, abruptly separated from blade; nerves 5-7 on each face, strongly raised, distant; stomata slightly raised. *Peduncles* 2 per axil, 0.5-2 mm long, glabrous; basal peduncular bract cucullate, rostrate, 2.5-4 mm long, puberulous on rostrum; heads globular, light- to mid-golden, 5 mm diam. (fresh), 3-3.5 mm diam. (dry), 14-25-flowered; bracteoles linear to spatulate, ciliolate. *Flowers* 5-merous. *Sepals* 1/2 length of petals, free, narrowly oblong, ciliolate. *Petals* free or some shortly connate basally. *Pods* linear, somewhat constricted between seeds, 12-22 mm long, 2 mm wide, puberulous with red, glandular(?) papillae, crustaceous, somewhat curved, the marginal nerve distinct, lighter coloured. *Seeds* longitudinal, oblong-elliptic, 2.5-3 mm long, 1-2 mm wide, brown-black, the aril terminal.

*Selected specimens examined.* WESTERN AUSTRALIA: adjacent to NE part of Nature Reserve A24435, Lake King townsite, *K.J. Atkins* 1540 (PERTH); 33 km SSW of Peak Charles, *M.A. Burgman* 1484 and *S. McNea* (PERTH); Circle Valley, *H. Knox* 2907831 (PERTH); One Mile Rock Reserve, *B.R. Maslin* 4484 (CANB, PERTH); 13 km SW of Mount Day, *K. Newbey* 5296 (BM, PERTH); 4 km NE of Peak Charles, Peak Charles National Park, *K. Newbey* 5407 (MO, PERTH); 22 km WNW of Roberts Swamp, c. 53 km W of Grass Patch, *K. Newbey* 8141 (PERTH).

*Distribution.* Scattered but locally frequent in small populations from Mount Holland (c. 85 km northeast of Hyden) and Lake King east to Kumarl and Scaddan (which are located between Norseman and Esperance), southwest Western Australia.

*Habitat.* Growing in loam, clay-loam or sand in open shrubland with *Eucalyptus transcontinentalis*, *E. calycogona* or *E. flocktoniae*.

*Flowering and fruiting periods.* Flowers from June to September; pods with mature seeds collected in December.

*Affinities.* The tomentulose branchlets, cucullate basal peduncular bracts, short peduncled heads and pentamerous flowers indicate the placement of the species within the "A. densiflora Group". The new species differs from most other members of the group in its short, flat, thick, oblong-elliptic phyllodes. *Acacia densiflora* has an element with flat phyllodes but in that instance the phyllodes are linear. *Acacia hadrophylla* shares a number of characteristics with *A. undosa* which also has flat phyllodes but they are generally longer, much thinner, linear to linear-oblongate, commonly with 2 glands and *A. undosa* has undulate pods.

*Conservation status.* Not considered rare or endangered.

*Etymology.* The specific epithet is formed from two latinized Greek words, *hadros*, defined as thick, bulky or stout, and *phyllon*, a leaf, referring to the thick phyllodes that characterize the species.

##### 5. *Acacia kalgoorliensis* R.S. Cowan & Maslin, sp. nov.

*Frutex* densus rotundatus multicaulis 0.5-2.5 m altus, ramulis pilis albis sub-appressis et rubris resinosisve. *Phyllodia* teretia, acute pungentia, ad apicem longum durum fuscum rectum vel raro

curvatum attenuata, pulvino 2-3 mm longo, crispato-sericeo, laminis 3-7 cm longis, plus minusve 1.5 mm diametro, rigidis, erectis, rectis, glabris, 20-nervatis, nervis indistinctis, stomatibus plus minusve elevatis, glande saepe 2. *Pedunculi* 2 in quoque axilla, 0.5-1.5(5) mm longi, glabri vel resinoso-pilis dispersis rubris ornatis; capitula globularia ad late ellipsoidea, 3-3.5 mm diametro, 15-22-floribus, bracteolis linearibus ad spatulatis, tomentulosis et ciliolatis. *Flores* 5-meri. *Sepala* longitudine 1/2 petali partes aequantia, discreta, villosulosa. *Petala* discreta. *Ovarium* papilloso-puberulum. *Legumina* linearia, supra semina elevata et inter semina constricta, ad 7.5 cm longa, 3 mm lata, chartacea, leviter curvata, appresso-puberula, pilis minutis, resinosis. *Semina* longitudinalia, anguste elliptica ad oblongo-elliptica, 4-4.5 mm longa, 1.8 mm lata, 1 mm crassitie, hebetato-nigra, arillo terminali.

*Typus*: 4 miles [6 km] N of Broad Arrow toward Menzies, Western Australia, 10 August 1971, B.R. Maslin 1910 (*holo*: PERTH 00194905; *iso*: CANB, K, NSW, NY).

Dense, rounded *shrubs* 1-3 m tall, many-stemmed from ground level, the main stems slightly twisted. *Bark* grey. *Branchlets* sub-appressed-puberulous, the hairs white, curved antrorsely or somewhat twisted and with red resin-hairs intermixed. *Phyllodes* terete, 3-7 cm long, c. 1.5 mm diam., rigid, erect, straight, green, glabrous except for the crispate-sericeous pulvinus; apex tapering into long, hard, dark, straight or rarely curved tip, sharply pungent; pulvinus 2-3 mm long;  $\pm$  20 nerves slightly raised, closely parallel; stomata somewhat raised; glands usually 2, one near middle, the other near the phyllode apex. *Peduncles* 2 per axil, 0.5-1.5 mm, rarely to 5 mm long, glabrous or with scattered red resin-hairlets; basal peduncular bract cucullate, rostrate, 2.5-3 mm long, appressed-puberulous; heads globular to widely ellipsoid, golden, 3-3.5 mm diam., 15-22-flowered; bracteoles linear to spatulate, tomentulose and ciliolate. *Flowers* 5-merous. *Sepals* 1/2 length of petals, free, linear to spatulate, villose. *Petals* free. *Pods* linear, raised over and constricted between seeds, to 7.5 cm long, 3 mm wide, chartaceous, shallowly curved, appressed-puberulous with minute, red-brown resin hairs. *Seeds* longitudinally arranged in pods, narrowly elliptic to oblong-elliptic, 4-4.5 mm long, 1.8 mm wide, 1 mm thick, dull, black; pleurogram U-shaped; areole raised, shiny; aril terminal.

*Selected specimens examined*. WESTERN AUSTRALIA: Hampton Hill Station, 23 km E of Kalgoorlie, R. Coveny 8426 and B. Haberley (NSW, PERTH); near Kanowna, C.A. Gardner 783 (PERTH); 22.4 km E of Kalgoorlie along road to Zanthus, January 1991, M. McDonald 1338 (PERTH); 8 miles [12.8 km] SW of Kalgoorlie towards Coolgardie, B.R. Maslin 1897 (MEL, MO, PERTH); about 16 km NNE of Kalgoorlie on road to Edjudina Station, B.R. Maslin 4847 (PERTH); 28.5 km SSE of Marvel Loch on track towards Mount Day, B.R. Maslin 5514 (PERTH).

*Distribution*. Restricted to near Kalgoorlie (with collections within a 50 km radius of Kalgoorlie) and the Marvel Loch area (c. 200 km west-southwest of Kalgoorlie), with a variant scattered c. 320-560 km NW of Kalgoorlie (near Wubin and Noongal and Yuinmery Stns), W.A.

*Habitat*. Rocky loam and clay on slopes of low hills in eucalypt woodland. The variant grows in sandy loam and loam over calcrete in eucalypt open woodland and *Acacia* open scrub.

*Flowering and fruiting periods*. Flowers from August to October; pods with mature seeds have been collected in January.

*Variants*. Four collections are clearly related to *A. kalgoorliensis* but may represent a distinct species. These collections differ by having widely ellipsoid, 30-40-flowered heads on peduncles 2-4 mm long:

Noongal Station, *P. Curry* 1073 (CANB, PERTH); c. 40 km NE of Wubin, *B.R. Maslin* 5586 (MEL, MO, NSW, PERTH); and 7.5 km E of Yuinmery Homestead, *J. Dell* JD95 and JD124B (PERTH). All three localities are widely separated (c. 560 km, 480 km and 320 km to the northwest, respectively) from Kalgoorlie.

One collection (*Bale* 109, Mount Hunt, Boulder, W.A. - PERTH) has peduncles 4-5 mm long but otherwise is typical of the species.

*Affinities.* The nearest affinity of this species is with *A. densiflora* Morrison (see above) which has united perianth parts and uniglandular phyllodes with the apex pungent but not drawn out into a protracted spinose tip as in *A. kalgoorliensis*. The red micro-hairlets intermixed with the appressed white or grey hairs on the branchlets and young phyllodes of *A. kalgoorliensis* also serve to distinguish it. In the Kalgoorlie area, another similar-appearing species occurs, *A. inceana* Domin, but its phyllodes appear almost nerveless and its flowers are tetramerous (see discussion below under “*A. enervia* Group”). Although not closely related, *A. donaldsonii* R.S. Cowan & Maslin (ms name, in prep.) is superficially similar but it has larger phyllodes (6-14.5 cm x 1.5-2.5 mm) with four to eight, immersed or slightly raised nerves, larger heads, united sepals and larger compressed-moniliform pods.

*Conservation status.* A Priority 3 taxon on the Department of Conservation and Land Management’s Declared Rare and Priority Flora List.

*Etymology.* The name of the species is derived from the Western Australian goldfields town, Kalgoorlie, where the species is centred.

**6. *Acacia mackeyana*** Ewart & Jean White, Proc. Roy. Soc. Victoria n. ser. 22(1): 6, pl. 3, 4 (1909)

*Lectotype* (here selected): Cowcowing, Western Australia, August 1904, *M. Koch* 1013, flowering (MEL 117106; *isolecto*: BRI, K, NSW, P, PERTH 02482622 and 02482614). *Paralectotype*: Cowcowing, Western Australia, August 1904, *M. Koch* 1013, fruiting (K, MEL, PERTH 00764213, 00764221 and 00764205).

*A. leptoneura* var. *mackeyana* (Ewart & Jean White) Blackall & Grieve, How to Know W. Australian Wildfl., Part 1: 197 (1954), *nomen nudum*.

Dense, domed or obconic, single- or multi-stemmed *shrubs* (0.3)0.5-1.7(2.3) m tall; with age the plants can develop a “bonsai” habit with spreading and twisted trunks and a dense, flat-topped crown. *Bark* grey to branchlet tips, smooth except fissured at base of main stems. *Branchlets* tomentulose to appressed-tomentulose with red resin-hairs intermixed. New growth bronzyish-coloured due to resin-hairs. *Stipules* persistent, triangular, less than 1 mm long, black, commonly with thick, more or less bulbous base. *Phyllodes* terete, (7)10-25(30) mm long, 1-1.5 mm wide, rigid, ascending to erect, commonly somewhat recurved, sometimes straight, glabrous except for the ± tomentulose adaxial surface of pulvinus, dark green; apex abruptly short- to long-mucronate, sharply pungent; pulvinus abruptly separated and commonly flared basally, 1-1.5 mm long; 20 nerves closely parallel and sometimes tuberculate; stomata between nerves raised; gland single, mostly at or above middle of phyllode. *Peduncles* 2 per axil, 2-5 mm long, glabrous; basal peduncular bract cucullate, rostrate, 2-4 mm long, tomentulose and ciliolate; heads globular, prolific and showy, golden, 5-6 mm diam. (fresh), 3-4 mm diam. (dry), 7-12-flowered; bracteoles linear, ciliolate. *Flowers* 5-merous. *Sepals*

to 1/2 as long as petals, free, linear, ciliolate. *Petals* free, elliptic, glabrous. *Pods* sub-terete, oblong-linear, 15-35 mm long, 2-2.5 mm wide, straight or slightly curved, thick-crustaceous, glabrous, longitudinally nerved. *Seed* longitudinal, narrowly oblong, 3-4 mm long, 1-2 mm wide, dull, dark brown to black, the aril terminal with scalloped margin.

*Selected specimens examined.* WESTERN AUSTRALIA: 5.5 km E of Tammin, *R. Coveny* 8311 and *B. Haberley* (PERTH); 2.5 miles [4 km] N of Cadoux towards Kalannie, *R. Cumming* 1868 (PERTH); 11 miles [17.6 km] N of Wyalkatchem towards Koorda, *B.R. Maslin* 155 (PERTH); 7 miles [11.2 km] W of Moorine Rock on Great Eastern Highway, *B.R. Maslin* 583a (NSW, PERTH); 5.5 km NW of Wongan Hills towards Piawaning, *B.R. Maslin* 4203 (PERTH); 29 km NW of Kulin towards Corrigin, *B.R. Maslin* 4372 (PERTH); near Snake Soak, c. 11 km due SW of Wialki, *B.R. Maslin* 4464 (PERTH); 1 km E of 90 Mile Tank, 32° 39'S, 120° 41'E, *B.R. Maslin* 5789 (MEXU, PERTH); Chiddarcooping Nature Reserve, *B.R. Maslin* 6380 (CANB, MEL, NSW, PERTH, Z); Davies property, 10 km due N of Coorow, *B.R. Maslin* 6577 (PERTH); Nugadong Reserve 12614, 21 km SE of Wubin, *B.G. Muir* 206 (1.5) (PERTH); 3 miles [4.8 km] E of Billericay, *K. Newbey* 3237 (CANB, K, MEL); 35 km from Ravensthorpe towards Lake King, *R. Perry* 674 (PERTH); Cemetery Road, Yorkrakine, *M.H. Simmons* 1274 (PERTH); Mullewa, 3 July 1952, *N.H. Speck* (PERTH 00884677); 20 km NE of Ongerup, *N. Stevens* KR9520-1 (MELU, PERTH); 5.9 km SE of Bruce Rock on main road to Naremben, *M.D. Tindale* 3736 (CANB, K, MEL, NSW, PERTH, US).

*Distribution.* Widely distributed in southwest Western Australia from near Coorow southeast to near Corrigin and Moorine Rock (which is c. 30 km west-southwest of Southern Cross on Great Eastern Highway), with a north-western outlier at Mullewa and south-eastern outliers in the Ongerup, Ravensthorpe and Frank Hann National Park areas (c. 200 km southeast of the Corrigin-Moorine Rock area).

*Habitat.* Gravelly soil, loam, loamy clay and sometimes sand in eucalypt woodland and mallee communities and also in *Melaleuca uncinata* thickets.

*Flowering and fruiting periods.* Flowers from June to August; pods with mature seeds have been collected in December and January.

*Typification.* In the protologue of *A. mackeyana* Ewart & Jean White cite only one collection, *M. Koch* 1013, even though both flowers and fruits were described. As was noted under *A. eremophila* above, Koch regularly followed the practice of assigning taxon numbers to his collections and consequently the same number appears on quite different collections; in this instance, although both collections are from the same locality and certainly the same taxon, it is desirable to fix the application of the name. Consequently, we have selected the flowering specimen on MEL sheet #117106 as lectotype.

*Affinities.* *Acacia mackeyana* is related to *A. densiflora* which has partly united petals and sepals, ± tomentulose peduncles and straight, generally longer, terete to flat phyllodes. Also related to *A. dissona* which has straight phyllodes, 15-20-flowered heads and linear, thinly crustaceous or coriaceous pods.

*Discussion.* Although the authors of the protologue described the petals as 3/4 united, we have not seen this condition in any of the specimens, including the type collection.

*Conservation status.* Widely distributed, not under threat.

**7. *Acacia papulosa* R.S. Cowan & Maslin, sp. nov.**

*Frutices* 0.25-2 m alti, ramulis gracilibus glabris papulosis. *Stipulae* persistentes angustotriangulares minutae glabrae. *Phyllodia* teretia, profunde et longitudinalia 8-sulcata, acuta apiculataque, subpungentia, pulvino cylindrico, saepe abrupte separato 1-1.5 mm longo, laminis 2-6 cm longis, 0.7-1 mm diametro, ascendentibus ad erectis, leviter incurvatis, glabris, inter nervos valde elevatis papulosisque, 8 vel 9 nervis principalibus longitudinalibus profunde impressis; glande parve indistincta. *Pedunculi* 3.5-5 mm longi binati glabri, capitula globularia vel oblongoidea 2.5-3.5 mm longa, 2.5-3 mm diametro, 10-20-floribus; bracteolis linearibus ad fusiformibus, leviter puberulis. *Flores* 5-meri. *Sepala* petalis dimidia breviora, ad 1/2-connata. *Petala* oblanceolata, acuta, discreta, glabra. *Legumina* linearia, inter semina leviter constricta circa 4 cm longa et 2.5 mm lata, erecta, leviter curvata glabra resinosa. *Semina* longitudinalia oblonga 3-4 mm longa, 1.5-1.8 mm lata nitida brunneo-nigra, pleurogramma seminibus dimidia breviora, arillo terminali, truncato-conico.

*Typus*: gorge of the Fitzgerald River, Western Australia, 23 September 1948, C.A. Gardner 9230 (*holo*: PERTH; *iso*: CANB, K, PERTH).

Bushy, dense *shrubs* 0.25-2 m tall with slender, glabrous, papulose branchlets. *Stipules* persistent, narrowly triangular, minute, glabrous. *Phyllodes* terete, deeply 8-sulcate, 2-6 cm long, 0.7-1 mm diam., coriaceous, ascending to erect, slightly incurved, glabrous, papulose on strongly raised inter-nerve intervals, drying dark-coloured; apex acute and apiculate, subpungent; pulvinus cylindric, 1-1.5 mm long; nerves 8 or 9, deeply impressed; gland indistinct, small, 3.5-11.5 mm from base of blade. *Peduncles* 2 per node, 3.5-5 mm long, glabrous; basal peduncular bracts caducous after anthesis, widely elliptic or ovate, more or less rostrate, glabrous, cucullate; heads globular or oblongoid, 2.5-3.5 mm long, 2.5-3 mm diam., 10-20-flowered; bracteoles linear to fusiform, acute, slightly puberulous. *Flowers* 5-merous. *Sepals* 1/2 as long as petals, to 1/2-united, oblong, obtuse, minutely puberulous. *Petals* oblanceolate, acute, free, glabrous. *Ovary* papillate-puberulous. *Pods* linear, raised over and slightly constricted between seeds on one margin, c. 4 cm long and 2.5 mm wide, erect, thin-coriaceous, slightly curved, glabrous, resinous, dark-brown with strong marginal nerves. *Seeds* longitudinally arranged in pods, oblong, 3-4 mm long, 1.5-1.8 mm wide, 1-1.3 mm thick, glossy, dark brown-black; pleurogram U-shaped; areole c. 1/2 as long as seed; aril terminal, conical with truncate tip, 1/3-1/2 length of seed, white.

*Other specimens examined*. WESTERN AUSTRALIA: Fitzgerald River, C.A. Gardner 9239 (MEL, PERTH); 6 km NW of Boxwood Hill, K. Newbey 4291 (PERTH); 6 km N of Boxwood Hill, K. Newbey 4621 (CANB, PERTH).

*Distribution*. Known from only two localities, one in the Fitzgerald River National Park, the other near Boxwood Hill, southwest Western Australia.

*Habitat*. *Eucalyptus occidentalis* woodland on spongolitic loam.

*Flowering and fruiting periods*. Flowers August through September; mature fruits with seeds collected late November to early December.

*Affinities*. *Acacia papulosa* is very similar superficially to the typical variety of *A. eremophila* in its deeply sulcate phyllodes with the inter-nerve spaces strongly raised and papulose by strongly raised stomata. *Acacia eremophila*, however, has pubescent branchlets, straight, more or less uncinat-



tipped phyllodes, heads 3-4 mm in diameter, spatulate bracteoles, shorter, hairy peduncles, non-resinous pods, elliptic to oblong-ovate seeds and it grows in loam or sand.

*Discussion.* C.A. Gardner's two collections of the species, as nearly as we can decipher his notes in his fieldbook (in the PERTH library archives), were made along the Fitzgerald River from the crossing of Colletts Road north about 6.5 km. That there have only been two collections in the Fitzgerald River National Park is surprising in view of relatively thorough collecting in the area over the past decade, especially by K. Newbey who made two collections from a second population near Boxwood Hill.

*Conservation status.* A Priority 2 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The specific epithet is based on the conspicuous papulose surface of the branchlets and the inter-nerve spaces on the phyllodes (from *papulosus*, Latin for pustulate or pimply).

### 8. *Acacia undosa* R.S. Cowan & Maslin, sp. nov.

*Frutex* densus tholiformis vel obconicus 0.3-1.5 m altus, ramulis tomentulosis et cum micro-piliis nigris. *Stipulae* persistentes, subulatae ad subulato-triangularis, 0.6-2 mm longae. *Phyllodia* linearia ad lineari-oblancheolata, 20-45 mm longa, 1-4 mm lata, oblique mucronata, innocua ad grosse pungentia, raro acute pungentia, rigida, patentia, recta ad leviter incurvata, glabra, saepe 2-glandulosa, nervis omnino circa 20, arcte parallelis, stomatibus valde elevatis. *Pedunculi* binati, 1-1.5 mm longi, glabri; pedunculorum bracteae basales ovatae, cucullatae, rostratae, 1.5-3.5 mm longae, villosae et ciliolatae; capitula globularia, 3-3.5 mm diametro, 18-20-floribus. *Flores* pentameri; sepala discreta vel 1/2-connata. *Legumina* linearia, valde undulata, 10-40 mm longa, 2.5 mm lata, papillata. *Semina* longitudinalia, elliptico-oblonga ad late oblongo-elliptica, 2.2-2.7 mm longa, 1.2-1.8 mm lata, atro-brunnea.

*Typus:* 0.5 km S of Belka Siding (between Bruce Rock and Merredin), Western Australia, 14 December 1971, B.R. Maslin 2361 (*holo:* PERTH 00191450; *iso:* CANB, K, NSW).

Dense, domed or obconic *shrubs* 0.3-1.5 m tall and spreading to about the same across. *Branchlets* tomentulose, the very short hairs curved to crisped and with black micro-hairlets intermixed. *Stipules* persistent, subulate to subulate-triangular, 0.6-2 mm long. *Phyllodes* linear to linear-oblancheolate, 20-45 mm long, 1-4 mm wide, rigid, spreading, straight to shallowly incurved, dull green, glabrous except for tomentulose pulvinus; apex obliquely mucronate to sub-uncinate with a hard, innocuous to coarsely pungent point, rarely with a straight, sharply pungent point; pulvinus 1-2 mm long; nerves c. 9 per face, 20 in all, closely parallel with very occasional anastomoses, plane or slightly impressed, the inter-nerve spaces with strongly raised stomata; glands not prominent, 1 or 2, one at or near middle of phyllodes and the other on upper half of phyllode. *Peduncles* 2 per axil, 1-1.5 mm long, glabrous; basal peduncular bract ovate, cucullate, rostrate, 1.5-3.5 mm long, villose and ciliate; heads globular, showy, golden, 3-3.5 mm diam., 18-20-flowered; bracteoles oblancheolate to linear-oblancheolate, ciliate. *Flowers* 5-merous. *Sepals* linear to oblong, free or to half-united, puberulous at apex. *Pods* linear, strongly undulate, 10-40 mm long, 2.5 mm wide, papillate, the marginal nerve distinct, much lighter in colour. Seeds longitudinally arranged in pods, elliptic-oblong to broadly oblong-elliptic, 2.2-2.7 mm long, 1.2-1.8 mm wide, dark brown, the aril terminal.

*Selected specimens examined.* WESTERN AUSTRALIA: Survey Camp N of Warralackin, *J.S. Beard* 4735 (PERTH); c. 0.25 miles [0.4 km] S of Belka Siding (between Merredin and Bruce Rock), *B.R. Maslin* 1768 (AD, BRI, MO, PERTH); 1.5 km S of Tammin, *B.R. Maslin* 2314 (PERTH); 21 km E of Lake Grace, *B.R. Maslin* 6353 (PERTH, Z); 36 km E of Lake King, *K. Newbey* 9476-1 (MEL, MELU, PERTH); 45 km E of Pingrup (Lake Magenta Nature Reserve), *K. Newbey* 11734 (PERTH); 20 miles [32 km] W of Newdegate, *S. Paust* 842 (PERTH); 35 km S of Hyden towards Newdegate (at Pingaring-Mount Varley road intersection), *R. Perry* 545 (PERTH).

*Distribution.* Known only from scattered localities from near Tammin and Bruce Rock south to Lake Grace and southeast to near Lake King (which is c. 115 km east of Lake Grace), southwest Western Australia.

*Habitat.* Commonly in patches of open mallee shrubland in well-drained clayey sand or in moist brown loam.

*Flowering and fruiting periods.* Flowers in August-September; pods with mature seeds have been collected in December.

*Variation.* Several collections from near Tammin to c. 110 km northeast at Warralakin (e.g., *K. Newbey* 1948 - PERTH) have half-united sepals but otherwise are referable to this species.

*Affinities.* The new species is similar in several characteristics to *A. hadrophylla* R.S. Cowan & Maslin (see above under *A. hadrophylla* for discussion). Specimens with very narrow phyllodes sometimes resemble the flat-phyllode variants of *A. densiflora* but that species has tomentulose peduncles and non-undulate pods.

*Conservation status.* A Priority 3 taxon in the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The specific epithet refers to the undulate pods, from *undosus*, Latin for billowy or with many waves.

### The "*Acacia ancistrophylla* Group"

Members of this "Group" can be distinguished by a combination of characters. The phyllodes are straight to sigmoidally curved and linear to linear-oblong with numerous, closely parallel, immersed to strongly discrete, non-anastomosing nerves, with one basal or sub-basal gland; new growth is sometimes densely beset with minute red-brown resin-hairs. The flowers are 5-merous with the sepals free to half-united. Pods are linear or narrowly oblong and straight to curved or coiled, often more or less constricted between the longitudinally or obliquely oriented, elliptic to oblong seeds which generally have a relatively large terminal or sub-terminal white aril.

Taxa attributed to this Group include the following: *A. amyctica* R.S. Cowan & Maslin sp. nov., *A. ancistrophylla* C.R.P. Andrews var. *ancistrophylla*, *A. ancistrophylla* var. *lissophylla* (J.M. Black) R.S. Cowan & Maslin, *A. ancistrophylla* var. *perarcuata* R.S. Cowan & Maslin var. nov. and *A. whibleyana* R.S. Cowan & Maslin sp. nov.

The "Group" is closely related to the "*A. enervia* Group" whose members lack the red-brown resin-hairs so common in the "*A. ancistrophylla* Group", as well as having longer pods.

### Key to taxa of "*A. ancistrophylla* Group"

1. Flowering peduncles 6-15 mm long; pods narrowly oblong, 5-7 mm wide; seeds oblique in pods; phyllodes 2.5-8 mm wide.  
South Australia ..... 3. *A. whibleyana*
1. Flowering peduncles 1.5-7 mm long; pods linear, 2-3 mm wide; seeds longitudinal in pods; phyllodes 1-5 mm wide.  
Western Australia (except *A. ancistrophylla* var. *lissophylla*)
  2. Phyllode tip sharply to coarsely pungent, the nerves strong, discrete and paler than inter-nerve spaces ..... 1. *A. amyctica*
  2. Phyllode tip not pungent, the nerves obscure to  $\pm$  evident, not paler than inter-nerve spaces
    3. Pods strongly arcuate to openly once-coiled; phyllode tip rounded with a minute mucro ..... 2c. *A. ancistrophylla* var. *perarcuata*
    3. Pods straight to shallowly curved; phyllode tip acute to subacute
      4. Phyllodes (7)10-20 times longer than wide; pods glabrous. Mostly South Australia, infrequent in Western Australia and northwest Victoria ..... 2b. *A. ancistrophylla* var. *lissophylla*
      4. Phyllodes mostly 3-8 times longer than wide; pods  $\pm$  appressed-puberulous. Western Australia ..... 2a. *A. ancistrophylla* var. *ancistrophylla*

#### 1. *Acacia amyctica* R.S. Cowan & Maslin, sp. nov.

*Frutex* obconicus 0.7-1.5 m altus, corona aperte ramosa, 1-1.5 m diametro, ramulis leviter angulatis sparse vel parce appresso-puberulis. *Stipulae* caducae. *Phyllodia* anguste oblanceolata ad elliptico-oblanceolata, acuta vel sub-obtusa, mucronata, grosse ad acute pungentia, versus basem angustata ad pulvinum 0.5-1 mm longum, laminis 15-25 mm longis, 2.5-4 mm latis, ratione horum 3.5-7, rigidis, ascenditibus ad erectis, rectis ad leviter curvatis, glabris, obscure medio-viridibus; nervi numerosi, arcte paralleli, valde discreti, pallidiores quam spatiis internervis, stomatibus distinctis, plus minusve elevatis, glande una, parva, inconspicua, basali. *Pedunculi* binati in quoque axilla, 4-7 mm longi, plus minusve appresso-puberuli vel glabri. *Capitula* globularia, aurea, 3-3.5 mm diametro, 18-25-floribus, bracteolis obovatis ad spathulatis, ciliolatis. *Flores* 5-meri, *sepalis* longitudine 1/3 petali aequantia, discretis oblongo-spathulatis ciliolatis, *petalis* discretis glabris. *Ovarium* albo-appresso-puberulum. *Legumina* (immatura et valvis apertis) linearia, inter semina non constricta, ad 6 cm longa, 3 mm lata, firme chartacea, valde curvata, glabra, marginibus pallidioribus. *Semina* longitudinalia, non visa.

*Typus*: 1 km N of Salmon Gums on Coolgardie-Esperance Highway, Western Australia, 25 September 1983, B.R. Maslin 5448 (*holo*: PERTH 00700517; *iso*: MO, NY, distributed as *Acacia ancistrophylla*).

Obconic *shrubs* 0.7-1.5 m tall with openly branching crown 1-1.5 m diam. *Bark* smooth, light grey. *Branchlets* slightly ribbed,  $\pm$  appressed-puberulous. New shoots appressed-puberulous. *Stipules*

caducous. *Phyllodes* narrowly oblanceolate to elliptic-oblanceolate, 15-25 mm long, 2.5-4 mm wide, l:w = 3.5-7, rigid, ascending to erect, straight to slightly curved, glabrous, dull medium-green; apex acute or sub-obtuse, mucronate, sharply to coarsely pungent; pulvinus 0.5-1 mm long; nerves numerous, closely parallel, strong, discrete and paler than inter-nerve spaces; stomata distinct, raised; gland single, small, inconspicuous, located on adaxial margin at base of blade. *Peduncles* paired in each axil, 4-7 mm long, more or less appressed-puberulous or glabrous; basal peduncular bract  $\pm$  semicircular, concave, appressed-puberulous, persistent to anthesis; heads globular, golden, 3-3.5 mm diam., 18-25-flowered; bracteoles obovate to  $\pm$  spatulate, ciliolate. *Flowers* 5-merous. *Sepals* 1/3 as long as petals, free or rarely connate basally, oblong-spathulate, ciliolate. *Petals* free, glabrous. *Ovary* white appressed-puberulous. *Pods* (immature, also dehiscent valves) linear, not constricted between seeds, to 6 cm long, 3 mm wide, firmly chartaceous, strongly curved to openly 1-1 1/2-coiled, glabrous, red-brown, the margins paler. *Seeds* longitudinally arranged in pods, not seen.

*Other specimens examined.* WESTERN AUSTRALIA: 24.75 km W of Grass Patch, 23.4 km W of Norseman-Esperance Highway on Grass Patch road, M.A. Burgman 1885 and S. McNee (PERTH); 11.5 km N of Salmon Gums towards Norseman, B.R. Maslin 2456 (CANB, PERTH); 4 km S of Peak Eleanor, Peak Charles National Park, c. 45 km W of Salmon Gums, K. Newbey 6340 (PERTH); 15 km E of Dunn Swamp, c. 80 km NE of Ravensthorpe, K. Newbey 8132 (PERTH); 95 km S of Norseman, N. Perry 687 (PERTH).

*Distribution.* Most collections are from the Salmon Gums-Grass Patch area (between Norseman and Esperance) but also further west from Peak Charles National Park (c. 50 km west of Salmon Gums) and near Dunn Swamp (c. 80 km northeast of Ravensthorpe), southwest Western Australia.

*Habitat.* Frequent on well-drained loam in flatlands in low woodland of *Eucalyptus gardneri* or *E. flocktoniae*; also on sandy clay in open mallee shrubland.

*Flowering and fruiting periods.* Flowers about August to September; immature pods in November, maturing about December.

*Affinities.* *Acacia amyctica* differs from other members of the "*A. ancistrophylla* Group" in its sharply to coarsely pungent phyllodes with the nerves strong, discrete and paler than inter-nerve spaces. It resembles *A. whibleyana* in its pungent phyllodes but that species, in addition to being well-separated geographically (endemic in South Australia), has wider pods in which the seeds are arranged obliquely, and phyllodes with immersed nerves and obscure stomata. A more distant relative is *A. lineolata* subsp. *multilineata* which has persistent stipules, phyllodes about ten times longer than wide with 1-3 supra-basal glands, larger heads, linear bracteoles and straight to slightly curved pods. There is also a superficial resemblance to *A. hadrophylla* R.S. Cowan & Maslin (see "*A. densiflora* Group" above).

*Conservation status.* A Priority 2 taxon in the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The specific epithet is in allusion to the pungent phyllodes, a character separating it from its nearest relatives, from *amycticus*, Latin for sharp, pungent.

## 2. *Acacia ancistrophylla* C.R.P. Andrews, J. Western Australia Nat. Hist. Soc. 1: 40 (1904)

*Typus*: near Dundas, Western Australia, October 1903, Herb. Cecil Andrews (*holo*: NSW, *fide* Maslin & Cowan 1994; *iso*: K, NSW, PERTH 00739995, 00740403 and 00740411).

Dense, rounded or flat-crowned *shrubs* 0.6-2.5 m tall, spreading 3-6 m diam, rarely obconic, small trees 1.3-1.6 m tall. *Bark* grey, smooth or fissured at base of main stems. *Branchlets* angled or terete or scarcely ribbed, sometimes glabrous but usually more or less appressed-puberulous and soon glabrescent. New shoots bronzy-green, sparingly to densely invested with minute, red-brown resin-hairs. *Stipules* caducous. *Phyllodes* oblanceolate, narrowly oblanceolate, oblong-oblanceolate, linear or linear-oblanceolate, 12-48 mm long, (1)1.5-5 mm wide, l:w = 3-20, coriaceous to rigid-coriaceous, patent to erect, straight to slightly curved, glabrous, normally green; apex straight to uncinately, acute, mucronate, sometimes rounded-obtuse with blunt mucro or apiculum; nerves numerous, closely parallel, obscure to  $\pm$  distinct but then concolorous with the inter-nerve spaces; stomata distinct to obscure; gland single, at or near base of blade. *Peduncles* 2 per node, 1.5-5.5 mm long, glabrous or appressed-puberulous with few to many red resin-hairs as well as white or grey non-resinous hairs; basal peduncular bract rounded, concave, appressed-puberulous; heads globular, mid- to dark-golden, 6-7 mm diam (fresh), 3-4 mm diam. (dry), 11-23-flowered; bracteoles obovate, puberulous with red resin-hairs. *Flowers* mostly 5-merous with some 4-merous ones intermixed. *Sepals* 1/4-1/2 as long as petals, free or rarely connate basally, oblong, obtuse or truncate, apex with red resin-hairs. *Petals* free, glabrous. *Ovary* papillose, puberulous or appressed-puberulous. *Pods* linear, somewhat irregularly raised over seeds, slightly constricted or not between seeds, to 4 cm long and 2.5-3 mm wide, chartaceous to thinly coriaceous, straight to strongly curved or openly once-coiled, appressed-puberulous with many red resin-hairs, sometimes also with appressed white hairs, or glabrous, brown, the margins obscure. *Seeds* longitudinally arranged in pods, oblong or widely elliptic, 3-3.5 mm long, 1-2.2 mm wide, 1 mm thick, dull tan or dark brown; pleurogram narrowly U-shaped; areole small, c. 1/6 as long as seed; aril terminal, conical, 1/2 or more as long as seed or a small, sub-terminal, closely appressed, thin plate of tissue, white or cream.

*Distribution*. Widespread in southwest Western Australia, with one variety, var. *lissophylla*, extending to southern South Australia and northwest Victoria.

*Affinities*. Within its group, *A. ancistrophylla* is nearest *A. whibleyana* which has longer, glabrous peduncles and broader pods with obliquely oriented seeds. *Acacia whibleyana* and *A. ancistrophylla* var. *lissophylla* are the only members of the "*A. ancistrophylla* Group" occurring outside W.A. *Acacia ancistrophylla* is also related to *A. lineolata* Benth. (see "*A. enervia* Group" below) which has phyllodes with one to three, mostly more than one, gland along the adaxial margin.

The differences among the three varieties comprising the species are subtle and difficult to express: var. *ancistrophylla* has straight or slightly curved, puberulous pods and its phyllodes have the tip often curved to uncinately; it is most similar to var. *perarcuata* which has rounded, obtuse phyllodes with a short mucro or apiculum and  $\pm$  coiled pods. The typical variety is also quite similar to *A. amyctica* which has sharply to coarsely pungent phyllodes. Variety *lissophylla* differs from the other varieties by its phyllode proportions, glabrous pods and seed shape.

*Discussion*. In the protologue, Andrews appears confused regarding whether the flowers are 4-merous or 5-merous but examination of representative specimens explains the apparent confusion, for the flowers vary in number of parts. Although they are mostly 5-merous, one specimen has been noted with a preponderance of 4-merous flowers (see under variety *ancistrophylla*).

**2a. *Acacia ancistrophylla* C.R.P. Andrews var. *ancistrophylla***

*Shrubs* 0.6-2.5 m tall, spreading to 3 m diam. *Bark* grey, smooth throughout. New shoots densely covered with red-brown resin-hairs. *Phyllodes* oblanceolate to oblong-oblanceolate, 12-25(40) mm long, 2.5-4.5 mm wide, l:w = 3-8(15), ascending, straight; apex acute, curved to uncinata, mucronate; nerves obscure; stomata obscure. *Peduncles* 2-4 mm long; heads 15-23-flowered. *Sepals* c. 1/2 as long as petals, free. *Pods* 2.5 mm wide, straight to shallowly curved, puberulous. *Seeds* oblong, 3-3.5 mm long, 1-1.8 mm wide, dull tan, the aril conical, terminal, 1/2 or more as long as seed, white.

*Selected specimens examined.* WESTERN AUSTRALIA: near Coolgardie, September 1920, C.A. Gardner s.n. (PERTH 00700436); 12.7 km W of Newdegate, J.W. Green 4464 (PERTH); Cowcowing, M. Koch 1034 (PERTH); 10 km E of Kulja towards Mollerin, B.R. Maslin 4446 (PERTH); 62.5 km by road S of Queen Victoria Rock, B.R. Maslin 5414 (PERTH); 46 km S of Duri, c. 92 km SE of Southern Cross, K. Newbey 6078 (AD, PERTH); on Cundelee [1: 250 000] map sheet at 651178, B. Severne 74145 (PERTH).

*Distribution.* Scattered from Wubin (c. 22 km north of Dalwallinu) and Newdegate (c. 50 km east of Lake Grace) east to Cundelee Mission (c. 200 km east of Kalgoorlie) and near Salmon Gums, southwest Western Australia.

*Habitat.* Common to very common in woodland and mallee communities (*Eucalyptus erythronema*, *E. sheathiana*, *E. salubris*, *E. diptera*, *E. salmonophloia*) on flats, hillsides and ridges in loam, clay or sandy clay.

*Flowering and fruiting periods.* Flowers in August-September; pods with mature seeds have been collected in December and January.

*Variation.* One collection (N. Perry 548 from Pingaring) has more or less pungent phyllode tips, similar to those of *A. amyctica*, but the nerves are obscure as in var. *ancistrophylla*. The J.W. Green collection cited above has strongly curved phyllodes, some even sigmoidally curved, and a higher proportion of 4-merous flowers than is typical. The Koch collection cited has glabrous peduncles that are longer than usual.

*Conservation status.* Not under threat.

**2b. *Acacia ancistrophylla* var. *lissophylla* (J.M. Black) R.S. Cowan & Maslin in Whibley & Symon, Acac. S. Australia, 206 (1992).**

*Basionym.* *Acacia sclerophylla* Lindley var. *lissophylla* J.M. Black, Trans. & Proc. Roy. Soc. South Australia 47: 369 (1923). *Lectotype* (here selected): Muloowortie, near Pine Point, E coast of Yorke Peninsula, South Australia, R. Tate s.n. (AD 97422173, flowering branchlet on left with slip-on tag; iso: PERTH 00962813-fragment ex AD). *Paralectotype*: (1) Muloowortie, near Pine Point, Yorke Peninsula, November 1879, J.G.O. Tepper s.n. (AD 97830007); (2) Yorke Peninsula, Ardrossan, 1880, Herb. Tate (AD 97426161); Yorke Peninsula, Herb. J.M. Black s.n. (AD 96820232); (3) Yorke Peninsula, Ardrossan, September 1880, J.G.O. Tepper s.n. (AD 97324140).

[*A. lineolata* auct. non Benth.; A.B. Court in J.H. Willis, Handb. Pl. Victoria 2: 237 (1973).]

*Shrubs* 1-3 m tall, spreading to 5 m diam. *Branchlets* angled, glabrous or sparsely appressed-puberulous and soon glabrescent. New growth only sparingly invested with red resin-hairs. *Phyllodes* linear or linear-oblongate, (10)15-48 mm long, (1)1.5-3.5(4) mm wide, l:w = (7)10-20, patent to erect, straight to slightly curved; apex curved, acute; nerves and stomata more or less distinct. *Peduncles* 2-5.5 mm long, appressed-puberulous with mixture of red resin-hairs and white non-resin hairs; heads 11-18-flowered. *Sepals* 1/4-1/3 as long as petals, free or rarely connate basally. *Pods* linear, raised over and slightly constricted between seeds, to 3 mm wide, straight to shallowly curved, glabrous. *Seeds* widely elliptic, 3 mm long, 2.2 mm wide, dark-brown, the aril sub-terminal, cream-coloured, consisting of a thin plate of tissue closely appressed to seed.

*Selected specimens examined.* WESTERN AUSTRALIA: 28 km SW of Balladonia Hotel, Dundas Nature Reserve, K. Newbey 11745 (PERTH).

SOUTH AUSTRALIA: 15 miles [24 km] from Poochera towards Minnipa on Eyre Highway, E.M. Canning WA/68 2267 (PERTH); c. 20 km E of Minnipa, N.N. Donner 2501 (PERTH); 40.7 km W of Kyancutta towards Ceduna on Eyre Highway, N. Hall H80/62 (BRI, PERTH); 18 miles [28.8 km] SE of Ceduna on Flinders Highway, 23 August 1974, H. Henderson s.n. (PERTH 00694711); c. 24 km due E of Kadina, B.R. Maslin 4525 (CANB, MEL, NSW, PERTH); c. 24 km E of Kimba on Eyre Highway, A.E. Orchard 2345 (PERTH); c. 10 km NE of Port Neill on Lincoln Highway, D.J.E. Whibley 1977 (K, PERTH). VICTORIA: Goschen area, 14 September 1989, T. Langdon s.n. (MEL 118318); Rosebery, September 1913, D.C. Trainor s.n. (MEL 1500550).

*Distribution.* Western Australia, South Australia and Victoria: known by three collections from Western Australia, from near Balladonia, Kalannie and from between Lake Grace and Newdegate; in South Australia scattered from Ceduna on western Eyre Peninsula east to Pine Point on the Yorke Peninsula; and in Victoria by two collections from the north-western region. We have not seen specimens from the Murray region of South Australia, although Whibley (1980) recorded *A. sclerophylla* var. *lissophylla*, the basionym, from this area. A.B. Court (1973: 237) recorded *A. lineolata* Benth. as occurring in Victoria but this apparently referred to the present taxon.

*Habitat.* Grows mostly on flats in sandy loam over limestone usually in mallee communities.

*Flowering and fruiting periods.* Flowers from August to October; pods with mature seeds have been collected in September and November. None of the Western Australian collections are fruiting and only very few of those from South Australia; additional fruiting material would be valuable.

*Authorship of the name.* During the course of David Symon's revision of Whibley's (1980) *Acacia* handbook, we supplied him with our notes on several taxa, as he acknowledges. At the time, our manuscript of the present paper which incorporated the above combination was in press and the relevant pages were sent to Symon. Unfortunately, publication of our paper was delayed but Symon attributed the combination to us, acknowledged the source, and indicated the combination was "in press". Consequently, "in" is the correct connecting word, as seems clear from Art. 46.2, Note 1 of the Code (Greuter *et al.* 1994).

*Typification.* The author responsible for the basionym failed to cite any collections in the protologue, only remarking that it was from the Yorke Peninsula. There are several sheets at AD of this variety but the one chosen as lectotype best fits the protologue morphologically and geographically and also is annotated by Black on a small slip-on label as "*sclerophylla* Lindley var. *lissophylla*". On another AD sheet (97830007) there are two other branchlets, one in flower, the other in fruit from the type

locality, collected by J.G.O. Tepper; at least the flowering branchlet is considered part of the original material but the fruiting one may not have been, since Black did not mention pods in the protologue.

*Discussion.* Variety *lissophylla* is transferred from *A. sclerophylla* where it was certainly misplaced; although that species is related to *A. ancistrophylla*, it is very distinct in its phyllode nervature (i.e. 3 nerves per face) and its resinous, usually pustulate, branchlet tips. The distinctions between this variety and the typical one are inconclusive and further investigation of these taxa is needed to resolve their status.

*Variation.* The Henderson collection cited above, as well as another South Australian collection (*M.H. Simmons* 1756 from the Gawler Range area), has the widest phyllodes in the variety. The Whibley collection cited has almost sessile flower-heads

*Conservation status.* Widely ranging but poorly known; 3K, using the criteria of Briggs & Leigh (1988).

## 2c. *Acacia ancistrophylla* var. *perarcuata* R.S. Cowan & Maslin, var. nov.

A var. *ancistrophylla frutice* 0.6-1.6 m altis et ad 6 m expansis, *phyllodiis* rotundatis *obtusis* mucronatis vel apiculatis 12-23 mm longis, 2.5-5 mm latis, ratione horum 3-7, ascendentibus, nervis stomatatisque obscuris ad plus minusve infirme manifestis, capitulis 11-15-floribus, *sepalis* discretis, *leguminibus* valde curvatis ad aperte 1-spiralibus, plus minusve appresso-puberulis, arillo albo, terminali, conico, longitudine seminis 1/2 superanti differt.

*Typus:* c. 3.5 miles [5.6 km] NNW of Korbel towards Hines Hill, Western Australia, 3 August 1971, *B.R. Maslin* 1758 (*holo:* PERTH 00700940; *iso:* CANB, K, NY).

Rounded or obconic *shrubs* 0.6-1.6 m tall, spreading to 6 m across. New growth densely covered with red-brown resin-hairs. *Phyllodes* oblanceolate to narrowly oblanceolate, rounded, obtuse, with blunt, very short mucro, 12-23 mm long, 2.5-5 mm wide, 3-7 times longer than wide, ascending; nerves and stomata obscure to more or less weakly evident. *Peduncles* 1-3 mm long, somewhat appressed-puberulous with red resin-hairs; heads 11-15-flowered. *Sepals* c. 1/3 as long as petals, free. *Pods* (sub-mature) not constricted between seeds, strongly arcuate to openly once-coiled, somewhat appressed-puberulous with many red resin-hairs and/or white ones. *Seeds* (sub-mature) with conical, terminal, white aril, 1/2 or more as long as seed.

*Selected specimens examined.* WESTERN AUSTRALIA: Walgoolan, *J.S. Beard* 6193 (PERTH); 39.4 km from Moorine Rock towards Perth along Great Eastern Highway, *E.M. Canning* WA/68 2731 (PERTH); 40 km south of Norseman, *P.E. Conrick* 1705 (PERTH); Carrabin, *R. Coveny* 8351 and *B. Haberley* (NSW, PERTH); 12.3 km E of Wyalkatchem towards Trayning, *R.J. Cumming* 2251 (MELU, PERTH); Mukinbudin, *C.A. Gardner s.n.* (PERTH 700428); c. 9 miles [14.4 km] due NE of Bruce Rock, *B.R. Maslin* 1813 (AD, BRI, PERTH) and 2374 (PERTH); 10 km due SE of Hines Hill, *B.R. Maslin* 6472 (PERTH); 7 km N of Mount Andrew, c. 116 km SE of Norseman, *K. Newbey* 7777 (MEL, PERTH); 5.9 km SE of Bruce Rock on main road to Narembeen, *M.D. Tindale* 3738 (NSW, PERTH).

*Distribution.* Occurring mostly within a radius of about 50-70 km from Merredin, namely, Mukinbudin south to Bruce Rock and southeast to Carrabin with three outliers, two of which are from



35-40 km south of Norseman and one near Mt Andrew which is c. 116 km southeast of Norseman, southwest Western Australia.

*Habitat.* In low *Eucalyptus* (*E. salmonophloia*, *E. salubris*, *E. diptera*, *E. eremophila*) woodland on red sand, clayey loam and loam.

*Flowering and fruiting periods.* Flowers from August to September; pods with nearly mature seeds have been collected in December. Mature pods and seeds are needed, especially from the Norseman area, to confirm the distribution given above, since some of the specimens are assigned here largely on the basis of phyllode characters.

*Conservation status.* A Priority 3 taxon in the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The varietal epithet refers to the strongly arcuate pods, from *per*, Latin prefix denoting an extreme condition and *arcuatus*, Latin for curved.

### 3. *Acacia whibleyana* R.S. Cowan & Maslin, sp. nov.

*Frutex* densus 1-2.5 m altus, 2.5-4 m diametro expansus, ramulis initio angularibus demum teretibus glabris, foliorum cicatricibus elevatis ornatis: *Stipulae* non visae. *Phyllodia* elliptica ad oblanceolata, plus minusve inaequilateralia, ad apicem arcuata ad rostriformia, aliquando recta, apiculata, pulvino 0.5 mm longo, laminis 9-30 mm longis, 2.5-8 mm latis, rigidis, crassis, vulgo rectis sed interdum leviter curvatis, glabris, nervis numerosis, arcte parallelis tenuibus, immersis, glande inconspicua, laminarum prope basem. *Pedunculi* 2 in quoque axilla, 6-15 mm longi, glabri; capitula globularia, aurea, 2.5-5 mm diametro, 18-19-floribus, bracteolis plus minusve spathulatis, ciliatis. *Flores* 5-meri. *Sepala* 1/3-1/2 petalis breviora, discreta, oblongo-oblanceolata. *Petala* elliptica, discreta, glabra, patentia. *Legumina* anguste oblonga, ad 4.5 cm longa, 5-7 mm lata, coriacea, plus minusve undulata et arcuata ad circinnata, glabra, apiculata. *Semina* obliqua, 2.5-3 mm longa, 2-2.2 mm lata, 1.2 mm crassitie, sub-nitida, atrate brunneo-nigra; areola elevata, arillo magno, terminali, funiculi 2-plicatum formata.

*Typus:* Eyre Peninsula [precise locality withheld for conservation reasons], South Australia, 3 December 1965, C.R. Alcock 831 (*holo:* PERTH 00721786; *iso:* AD, CANB, K).

Dense *shrubs* 1-2.5 m tall, spreading 2.5-4 m diam. *Branchlets* angular at first but soon terete, glabrous, with raised, prominent old phyllode-scars. *Stipules* not seen. *Phyllodes* elliptic to oblanceolate, more or less inequilateral, 9-30 mm long, 2.5-8 mm wide, 2-4.5 times longer than wide, rigid, thick, ascending, mostly straight, occasionally slightly curved, glabrous, dull mid-green; apex curved to rostriform or occasionally straight, apiculate; pulvinus 0.5 mm long; nerves numerous, closely parallel, fine, immersed, anastomoses infrequent; gland small, inconspicuous, near base of blade. *Peduncles* 2 per node, 6-15 mm long, glabrous, slender; basal peduncular bracts persistent until about anthesis, ± semicircular, ciliolate; heads globular, bright golden, 2.5-5 mm diam., 18-19-flowered; bracteoles spathulate with the blade ciliate. *Flowers* 5-merous. *Sepals* 1/3-1/2 petal length, free, oblong-oblanceolate. *Petals* elliptic, free, glabrous, spreading. *Ovary* minutely puberulous. *Pods* narrowly oblong, slightly raised over but not constricted between seeds, to 4.5 cm long, 5-7 mm wide, coriaceous, slightly undulate, shallowly to markedly curved, sometimes circinnate, smooth, glabrous, apiculate, the margins somewhat thickened. *Seeds* obliquely arranged

in pods, widely elliptic, 2.5-3 mm long, 2-2.2 mm wide, 1.2 mm thick, sub-glossy, dark brown-black; pleurogram U-shaped; areole raised; aril large, formed by two terminal loops of fleshy funicle.

*Other specimens examined.* SOUTH AUSTRALIA: Eyre Peninsula [precise localities withheld for conservation reasons], *B. Copley* 4762, 4916 and 4917 (all AD), *B. Hadlow* BH300 and *A.B. Court* (CBG, PERTH), *M. Jahn s.n.* (CBG 8803933 and PERTH 01048457), *K.B. Warnes* 98 (AD) and *s.n.* (AD 97108520, 97108582 and 97108521).

*Distribution.* Restricted to a near-coastal area south of Tumby Bay on the Eyre Peninsula in South Australia.

*Habitat.* Grows on limestone and loam, sometimes near salt swamps.

*Flowering and fruiting periods.* Flowering in August; pods with mature seeds have been collected in December and January.

*Affinities.* *Acacia whibleyana* is most closely related to *A. ancistrophylla* C.R.P. Andrews (see above) which differs most obviously in having usually appressed-puberulous branchlets that lack raised phyllode scars, shorter peduncles and narrower pods with the seeds arranged longitudinally. Of the three varieties of *A. ancistrophylla*, var. *lissophylla* occurs within the same general region as *A. whibleyana*; in addition to the characters already noted this variety is distinguished from the new species by its generally narrower phyllodes of a different shape. *Acacia amyctica* R.S. Cowan & Maslin from Western Australian (see above) is also related but its phyllodes are coarsely pungent and have distinct, raised nerves that are paler than the inter-nerve spaces, raised stomata, 18-35-flowered heads and pods that are narrower with the seeds arranged longitudinally.

*Conservation status.* 2E (Endangered), using the criteria of Briggs & Leigh (1988). The new species is currently known from less than 50 plants growing on road verges in a very localized area (M. Jusiatis and B. Sorensen, pers. comm.).

*Etymology.* The specific name is given to honour David J.E. Whibley who has made a major contribution to our knowledge of the Wattles in South Australia. His 1980 publication on the subject, as well as the Whibley and Symon revised edition in 1992, is an outstanding example of a true handbook with each species described precisely but succinctly and illustrated with habit-photographs as well as line drawings. We take great pleasure in perpetuating his name and recognizing his contributions in this way.

### The “*Acacia enervia* Group”

The taxa of this “Group” are characterized by terete to flat phyllodes which commonly have the apex acute to short-acuminate and drawn out in a delicate curving tip; the numerous closely parallel nerves vary from obscure to conspicuously raised. The heads are rather small, borne on filiform peduncles, and the flowers are 4- or 5-merous with the perianth parts free or nearly free. The pods are flat and linear.

There are three species, each comprising two subspecies, included in the Group, namely, *A. enervia* Maiden & Blakely subsp. *enervia*, *A. enervia* subsp. *explicata* R.S. Cowan & Maslin subsp. nov.,

*A. inceana* Domin subsp. *inceana*, *A. inceana* subsp. *conformis* R.S. Cowan & Maslin subsp. nov., *A. lineolata* Benth. subsp. *lineolata*, *A. lineolata* subsp. *multilineata* (W. Fitzg.) R.S. Cowan & Maslin, comb. et stat. nov. (this last taxon was formerly referred by us to the "*Acacia multilineata* Group", cf. Cowan & Maslin 1990)

This informal Group is closely allied to the "*A. ancistrophylla* Group" whose members differ in having new growth, branchlets and other parts, puberulous with white and/or red-brown resin-hairs and much shorter, often curved to coiled pods.

#### Key to Taxa of "*A. enervia* Group"

1. Flowers 4-merous; pods 3-4 mm wide
  2. Phyllodes perfectly terete; pods tan; plants from Kalgoorlie area SE to Binneringie Station (E of 120° 30' long.) ..... 2a. *A. inceana* subsp. *inceana*
  2. Phyllodes sub-terete to flat; pods pale dull brown; plants from Morawa to Kalannie SE to Hines Hill and Boorabbin (W of 120° 30' long.) ..... 2b. *A. inceana* subsp. *conformis*
1. Flowers 5-merous; pods 2-3 mm wide
  3. Phyllode glands (inconspicuous) 0 or 1, when present situated from distal end of pulvinus to 0.5 (1) mm above; seed aril white; nerves of phyllodes weak to obscure
    4. Phyllodes terete to sub-terete, often with pustulate stomata ..... 1a. *A. enervia* subsp. *enervia*
    4. Phyllodes flat, linear to narrowly oblanceolate, stomata not pustulate ..... 1b. *A. enervia* subsp. *explicata*
  3. Phyllode glands (inconspicuous) 1-3 along adaxial margin, the lowermost (3)5-21 mm above pulvinus; seed aril yellow; phyllode nerves distinct, slightly raised
    5. Phyllodes linear to linear-oblanceolate or oblong-elliptic, ± 20 times longer than broad, curved-acute, not pungent; sepals free or to 1/2-united; plants often of saline situations on sandy or stony loam ..... 3a. *A. lineolata* subsp. *lineolata*
    5. Phyllodes oblong-oblanceolate to oblong-elliptic, 10-13 times longer than broad, acute to short-acuminate, coarsely to sharply pungent, rigid-coriaceous; sepals always free; plants of sand plains or on rocky clay ..... 3b. *A. lineolata* subsp. *multilineata*

1. **Acacia enervia** Maiden & Blakely, J. Roy. Soc. Western Australia 13: 8, pl. 8, figs 12-19 (1928)

*Typus*: Hines Hill, Western Australia, 2 October (*sphalm.* "September" in protologue) 1923, M. Koch 2806 (*holo*: NSW 195719; *iso*: K, MEL, PERTH 00969737, 00969729 and 00750484-fragment ex NSW).

Dense, rounded *shrubs*, often becoming obconic, rarely small trees, 0.6-3.5 m tall, spreading 1-3.5 m diam.. *Bark* grey, fibrous, fissured. *Branchlets* slightly angular, glabrous or somewhat appressed-puberulous apically and glabrescent. *Phyllodes* flat and linear to narrowly oblanceolate or

terete, 2-8.5 cm long, 0.8-6 mm wide, inclined to erect, straight, glabrous or more or less appressed-puberulous, glabrescent, pale to dark green; apex acute to short-acuminate, slender and curved; nerves numerous, closely parallel, indistinct to obscure; stomata occasionally somewhat pustulate but indistinct; gland small, inconspicuous, at distal end to 0.5(1) mm above pulvinus or absent. *Peduncles* 1-3 per axil, 2-9 mm long, filiform, sparsely puberulous, appressed-puberulous or glabrous; heads globular, medium to deep golden yellow, 3-5 mm diam., 18-33-flowered; bracteoles obovate to  $\pm$  spatulate, ciliolate. *Flowers* mostly 5-merous, sepals or petals sometimes only 4. *Sepals* 1/2-2/3 petal length, free or sometimes partly coherent but becoming free. *Pods* (sub-mature) linear, somewhat constricted between seeds, to 8.5 cm long, 2-2.5 mm wide, thinly coriaceous, straight or shallowly curved, glabrous. *Seeds* longitudinally arranged in pods, narrowly elliptic to oblong, 3-4 mm long, 1.5 mm wide, black, the aril terminal, white.

*Distribution.* Wide-ranging in southwest Western Australia from near Jibberding (which is c. 50 km northeast of Dalwallinu) southeast to near Lake Grace, and Lake Magenta (c. 80 km east-northeast of Ravensthorpe) east to near Clear Streak Well (which is c. 70 km east-southeast of Norseman).

*Typification.* The label on the holotype in Koch's hand clearly states the date of collection as "2 X 1923" but it was apparently mistakenly transcribed by Maiden and Blakely as September.

*Affinities.* Very near *A. lineolata* Benth. but differing in the number and position of the phyllode glands (one at the distal end or up to 1 mm above the pulvinus in *A. enervia*, one or more along the adaxial margin (3)5-21 mm above the pulvinus in *A. lineolata*) and the prominence of the nervature, as well as in the colour of the aril (white in this species and yellow in *A. lineolata*). *Acacia enervia* subsp. *explicata* and *A. lineolata* subsp. *lineolata* are especially similar and can easily be confused, particularly when they occur sympatrically (for example, on a saline flat about 2 km west of the Wongan Hills: cf. B.R. Maslin 5368, subsp. *explicata* and B.R. Maslin 5369, subsp. *lineolata*).

*Infraspecific taxa.* *Acacia enervia* comprises two subspecies of which the typical one is recognized by its slightly smaller heads and terete phyllodes which often appear micro-pustulate because of the stomata.

#### 1a. *Acacia enervia* Maiden & Blakely subsp. *enervia*

*Phyllodes* terete to sub-terete, 2-6 cm long, 0.8-2 mm wide; nerves obscure; stomata often micro-pustulate. Heads 3-4 mm diam. *Pods* to 8.5 cm long, shallowly curved. *Seeds* oblong.

*Selected specimens examined.* WESTERN AUSTRALIA: Bruce Rock, September 1933, *E.T. Bailey s.n.* (CANB, K, PERTH 00683485 and 00683434); between Corrigin and Quairading, *W.E. Blackall* 3245A (PERTH); 2.2 miles [3.5 km] E of Warralakin towards Bullfinch, *R. Cumming* 2368 (PERTH); c. 5 miles [8 km] due SE of Hines Hill, *B.R. Maslin* 1732 (MEL, PERTH); 8 km N of Southern Cross towards Bullfinch, *B.R. Maslin* 3957 (CANB, K, MEL, NY, PERTH); 3.5 km N of Queen Victoria Rock on road to Coolgardie, *B.R. Maslin* 5406 (CANB, K, MEL, PERTH); 6 km SE of Cave Hill, c. 75 km NW of Norseman, *K. Newbey* 6135 (PERTH); 34 km SW of 90 Mile Tank, Frank Hann National Park, Norseman-Lake King road, *K. Newbey* 6506 (NY, PERTH); 8 km N of Clear Streak Well, c. 70 km ESE of Norseman, *K. Newbey* 7693 (PERTH); just outside Peak Charles parking area, *M.H. Simmons* 312 (PERTH); Kununoppin, 8 February 1911, *F.E. Victor s.n.* (PERTH 00683361).

*Distribution.* Found from Kununoppin (c. 60 km northwest of Merredin) east to near Coolgardie and south to Frank Hann National Park (located 30-110 km east-northeast of Lake King) and near Clear Streak Well (which is c. 70 km east-southeast of Norseman) in southwest Western Australia.

*Habitat.* In sand or loam, rarely clay, in open eucalypt woodland or open mallee scrub.

*Flowering and fruiting periods.* Flowering in September and October with one collection in December; immature pods have been collected in November, December and February.

*Conservation status.* Not under threat.

**1b. *Acacia enervia* subsp. *explicata* R.S. Cowan & Maslin, subsp. nov.**

*Phyllodia* plana, linearia ad anguste oblanceolata, 2.5-8.5 cm longa, 1-6 mm lata; capitula 4-5 mm diametro; *legumina* ad 7 cm longa, saepe leviter curvata; *semina* anguste elliptica vel oblongo-elliptica.

*Typus:* 19 km N of Wongan Hills near Kondut in broad saline "floodway", Western Australia, 30 September 1984, *G. Craig* 1608 (*holo:* PERTH 01469924; *iso:* CANB, PERTH 00697850).

*Phyllodes* flat, linear to narrowly oblanceolate, 2.5-8.5 cm long, 1-6 mm wide; nerves more or less distinct. Heads 4-5 mm diam. *Pods* to 7 cm long, often slightly curved. *Seeds* narrowly elliptic or oblong-elliptic.

*Selected specimens examined.* WESTERN AUSTRALIA: Walyahmoning Rock, *Baynes Museum* 56 (PERTH); Bencubbin, *W.E. Blackall* 832 (PERTH); 12-14 km E of Lake Grace towards Newdegate, *G. Craig* 1512 (PERTH); 9.6 km N of Ballidu towards Pithara, *G. Craig* 1595b (PERTH); 9 km E of Pithara towards Kalannie, *G. Craig* 1599 (K, PERTH); 18.2 km W of Koorda towards Cadoux, *R.J. Cumming* 2311 (PERTH); 1 km N of "Koobabbie" House, Coorow, *A. Doley* 9B (PERTH); 10 km E of Mollerin towards Beacon, *B.R. Maslin* 4140 (PERTH); 4 km W of Wyalkatchem, *B.R. Maslin* 4449 (PERTH, TLF); about 2 km W of Wongan Hills on road to Piawaning, *B.R. Maslin* 5368 (MEL, PERTH); 4 km from Coolgardie on road to Queen Victoria Rock, *B.R. Maslin* 5404 (AD, K, NSW, NY, PERTH); 1 km S of Yellowdine, *K. Newbey* 5985 (PERTH); 1 km S of Ghooli microwave station, c. 20 km E of Southern Cross, *M.H. Simmons* 1220 (PERTH); 21.1 km S of Pingrup turnoff on Newdegate-Lake Magenta road, *M.H. Simmons* 1343 (PERTH).

*Distribution.* Extends from between Jibberding and Whitewells homesteads (c. 50-70 km northeast of Dalwallinu) south to near Lake Grace and east to Coolgardie, common in the Coorow to Wongan Hills region, southwest Western Australia. One collection, *B.R. Maslin* 5801 from 18 km east of the Norseman-Esperance road on Quast Road about 27 km NNE of Salmon Gums (PERTH), is far southeast of the main range of the subspecies and indicates a considerably wider distribution.

*Habitat.* Mostly in saline situations around salt marshes, flats and lakes; occasionally in rocky clay on hills or in sandy loam near saline areas.

*Flowering and fruiting periods.* Flowers from August to October with the main flush apparently in September; pods with mature seeds have been collected in January.

*Conservation status.* Not known to be under threat.

*Etymology.* The name is chosen to refer to the expanded, flattened phyllodes of this taxon, from *explicatus*, Latin for spread out or expanded.

**2. *Acacia inceana*** Domin, Vestn. Kral. Ceske Spolecn. Nauk, Tr. Mat.-Prir. 2: 43 (1923) *Typus*: Western Australia, *W.H. Ince* (*holo*: K; *iso*: NSW, PR 527977-fragment ex K).

*A. inceae* Maiden & Blakely, J. Roy. Soc. Western Australia 13: 8, pl. 5, figs 7-10 (1928), *synon. nov.* *Typus*: Western Australia, *W.H. Ince* (*holo*: K; *iso*: NSW, PR 527977-fragment ex K).

*Shrubs* 1-3 m tall. *Bark* grey, smooth or rough at base. *Stipules* caducous, small indistinct. *Branchlets* terete, glabrous or appressed-puberulous, glabrescent. *Phyllodes* terete to flat, 4-8.5 cm long, *c.* 1-1.5 mm diam. or to 2 mm wide when flat, rather rigid, ascending to erect, straight or slightly curved, glabrous or appressed-puberulous at first, glabrescent except pulvinus, bright- to olive-green; apex fine, curved or rarely straight, brown, innocuous to  $\pm$  pungent; nerves numerous, fine, closely parallel, indistinct; stomata sometimes raised; glands 1 or 2, lowest one 10-15 mm above pulvinus. *Peduncles* 2 per axil, 3-6 mm long, glabrous; heads globular, 3.5-4 mm diam., 10-30-flowered. *Flowers* 4-merous. *Sepals* 1/2 petal-length, free, narrowly oblong to  $\pm$  spatulate or linear-spatulate. *Pods* linear, slightly raised over but not constricted between seeds, 4-8.5 cm long, 3-4 mm wide, thinly coriaceous, straight, glabrous, tan or pale dull brown. *Seeds* (subsp. *conformis*) longitudinally arranged in pods, oblong, 4.5-6 mm long, 2-2.5 mm wide, sub-glossy, dark brown, the aril terminal, white.

*Distribution.* Occurs from near Morawa southeast to Hines Hill (*c.* 20 km southwest of Merredin on Great Eastern Highway) and east to the Kalgoorlie area, southwest Western Australia.

*Typification.* Both Domin's name and that of Maiden & Blakely were based on the same collection at Kew; Domin obtained a fragment during a visit to Kew and Maiden received the collection later on loan for naming. Thus the main collection is at Kew with fragments at Prague and Sydney.

*Affinities.* The species is morphologically similar to *A. enervia* Maiden & Blakely (see above) which has pentamerous flowers and phyllodes with a single gland at the base of the blade (or gland absent). From the limited material available, it appears that the pods differ in width between the two species, wider in *A. inceana*. It comprises two subspecies.

## **2a. *Acacia inceana*** Domin subsp. ***inceana***

*Phyllodes* terete, the tip curved or sometimes straight, pungent to coarsely pungent, 4-8.5 cm long, glabrous; *peduncles* 3-5 mm long; heads 20-30-flowered; *sepals* narrowly oblong; *Pods* 8-8.5 cm long, tan; *seeds* not seen.

*Selected specimens examined.* WESTERN AUSTRALIA: Binneringie Station, *J.S. Beard* 6273 (PERTH); 18 km N of Kalgoorlie on road to Menzies, *B.R. Maslin* 6019 (PERTH); Bulong, 20 miles [32 km] E of Kalgoorlie, *B. Severne* 8744 (PERTH); 3.8 km N on Yarrri Battery road from Yindi junction [*c.* 30 km NNE of Kalgoorlie], *M.H. Simmons* 1179 (PERTH).

*Distribution.* All known collections are from north and east of Kalgoorlie within a 35 km radius, excluding one from Binneringie Station, c. 100 km southeast of Kalgoorlie.

*Habitat.* On red soil with scattered eucalypts and low semi-dense shrub association, rarely in saline habitats.

*Flowering and fruiting periods.* Flowers in August-September; pods with mature seeds not seen.

*Affinities.* This subspecies is quite similar to subsp. *conformis* which differs by its sub-terete to flat phyllodes, fewer flowers per head and pale dull brown pods, as well as by its habitat preference and distribution. There is also a strong superficial resemblance to *A. kalgoorliensis* R.S. Cowan & Maslin (see above under "*A. densiflora* Group") from the same general region but that species has branchlets with sub-appressed, white hairs and intermixed red resin-hairs, phyllodes with about 20 slightly raised nerves, between which raised stomata are clearly evident, and 5-merous flowers.

*Discussion.* It must be noted that Maiden described the species as 5-merous but all the material seen by us has predominantly 4-merous flowers, 5-merous ones rarely being found among the 4-merous ones.

*Conservation status.* Not known to be threatened.

**2b. *Acacia inceana* subsp. *conformis* R.S. Cowan & Maslin, subsp. nov.**

*Phyllodia* sub-teretia ad plana, apice innocuo, curvato, 4-7 cm longa, 1-2 mm lata, initio appresso-puberula glabrescentia praeter pulvinum puberulum; *pedunculi* 5-6 mm longi, capitulis 10-15-floribus, *sepalis* plus minusve spatulatis; *legumina* 4-7 cm longa.

*Typus:* between Morawa and Perenjori [precise locality details withheld for conservation reasons], Western Australia, 31 August 1982, *R.J. Cumming* 2199 (*holo:* PERTH 00191043; *iso:* CANB, K).

*Phyllodes* sub-terete to flat, 4-7 cm long, 1-2 mm wide, at first appressed-puberulous but glabrescent except for pulvinus; tip curved,  $\pm$  innocuous, *peduncles* 5-6 mm long, bearing 10-15-flowered heads; *sepals* more or less spatulate; *Pods* 4-7 cm long, pale dull brown.

*Selected specimens examined.* WESTERN AUSTRALIA: [precise localities withheld for conservation reasons], N of Kalannie, *G. Craig* 1600 (NY, PERTH) and 1632A (NSW, PERTH); NE of Kulja, *G. Craig* 1622 (MEL, PERTH); between Mukinbudin and Bencubbin, *B.R. Maslin* for *R.J. Cumming* 2303 (MELU, PERTH); between Hines Hill and Nungarin, *B.R. Maslin* 2339 (PERTH) and 2339A (CANB, K, PERTH); Cowcowing, *F. Stoward* 311 (PERTH).

*Distribution.* Extends from near Morawa southeast to Hines Hill and east to Boorabbin (c. 90 km west of Coolgardie on Great Eastern Highway), southwest Western Australia.

*Habitat.* A highly salt-tolerant species on alkaline dark red-brown, coarse clay-sand overlying yellow-brown coarse clay-sand or sandy loam at margins of salt pans or lakes.

*Flowering and fruiting periods.* Flowers in August-September; pods with mature seed have been collected from September to December.

*Conservation status.* A Priority 1 taxon in the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The epithet is chosen in allusion to the similar appearance of this taxon to *A. enervia* subsp. *explicata*, which differs in having 5-merous flowers, from *conformis*, Latin for similar.

### 3. *Acacia lineolata* Benth., *Linnaea* 26: 626 (1855)

*Lectotype* (here selected): Swan River [Western Australia], 1848, *J. Drummond* 4: 13 (K, Herb. Hooker; *isolecto*: G, K-Herb. Bentham, OXF, P, PERTH 00886378-fragment ex K, TCD). *Paralectotype*: Swan River [Western Australia], *J. Drummond* 4: 12 (K, Herb. Hooker and Herb. Bentham, mounted with *lectotype* and *isolectotype*, see discussion below); we are unable to apply a name to this specimen, but it is not *A. lineolata*, *sensu lectotypico*.

Dense, rounded or obconic *shrubs* 0.5-1.7 m tall with dense or bushy crown to 3 m diam. *Bark* grey, smooth, sometimes fissured at base. *Branchlets* somewhat angled at apex, glabrous or appressed-puberulous with the angles glabrous. New growth citron-silvery or silvery grey sericeous. *Stipules* persistent, triangular, less than 1 mm long. *Phyllodes* linear to linear-oblongate to oblong-elliptic, usually flat, 2-6.5(7.5) cm long, (1)2-5 mm wide, coriaceous to rigid-coriaceous, patent to ascending, straight to somewhat incurved or sigmoidally curved, glabrous or appressed-puberulous when young and glabrescent, olive-green or dull dark-green; apex straight or more or less curved, acute to short-acuminate, innocuous to pungent; nerves numerous, closely parallel, clearly evident and yellow (at least in dry state), immersed to raised, the inter-nerve spaces darker coloured and clearly marked by rows of distinct, sometimes raised stomata, anastomoses absent or occasional; gland(s) 1-3, small, inconspicuous, on adaxial margin, the lowermost (3)5-21 mm above pulvinus. *Peduncles* (1)2 per axil, 2-11 mm long, glabrous to more or less appressed-puberulous; basal peduncular bracts caducous, cucullate; heads globular or slightly oblongoid, golden, 4-6 mm diam., 18-35-flowered; bracteoles linear to fusiform, ciliolate. *Flowers* 5-merous. *Sepals* 1/4-2/3 as long as petals, free or up to 1/2-united. *Petals* free or to 1/2-united. *Ovary* puberulous, appressed-puberulous or papillate-puberulous. *Pods* linear, raised over and slightly constricted between seeds, to 10 cm long and 2-3 mm wide, thinly coriaceous or chartaceous, straight to shallowly curved, somewhat appressed-puberulous between seeds or glabrous. *Seeds* longitudinally arranged in pods, elliptic, oblong-elliptic or oblong, 3-4 mm long, 1.2-2 mm wide, compressed or turgid, glossy, brown or brown-black; pleurogram U-shaped; areole about 1/4-1/3 as long as seed, paler brown; the aril terminal, 1/3-2/3 as long as seed, conical, bright yellow.

*Distribution.* Occurs in southwest Western Australia from Yuna (c. 35 km east of Northampton) south to Pingrup.

*Typification.* There are two sheets at Herb. K bearing type material, one stamped "Herbarium Hookerianum", the other "Herbarium Benthamianum": both have branchlets of two different collections, namely, *Drummond* 4: 12 and 4: 13. On the first of these sheets the correct collection number is assigned for each of the two elements, as shown by duplicates mounted separately at G, OXF, and P. The collection numbers are reversed on the Herb. Bentham sheet, hence the choice of the specimen of *Drummond* 4: 13 on the Herb. Hooker sheet as lectotype. The other collection (paralectotype) has not been identified; it is not this taxon, although it is superficially similar.

*Affinities.* Similar to *A. enervia* Maiden & Blakely (see above for discussion).



*Infraspecific taxa.* Comprising two subspecies with the typical one differing from subsp. *multilineata* in having proportionately much longer than wide, often sigmoidally curved phyllodes with the apex recurved.

### 3a. *Acacia lineolata* Benth. subsp. *lineolata*

*Phyllodes* linear to linear-oblongate, occasionally  $\pm$  terete, 2-5(7.5) cm long, (1)2-4 mm wide, c. 20 times longer than wide, more or less curved, often sigmoidally; apex curved-acute and not at all pungent or rigid. *Peduncles* 2-6 mm long. *Sepals* free or to half-united. *Seeds* glossy brown-black.

*Selected specimens examined.* WESTERN AUSTRALIA: between Pithara and Miling, *W.E. Blackall* 2893 (PERTH); Pingrup, *W.E. Blackall* 2987 (PERTH); 11 miles [17.6 km] N of Dandaragan, *W.E. Blackall* 3671 (PERTH); 0.7 km S of Tammin on road to Gardner Reserve, *R.S. Cowan* A744 and *B.R. Maslin* (PERTH); 14.1 km from junction of Gorge road with Ajana-Kalbarri road, Kalbarri National Park, *R.S. Cowan* A-821 and *R.A. Cowan* (PERTH); east of Coblinine River crossing on Warren Road (east of Katanning), *G. Craig* 1586 (PERTH); 7 km S of Miling on Lyons East Road, *G. Craig* 1590 (PERTH); 41.6 km from Brand Highway towards Coorow, *R.J. Cumming* 1319 (PERTH); Wilroy, *J. Galbraith* 347 (PERTH); 12 miles [19.2 km] E of Katanning on road to Nyabing, *B.R. Maslin* 784 (MEL, PERTH); 32 km W of Kununoppin towards Wyalkatchem, *B.R. Maslin* 3400 (CANB, K, NSW, P, PERTH); 14 km E of Kulja towards Beacon, *B.R. Maslin* 3975 (CANB, K, MEL, NSW, PERTH); about 2 km W of the Wongan Hills on road to Piawaning, *B.R. Maslin* 5369 (NY, PERTH); 27 km due NNW of Goomalling, Mortlake River North, *B.R. Maslin* 6200 (BM, BRI, PERTH); 3 miles [4.8 km] N of Brookton, *K. Newbey* 891 (PERTH).

*Distribution.* Occurs from Kalbarri National Park (c. 100 km north of Geraldton) southeast to near Katanning and Pingrup (c. 50 km north of Ongerup), southwest Western Australia.

*Habitat.* In sandy or stony, often saline, loam in association with *Casuarina* spp. and *Halosarcia* spp. or in eucalypt woodland.

*Flowering and fruiting periods.* Flowers in August-September; pods and mature seeds have been collected in late November.

*Variant.* In the north-central part of the range from Yuna south to Yorkrakine (c. 25 km due southeast of Wyalkatchem) and east to Kulja (c. 45 km due north-northwest of Koorda), a form with narrow phyllodes (1-1.5 mm wide) occurs, some so narrow as to appear more or less terete, e.g. *B.R. Maslin* 3975 (CANB, K, MEL, NSW, PERTH) and 6200 (BM, BRI, PERTH).

*Conservation status.* Not under threat.

### 3b. *Acacia lineolata* subsp. *multilineata* (W. Fitzg.) R.S. Cowan & Maslin, comb. et stat. nov.

*A. multilineata* W. Fitzg., J. Western Australian Nat. Hist. Soc. 1: 13 (1904). *Lectotype:* Arrino, Western Australia, September 1903, *W.V. Fitzgerald s.n.* (NSW 216915, left-hand specimen on sheet, *fide* Maslin & Cowan 1994a; *isolecto:* NSW 216915 (right hand specimen), PERTH 00765813, 00765791 (ex herb. *C.A. Gardner* no. 1306B), 00765805 (Fragment, presumably ex herb. *W.E. Blackall*).

*Phyllodes* oblong-oblongate to oblong-elliptic, acute to short-acuminate, 3-6.5 cm long, 3-5 mm wide, 10-13 times longer than wide, rigid-coriaceous, straight to incurved; apical point straight and coarsely to sharply pungent. *Peduncles* 5-11 mm long. *Sepals* always free. *Seeds* glossy, brown.

*Selected specimens examined.* WESTERN AUSTRALIA: Mullewa area [precise localities withheld for conservation reasons], *A.M. Ashby* 1571 (PERTH), 4515 (PERTH), 4516 (CANB, PERTH), 4645 (PERTH) and 4646 (PERTH), *G. Phillips* GP42 (PERTH), *B.R. Maslin* 3637 (K, MEL, PERTH) and 5077 (PERTH); near Arrino, *B.R. Maslin* 6588 (PERTH).

*Distribution.* In addition to the type, which was collected from Arrino, the species is known only from a few localities in the vicinity of Mullewa, southwest Western Australia. The type locality is considerably south and west of most of the other collection localities but a recent collection confirms the continued presence of the species there (*B.R. Maslin* 6588).

*Habitat.* On sandplains and on rocky clay.

*Flowering and fruiting periods.* Flowers from June to August; pods with mature seeds have been collected in November and December.

*Affinities.* Subspecies *multilineata* bears a superficial resemblance to *A. patagiata* R.S. Cowan & Maslin (which has very different phyllode nervature) and *A. unguicula* R.S. Cowan & Maslin (which has spinose stipules), see Cowan & Maslin (1990) for description of these two species.

*Conservation status.* A Priority 1 on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

### The "*Acacia fragilis* Group"

The species of this informal grouping have few characters in common: sub-terete to terete phyllodes with a gland in the basal one-third of the blade; 5-merous flowers with free sepals; and linear, compressed pods. Some of the previously described taxa are re-described here in an attempt to clarify the past confusion regarding their identity. The taxa comprising this "Group" include the following: *A. assimilis* S. Moore subsp. *assimilis*, *A. assimilis* subsp. *atroviridis* R.S. Cowan & Maslin subsp. nov., *A. aulacophylla* R.S. Cowan & Maslin sp. nov., *A. consanguinea* R.S. Cowan & Maslin sp. nov., *A. fragilis* Maiden & Blakely, *A. ophiolithica* R.S. Cowan & Maslin sp. nov. and *A. uncinella* Benth.

### Key to taxa of "*A. fragilis* Group"

(*Acacia triptycha* is not a member of the Group as defined above, but is included in this key because of its superficial similarity to *A. assimilis* subsp. *atroviridis*.)

1. Phyllodes flat (appearing sub-terete when very narrow) with three longitudinal nerves on each face ..... *A. triptycha*
1. Phyllodes terete

2. Phyllodes with numerous (>8), closely parallel nerves
  3. Phyllodes commonly light green, mostly 50-95 mm long; pulvinus slender, cylindric, not flared towards base; heads mostly 30-40-flowered ..... 1a. *A. assimilis* subsp. *assimilis*
  3. Phyllodes dark green, mostly 80-140 mm long; pulvinus flared towards its base, often strongly compressed dorsi-ventrally (adaxial or abaxial view); heads mostly 50-70-flowered ..... 1b. *A. assimilis* subsp. *atroviridis*
2. Phyllodes 4- or 8-nerved, the nerves sometimes obscure
  4. Phyllodes (6)7.5-12(16.5) cm long, deeply sulcate between the 8 strongly raised nerves ..... 2. *A. aulacophylla*
  4. Phyllodes shorter and/or not deeply sulcate
    5. Pulvinus flared at its base, appressed-puberulous on its upper surface; bracteoles acute; phyllodes mostly 25-43 mm long (rarely to 70 mm) with glabrous apical points; heads mostly 20-25-flowered ..... 3. *A. consanguinea*
    5. Pulvinus  $\pm$  terete, glabrous (except occasionally hairy in *A. uncinella*); bracteoles rounded
      6. Heads 10-15-flowered on very slender peduncles (5)7-13 mm long; phyllodes mostly 25-36 mm long, nerves scarcely discernible, apical point minute and glabrous ..... 5. *A. ophiolithica*
      6. Heads 16-31-flowered on peduncles 4-6 mm long; phyllodes with discernible nerves (x10 mag.) and distinct apical points
        7. Phyllodes 3.5-7(8) cm long, the apex drawn out in a delicate, curved, long-acuminate (mostly 2-6 mm), normally persistently hairy tip ..... 4. *A. fragilis*
        7. Phyllodes 1-3.5 cm long, the apex not as above (i.e. shorter and/or glabrous) ..... 6. *A. uncinella*

**1. *Acacia assimilis* S. Moore, J. Linn. Soc., Bot. 45: 172 (1920)**

*Lectotype* (here selected): Bruce Rock, Western Australia, 1915, *F. Stoward* 116, BM; *isolecto*: BM, PERTH 00741477-fragment ex BM. *Paralectotype*: Cowcowing, Western Australia, 1916, *F. Stoward* 405 (BM, PERTH 00741485 and 00741469).

Low, rounded, dense, spreading *shrubs* or small trees (0.5)1-2.5(4) m tall. *Bark* on main stems grey, brown or grey-brown, fissured at base, smooth above. *Branchlets* terete, light brown, red, grey-red or red-brown, glabrous. New shoots densely yellow pubescent, the hairs appressed. *Stipules* caducous, scarious-chartaceous, narrowly oblong. *Phyllodes* terete, filiform, (40)50-140(175) mm long, (0.7)0.8-1.3 mm diam., patent or ascending to occasionally erect, straight to gently curving, light to dark green, glabrous (except apex); apex delicately curved, caudate-acuminate,  $\pm$  plumose or appressed-puberulous and glabrescent; pulvinus cylindric or flaring towards base, 1-2.5(3.5) mm long; nerves numerous, closely parallel, slightly raised and frequently lighter green than inter-nerve spaces; gland single, 2-24(30) mm above pulvinus, widely elliptic, depressed. *Peduncles* 2 per axil, (3)6-11(14) mm long, hoary appressed-puberulous or glabrous; basal peduncular bract broadly

rounded, glabrous to slightly appressed-puberulous laterally; heads globular to widely ellipsoid or obloid, bright to dull golden or lemon-yellow, 4-5(6) mm diam., (17)30-70(80)-flowered; bracteoles spatulate, the stipe long and slender, the blade rounded, somewhat concave, ciliate, sometimes dark-coloured, the apex sometimes obviously exerted in bud. *Flowers* normally 5-merous, rarely a few 4-merous interspersed. *Sepals* about 1/2 length of petals, free or very shortly united basally, spatulate to linear-spatulate, the blade rounded, ciliate, the stipe elongate, narrow. *Petals* 1/2-3/4-united, rarely free, oblanceolate. *Ovary* appressed-puberulous or papillose-puberulous. *Pods* linear, raised over seeds and slightly or not at all constricted between them, 30-85 mm long, 3-4 mm wide, papery, straight, glabrous or with scattered, appressed hairlets, rather shiny. *Seeds* longitudinally arranged in pods, widely elliptic to ovate or oblong-elliptic, unilaterally constricted apically, 2.5-3 mm long, 1.5-1.8 mm wide, dull, dark-brown to black; pleurogram semicircular or U-shaped; areole tiny; the aril sub-terminal.

*Distribution.* The species is widespread and common from Mullewa southeast to Boxwood Hill and the Norseman-Scaddan area of southwest Western Australia. The southern end of that range is occupied almost exclusively by subsp. *atroviridis*. The geographic ranges of the two subspecies are contiguous in the Lake King-Newdegate (east of Lake Grace) and Salmon Gums-Norseman areas (south of Norseman). One collection (*B.R. Maslin* 2447 from 1.5 km N of Salmon Gums, PERTH) has intermediate characteristics, suggesting possible hybridization between the two subspecies. Two further PERTH collections of the typical subspecies (*N.N. Donner* 1392 from c. 28 km southwest of Nannup and *W.E. Blackall s.n.* from the Darling Range, 32 km from Dwellingup) are considerably southwest and west respectively of the range of the species and are possibly incorrectly labelled with respect to locality or they may represent cultivated specimens.

*Typification.* The protologue lists two collections representing the same taxon, *F. Stoward* 116 from Bruce Rock and 405 from Cowcowing; material of both collections appear on the type sheet at BM and we have designated the specimen nearest the left side of the sheet as lectotype (no. 116). There are three other branchlets of what is presumably also *Stoward* 116 in the middle of the sheet and one other branchlet on the right, separated by pencil lines, of *Stoward* 405, which we regard as a paralectotype.

*Affinities.* This species and *A. fragilis* Maiden & Blakely are superficially similar but *A. assimilis* has generally longer phyllodes with at least twice as many nerves. In addition, they differ in the union of the perianth parts: *A. fragilis* has free petals and sepals, whereas the petals in *A. assimilis* are normally half or more united. *Acacia aulacophylla* R.S. Cowan & Maslin (see below) is also closely related but differs markedly in the eight strongly raised nerves of its phyllodes.

*Infraspecific taxa.* The species comprises two subspecies which differ primarily in phyllode colour and length, the form of the pulvinus and the number of flowers per head.

#### 1a. *Acacia assimilis* S. Moore subsp. **assimilis**

*Phyllodes* (40)50-95(150) mm long, (0.7)0.8-1(1.3) mm diam., commonly light or bright green; pulvinus slender, about the diameter of the phyllode base (viewed abaxially or adaxially), cylindrical, not flaring basally. Heads (17)30-40(44)-flowered; bracteoles dark with at least the apex well-exserted. *Sepals* more than 1/2 as long as the 1/2-2/3-united petals.

*Selected specimens examined.* WESTERN AUSTRALIA: 6 miles [9.6 km] N of Muntadgin, *E.T. Bailey* 288 (PERTH); about 10 km W of Three Springs, 28 August 1972, *C. Chapman s.n.* (K, PERTH 00689254); 10 miles [16 km] E of Mullewa, *R.J. Cumming* 1934 (BRI, MEL, NSW, PERTH);

Bendering, C.A. Gardner 9461 (CANB, G, NY, PERTH); 8.7 km N from Southern Cross towards Bullfinch, N. Hall H76/45 (PERTH); Wongan Hills, 16 August 1925, E.H. Ising s.n. (PERTH 00689203); 8 km due SSW of Bencubbin, B.R. Maslin 2001 (PERTH); 6.5 miles [10.4 km] S of Merredin towards Bruce Rock, B.R. Maslin 2299 (AD, BRI, CANB, K, MEL, PERTH); 4 km N of Daniell Siding, Norseman-Salmon Gums road, B.R. Maslin 2464 (MEL, PERTH); 10 miles [16 km] W of Moorine Rock, Great Eastern Highway, B.R. Maslin 3201 (AD, NSW, PERTH); 7 km N of Tammin towards Korrelocking, B.R. Maslin 4420 (PERTH); 2.5 km W of Kulja towards Burakin, B.R. Maslin 4445 (MEL, PERTH, TLF); 6 miles [9.6 km] N of Lake Bidby, K. Newbey 1050 (PERTH); 8 miles [12.8 km] NE of Hyden, K. Newbey 1067 (PERTH); 4 km SSW of McDermid Rock, K. Newbey 5281 (PERTH); Mount Gibbs, K. Newbey 5486 (PERTH); Stennet Rock, c. 48 km SSW of Norseman, K. Newbey 7679 (PERTH); Wallaroo Rock, c. 72 km WNW of Coolgardie, K. Newbey 8830 (PERTH); 22.5 km W of Paynes Find, R.A. Saffrey 854 (MEL, PERTH, TLF); 1 miles [1.6 km] SW of Manmanning, B.H. Smith 385 (AD, BRI, CBG, NSW, PERTH).

*Distribution.* Common from Mullewa south-southeast to near Lake Bidby (which is c. 45 km northeast of Lake Grace) and east to near Norseman and Coolgardie. Two distributionally anomalous specimens are referred to above in the discussion of distribution.

*Habitat.* Grows in sand, sandy or gravelly loam often in association with granite, less frequently in laterite, in mallee heath and scrub on wet, low-lying areas on hillocks and mountain slopes and open sandplains.

*Flowering and fruiting periods.* Flowers from July to October; pods with mature seeds have been collected in December and January.

*Conservation status.* Widespread and not under threat.

**1b. *Acacia assimilis* subsp. *atroviridis* R.S. Cowan & Maslin, subsp. nov.**

A subsp. *assimilis phyllodiis* (60)80-140(175) mm longis, 1-1.5 mm diametro, aequae *atroviridis*, pulvino versus basem dilato, saepe valde dorsi-ventraliter compresso (adaxialiter vel abaxialiter visus); capitula cum 50-70(80) floribus, bracteolis non exsertis differt.

*Typus:* 83.9 miles [135 km] from Albany on Borden-Pingrup road, Western Australia, 25 May 1973, A.M. Ashby 4724 (*holo:* PERTH 00686670; *iso:* BRI, CANB, K, MEL, NSW, NY, PERTH 00688789).

*Phyllodes* (60)80-140(175) mm long, 1-1.5 mm diam., drying uniformly dark-green, the pulvinus flared towards its base, often strongly compressed dorsi-ventrally (adaxial or abaxial view). Heads 50-70(80)-flowered; bracteoles neither dark-coloured nor obviously exserted. *Sepals* half or less as long as 2/3-3/4-united petals.

*Selected specimens examined.* WESTERN AUSTRALIA: 30 km W of 90 Mile Tank, T.E.H. Aplin and M.E. Trudgen 5917 (K, PERTH); 88 miles [141 km] from Albany on Borden-Pingrup road [c. 20 km N of Borden], A.M. Ashby 4733 (B, BM, MEL, NY, PERTH, W); 28 km due E of Lake King Gate on Rabbit Proof Fence, 33° 04' 30"S, 120° 19'E, K. Bradby 39 (PERTH); 32 km ESE of Muckinwobert Rock on West Point Road, 33° 28'S, 120° 37'E, M.A. Burgman 1050 and S. McNee (PERTH); Boxwood Hill-Toompup road, 11 km NW from Chillilup Pool turnoff, 34° 17'S, 118° 31'E, M.D. Crisp 5163 (PERTH); Fitzgerald River, C.A. Gardner 9259 (PERTH); Oldfield Location 1002, near Dallinup

Creek, 33° 34'S, 120° 40'E, A.S. *George* 15723 (PERTH); Kumarl, L.A. *Horbury* 102 (PERTH); 2 km S of North Ironcap, 33° 24'S, 119° 41'E, G.J. *Keighery* 3782 (MO, PERTH); 10 km W of Munglinup, B.R. *Maslin* 2556 (AD, K, PERTH); 20 km S of Salmon Gums on Coolgardie-Esperance Highway, B.R. *Maslin* 5453 (CANB, PERTH); 6 miles [9.6 km] S of Lake Grace, K. *Newbey* 1623 (CANB, G, K, NSW, PERTH); Peak Eleanora, Peak Charles National Park, K. *Newbey* 6384 (PERTH); 6 km S of Mount Gibbs, Frank Hann National Park, K. *Newbey* 6544 (PERTH); Lake Varley-Holt Rock, May 1961, R.P. *Roberts s.n.* (PERTH 00689718); 10.9 miles [17.5 km] NE of Dumbleyung towards Kukurin, M.D. *Tindale* 165 and B.R. *Maslin* (PERTH); 11.3 km from Lake King towards Newdegate, J.W. *Wrigley* WA/68 5501 (PERTH).

*Distribution.* Common from near Dumbleyung south to near Boxwood Hill (c. 50 km south-southwest of Jerramungup) and east to Coolgardie-Esperance Highway in the Kumarl-Scaddan area, southwest Western Australia.

*Habitat.* Grows in sand, sandy or gravelly loam, often in association with granite, less commonly with laterite in scrub, woodland and heath.

*Flowering and fruiting periods.* Flowers throughout the year; pods with mature seeds have been collected in November and December. Developing pods may occur on plants that are also in flower.

*Affinities.* Differences between the subspecies are discussed under the species. Subspecies *atroviridis* is quite similar to *A. triptycha* F. Muell. ex Benth. in appearance and even in details of flower morphology, including form of bracts and bracteoles. They differ in that the phyllodes of *A. triptycha* are flat, 8-nerved (3 nerves per face), rather than being terete and multinerved. Geographically, they occur in similar areas, so there is a real possibility of misidentifying collections of both taxa.

*Conservation status.* Widespread and not under threat.

*Etymology.* The colour of the dried phyllodes suggested the name for this taxon, from two Latin words, *atratus* meaning dark, and *viridis*, a word for green.

## 2. *Acacia aulacophylla* R.S. Cowan & Maslin, sp. nov.

*Frutex* 1-4 m altus, saepe rotundatus, ramulis teretibus, glabris. *Phyllodia* teretia, arcuate longo-acuminata, appresso- vel sub-appresso-puberula, interdum partim glabrescentia, pulvino gracili, 2-4 mm longo, laminis (60)75-120(165) mm longis, 1(1.5) mm diametro, semi-rigidis, ascendentibus ad erectis, glabris, diluto- vel medio-viridibus, 8 nervis valdissime elevatis, *glande* distincta, 2-15 mm supra pulvinum, circulari vel lato-elliptica. *Pedunculi* 1 vel 2 in quoque axilla, (4)5-8(10) mm longi, raro longiores, appresso-puberuli, pedunculorum bractea basali caduca, late ovata, cucullata, ciliata, appresso-puberula vel glabra. Capitula globularia, lutea, 5-6 mm diametro, 40-87-floribus, dense congesta, bracteolis spathulatis ad sub-peltatis, puberulis, ciliatis. *Flores* 5-meri, *sepalis* petalorum circa dimidiis longitudinis, discretis, spathulatis, ciliatis, *petalis* 1/2-3/4-connatis. *Legumina* linearia, non constricta, 60-100 mm longa, 5-6 mm lata, pendula, coriacea, recta, glabra, nervis marginalibus distinctis, pallidis. *Semina* longitudinalia, late elliptica, compressa, 4.5 mm longa, 2.5 mm lata, circum axem longitudinalem cristata, obscure nigra, arillo sub-terminali.

*Typus:* 1.6 km N of Cue towards Meekatharra, Western Australia, 30 July 1974, B.R. *Maslin* 3594 (*holo:* PERTH 00187275; *iso:* CANB, K, MEL, NY).

Often rounded *shrubs* 1-4 m tall, bushy but becoming openly branched with age, single-stemmed or branched at ground level. *Bark* grey, smooth throughout or fissured only at base of main stems. *Branchlets* terete, glabrous, red-brown ageing grey. New shoots often golden appressed-puberulous. *Stipules* only on very young branchlets, lanceolate-oblong, 1.5-2 mm long, 0.6-1 mm wide, scarious, appressed-puberulous. *Phyllodes* terete, (60)75-120(165) mm long, 1(1.5) mm diam., semi-rigid, ascending to erect, straight, glabrous, light to medium green; apex long-acuminate, the delicate tip arcuate, appressed to subappressed-puberulous and sometimes partly glabrescent; pulvinus slender, 2-4 mm long; nerves 8, very strongly raised and deeply sulcate between; gland distinct, 2-15 mm above pulvinus, circular or widely elliptic. *Peduncles* 1 or 2 per axil, (4)5-8(10) mm long, rarely longer, appressed-puberulous; basal peduncular bract caducous, broadly ovate, cucullate, ciliate, appressed-puberulous or glabrous; heads globular, golden, 5-6 mm diam., 40-87-flowered, densely congested; bracteoles spatulate to subpeltate, puberulous, ciliate. *Flowers* 5-merous. *Sepals* about half as long as petals, free, spatulate, ciliate. *Petals* 1/2-3/4-united. *Ovary* densely appressed-puberulous. *Pods* linear, not strongly raised over nor constricted between seeds, 60-100 mm long, 5-6 mm wide, pendulous, coriaceous, straight, glabrous, the marginal nerves distinct, light-coloured. *Seeds* longitudinally arranged in pods, widely elliptic, compressed, 4.5 mm long, 2.5 mm wide, crested around long axis, dull, black; pleurogram crescent-shaped; the aril sub-terminal.

*Selected specimens examined.* WESTERN AUSTRALIA: Watheroo, August 1903, *C. Andrews s.n.* (PERTH 00187283); Mary Spring, Kalbarri National Park boundary, *D.R. Bellairs* 1609 (MEL, PERTH); East Yuna Reserve, NE of Geraldton, *A.C. Burns* 9 (PERTH); No. 8 Tank, Tching Range, Nookawarra Station, *R.J. Cranfield* 5187 (G, PERTH); 1.5 km S of Jingemarra Homestead, *R.J. Cranfield* 5255 (PERTH); 31.3 miles [50.1 km] S of Yalgoo towards Paynes Find, *R. Cumming* 1993 (AD, NSW, PERTH); 6 miles [9.6 km] E of Morawa, *J.R. Knox* 650813 (PERTH); about 6.5 km N of Mount Magnet towards Cue, *B.R. Maslin* 3582 (PERTH); Gnows Nest Range, 50 km SE of Yalgoo towards Paynes Find, *B.R. Maslin* 4254 (NY, PERTH); 5 km E of Mullewa on road to Yalgoo, *B.R. Maslin* 5075 (PERTH); 41 km from Byro Homestead on the track to Milly Milly Station, *B.R. Maslin* 5175 (BM, MO, PERTH); Donkey Paddock, Coodardy Station, *A.A. Mitchell* 759 (PERTH); 9 miles [14.4 km] N of Madoonga Homestead, *N.H. Speck* 1072 (BRI, DNA, NSW, PERTH).

*Distribution.* Found from Byro Station (c. 250 km west-northwest of Meekatharra) south to Mullewa and Morawa and extending inland to Cue (c. 65 km north of Mount Magnet), Western Australia. Two collections were made slightly outside this distribution at Mary Spring, c. 120 km northwest of Mullewa and at Watheroo, c. 120 km south of Morawa.

*Habitat.* On laterite or granite hills, outcrops and breakaways on sand, rocky sand, clay or loam in open scrub, often dominated by *Acacia* species. The occurrence of this species on hilltops and breakaways may in large part account for its discontinuous distribution.

*Flowering and fruiting periods.* Flowers mostly from April to August but one collection (*B.R. Maslin* 5075), with mature flowers and fruit, was made in December; pods with mature seeds have been collected in December.

*Affinities.* The deeply furrowed phyllodes with strongly raised nerves, distinguish *A. aulacophylla* from all its relatives, of which *A. assimilis* is perhaps closest, in spite of the difference in number of nerves in the phyllodes; superficially the two taxa can easily be confused. *Acacia acuminata* subsp. *burkittii* (F. Muell. ex Benth.) Tindale & Kodala (ms) which is common in the geographic range of the new species has a similar habit and foliage colour but is readily distinguished by its spicate inflorescences and  $\pm$  moniliform pods which are 4-7 mm wide.

*Conservation status.* Not threatened.

*Etymology.* The furrowed phyllodes provide the basis for the specific epithet, from two latinized Greek words, *aulakos*, with the meaning of a furrow and *phyllon* for leaf.

### 3. *Acacia consanguinea* R.S. Cowan & Maslin, sp. nov.

*Frutex* multicaulis 0.4-1.5 m altus, cortice laevi, cinerea, ramulis teretibus, appresso-puberulis, cinereis. *Phyllodia* teretia, apice arcuato, mucronato, glabro, pulvino ad paginam adaxilem appresso-puberulo et ad basem dilato, laevi ad leviter transversaliter corrugato, (20)25-43(70) mm longa, (1)1.2-1.5(1.7) mm diametro, rigida, patentia ad ascendentia, vulgo leviter incurvata sed interdum recta vel leviter sigmoide arcuata, 8-nervata, nervis planis sed plerumque valde elevatis in sicco, glande minuta (4)6-10(13) mm supra pulvinum. *Pedunculi* 2 in quoque axilla, 3-6(8) mm longi, plus minusve appresso-puberuli vel plerumque glabri; capitula globularia, 4-5 mm diametro et (14)20-25(29)-floribus, bracteolis in alabastro exsertis, oblanceolato-spathulatis, puberulis et ciliatis, lamina plus minusve elliptica, acuta. *Flores* pentameri, *sepalis* *petalisque* discretis. *Legumina* linearia, supra semina alternatim valde elevata, inter semina leviter constricta, 30-60 mm longa, 2.5-3 mm lata, leviter curvata et undulata, tenuiter chartacea, glabra, lucida. *Semina* longitudinalia, late elliptica, 2-2.2 mm longa, 1.5-1.8 mm lata, 1.5 mm crassitie, lucida, maculata cum maculis brunneis in diluto-griseo-brunneis, arillo sub-laterali, cristato.

*Typus:* 10 km NW of Bullabulling towards Caenyie Rock, Western Australia, 8 August 1971, B.R. Maslin 1890 (*holo:* PERTH 00342793; *iso:* CANB, G, K, NSW, NY).

Dense or openly branched, often rounded, spreading *shrubs* 0.4-1.5 m tall, much-branched at ground level. *Bark* grey, smooth. *Branchlets* terete, appressed-puberulous, grey. *Stipules* caducous. *Phyllodes* terete, (20)25-43(70) mm long, (1)1.2-1.5(1.7) mm diam., rigid, patent to ascending, commonly shallowly incurved, sometimes straight or shallowly sigmoid, glabrous, dark-green; apex curved, mucronate, glabrous; pulvinus 1.5-2 mm long, smooth to faintly transversely wrinkled, dilated at base and appressed-puberulous on adaxial surface; nerves 8, often obscure, plane, distant, in dry state often appearing raised and separated by deep, more or less irregular furrows; gland minute, often not visible, (4)6-10(13) mm above pulvinus, depressed, elliptic. *Peduncles* 2 per axil, 3-6(8) mm long, glabrous or occasionally sparsely appressed-puberulous; basal peduncular bract cucullate, rounded, minutely appressed-puberulous; heads globular, golden, 4-5 mm diam., (14)20-25(29)-flowered; bracteoles exserted, oblanceolate-spathulate, acute, puberulous, ciliate, the lamina more or less elliptic, acute. *Flowers* 5-merous. *Sepals* about half the petal length, free, linear-spathulate, ciliolate. *Petals* oblanceolate, free, rarely half-united, glabrous. *Ovary* micro-puberulous. *Pods* linear, strongly raised on alternating sides over seeds and moderately constricted between them, 30-60 mm long, 2.5-3 mm wide, thin-chartaceous, slightly curved and undulate, glabrous, glossy. *Seeds* longitudinally arranged in pods, widely elliptic, constricted near hilum, crested around long axis, 2-2.2 mm long, 1.5-1.8 mm wide, 1.5 mm thick, glossy, mottled darker brown on pale grey-brown; pleurogram semicircular; areole minute; aril sub-lateral, crested.

*Selected specimens examined.* WESTERN AUSTRALIA: Carrabin, W.E. Blackall 4024 (B, K, PERTH); 54.9 km from Coolgardie towards Southern Cross along Great Eastern Highway, E.M. Canning WA/68 2467 (PERTH); 16.7 km from Moorine Rock towards Perth along Great Eastern Highway, E.M. Canning WA/68 2552 (PERTH); Noongar, 31° 20'S, 118° 58'E, R. Coveny 8375 and B. Haberley (PERTH); 26 km SW of Bodallin, 31° 34'S, 118° 43'E, R.J. Cranfield 2456 (PERTH); 39.2 miles [62.8 km] W of Kumarl towards Lake King, R. Cumming 2556 (PERTH); 8 miles [13 km]



S of Bonnie Rock, *J. Goodwin* 87(1262) (PERTH); 25 km W of Bullabulling on Great Eastern Highway, *B.R. Maslin* 2413 (AD, CANB, K, MEL, NSW, NY, PERTH); 10 km by road S of Queen Victoria Rock, *B.R. Maslin* 5408 (PERTH); about 12 km N of Southern Cross on road to Bullfinch, *B.R. Maslin* 6711 (PERTH); 2 km S of Karalee, c. 50 km E of Southern Cross, *K. Newbey* 6032 (PERTH); 0.5 km E of Marvel Loch turn-off on Great Eastern Highway, *M.H. Simmons* 1204 (PERTH); Muntadgin, *T.W. Stone* and *E.T. Bailey* 816 (PERTH) and *T.W. Stone* 866 (PERTH); 12 miles [19.2 km] NW of Wialki, 4 October 1958, *G.M. Storr s.n.* (PERTH 00750158); Ghooli, 15 km E of Southern Cross along Great Eastern Highway, *A. Strid* 20035 (AD, BRI, CANB, G, MEL, MO, NSW, PERTH).

*Distribution.* Locally common from Muntadgin (c. 40 km southeast of Merredin) east to near Coolgardie with most collections from along the Great Eastern Highway, southwest Western Australia. There are two outlying populations, the first represented by *G.M. Storr s.n.* (PERTH 00750158) from near Wialki (c. 150 km north-northwest of Muntadgin) and the second represented by *R. Cumming* 2556 (PERTH) from c. 63 km west of Kumarl (Kumarl is c. 200 km south of Coolgardie).

*Habitat.* Found on sand, sandy loam or sandy clay in heath or dense scrub.

*Flowering and fruiting periods.* Flowers mainly in September, occasionally August; pods with mature seeds have been collected in December.

*Affinities.* The new species is closely related to *A. fragilis* Maiden & Blakely and *A. uncinella* Benth. (see below) from both of which it differs in having the pulvinus appressed-puberulous on its adaxial surface and flared towards its base, gland minute, bracteoles acute and slightly exerted in the bud and seeds nearly rotund. The phyllode apex of *A. consanguinea* is more like *A. uncinella* in form and in being glabrous but the heads are larger as in *A. fragilis*. Flower morphology also links the new species more closely with *A. fragilis*; both have free sepals and petals in the vast majority of specimens examined. Geographically *A. fragilis* and *A. consanguinea* occur in more northern areas than does *A. uncinella*.

*Conservation status.* Not under threat.

*Etymology.* The close relationship of the species with other species of this alliance suggests the name, from *consanguineus*, Latin for kindred, related by blood.

#### 4. *Acacia fragilis* Maiden & Blakely, *J. Roy. Soc. Western Australia* 13: 5, pl. 4, figs 1-11 (1928)

Based on *A. triptycha* var. *tenuis* Maiden, *J. & Proc. Roy. Soc. New South Wales* 53: 178 (1920). *Typus*: Tammin, Western Australia, September [*sphalm.* November in protologue] 1909, *J.H. Maiden s.n.* (*holo*: NSW; *iso*: K, NSW, PERTH 00963828 and 00859435-fragment ex NSW).

Dense, rounded *shrubs*, becoming more openly branched with age, 0.5-2.5 m tall, spreading 2.5-3 m across; stems to 10 cm diam. at base. *Bark* grey, finely fissured basally. *Branchlets* terete, glabrous, red-brown, becoming grey with separation of epidermis from lower layers. New shoots golden-sericeous. *Stipules* only on very young shoots, lanceolate-linear, scarious, obtuse. *Phyllodes* terete to sub-terete, 35-70(80) mm long, 1-1.3 mm diam., reclined, patent or erect, straight to shallowly curved, glabrous, more or less shiny, smooth but longitudinally wrinkled when dry, dark-green; apex

arcuate-acuminate to caudate-acuminate, the tip slender, (1.5)2-6(7) mm long, appressed to spreading puberulous on young phyllodes and commonly on mature phyllodes, rarely completely glabrous; pulvinus 1.5-3 mm long, slender, cylindrical, glabrous, orange-coloured; nerves 8, sometimes appearing more numerous when dry, the nerves raised or more often obscured in drying by numerous, longitudinal, irregular furrows; gland not always evident, (5)7-14(24) mm above pulvinus, narrowly elliptic, 0.3-0.5 mm long. *Peduncles* 2 per axil, 4-5.5 mm long, somewhat appressed-puberulous or glabrous; basal peduncular bracts cucullate, rounded, more or less appressed-puberulous at least basally; heads globular, golden, (3.5)4-4.5(5.5) mm diam., 23-31-flowered; bracteoles spatulate, the blades rounded, somewhat concave, ciliate, dark-coloured. *Flowers* 5-merous. *Sepals* c. 1/2 as long as free petals, free, spatulate, ciliate. *Ovary* appressed-puberulous to sub-appressed villosulose. *Pods* linear, raised on alternating sides over and slightly constricted between seeds, 50-70 mm long, 2-3 mm wide, thinly crustaceous, straight, glabrous, shiny. *Seeds* longitudinally arranged in pods, elliptic, 2.5-3 mm long, 1.5 mm wide, with a unilateral, terminal constriction, dull, brown, the aril sub-terminal.

*Selected specimens examined.* WESTERN AUSTRALIA: 1-2 miles [1.6-3.2 km] N of Carnamah along Geraldton Highway, *T.E.H. Aplin* 54 (PERTH); c. 20 km E of Damboring, then 3 km S, *T.E.H. Aplin* 4864 (PERTH); 22 miles [35 km] E of Dalwallinu, *J.S. Beard* 7973 (NSW, PERTH); 6.6 km NW of Wongan Hills towards Piawaning, *R. Coveny* 7834 and *B.R. Maslin* (PERTH); 3.3 km E of Ravensthorpe-Hopetoun road on Elverdton Road, *R.S. Cowan* A760 and *B.R. Maslin* (PERTH); between Caron and Latham, *C.A. Gardner* and *W.E. Blackall* 758 (PERTH); 16 miles [25.6 km] W of Boondi, *J. Goodwin* 277 (PERTH); c. 3 km by road SE of Kondut on road to Cadoux, *L. Haegi* 1109 (NSW, PERTH); 21 km NW of Holt Rock on track to Hyden, *L. Haegi* 1214 (NSW, PERTH); Merredin, *M. Koch* 2742 (NSW, PERTH); 1.4 miles [2.2 km] S of Konnongarrang, *B.R. Maslin* 1633 (CANB, PERTH); 6 km S of Tammin, *B.R. Maslin* 2319 (BRI, K, PERTH); Mount Desmond, *B.R. Maslin* 2567 (PERTH); 53 km N of Wubin towards Perenjori, *B.R. Maslin* 3182 (BM, PERTH); 10.5 km N of Bungalla towards Wyalkatchem, *B.R. Maslin* 3394, 3396 and 3396A (all PERTH); 1.6 km from Wubin towards Mount Magnet, *B.R. Maslin* 3529 (CANB, MEL, NY, PERTH); 14 km E of Grass Patch on Steddys Road, *P. van der Moezel* 66 (PERTH); Ponton Creek, 20.5 km E of Zanthus, *J. Taylor* 552 *et al.* (CANB, PERTH).

*Distribution.* Common in southwest Western Australia from near Carnamah south-southeast to the Cunderdin-Merredin area. A few populations occur outside this range, namely, near Holt Rock, c. 170 km southeast of Merredin (*L. Haegi* 1214), near Boondi, c. 190 km east of Merredin (*J. Goodwin* 277) and on Ponton Creek, 20.5 km east of Zanthus, c. 600 km east of Merredin (*J. Taylor et al.* 552); additionally, a variant from the Ravensthorpe Range and Grass Patch is discussed below.

*Habitat.* Grows in sand, gravelly or clayey sand and rocky or sandy loam on heath and sandplains with mallee eucalypts and wattles.

*Flowering and fruiting periods.* Flowers from (July) August-October; pods with mature seeds have been collected in December and January.

*Typification.* Maiden's publication gives November as the date of collection of the type but the NSW specimens record September as the correct month and we have adopted the latter.

*Variation.* Specimens of *A. fragilis* from the Ravensthorpe Range (e.g. *R.S. Cowan* A760 and *B.R. Maslin*, and *B.R. Maslin* 2567) and Grass Patch (*P. van der Moezel* 66) represent the one taxon and are attributed to *A. fragilis* on account of their phyllode length (> 3.5 cm) but they occur within

the geographic range of *A. uncinella*. They are similar to *A. uncinella* in having a half-united corolla and, to some extent, in the phyllode apex which is often glabrous but also often elongate as in *A. fragilis*. There is a need to examine more closely the significance of the petal union character in a comprehensive review of the *A. fragilis*-*A. uncinella* relationship. Another variant occurs near Bungalla, c. 10 km east of Kellerberrin (e.g. *B.R. Maslin* 3394); it is characterized by having phyllodes near the tip of the branchlets with the apex glabrous but some of the phyllodes farther down the branchlets with plumose tips.

*Affinities.* A highly variable species distinguishable, somewhat arbitrarily, from *A. uncinella* Benth. (see below), its closest relative, which generally occurs farther south, although the two overlap in the central wheatbelt from Bungalla to near Boorabbin (Boorabbin is c. 80 km east of Southern Cross). All characters vary to some extent but, in general, *A. fragilis* has longer phyllodes (mostly 3.5-7 cm), the apex of which terminates in a long to very long, delicate, gently curved, hairy tip (mostly 2-6 mm but up to 7 mm long); the pubescence on the tip varies from appressed to spreading; it is always present on juvenile phyllodes and usually persists on at least some of the mature ones. *Acacia uncinella* has shorter phyllodes (1-3.5 cm) generally with a shorter, sub-uncinate-mucronate tip (0.8-1.5 mm long) that is only minutely appressed-puberulous at first but commonly soon glabrescent. The petals of *A. uncinella* are mostly half-united but in *A. fragilis* this character appears sporadically without any obvious pattern except for the Ravensthorpe variant discussed above. The possibility of hybridization between the two species should receive serious attention, for there are collections in the zone of overlap (i.e. the central wheatbelt from Bungalla to Boorabbin) which cannot be confidently assigned to either taxon. Clearly much more detailed study is needed to elucidate this complex group and in the meantime it is considered prudent to retain the current classification and not pre-emptively effect name changes.

*Conservation status.* Widespread and not considered rare or endangered.

##### 5. *Acacia ophiolithica* R.S. Cowan & Maslin, sp. nov.

*Frutex* rotundatus 0.3-2 m altus, ramulis teretibus ad leviter angulatis, glabris rubello-castaneis. *Phyllodia* teretia, oblique et abrupte mucronata, saepe rostriformia vel subuncinata, pulvino gracili, 1.5-2 mm longo, croceo, a laminam abrupte separato, laminis (20)25-36(45) mm longis, 0.7-1 mm diametro, erectis ad ascendentibus, rectis, glabris, pallido- ad vivido- vel atro-viridibus, 4 vel 8 nervis immersis perobscuris, glande saepe non manifesta, minuta, 6-14 mm supra pulvinum. *Pedunculi* 2 in quoque axilla, (5)7-13 mm longi, filiformes, glabri, peduncolorum bractea basali caduca, cucullata, glabra. *Capitula* globularia, 5 mm (3-3.5 mm in sicco) diametro, 10-15-floribus, bracteolis spathulatis, brevi-stipitatis et laminis ellipticis, ovatis vel lanceolatis, plus minusve concavis, ciliatis. *Flores* 5-meri, petalarum sepalis minus quam dimidiis longitudinis, discretis, lineari-spathulatis usque ad spathulatis, parce ciliatis, petalis discretis. *Legumina* linearia, 30-37 mm longa, 2.5-3.5 mm lata, deflexa, chartacea, recta vel leviter curvata, glabra, lucida, marginibus distincte incrassatis. *Semina* longitudinalia, oblonga usque ad elliptica, ad apicem unilateraliter constricta, 2.4-2.8 mm longa, 1.3-1.6 mm lata, subcompressa, lucido-brunnea, arillo sub-terminali.

*Typus:* adjacent to Jerdacuttup River on North Jerdacuttup Road, 10.5 km E of Ravensthorpe-Hopetoun road, Western Australia, 31 August 1980, *B.R. Maslin* 4789 (*holo:* PERTH 00149381: *iso:* AD, BRI, CANB, K, MEL, NSW, NY).

[*A. uncinella* auct. non Benth.: G. Bentham, Fl. Austral. 2: 341 (1864), as to the Maxwell specimen cited.]

Bushy, rounded *shrubs* 0.3-2 m tall. *Bark* light grey, smooth except fibrous at extreme base. *Branchlets* terete to slightly angled, glabrous, reddish-tan. New shoots vivid green, sub-glabrous. *Stipules* caducous, minute, triangular. *Phyllodes* terete, (20)25-36(45) mm long, 0.7-1 mm diam., slender, congested on branchlets, erect to ascending, becoming patent in age, straight, glabrous, green, occasionally slightly glaucous; apex narrowed, obliquely and often abruptly mucronate, often rostriform or sub-uncinate; pulvinus abruptly separated from phyllode-blade, very slender, terete, glabrous, orange-coloured, 1.5-2 mm long; nerves 4 or 8, immersed, very obscure; gland often not evident, 6-14 mm above pulvinus when present, plane, round or elliptic, minute. *Peduncles* 2 per axil, (5)7-13 mm long, filiform, glabrous; basal peduncular bract caducous, cucullate, glabrous; heads globular, bright light golden, 5 mm (3-3.5 mm dry) diam., 10-15-flowered; bracteoles spatulate with very short stipe and elliptic, ovate or lanceolate blade, more or less concave, ciliate. *Flowers* 5-merous, a few 4-merous interspersed. *Sepals* less than half the petal-length, free, linear-spatulate to spatulate, sparingly ciliate. *Petals* free. *Pods* linear, slightly raised over seeds on alternating sides, not constricted, 30-37 mm long, 2.5-3.5 mm wide, deflexed, chartaceous, straight or slightly curved, glabrous, shining, red-brown, the margins conspicuous, thickened. *Seeds* longitudinally arranged in pods, oblong to elliptic, constricted unilaterally at apex, 2.4-2.8 mm long, 1.3-1.6 mm wide, sub-compressed, glossy, brown; pleurogram U-shaped; areole tiny; aril sub-terminal.

*Selected specimens examined.* WESTERN AUSTRALIA: c. 13 km E of Ravensthorpe, 20 August 1979, *E.M. Bennett s.n.* (AD, K, MEL, NY, PERTH 00149322); 28.7km SE of Ravensthorpe, *M.A. Burgman* 2740 and *S. McNee* (PERTH); 11 km E of Ravensthorpe towards Esperance, *R.S. Cowan* A761 and *B.R. Maslin* (PERTH); Jerducuttup River elbow, *C.A. Gardner* 14083 (PERTH); 11 km E of Ravensthorpe towards Esperance, *B.R. Maslin* 3921 (B, DNA, PERTH, W) and 4053 (PERTH); 22.5 km E of Ravensthorpe on Highway No. 1 to Esperance, *B.R. Maslin* 5461 (BM, CANB, G, MO, PERTH, Z); W tributary of Oldfield River, *G. Maxwell s.n.* (MEL, NSW, PERTH 00149403 and 00149330).

*Distribution.* Restricted to and locally common in a small area east of the Ravensthorpe Range (slightly east of Ravensthorpe township) in the vicinity of the Jerducuttup River, southwest Western Australia.

*Habitat.* On clay or clay-loam, sometimes rocky, on river banks and beneath mallee eucalypts, often forming dense populations, frequently on soils derived from serpentine.

*Flowering and fruiting periods.* Flowers from (August) September to October; pods with mature seeds have been collected in December.

*Affinities.* This is a very distinctive species in this group because of its habitat, slender, very obscurely 4- or 8-nerved phyllodes, long slender peduncles and small, relatively few-flowered heads. In overall appearance it is most like *A. uncinella* Benth. (see below) and Bentham (1864: 341) actually cited a Maxwell collection of the species from the Oldfield River area as *A. uncinella*. It is sympatric with and resembles in a general way *A. binata* Maslin (1978: 202) which has obscurely 3-nerved, obtuse phyllodes, larger heads in short 2-headed racemes and more or less coiled pods.

*Conservation status.* A Priority 2 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The name of the species refers to its habitat, from *ophiolithicus*, Latin for the frequent substrate (soils derived from serpentine rock) of the plant.

**6. *Acacia uncinella* Benth., Linnaea 26: 613 (1855)**

*Typus*: interior of Western Australia, *J.S. Roe s.n. (holo: K; iso: PERTH 00850012-fragment ex K)*.

Low, rounded *shrubs* 0.3-3 m tall, spreading 1-1.5 m across, with stems to 7 cm diam. *Bark* light grey, fibrous, smooth. *Branchlets* terete to slightly angled, glabrous or densely villose to more or less appressed-villose or appressed-puberulous, glabrescent, tan to brown-red at first, becoming grey. New shoots white- or yellow-appressed-puberulous or villose. *Stipules* only seen on youngest shoots, lanceolate-linear, obtuse, scarious, light brown. *Phyllodes* terete to compressed, 10-35 mm long, 0.7-1.5 mm diam., spreading to ascending or erect, straight or shallowly curved, sometimes sigmoidally, glabrous, glossy, light to dark green; apex mucronate, sometimes abruptly so, sub-uncinate, the tip 0.8-1.5 mm long, glabrous, minutely appressed-puberulous or puberulous and more or less glabrescent; pulvinus often abruptly separated, 1-2 mm long, glabrous or puberulous to appressed-puberulous; nerves 8, distant, raised to plane, often obscured by furrows in drying; gland 4-11(20) mm above pulvinus, depressed, elliptic, usually in angle of two coalescing adaxial nerves. *Peduncles* 2 per axil, (2)4-5 mm long, puberulous to appressed-puberulous to glabrous; basal peduncular bract cucullate, rounded, glabrous to appressed-puberulous; heads globular, golden, 2.8-4.5 mm diam., 16-30-flowered; bracteoles spatulate to peltate-spatulate, the blade rounded, puberulous, ciliate, concave. *Flowers* 5-merous. *Sepals* free, about half as long as petals, narrowly spatulate, ciliate. *Petals* about 1/2-united, occasionally free. *Ovary* appressed-puberulous. *Pods* linear, slightly raised over and constricted between seeds, 40-50 mm long, 2.5-3.5 mm wide, thin-crustaceous, straight, glabrous or sparingly appressed-puberulous. *Seeds* arranged longitudinally in the pods, elliptic or oblong-elliptic with terminal constriction, 2.5-3.5 mm long, 1.8-2 mm wide, sub-nitid, mottled dark and pale brown, nigrescent; aril sub-terminal, crested.

*Selected specimens examined*. WESTERN AUSTRALIA: near Boorabbin, *T.E.H. Aplin* 1935 (B, G, K, NSW, PERTH); Pingrup, *W.E. Blackall* 3033 (PERTH); 0.2 km E of Varley Gate on Rabbit Proof Fence, 32° 45'S, 119° 43' 30"E, *K. Bradby* 24 (PERTH); King Rocks, *P.E. Conrick* 1563 (PERTH); Wittenoom Hills, *N.N. Donner* 2888 (PERTH); c. 95 km WSW of Coolgardie on Great Eastern Highway, *N.N. Donner* 4556 (PERTH); c. 3 km N of Bungalla towards Wyalkatchem, *B.R. Maslin* 3390 (AD, BRI, CANB, G, MO, NSW, PERTH); 27 km E of Newdegate towards Lake King, *B.R. Maslin* 3863A (NY, PERTH); c. 2.5 km due NW of No Tree Hill, 20 km due NW of Hopetoun, *B.R. Maslin* 3892 (CANB, K, MEL, NSW, PERTH); 1 km E of Lake King, *B.R. Maslin* 4064A (PERTH); 18 miles [28.8 km] N of Ongerup, *K. Newbey* 2474 (PERTH); Hatter Hill, *K. Newbey* 3295 (MEL, MO, PERTH); 6.5 km E of Lake Ace, *K. Newbey* 8039 (PERTH); 33 km SW of Buningonia Spring, c. 70 km SSW of Zanthus, *K. Newbey* 8251 (PERTH); 18.5 km N of Hyden on road to Anderson Rocks, *J.G. and M.H. Simmons* 1309 (PERTH); 54 km W of Kumarl, *P.G. Wilson* 5698 (MEL, PERTH); 33 km E of Lake King at No. 1 Rabbit Proof Fence, *P.G. Wilson* 5750 (K, NSW, PERTH).

*Distribution*. Most common in an area bounded by Ongerup, east to the Wittenoom Hills (c. 50 km north-northeast of Esperance) and north to Anderson Rocks (c. 30 km north of Hyden), southwest Western Australia. Four populations have been recorded from slightly north of this area (and within the range of *A. fragilis*) from near Merredin, Trayning, Bungalla (c. 10 km east of Kellerberrin) and Boorabbin (c. 80 km east of Southern Cross); a collection from Buningonia Spring, south of Zanthus (c. 185 km northeast of Norseman), represents the most easterly record for the species.

*Habitat*. Sand, loam and rocky loam along road verges, mallee scrub and proteaceous shrubland, on slopes, hilltops and sandplains, often near salt flats or lakes.

*Flowering and fruiting periods.* Flowers from August to October; pods with mature seeds have been collected in December.

*Affinities.* Differs from the generally more northern *A. fragilis* Maiden & Blakely by very few, relatively constant characters. Differences are discussed fully under *A. fragilis*.

*Variation.* A population in the vicinity of Lake King may require formal recognition but so few collections are available that such a course is unjustified at present. It is recognized by its densely villose to appressed-puberulous new growth, the hairs at initiation being golden but very quickly becoming white; the heads are borne on these young branchlets. Most of the pubescence on the branchlets and on the pulvinus persists, sometimes even beyond the current year's growth. The peduncles also are hairy at flowering but generally glabrous by the time the pods are mature; the hairs vary from appressed to spreading and sometimes form a dense indumentum. There is also a tendency for the heads of the variant to be a little smaller, with fewer flowers, but in these characters there is overlap with the typical form.

Clearly, this species, along with *A. fragilis*, will be understood fully only with the acquisition of much more data, particularly from carefully conducted field observations.

*Conservation status.* Not under threat.

### The "*Acacia dielsii* Group"

This "Group" comprises three species, *A. dielsii* E. Pritz., *A. obesa* R.S. Cowan & Maslin sp. nov. and *A. nivea* R.S. Cowan & Maslin sp. nov. Characters shared by these taxa include the following: phyllodes short (10-35 mm long), terete, innocuous, multistriate and normally glabrous; heads globular and few-flowered; flowers 5-merous; and seeds longitudinal in the pods. Relationships of the "Group" are not known.

### Key to species of "*A. dielsii* Group"

1. Heads pedunculate
  2. Pods not undulate, breaking readily at narrow constrictions between the exarillate seeds; branchlets not resinous ..... 1. *A. dielsii*
  2. Pods undulate, not constricted between the arillate seeds; branchlets resinous ..... 2. *A. nivea*
1. Heads sessile ..... 3. *A. obesa*

1. *Acacia dielsii* E. Pritz., Bot. Jahrb. Syst. 35: 294 (1904)

*Typus:* in Avon district, 5 km S of Tammin, Western Australia, 21 May 1901, *L. Diels* 2859 (*iso:* PERTH 00748854-fragment ex B).

*A. ewartiana* W. Fitzg. ex Jean White in A.J. Ewart, Jean White & B. Wood, Proc. Roy. Soc. Victoria n. ser. 23, pt. 2: 287, pl. 50, figs 5-7 (1911). *Syntype:* Cowcowing, Western Australia, August and September 1904, *M. Koch* 998 (both MEL but *n.v.*, see Maslin & Cowan 1994a for discussion).

*A. ewartiana* W. Fitzg., J. Bot. 50: 19 (1912). *Lectotype*: Cowcowing, W.A., August 1904, *M. Koch* 998 (BM, *fide* Maslin and Cowan, 1994a); *isolecto*: K, MEL (2 sheets, *n.v.*), NSW, PERTH 00751618. *Paralectotype*: Cowcowing, W.A., September 1904, *M. Koch* 998 (MEL - *n.v.*, NSW, PERTH 00751596).

*Shrubs* 0.5-2 m tall. *Branchlets* terete or slightly angled, glabrous, occasionally tomentulose or ± sericeous. *Phyllodes* terete, rounded- or truncate-obtuse, minutely ± uncinata-mucronate, 10-35 mm long, 0.7-1.2 mm diam., inclined to erect, straight to curved, glabrous, sometimes glaucous, with 14-18, distant, raised nerves. *Peduncles* 2-4(7) mm long, 2 per axil, slender, glabrous; basal bracts persistent, cucullate, often glaucous; heads globular, 2.5-3.5 mm diam., dark-golden, aromatic, loosely (8)10-13(17) flowered. *Flowers* 5-merous; *sepals* 1/3-2/3-united, rarely free; *petals* 1/2-3/4-united. *Legume* raised over seeds and constricted to narrow isthmus between seeds, readily breaking into 1-seeded articles at the constrictions, to 3 cm long, 1.2-1.8 mm wide, thin-papery, straight to slightly curved, sparingly appressed-puberulous, articles fusiform, 4-5 mm long. *Seeds* arranged longitudinally in the pods, narrowly oblong-elliptic, 2.5-3 mm long, slightly glossy, mottled tan, exarillate.

*Selected specimens examined*. WESTERN AUSTRALIA: c. 4 km W of Newdegate on road to Lake Grace, *E.M. Canning* WA/68 7407B (PERTH); Mount Madden, *J. Goodwin* 224 (PERTH); 9 km NNE of Bruce Rock on road to Merredin, *B.R. Maslin* 6473 (CANB, PERTH, Z); Murchison River, c. 15 km E of North West Coastal Highway, 10 November 1984, *M. Whiting* and *J. Coxon s.n.* (PERTH 00684031).

*Distribution*. Occurs in a belt from the Murchison River (east of Kalbarri) south to the Newdegate area (Newdegate is c. 50 km east of Lake Grace), southwest Western Australia.

*Habitat*. Grows on sandy, loamy and lateritic soils in open scrub and shrubland.

*Variation*. There is considerable variation in some of the characters, especially the vestiture of the branchlets and the degree of union of perianth parts. In the north coastal part of the range, many of the collections are from plants with more or less appressed-puberulous branchlets. Only a little farther inland the more common, glabrous condition is found and it ranges south to the limit of the species; the type of *A. ewartiana* is of this variant. The type collection of *A. dielsii* is from the middle of the geographic range and it has tomentulose branchlets; one other collection at PERTH, labelled *Diels* and *Pritzel* 157 and made in the same month and year at the same location (possibly an isotype or paratype) has exactly the same morphology as the type.

*Affinities*. A very distinct species by virtue of the deeply constricted, easily fragmented pods and exarillate seeds, characters that reliably separate it from its nearest relative, *A. nivea* R.S. Cowan & Maslin (see under *A. nivea* below for discussion).

*Conservation status*. Not under threat.

## 2. *Acacia nivea* R.S. Cowan & Maslin, sp. nov.

*Frutex* 40-100 cm altus, 60-170 cm expansus, ramulis teretibus, dense puberulis vel strigulosis, pilis appressis vel sub-erectis, in resina inclusis, resina sicco saepe alba. *Stipulae* plusminusve persistentes, minutae, triangulares, fuscatae, circa 0.5 mm longae. *Phyllodia* teretia, rotundato-

obtusa et excentrice micro-mucronulata, (10)13-18(20) mm longa, 0.8-1.2 mm diametro, inclinata ad erecta, recta vel leviter arcuata, glabra, demum resinosa, nervis 12-16, immersis vel solum leviter elevatis. *Pedunculi* glabri, 2 per axillam, 2-4.5 mm longi, pedunculorum bracteis basalibus persistentibus, triangularibus ad late ovatis, acutis, circa 0.5 mm longis, leviter concavis; capitula globularia, 2.5-3 mm diametro, 9-12-floribus. *Flores* 5-meri. *Sepala* petalaeque plerumque discreta sed raro sepala ad basem connata. *Legumina* (sub-matura) linearia, undulata, alternatim supra semina valde elevata, 30-35 mm longa, 3 mm lata, chartacea vel tenuiter coriacea, leviter curvata, marginibus incrassatis. *Semina* (immatura) longitudinalia, arillo laterali.

*Typus*: about 23 km E of Mount Madden, Western Australia, 6 August 1968, *P.G. Wilson* 6840 (*holo*: PERTH 00684139; *iso*: CANB, K).

Low-spreading to domed,  $\pm$  dense *shrubs* 40-100 cm tall and 60-170 cm across. *Branchlets* terete, densely puberulous or strigulose with very short, straight, appressed to sub-erect hairs which soon become imbedded in a hard, normally white, resin. *Stipules* more or less persistent, minute, triangular, dark-coloured, c. 0.5 mm long. *Phyllodes* terete, (10)13-18(20) mm long, 0.8-1.2 mm diam., inclined to erect, straight to slightly arcuate, glabrous, becoming resinous, dull medium-green or grey-green; apex rounded-obtuse and excentrically micro-mucronulate; pulvinus abruptly separated from phyllode-blade, c. 1 mm long; nerves 12-16, fine, plane or only slightly raised; gland obscure, 3-8 mm above pulvinus. *Peduncles* 2 per node, 2-4.5 mm long, glabrous; basal peduncular bract persistent, triangular to broadly ovate, c. 0.5 mm long, shallowly acute, concave, dark-coloured, ciliolate; heads globular, golden, 2.5-3 mm diam., 9-12-flowered; bracteoles spatulate with oblate, concave, ciliolate blade. *Flowers* 5-merous. *Sepals* 1/4-1/3 as long as petals, free or rarely up to 1/3-united, obovate to oblanceolate, dark-coloured, ciliolate. *Petals* elliptic, free, glabrous. *Ovary* appressed-puberulous. *Pods* (slightly immature) linear, undulate, strongly raised over seeds on alternate sides, 30-35 mm long, 3 mm wide, chartaceous or thinly coriaceous, slightly curved, glabrous, margins thickened. *Seeds* (sub-mature) longitudinally arranged in pods; pleurogram semicircular; the aril lateral and half as long as seed.

*Selected specimens examined*. WESTERN AUSTRALIA: 14 km W of Grass Patch, 13.25 km W of Norseman-Esperance Highway, on Grass Patch Road, *M.A. Burgman* and *S. McNea* 1883 (PERTH); Mount Madden, *J. Goodwin* 224 (PERTH); Frank Hann National Park, *D. Monk* 115 (PERTH); 30 km W of Ponier Rock, c. 80 km SW of Balladonia Motel, Eyre Highway, *K. Newbey* 7315 (PERTH); 0.7 km N of Mount Andrew, c. 115 km SE of Norseman, *K. Newbey* 7705 (PERTH); 36 km E of Lake King, *K. Newbey* 9475 (MELU, PERTH), *K. Newbey* 9475-1 (MELU, PERTH) and *K. Newbey* 9475-2, 3, 4, 5 and 6 (all PERTH); 29 km N of Lake King on road from Lake Varley, *M.H. Simmons* 1334 (PERTH); 10 km due S of Clyde Hill, *H. Smolinski* (PERTH 00612928).

*Distribution*. Most collections have been made in the Lake King area, especially to the north, east and southeast of the township. It also occurs southeast to an area c. 40 km north-northwest of Munglinup (Munglinup is c. 75 km east-southeast of Ravensthorpe) and east to near Grass Patch (c. 70 km north of Esperance), Clyde Hill (c. 110 km northeast of Esperance) and in the Mount Andrew-Ponier Rock area (southwest of Balladonia), southwest Western Australia.

*Habitat*. Grows on sand, sandy loam or clay in open low woodland, open mallee shrubland (often with *Eucalyptus transcontinentalis* Maiden or *E. eremophila* (Diels) Maiden) and open scrub.

*Flowering and fruiting periods*. Flowers in August and September; pods with sub-mature seeds have been collected in December.



*Affinities.* It is not surprising that this species has been confused with *A. dielsii* E. Pritz. (see above), for they are superficially very similar, the most diagnostic features being the type of fruit. In *A. dielsii* the pods are very thin and brittle, less than 2 mm wide, not undulate, and break readily at the very deep constrictions between the exarillate seeds. Sterile specimens of *A. dielsii* can be distinguished from *A. nivea* by the latter's resinous branchlets, with the resin commonly drying white, and the tendency for the phyllodes to have a more obvious tip. In flower the two species can be separated by the normally united sepals and petals of *A. dielsii*, as well as by its larger, cucullate basal peduncular bracts. Furthermore, in *A. dielsii* the branchlets are commonly glabrous. From *A. obesa* R.S. Cowan & Maslin (see below), another relative, the new species can be distinguished by its pedunculate heads, free petals and white-resinous branchlets. Also superficially similar to *A. pinguiculosa* subsp. *teretifolia* R.S. Cowan & Maslin (ms name, in prep.) which has thicker, 6-8-nerved phyllodes and biconvex pods.

*Conservation status.* Not considered to be threatened.

*Etymology.* The white-resinous nature of the branchlets provides the basis for the name, from *niveus*, Latin for snowy or snowy white.

### 3. *Acacia obesa* R.S. Cowan & Maslin, sp. nov.

*Frutex* 0.3-0.6(1) m altus, ramulis teretibus, tomentulosis vel interdum appresso-puberulis. *Stipulae* persistentes, 0.6-1.8 mm longae. *Phyllodia* teretia, rotundato-obtusa et saepe minute mucronulata, vulgo leviter ad valde curvata sed raro aliquot recta interspersa, pulvino tomentuloso vel appresso-puberulo, laminis (10)15-25 mm longis, 1.2-1.75 mm diametro, glabris, raro tomentulosis et glabrescentibus, 12-16-nervatis, nervis elevatis, glande minuta, basali. Capitula sessilia, globularia, diluto-lutea, 3.5-4 mm diametro, 9-14-floribus, bracteolis unilateraliter peltatis. *Flores* 5-meri. *Sepala* 2/3-3/4-connata, zona marginali appresso-puberula, pilis rubris, minutissima. *Legumina* linearia, biconvexa, 20-40 mm longa, 2-2.5 mm lata, coriacea, valde curvata, glabra vel ad basem puberula vel ubique puberula. *Semina* longitudinalia, quadrato-rotundata, 1.5-1.8 mm longa, 1.3-1.5 mm lata, 1 mm crassitie, lucida, maculata, arillo terminali, magno.

*Typus:* 21 miles [33.6 km] E of Hyden, Western Australia, 14 July 1970, B.R. Maslin 550 (*holo:* PERTH 00158488; *iso:* BRI, CANB, K, MEL, NY).

Low, spreading *shrubs* 0.3-0.6(1) m tall. *Branchlets* terete, tomentulose or occasionally appressed-puberulous (hairs straight) with intermingled red or black micro-hairs. *Stipules* persistent, triangular to subulate, 0.6-1.8 mm long, tomentulose. *Phyllodes* terete, (10)15-25 mm long, 1.2-1.75 mm diam., normally thick, ascending, shallowly to strongly curved but sometimes a few  $\pm$  straight ones interspersed, glabrous, rarely tomentulose and glabrescent; apex rotund-obtuse, often minutely mucronulate; pulvinus 1-1.5 mm long, indumentum as on branchlets; nerves 12-16, raised; gland basal, not always evident, minute. Heads sessile, globular, pale golden, 3.5-4 mm diam., 9-14-flowered; bracteoles unilaterally peltate, the stipe short, the blade obovate, ciliolate. *Flowers* 5-merous. *Sepals* 1/2-2/3 petal length, 2/3-3/4-united, lobes more or less triangular, acute to sub-obtuse, with a marginal band of red, appressed micro-hairs. *Petals* free or weakly coherent in lower half. *Ovary* papillate-puberulous, appressed, red micro-hairs sometimes also present. *Pods* linear, biconvex, 20-40 mm long, 2-2.5 mm wide, coriaceous, strongly curved, becoming once- or twice-coiled after dehiscence, glabrous except puberulous basally or generally puberulous. *Seeds* longitudinally arranged in pods, quadrate-rotund, 1.5-1.8 mm long, 1.3-1.5 mm wide, 1 mm thick, the lateral faces flattened, glossy, mottled dark-tan on very pale tan; pleurogram U-shaped; aril nearly as long as the seed.

*Selected specimens examined.* WESTERN AUSTRALIA: 5 miles [8 km] E of East Hyden Wheat Bin, *M. Barrow* M19 (PERTH); 27 km N of Lake Grace towards Kulin, *B.R. Maslin* 4070 (PERTH); Griffins Find, 1979, *R.F. Maslin s.n.*(PERTH 00683035); 7 miles [11.3 km] W of Lake Grace, *K. Newbey* 1621 (PERTH) and 1621D (AD, G, PERTH); c. 40 km E of Hyden, Lake Liddelow Nature Reserve 29910, 23 July 1986, *L. Silvester* (PERTH 00841633); 1 km S of Lake King township, *P.G. Wilson* 6940 (NSW, PERTH).

*Distribution.* Occurs in scattered localities in Lake Grace, Hyden and Lake King areas of southwest Western Australia.

*Habitat.* Grows in sand and gravelly loam in open low woodland, mallee and heath.

*Flowering and fruiting periods.* Flowers from July to September; pods with mature seeds have been collected in December.

*Affinities.* *Acacia dielsii* is related to, but readily distinguished from, *A. obesa* by its pods and seeds (see discussion under *A. nivea* above), peduncles mostly 2-4 mm long, branchlets commonly glabrous and phyllodes more slender (0.7-1.2 mm diam.). There is a distinct superficial resemblance between *A. obesa* and *A. pingiculosa* subsp. *teretifolia* R.S. Cowan & Maslin (ms name, in prep.) but that taxon has 6- or 8-nerved phyllodes, pedunculate heads and differently-shaped, smaller seeds. Likewise, *A. arcuatis* R.S. Cowan & Maslin (ms name, in prep.) superficially resembles *A. obesa* but is readily distinguished by its 8-nerved phyllodes, 4-merous flowers and straight pods which are 1.5-2 mm wide.

*Discussion.* The short, plump, finely multistriate phyllodes and sessile, few-flowered heads are characteristic of this species. In a variant from along Kulin Road north of Lake Grace (*B.R. Maslin* 4070, PERTH) the phyllodes are loosely tomentulose at first but glabrescent; all the other collections have phyllodes glabrous, except for the pulvinus. This variant also generally has puberulous pods, whereas the old valves on the holotype sheet are glabrous except at the very base. In *Wilson* 6940 (PERTH), the branchlet pubescence is appressed but otherwise the collection is identical with the remainder of the material.

*Conservation status.* A Priority 3 taxon on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

*Etymology.* The corpulent phyllodes of this species are the basis for the name, from *obesus*, Latin for plump or fat.

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## New and priority taxa in the genera *Cryptandra* and *Stenanthemum* (Rhamnaceae) of Western Australia

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### Abstract

Rye, B.L. New and priority taxa in the genera *Cryptandra* and *Stenanthemum* (Rhamnaceae) of Western Australia. Nuytsia 10 (2): 255-305 (1995). The genus *Stenanthemum* is reinstated, with two new combinations: *Stenanthemum complicatum* (F. Muell.) Rye and *S. divaricatum* (Benth.) Rye. The following new Rhamnaceae taxa, some of which have conservation significance, are described and illustrated: *Cryptandra apetala* var. *anomala* Rye, *C. arbutiflora* var. *borealis* Rye, *C. arbutiflora* var. *intermedia* Rye, *C. arbutiflora* var. *pygmaea* Rye, *C. aridicola* Rye, *C. congesta* Rye, *C. distigma* Rye, *C. graniticola* Rye, *C. intonsa* Rye, *C. minutifolia* Rye, *C. minutifolia* subsp. *brevistyla* Rye, *C. nola* Rye, *C. polyclada* subsp. *aequabilis* Rye, *C. recurva* Rye, *C. wilsonii* Rye, *Stenanthemum bilobum* Rye, *S. cristatum* Rye, *S. emarginatum* Rye, *S. intricatum* Rye, *S. limitatum* Rye, *S. mediale* Rye, *S. nanum* Rye, *S. newbeyii* Rye, *S. notiale* Rye, *S. notiale* subsp. *chamelum* Rye, *S. petraeum* Rye, *S. poicilum* Rye, *S. reissekii* Rye and *S. stipulosum* Rye. A few additional species of *Cryptandra* and *Stenanthemum* that are presently included on the Priority Flora List are also illustrated.

### Introduction

*Cryptandra* and *Stenanthemum* are the two largest genera of the family Rhamnaceae in Western Australia, but the latter name is scarcely known because it has not been used for taxa in this state since the 1920s. *Stenanthemum* is accepted here in the sense that it was originally circumscribed by Reissek (1858), and not as reduced by Bentham (1863) to exclude those species with a short floral tube. Although generic limits in the south-western Australian Rhamnaceae have yet to be fully defined, Kevin Thiele (pers. comm.), who is studying the generic boundaries throughout Australia, agrees with the need to reinstate the genus *Stenanthemum*. The short-flowered *Stenanthemum* species that Bentham transferred to *Spyridium* and long-flowered species that have since been included in *Cryptandra* are too closely related to be placed in separate genera. There is no clearly defined separation of flower length between the two categories and there are no correlating characters that can be used to distinguish them. Both *Cryptandra* and *Spyridium* also have short- and long-flowered species among their typical members.

An earlier paper (Rye 1995) dealing with *Spyridium* and *Trymalium* species outlines the main distinguishing characteristics of those genera. *Spyridium* has often been confused with the two genera treated here but differs in its disc, fruit and aril. Typical *Cryptandra* and *Stenanthemum* species can

be distinguished from one another by differences in their vegetative characters, inflorescence, disc and degree of superiority of the ovary in fruit. In Western Australia there are approximately 19 species in *Cryptandra* with these typical features and 21 in *Stenanthemum*. At least ten further species are of uncertain generic placement as they have unique characters or unusual combinations of characters. New genera will probably be needed to accommodate some of these uncertain taxa, which will be dealt with in a later paper after the generic boundaries in the family have been examined further.

The purpose of this paper is to provide scientific names, descriptions and illustrations for new Western Australian taxa in the genera *Cryptandra* and *Stenanthemum* and to give information on any additional members of these genera that are currently listed on the Priority Flora List. Publication of keys and distribution maps is intended for a later paper, together with a complete listing of Rhamnaceae for Western Australia.

### Materials and methods

Type specimens were borrowed from LD, MEL and W and specimens of taxa extending into South Australia were borrowed from AD. Unless otherwise indicated, all specimens cited were housed at PERTH. All measurements, habitat information, flowering times and other data were obtained from the herbarium specimens. To avoid unnecessary repetition of characters in the descriptions of new taxa, a list of implicit characters was prepared, the individual descriptions only mentioning these characters if they differed from the usual state for their genus. The implicit characters are relevant to those Western Australian species listed as included in this study and should not be taken as generic characters for the genus as a whole.

Conservation codes were assigned to the taxa using the standards adopted by the Western Australian Department of Conservation and Land Management for its Priority Flora List and Gazetted Rare Flora List. These codes are defined at the end of each "Nuytsia" issue.

### Results

#### Species included in the genus *Cryptandra* Sm.

Apart from the species listed below, the following Western Australian species are considered to be typical of the genus *Cryptandra*: *C. leucopogon* Meisn. ex Reissek, *C. monticola* Rye & Trudgen, *C. myriantha* Diels, *C. nutans* Steud. and *C. spyridioides* F. Muell. There are also many members of the genus in eastern Australia.

#### Implicit characters for *Cryptandra*

*Indumentum* white or clear. *Stipules* persistent, each pair shortly united at the base on lower (abaxial) side of petiole, meeting but free on the upper side of petiole. *Petioles* protruding from the connate base of the stipules, glabrous. *Leaves* entire, with recurved to revolute margins partially to completely concealing the lower surface; upper surface green. *Bracts* brown, glabrous or subglabrous inside. *Flowers* subtended by one or more whorls of bracts, all or the lower ones of each branchlet also subtended by a leaf and its paired stipules. *Floral tube* extended into a free tube above the ovary

summit. *Disc* occurring at or near the junction of the free floral tube and ovary, undulate with 5 lobes opposite the sepals, expanding and becoming circular in fruit, densely stellate-hairy. *Ovary* 3-celled, densely stellate-hairy. *Style* glabrous throughout or with a few stellate hairs at the extreme base; stigmatic lobes 3, minute, spreading. *Fruit* a schizocarp; fruitlets crustaceous, dehiscing over the summit and down inner surface, with an open basal attachment forming a basal hole when the fruitlet is shed from the plant. *Seeds* with a dark blackish base seated on an aril, uniformly coloured above; aril succulent, whitish-translucent, with one inner (adaxial) and two lateral lobes.

***Cryptandra apetala*** Ewart & Jean White, Proc. Roy. Soc. Victoria 22: 93, pl. 21 (1909). *Type*: Cowcowing, Western Australia, September, *M. Koch* 1596 (*n.v.*, illustration seen).

***Cryptandra apetala*** var. ***anomala*** Rye, var. nov.

*Cryptandrae apetalae* var. *apetalae* floribus petalis instructis recedit.

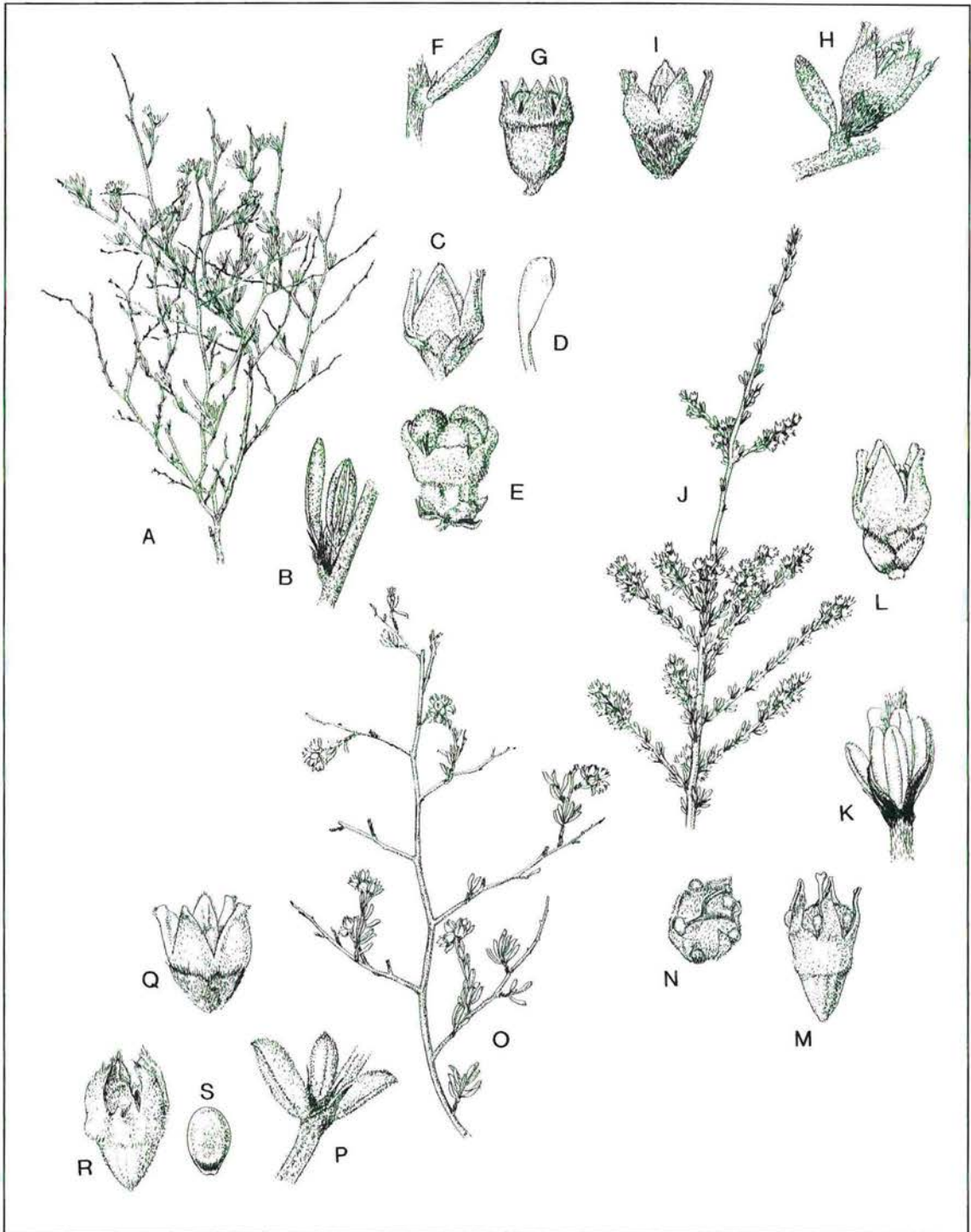
*Typus*: 5 miles [8 km] W of Hines Hill, Great Eastern Highway, Western Australia, 20 August, 1961, *A.S. George* 2664 (*holo*: PERTH 01514121; *iso*: CANB).

*Shrub* 0.15-0.5 m high. *Young stems* sparsely to densely minutely stellate-hairy, sometimes also with longer simple hairs 0.2-0.3 mm long. *Stipules* 0.5-1 mm long, acute to long-acuminate, minutely ciliate; outer surface often with minute hairs along the midvein, rarely with scattered minute stellate hairs throughout. *Petioles* 0.3-0.4 mm long. *Leaf blades* usually narrowly elliptic or narrowly oblong-elliptic, 2.1-2.8 x 0.5-1 mm acute, the apex erect (not recurved); lower surface partially to completely concealed, densely to very densely stellate-hairy and usually with a few simple hairs 0.2-0.3 mm long along the midvein; upper surface very sparsely to densely minutely stellate-hairy. *Floral bracts* c. 6, very broadly ovate, 0.6-1 mm long, obtuse or acute, minutely ciliate; outer surface usually minutely hairy along the midvein. *Flowers* 1-5 per branchlet, in a spike-like or head-like cluster 3-5 mm wide, white to cream or pink and white (the sepals sometimes white with pink tips). *Floral tube* 0.7-0.9 mm long (enlarging to 1.5-1.7 mm in fruit), densely minutely stellate-hairy; adnate portion of tube 0.3-0.5 mm long, more densely hairy than free portion; free portion of tube 0.4-0.5 mm long. *Sepals* 0.6-0.8 mm long, densely minutely stellate-hairy and with simple hairs 0.2-0.3 mm long at apex. *Petal claw* 0.2-0.4 mm long. *Disc* with hairs c. 0.1 mm long. *Ovary summit* with hairs 0.1-0.2 mm long. *Style* 0.4-0.5 mm long. *Schizocarp* slightly less than half inferior (c. four-sevenths inferior), 2-2.5 x 1.5-1.8 mm; superior portion densely stellate-hairy, the apex protruding well above the base of the sepals. *Seeds* not seen at maturity. (Figure 1A-E)

*Other specimens examined*. WESTERN AUSTRALIA: Hyden, 6/9/1966, *M. Barrow* 21; between Corrigin and Quairading, 4/10/1933, *W.E. Blackall* 3248; near Wyalkatchem, 10/1937, *W.E. Blackall*; 3-5 km E of Merredin on Great Eastern Highway, 29/9/1981, *R. Spjut, G. White & R. Phillips* 7234; Kwoylin, 11/1920, *E.H. Wilson & D.A. Herbert* 157; 1 km S of Lake King township, 9/8/1968, *P.G. Wilson* 6944.

*Distribution*. Extends from near Wyalkatchem and Merriden south east to Lake King, southern Western Australia.

*Habitat*. Various recorded from "yellow sand over laterite", "heath" and "Eucalyptus woodland and Acacia bushland".



**Figure 1.** A-E - *Cryptandra apetala* var. *anomala*. A - flowering branch (x1), B - portion of stem with leaf cluster (x7), C - flower and bracts (x10), D - petal (x30), E - schizocarp and bracts (x7); F,G - simple-haired variant of *C. apetala* var. *apetala*. F - stipules and leaf (x10), G - schizocarp (x8); H,I - stellate-haired variant of *C. apetala* var. *apetala*, flower and bracts (x10), I - stipules, leaf and flower (x10); J-N - *C. distigma*. J - flowering branch (x1), K - leaf cluster (x6), L - flower and bracts (x8), M - schizocarp (x8), N - schizocarp from top view splitting in half (x8); O-S - *C. recurva*. O - flowering branch (x1), P - leaf cluster (x6), Q - flower with bracts (x8), R - schizocarp (x7), S - seed (x7). Drawn from M. Barrow 21 (A-E), A. Fairall 1763 (F,G), Y. Chadwick 1735 (H), R.J. Cranfield 2332 (I), K.R. Newbey 8821 (J-L), A.S. George 5842 (M,N), K.R. Newbey 6108 (O-Q) and M.A. Burgman 3773 (R,S).

*Flowering period.* August-October. Fruits recorded September-November.

*Conservation status.* Not presently listed as a priority taxon, but it may need monitoring as it occurs in wheatbelt areas where there are few remnant patches of bushland and is not known from any conservation reserves. It has a geographic range of approximately 300 km.

*Etymology.* From the Greek *anomalos* - inconsistent or deviating from the normal rule, referring to the anomaly of this variety having petals but belonging to a species named *apetala*.

*Notes.* This variety is distinguished by its distinct geographical range and presence of petals from the apetalous typical variety. Two specimens (W.E. Blackall 4001, 8/1930) of var. *apetala* do have a few flowers with petals attached, but these petals are abnormal, being reduced in size and apparently easily shed. Both normal and abnormal petals have a long claw, a character distinguishing *C. apetala* from two related species, *C. nutans* and *C. recurva*.

### ***Cryptandra apetala* Ewart & Jean White var. *apetala***

*Variants.* Very variable in indumentum. There are two main variants, which probably intergrade.

1. Simple-haired variant. This variant is distinguished by the simple hairs on the young stems and upper surface of the leaves but one specimen also has some stellate hairs on the stems. (Figure 1F,G)

2. Stellate-haired variant. This variant is similar to *C. apetala* var. *anomala* except that it generally lacks petals, although a couple of specimens have a few flowers with reduced petals. As there are no unopened buds on these specimens, it is not known whether only some flowers have petals, or whether all flowers have petals to begin with and these petals are shed after the flowers open. A few specimens differ from the rest in having ferruginous hairs on the bracts. (Figure 1H,I)

*Distribution.* Extends from Nerren Nerren Station (north of Kalbarri National Park) south east to Barker Lake.

*Flowering period.* June-September. Fruits July-November.

*Conservation status.* Widespread, with a range of c. 720 km, including two nature reserves. The simple-haired variant might be at risk, however, as it is not known from any nature reserves and has not been collected since 1974. It has been recorded from three localities in the Lake Moore-Cowcowing area, with a range of at least 75 km.

***Cryptandra arbutiflora* Fenzl in Endl., Fenzl, Benth. & Schott, Enum. Pl. Hueg. 26-27 (1837). - *Wichurea arbutiflora* (Fenzl) Nees ex Reissek, Pl. Preiss. 2: 290 (1848). Type: Swan River, [Western Australia], Huegel (W).**

*Implicit characters for the species.* Branchlets tending to be spinescent. Young stems with simple hairs. Stipules glabrous. Leaf blades elliptic to linear, usually acute, with an erect to recurved mucro. Floral bracts usually 7-10 per flower, broadly or very broadly ovate, c. 1 mm long, acute, glabrous, entire at first but often becoming lacerate. Flowers (1)2-many per branchlet, in a loose spike- or raceme-like cluster 5.5-9 mm wide and up to 20 mm long, glabrous. Petals subsessile or with a claw c. 0.1 mm long. Disc with hairs c. 0.2 mm long. Schizocarp with the superior portion concealed within the free floral tube.



**Cryptandra arbutiflora** Fenzl var. **arbutiflora**

*Conservation status.* Widespread and not considered to be at risk.

**Cryptandra arbutiflora** var. **borealis** Rye, var. nov.

A aliis varietatibus *Cryptandrae arbutiflorae* pilis caulibus brevissimis recurvis vel retrorsis differt.

*Typus:* 17 km from Northampton on Port Gregory road, Western Australia, 8 August 1994, S. Patrick 1966 (*holo:* PERTH 04159810; *iso:* CANB).

*Shrub* erect or spreading, 0.25-1 m high. *Young stems* with coarse, recurved or retrorse hairs up to 0.1 mm long. *Stipules* 1.5-2.2 mm long, acute. *Petioles* 0.5-1.2 mm long. *Leaf blades* 4-8(14) x 0.6-2(2.5) mm, glabrous on both surfaces. *Flowers* white at first, turning pink or rarely red with age. *Floral tube* 1.2-1.8(2.3) mm long (enlarging to 2-2.5(3) mm in fruit); adnate portion of tube 0.2-0.4 mm long; free portion of tube 1.0-1.5(2.0) mm long. *Sepals* 1.0-1.8 mm long. *Ovary summit* usually sparsely hairy. *Style* 1.7-2.8 mm long; stigmatic lobes c. 0.2 mm long. *Schizocarp* up to half (two-fifths to half) inferior, 2.2-2.8 x 1.5-1.7 mm; superior portion usually with a few large stellate hairs, the hairy disc located directly above the junction between the ovary and free floral tube and usually touching it. *Seeds* 1.3-1.6 x 0.7-1.1 mm, orange brown. (Figure 2A-C)

*Selected specimens examined.* WESTERN AUSTRALIA: Kalbarri National Park, 20/7/1967, A.M. Ashby 2165; Wokatherra Hill, 22/8/1983, R.J. Cranfield 2685; 3 miles [5 km] W of Casuarina, 5/8/1976, R.J. Hnatiuk 760338; c. 15.4 km S of Northampton along North West Coastal Highway, 21/8/1983, C.M. Lynch 28; Oakajee Reserve, 7/8/1994, S. Patrick 1953; 25 km S of Murchison River and 10 km N of Hutt along North West Coastal Highway, 11/9/1981, R. Spjut & C. Edson 7054; Spalding Park Reserve, Chapman River, 26/6/1981, K.E. Watson 109.

*Distribution.* Extends from Kalbarri south to Geraldton and also recorded at Casuarina, southern Western Australia.

*Habitat.* Occurs in sand over sandstone, limestone, quartz or other types of rocks.

*Flowering period.* May-August. Fruits recorded July-September.

*Conservation status.* Not considered to be at risk at present.

*Etymology.* From the Latin *borealis* - northern, this variety occupying the northern part of the species range.

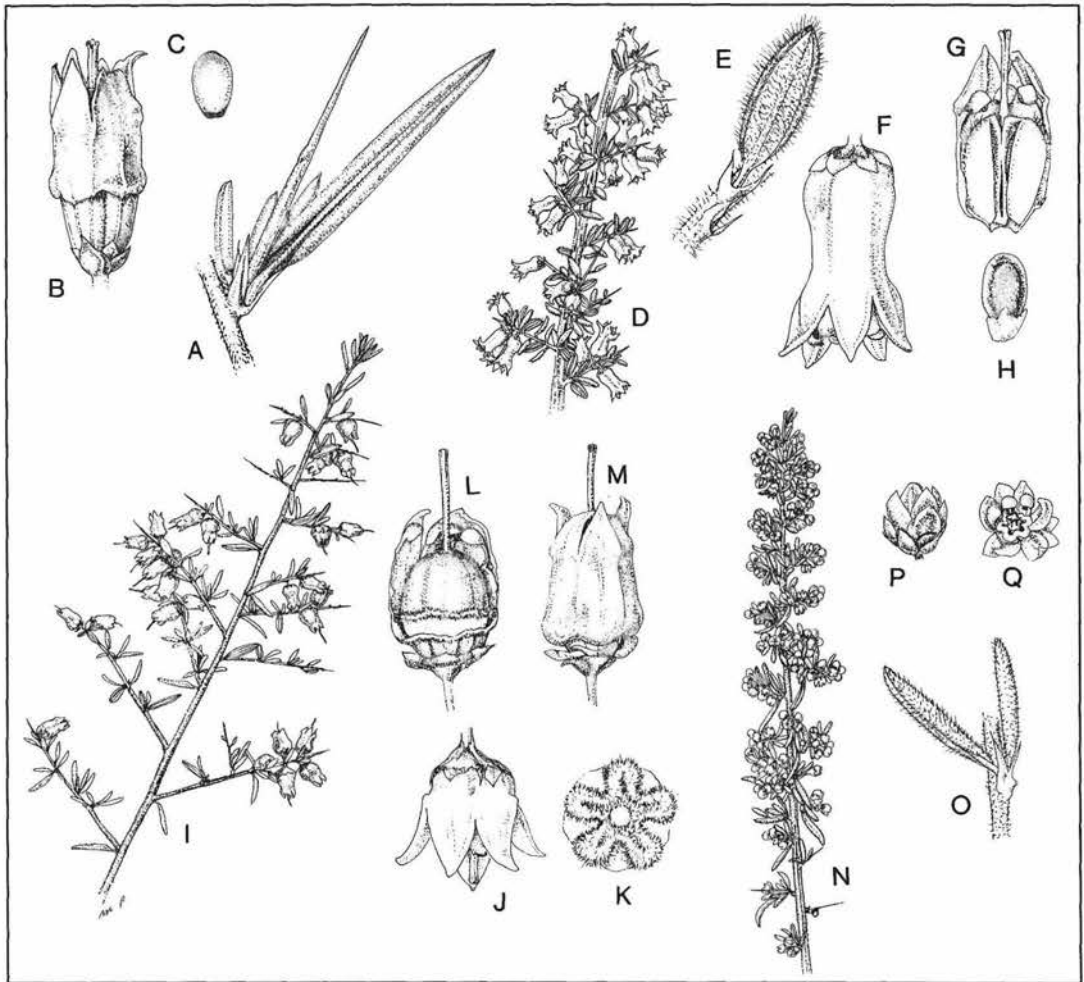
*Notes.* The other varieties of *Cryptandra arbutiflora* all differ from var. *borealis* in having patent or spreading, usually longer, hairs on the stems, and each differs in at least one other character, such as leaf indumentum or flower length.

**Cryptandra arbutiflora** var. **intermedia** Rye, var. nov.

A aliis varietatibus *Cryptandrae arbutiflorae* pagina infera foliorum juvenium dense stellato-pubescentibus differt.

*Typus*: 2 km SW of Jurien Bay turnoff from Brand Highway, 3.7 km W along track opposite Marchagee track, Western Australia, 2 July 1992, R.J. Cranfield & P. Spencer 8283 (*holo*: PERTH 02847515; *iso*: CANB).

*Shrub* erect, 0.3-0.7 m high. *Young stems* with coarse or fine, patent or spreading hairs, the larger ones usually 0.2-0.3 mm long but sometimes minute. *Stipules* 0.8-1.4 mm long, attenuate to acuminate. *Petioles* 0.4-1.2 mm long. *Leaf blades* 3-9 x 0.6-2 mm; lower surface densely stellate-hairy at first, sometimes becoming glabrous; upper surface often with simple patent hairs, the larger hairs 0.2-0.3 mm long, sometimes glabrous. *Flowers* usually white, rarely pink. *Floral tube* 1.5-2.6(3) mm long (enlarging to 2-4 mm in fruit); adnate portion of tube c. 0.4 mm long; free portion of tube 1.2-2.8 mm long. *Sepals* 1.2-1.7 mm long. *Ovary summit* usually with scattered stellate hairs, sometimes more densely hairy or glabrous. *Style* 1-1.7 mm long; stigmatic lobes c. 0.2 mm long.



**Figure 2.** A-C- *Cryptandra arbutiflora* var. *borealis*. A - spinescent branchlet (x7), B - fruit (x6), C - seed (x7); D-H - *C. arbutiflora* var. *intermedia*. D - flowering stem (x1), E - stipules and undersurface of leaf (x7), F - flower with bracts (x7), G - dehiscent fruitlet (x7), H - inner surface of seed and aril (x7); I-M - *C. arbutiflora* var. *pygmaea*. I - fruiting branch (x1), J - flower with bracts (x8), K - top view of disc (x15), L - schizocarp with bracts (x8), M - schizocarp, showing the disc separated from the floral tube (x8); N-Q - *Cryptandra arbutiflora* var. *tubulosa* (*C. glabrata* type). N - branch with very young flower buds (x1), O - leaf cluster (x6), P - young flower bud and bracts (x6), Q - disc surrounded by parts of opened bud and bracts (x6). Drawn from Spjut & Edson 7054 (A,B), F.W. Went 27 (C), E.A. Griffin 4823 (D-F), E.A. Griffin 2395 (G,H), A.R. Annel 1291 (I), E. Wittwer 1563 (J,K), A.R. Annel 1281 (L,M), and L. Preiss 2420b, type specimen from LD (N-Q).

*Schizocarp* largely superior to half inferior (one-fifth to half inferior), 2.2-2.6 x 1.5-1.7 mm; superior portion stellate-hairy or sometimes glabrous, the hairy disc located directly above the junction between the ovary and free floral tube and usually touching it. *Seeds* 1.3-1.5 x 0.6-0.8 mm, sometimes uniformly coloured but usually orange brown or reddish brown centrally, the central area surrounded by darker spots or a darker boundary, the margin often more yellowish brown. (Figure 2D-H)

*Selected specimens examined.* WESTERN AUSTRALIA: 35 miles [56.4 km] W of Watheroo on Badgingarra road, 18/7/1965, *J.C. Anway* 192; off Jurien Rd, 6 km W of Brand Highway, 12/10/1979, *E.A. Griffin* 2393 & 2395; 2.5 km E of Mt Peron, 25/7/1980, *E.A. Griffin* 2745; Yandan Nature Reserve (39571) SE of Cataby, 28/6/1988, *E.A. Griffin* 4860; near Coomallo Creek, 3/8/1976, *R.J. Hnatiuk* 760118; Gingin Cemetery, 7/8/1973, *A. Kanis* 1509; Mt Lesueur, 26/10/1973, *D. Kitchener* 69; near Moora, 4/9/1962, *F.W. Went* 92.

*Distribution.* Extends from Cockleshell Gully and Mt Peron south to Gingin and east to near Moora, with a possible isolated occurrence at Northam, southern Western Australia.

*Habitat.* Occurs in sandy or gravelly soils, usually over laterite, rarely over sandstone, often on lateritic breakaways.

*Flowering period.* June-September. Fruits recorded July-October.

*Conservation status.* Not considered to be at risk at present.

*Etymology.* From the Latin *inter* - between and *medius* - middle, this variety tending to have intermediate floral characters in comparison with the other varieties of *C. arbutiflora*. It also occurs in an intermediate geographic area in relation to the other three main varieties.

*Notes.* All of the other varieties can be distinguished from var. *intermedia* by the glabrous undersurface of their young leaves. A specimen from Northam (*Gregory* 10/1900) with leaves having a stellate-hairy undersurface, falls outside the normal geographic range for this variety and is in some respects more like var. *arbutiflora*, so is presently regarded as intermediate.

***Cryptandra arbutiflora* var. *pygmaea* Rye, var. nov.**

A aliis varietatibus *Cryptandrae arbutiflorae* tubo florali brevior in statu fructifero a disco manifeste disjuncto.

*Typus:* Muir Highway, Manjimup District, Western Australia, 16 November 1990, *A.R. Annels* 1291 (*holo:* PERTH 03128830).

*Shrub* low and spreading, 0.05-0.2 m high. *Young stems* with coarse, patent or spreading hairs 0.1-0.2 mm long. *Stipules* 0.5-1 mm long, acute. *Petioles* 0.6-0.8 mm long. *Leaf blades* 3-6 x 0.6-1.5(2) mm, glabrous on both surfaces. *Flowers* white. *Floral tube* c. 1 mm long (enlarging to c. 2 mm in fruit); adnate portion of tube c. 0.3 mm long; free portion of tube c. 0.7 mm long. *Sepals* c. 1.5 mm long. *Ovary* summit glabrous. *Style* 1.5-2 mm long; stigmatic lobes lateral, c. 0.3 mm long. *Schizocarp* less than half (one-fifth to one-third) inferior, 2-2.5 x c. 1.4 mm; superior portion glabrous, the hairy disc located 0.25-0.4 mm above the junction between the ovary and free floral tube. *Seeds* not seen at maturity. (Figure 2I-M)

*Other specimens examined.* WESTERN AUSTRALIA: N side of Muir Highway, 150 m E of Ireland Rd, 15/11/1990, A.R. Annels 1281; Muir Highway, 20 km E of Manjimup, 16/8/1975, E. Wittwer 1563.

*Distribution.* Restricted to a very small area in the Nyalup-Lake Muir area, east of Manjimup, southern Western Australia.

*Habitat.* Occurs on shallow clay around granite outcrops, in heath vegetation surrounded by Jarrah forest.

*Flowering period.* August-October. Fruits recorded November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 1. This taxon is known from only one or two populations in a very restricted area and is not known from any conservation reserves. Tony Annels (pers. comm.) has collected it at two sites about 0.8 km apart, observing a few plants at each location but none in between, suggesting that there may be two discrete populations rather than a single scattered population.

*Etymology.* From the Greek *pygmaios* - dwarf, referring to the small stature of the plant and the small size of its flowers in comparison with the other varieties of *C. arbutiflora*.

*Notes.* As far as it is currently known, this taxon is more distinct than the other varieties of *C. arbutiflora* and could therefore be regarded as a new species or subspecies. It is usually a smaller plant than the other varieties and has shorter flowers owing to the shorter free portion of the floral tube. A more significant difference appears to be the distinct separation between the disc and the floral tube in fruit, but the degree of separation varies, as it does within var. *borealis*. If further populations of var. *pygmaea* are located, these will no doubt increase the known variation within the taxon and probably decrease its apparent 'distinctiveness'. The high degree of variability within other varieties of *C. arbutiflora* also argues for placement of the taxon as a variety.

***Cryptandra arbutiflora* var. *tubulosa*** (Fenzl) Benth., Fl. Austral. 1: 444 (1863). - *Cryptandra tubulosa* Fenzl in Endl., Fenzl, Benth. & Schott, Enum. Pl. Hueg. 26 (1837). - *Wichurea tubulosa* (Fenzl) Nees ex Reissek in Lehm., Pl. Preiss. 2: 291 (1848). *Type:* King George Sound, [Western Australia], Huegel (W).

*Cryptandra glabrata* Steud. in Lehm., Pl. Preiss. 1: 188 (1845). - *Cryptandra miliaris* Reissek *nom. illeg.* in Lehm., Pl. Preiss. 2: 288 (1848), *C. miliaris* var. *psilophylla* Reissek *nom. illeg.* in Lehm., Pl. Preiss. 2: 288 (1848). *Type:* Pointwater [Point Walter, Perth, Western Australia], 17 July 1839, L. Preiss 2420a (LD).

*Cryptandra lasiophylla* Steud. in Lehm., Pl. Preiss. 1: 188 (1845). - *C. miliaris* var. *lasiophylla* (Steud.) Reissek in Lehm., Pl. Preiss. 2: 288 (1848). *Type:* Pointwater [Point Walter, Perth, Western Australia], 17 July 1839, L. Preiss 2420b (LD).

*Conservation status.* Var. *tubulosa* is known from many populations with a range of over 300 km, including some on nature reserves, so is not considered to be at risk. However, it was mistakenly included twice on the 1990 Priority Species List, under the names *Cryptandra miliaris* and

*C. tubulosa*, the latter described as an extinct taxon from King George Sound. As *C. miliaris* was an illegitimate name, the earlier name of *C. glabrata* was adopted for the 1994 Priority Species List, at which stage it was thought to be a distinct species known only from the type specimens.

*Notes.* Typical var. *tubulosa* has a coastal distribution extending from Perth southwards and occurring near Northcliffe on the south coast. Although King George Sound was given as the type locality, there are no recent collections from that area and it appears that the cited locality referred vaguely to a large region of southern Western Australia rather than the specific sound near Albany.

An atypical variant with a glabrous or relatively sparsely hairy disc (Figure 2N-Q) was originally given two species names, *Cryptandra glabrata* and *C. lasiophylla*, which were later combined under a further name *C. miliaris*. This variant does not appear to be sufficiently distinct to be given a separate varietal name and is reduced here to a synonym of *C. arbutiflora* var. *tubulosa*. It has not been collected since the original specimens were taken in 1839 from Point Walter, Perth, despite a recent search at the type locality, where the vegetation is now much degraded. The nature of this taxon was obscure because the type specimens were collected in early bud and lacked mature flowers and fruits. However, its vegetative characters, inflorescence type and glabrous flower buds match *C. arbutiflora*. Judging from the most advanced flower bud found on the type specimens, the flowers would be elongate at maturity like those of *C. arbutiflora*.

Although descriptions in several early works, such as Bentham (1863), indicate that the Point Walter taxon has a glabrous disc, contrasting with the densely hairy disc of *Cryptandra arbutiflora*, only one of the type specimens (*L. Preiss* 2420a) has a glabrous disc. The other specimen (*L. Preiss* 2420b) is intermediate, having a hairy, but not densely hairy, disc. A more obvious difference between the two type specimens is that one has hairy leaves and the other glabrous leaves. Variation in leaf indumentum is one of many variable characters known in most varieties of the highly polymorphic species, *C. arbutiflora*. Certainly, the occurrence of a glabrous disc alone does not warrant recognition of a distinct species. Infra-specific variation in the disc indumentum is known in a number of other Western Australian Rhamnaceae species.

### ***Cryptandra aridicola* Rye, sp. nov.**

*Cryptandrae minutifoliae* arcte affine sed basi floris minus pubescenti, costi tubi floralis epilosi, unguibus petalorum longioribus differt.

*Typus:* Edjudina Station, Western Australia, 9 July 1989, *H. Pringle* 2380 (*holo:* PERTH 01177591; *iso:* CANB, MEL).

*Shrub* usually spreading, 0.3-0.8 m high. *Branchlets* not spinescent. *Young stems* densely hairy at first with a matted white indumentum, soon becoming glabrous. *Stipules* 0.8-1.3 mm long, acute to acuminate, ciliate. *Petioles* 0.2-0.3 mm long, concealed by united base of stipule pair. *Leaf blades* appearing sessile, narrowly oblong-elliptic, 1.4-3.6 x 0.6-0.7 mm, with a recurved mucro; lower surface concealed; upper surface minutely papillose or glabrous. *Floral bracts* 12-16, broadly ovate to broadly obovate, 2.5-3.5 mm long, obtuse, minutely or sometimes distinctly ciliate, the cilia 0.1-0.2 mm long; outer surface glabrous; inner surface hairy along the midvein or central area in the distal half. *Flowers* solitary or few (usually 2-7) per branchlet, in a spike-like cluster 10-18 mm wide, white or occasionally pink. *Floral tube* 2.5-3.5 mm long (enlarging to 3.4 mm or more in fruit); adnate portion of tube 0.4-0.6 mm long, densely stellate-hairy on basal half, glabrous or sparsely stellate-hairy

on distal half; free portion of tube 2.1-2.9 mm long, glabrous or subglabrous on basal half, becoming moderately densely hairy towards the summit between the glabrous ribs, the indumentum similar to that on base of sepals. *Sepals* 2.7-3.7 mm long, densely stellate-hairy and with larger simple hairs at least towards the apex; simple hairs 0.4-0.6 mm long. *Petal claw* 0.5-0.8 mm long. *Disc* with hairs 0.1-0.3 mm long. *Ovary summit* with hairs 0.2-0.5 mm long. *Style* 3.5-5 mm long. *Schizocarp* about half inferior, c. 3.3 x 2.2 mm; superior portion concealed within the free floral tube, moderately densely hairy. *Seeds* not seen at maturity. (Figure 3A-E)

*Selected specimens examined.* WESTERN AUSTRALIA: 16 km E of Bullabulling, 23/8/1939, W.E. Blackall 4068; Cundelee, 1967, P. Boswell A21; Boulder Valley, 30/8/1901, W.D. Campbell; 19 miles [30.6 km] E of White Cliffs Homestead, E of Laverton, 2/7/1963, A.S. George 4567; 21 km E of Cosmo Newberry, 28/7/1974, A.S. George 12197; 32 km E of Zanthus, 30/6/1966, D.W. Goodall 174/2886; Coolgardie, 9/1899, R. Helms; 21 km SE of Sinclair Soak, 6/8/1980, K.R. Newbey 6953; 3 km S of Emu Rocks, 22/7/1992, D.J. Pearson 1898; Kalgoorlie Nickel Smelter, 30/6/1992, R. Spencer 253; Fraser Range, 13/9/1965, B.L. Turner 5573.

*Distribution.* Extends from Anketell Station and near Cosmo Newberry south to near Bank Rock and Fraser Range, southern Western Australia.

*Habitat.* Occurs in sand or clayey sand, on plains or on rocky ridges or hills.

*Flowering period.* July-September. Fruits recorded August-September.

*Conservation status.* Not considered to be at risk at present.

*Etymology.* From the Latin *aridus* - dry and *-cola* - inhabitant, referring to the arid habitat in which the species occurs.

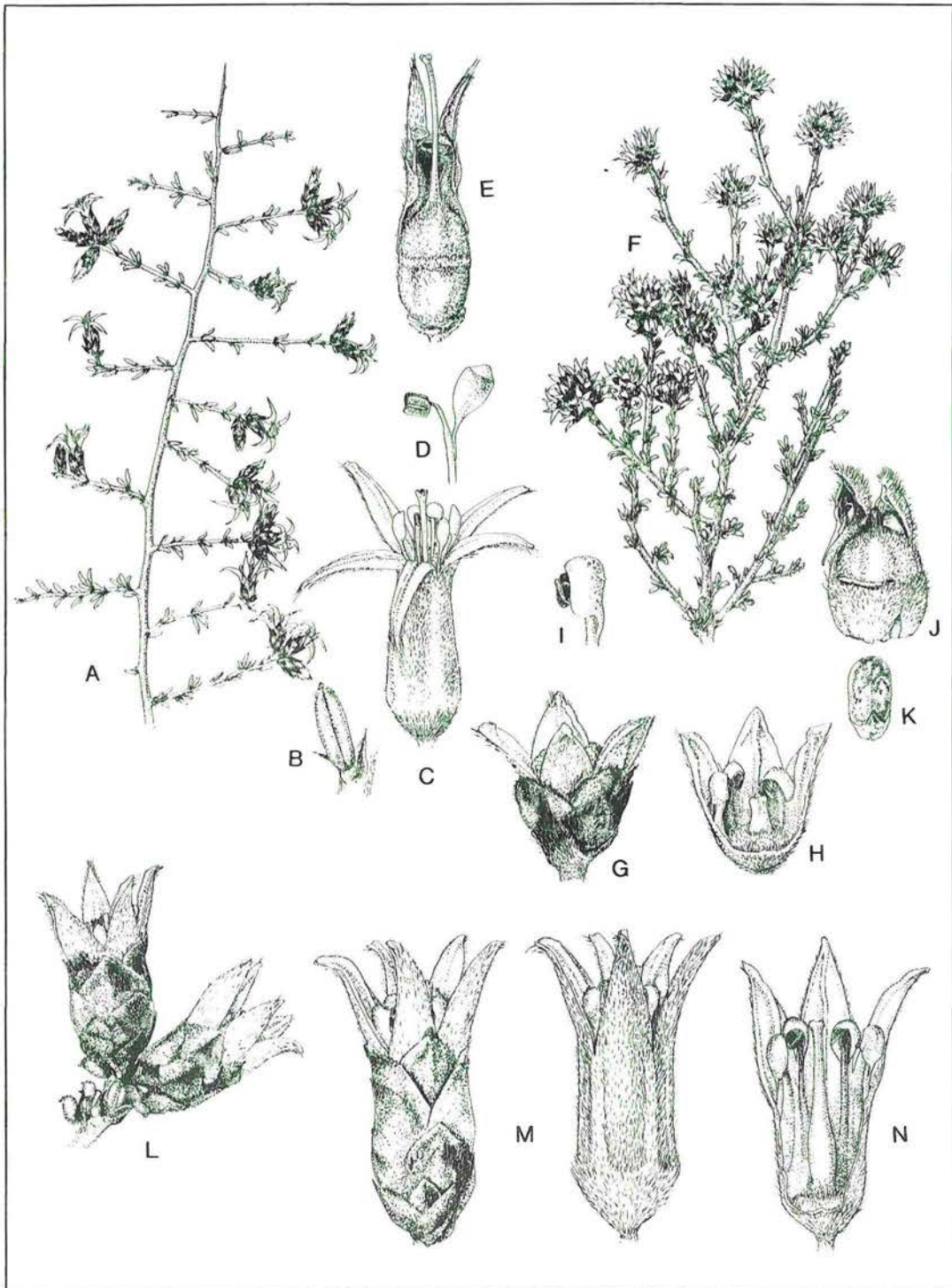
*Notes.* Very closely related to *Cryptandra minutifolia*, which differs in being densely hairy throughout on the adnate portion of the floral tube, being hairy on the ribs on the free portion of the tube and in its shorter petal claws and usually shorter style.

### ***Cryptandra congesta* Rye, sp. nov.**

*Cryptandrae myrianthae* simile sed bracteis magis manifeste ciliatis, tubo florali longiore, apice styli magis integro differt.

*Typus:* Mt Lindesay, Western Australia, 10 April 1990, G.J. Keighery 11278 (*holo:* PERTH 01177575; *iso:* CANB, MEL).

*Shrub* low and spreading, 0.1-0.2 m high. *Branchlets* not spinescent. *Young stems* with simple appressed or antrorse hairs 0.1-0.3 mm long. *Stipules* 0.6-1 mm long, acute, glabrous outside or with a few short hairs along midvein, usually with a few cilia. *Petioles* 0.5-0.7 mm long. *Leaf blades* narrowly ovate or narrowly oblong, 2-3.3 x 0.6-0.9 mm, obtuse to acute; lower surface glabrous on the visible midvein, densely hairy on the usually concealed sides; upper surface glabrous, minutely papillose-toothed on the margins especially towards apex. *Floral bracts* 4-6 per flower, ovate, c. 2 mm long, acute or attenuate, prominently ciliate, the longest cilia 0.3-0.6 mm long; outer surface often hairy along the midvein. *Flowers* usually 5-12 per branchlet, in a head-like cluster 5-8.5 mm wide,



**Figure 3.** A-E- *Cryptandra aridicola*. A - flowering branch (x1), B - stipules and undersurface of leaf (x5), C - flower (x6), D - petal and stamen (x12), E - fruit (x6); F-K - *C. minutifolia* subsp. *brevistyla*. F - flowering branch (x1), G - mature flower with bracts (x7), H - flower dissected open (x7), I - petal and stamen (x15), J - schizocarp (x7), K - inner surface of seed and aril (x7.5); L-N - *C. minutifolia* subsp. *minutifolia*. L - leaves and flower cluster (x5), M - young flower with and without bracts (x7), N - young flower dissected open (x7). Drawn from A.S. George 12197 (A-D), P.G. Wilson 12080 (E), K.R. Newbey 5110 (F-I), C.A. Gardner 2/11/1943 (J,K) and L. Haegi 1829 (L-N).

white. *Floral tube* 1.3-1.7 mm long (enlarging to c. 2 mm in fruit), glabrous; adnate portion of tube 0.4-0.5 mm long; free portion of tube 0.9-1.2 mm long. *Sepals* 0.8-1.8 mm long, glabrous towards base, becoming densely hairy towards apex, with a mixture of short stellate hairs and simple hairs c. 0.3 mm long. *Petal claw* 0.1-0.2 mm long. *Disc and ovary summit* with fine tangled hairs 0.2-0.3 mm long. *Style* c. 1.8 mm long, with some minute papillae or minute simple hairs; stigmatic surfaces lateral, scarcely forming lobes. *Schizocarp* c. half inferior, c. 1.8 x 1.4 mm; superior portion concealed within the free floral tube, hairy. *Seeds* c. 1.4 x 0.75 mm, pale to medium orange-brown. (Figure 4A-D)

*Other specimens examined.* WESTERN AUSTRALIA: Mt Lindesay walk track, 14/4/1992, B.G. Hammersley 574; Little Lindesay, 8/10/1994, B.G. Hammersley 1192; Denbarker State forest, 8/10/1994, B.G. Hammersley 1198.

*Distribution.* Known from a small area north of Denmark, southern Western Australia.

*Habitat.* Occurs in coarse sand around granite sheets or outcrops.

*Flowering and fruiting period.* April-October.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 2. This species is known from several locations in a proposed national park, its known range being about 5 km. In this very restricted area, the species is fairly abundant (B.G. Hammersley pers.comm.).

*Etymology.* From the Latin *congestus* - crowded, referring to the densely clustered flowers.

*Notes.* Similar to *Cryptandra myriantha* in having glabrous a floral tube but *C. myriantha* differs in its less prominently ciliate bracts, shorter floral tube and distinctly 3-lobed style apex. *Cryptandra congesta* may be more closely related to species with floral tubes of a similar length, such as *C. polyclada* and *C. wilsonii*, but these can be distinguished readily by their more hairy flowers.

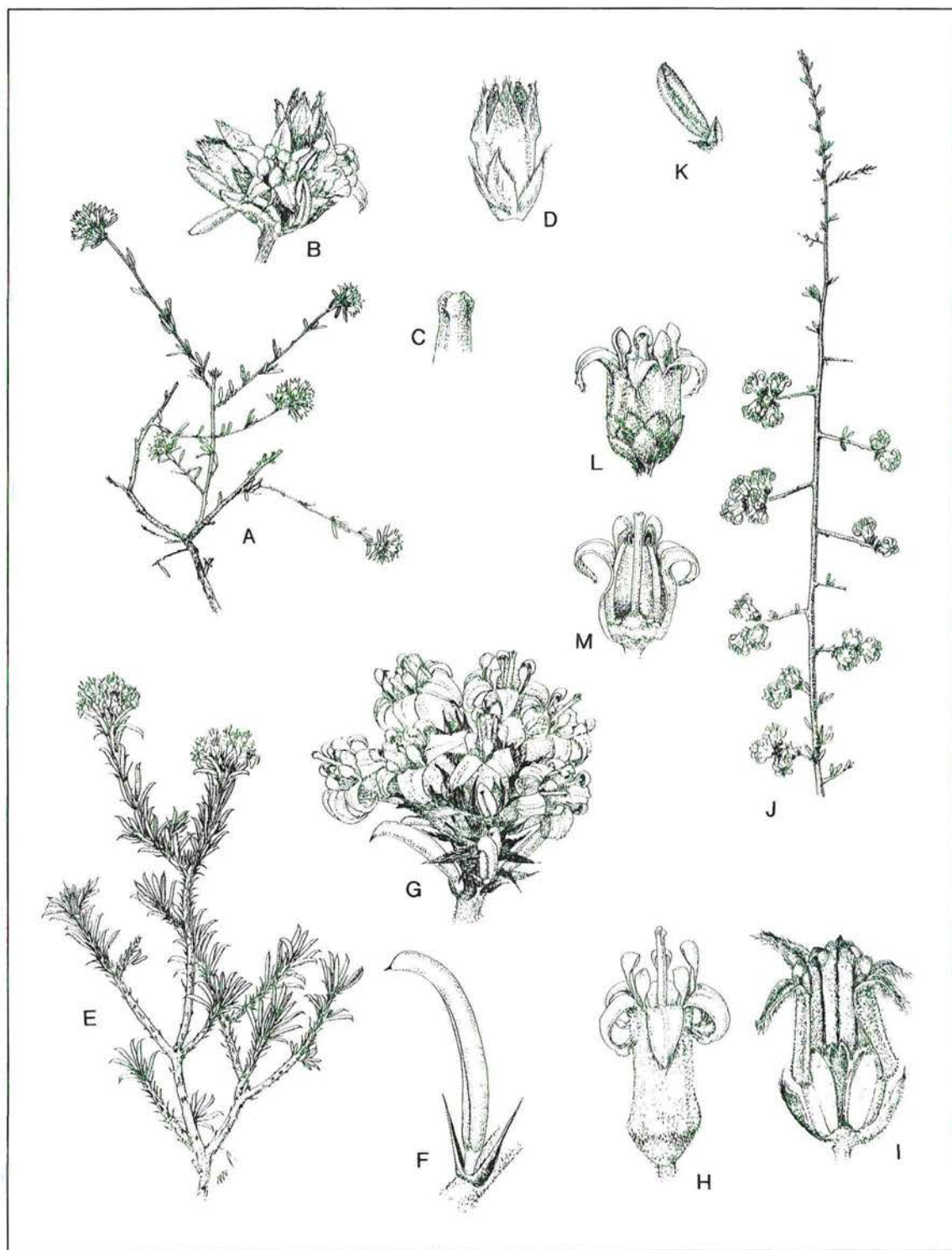
### ***Cryptandra distigma* Rye, sp. nov.**

*Cryptandrae nutans* arcte affine sed ungue petali longiori, lobis stigmaticis duobus, ovario 2-cellularibus differt.

*Typus:* Kirgella Rocks Station, 1.5 km south of causeway, Western Australia, 14 July 1989, H. Pringle 2419 (*holo:* PERTH 01166034; *iso:* CANB, MEL).

*Shrub* 0.5-1.5 m high. *Branchlets* not spinescent. *Young stems* with a dense indumentum of fine matted hairs c. 0.3 mm long. *Stipules* 0.7-1.5 mm long, acute to acuminate, ciliate; outer surface often with hairs along midvein. *Petioles* 0.1-0.3 mm long. *Leaf blades* narrowly oblong-elliptic or narrowly obovate, obtuse, 1.3-2.4 x 0.5-0.6 mm; lower surface concealed; upper surface glabrous. *Floral bracts* 3-6 per flower, ovate to very broadly ovate, 0.8-1.2 mm long, acute or obtuse, with cilia 0.05-0.2 mm long; outer surface glabrous or with short hairs mainly along the midvein. *Flowers* usually 3-15 per branchlet, in a spike-like or head-like cluster 4-8 mm wide, white or cream. *Floral tube* 0.8-1.3 mm long (enlarging to 2-2.3 mm in fruit), minutely stellate-hairy, usually also with short simple hairs 0.2-0.4 mm long; adnate portion of tube 0.4-0.7 mm long, very densely hairy, usually with large hairs mainly towards the summit; free portion of tube 0.4-0.6 mm long, densely or moderately densely hairy.





**Figure 4.** A-D-*Cryptandra congesta*. A - flowering branch (x1), B - flower cluster (x6), C - stigma (x20), D - young schizocarp and bracts (x8); E-I - *C. intonsa*. E - flowering branch (x1), F - stipules and leaf (x7.5), G - flower cluster (x4), H - flower (x7.5), I - dehiscent schizocarp (x6); J-M - *C. nola*. J - flowering branch (x1), K - stipules and undersurface of leaf (x6), L - flower and bracts (x7.5), M - flower dissected open (x7.5). Drawn from G.J. Keighery 11278 (A-D), V. English 149 (E-H), V. English 986 (I) and G.J. Keighery & J.J. Alford 2048 (J-M).

*Sepals* 0.9-1.3 mm long, with an indumentum similar to that on free portion of floral tube or sometimes with more long simple hairs. *Petal claw* 0.2-0.3 mm long. *Disc* with hairs 0.1-0.2 mm long. *Ovary* 2-celled; summit with hairs (0.1)0.2-0.3 mm long. *Style* 0.7-1.3 mm long; stigmatic lobes 2. *Schizocarp* slightly less than half inferior, 2.4-2.8 x 1.3-1.4 mm; superior portion rather densely stellate-hairy, the apex protruding above the base of the sepals. *Seeds* not seen at maturity. (Figure 1J-N)

*Selected specimens examined.* WESTERN AUSTRALIA: Streich Mound, 25 miles (40.2 km) N of Cundeelee Mission, 17/6/1970, K.M. Allan 287; 11.5 km N of Clyde Hill, 21/6/1983, M.A. Burgman 1418 & S. McNee; 10 km E of Queen Victoria Springs, 2/7/1966, D.W. Goodall 2990; 10.5 km ESE of Widgiemooltha, 17/8/1981, K.R. Newbey 8566; 2 km E of Wallaroo, 17/9/1981, K.R. Newbey 8821; 25 km NNE of Queen Victoria Spring, 21/9/1989, D.J. Pearson 718; c. 30 km SSW of Coolgardie, 3 km NW of Gnarlbine Rock, 18/9/1979, J. Taylor 580, M.D. Crisp & R. Jackson.

*Distribution.* Extends from Kirgella Rocks Station south to Widgiemooltha and from Wallaroo east to Queen Victoria Spring Nature Reserve, with an isolated record from north of Clyde Hill, southern Western Australia.

*Habitat.* Usually occurs in sand, recorded from sandplain and dunes, also one record from clay. Where noted, the soil colour was given as yellow in most cases, red in two cases.

*Flowering period.* June-September. Fruits September-October.

*Conservation status.* Not considered to be at risk at present.

*Etymology.* From the Greek *dis* - double and *stigma* - mark or pollen-receiving surface, referring to the two stigmatic lobes.

*Notes.* Closely related to *Cryptandra nutans*, which differs in its shorter petal claw, 3 stigmatic lobes and 3-celled ovary, also tending to have a coarser, more spreading stem indumentum and flowers borne in terminal clusters on more prominent and more erect branchlets. *C. distigma* has a very fine, appressed and matted indumentum on the stems and flowers borne more along short lateral branchlets. *C. nutans* also has a distinct geographical range, occurring from Geraldton to Albany and extending eastwards on or near the south coast to Cocklebidy.

Apart from *Cryptandra spyridioides*, *C. distigma* is the only typical Western Australian member of the genus to have a 2-celled ovary, but there are two atypical species, *C. intratropica* W. Fitzg. and *C. mutila* Nees ex Reissek, with this characteristic. There is also an unnamed atypical species with a 1-celled ovary.

***Cryptandra glabriflora*** Benth., Fl. Austral. 1: 441 (1863). *Type:* Murchison River, [Western Australia], Oldfield (MEL 227037).

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 2. Known only from Kalbarri National Park, collected from four specific and several vague localities within the park, the most recent collections in 1994. (Figure 5A-E)

*Notes.* Readily distinguished from the common and widespread species *Cryptandra myriantha*, which was previously regarded as a synonym, by its spinescent branchlets, shorter free portion of the floral tube and very large hairs on the summit of the schizocarp.

***Cryptandra graniticola*** Rye, sp. nov.

*Cryptandrae myrianthae* arcte affine sed granitico consociato, indumento cauli tenuiore magis inplexo, ramuli pluremque spinescentibus, sepalis minus pubescentibus differt.

*Typus:* 5 miles [8 km] north of Norseman, Western Australia, 8 August 1951, *R.D. Royce* 3483 (*holo:* PERTH 01505971; *iso:* CANB, MEL).

*Shrub* 0.4-1.5 m high. *Branchlets* usually tending to be spinescent. *Young stems* with a matted indumentum of long fine hairs, the largest hairs *c.* 0.3 mm long. *Stipules* 0.5-1 mm long, acute to acuminate, often with a few short hairs along midvein, ciliate. *Petioles* 0.3-0.6 mm long. *Leaf blades* linear to narrowly obovate, 2-4.7 x 0.3-0.5 mm, usually obtuse, sometimes with a short mucro; lower surface glabrous on the visible midvein, densely hairy on the usually concealed sides; upper surface glabrous. *Floral bracts* 5-8 per flower, ovate or broadly ovate, 1-1.5 mm long, acute or obtuse, ciliate, the cilia up to 0.2 mm long; outer surface glabrous. *Flowers* usually 2-10 per branchlet, in a spike-like or head-like cluster 5-8 mm wide, white. *Floral tube* 0.8-1.0 mm long (enlarging to *c.* 1.6 mm in fruit), glabrous; adnate portion of tube 0.4-0.6 mm long; free portion of tube 0.4-0.5 mm long. *Sepals* 1.1-1.6 mm long, largely glabrous but usually with a few simple appressed hairs towards apex, sometimes sparsely hairy on distal half; hairs up to 0.2 mm long. *Petal claw* 0.2-0.3 mm long. *Disc* with hairs 0.1-0.2 mm long. *Ovary summit* with hairs *c.* 0.2 mm long. *Style* 1-1.3 mm long; stigmatic lobes 3(4). *Schizocarp* slightly less than half inferior, *c.* 2.2 x 1.5 mm; superior portion densely stellate-hairy, the apex protruding above the base of the sepals. *Seeds* *c.* 1.3 x 0.7 mm, orange brown. (Figure 5F-J)

*Selected specimens examined.* WESTERN AUSTRALIA: Near Norseman, on road towards Coolgardie, 5/9/1968, *E.M. Canning*; Jimberlana Hill, 10/10/1976, *R.J. Chinock* 3333; Peak Charles, 15/9/1976, *L. Haegi* 961; Peak Eleanor, Peak Charles National Park, 8/11/1979, *K.R. Newbey* 6395; 23 km SE of Sinclair Soak, *c.* 75 km NE of Norseman, 7/8/1980, *K.R. Newbey* 6966; 1.8 km S of Peak Charles road on the road to Peak Eleanor, 17/9/1985, *P.J. Poli* 25; near southern end of Lake Cowan, 24/7/1967, *P.G. Wilson* 6053.

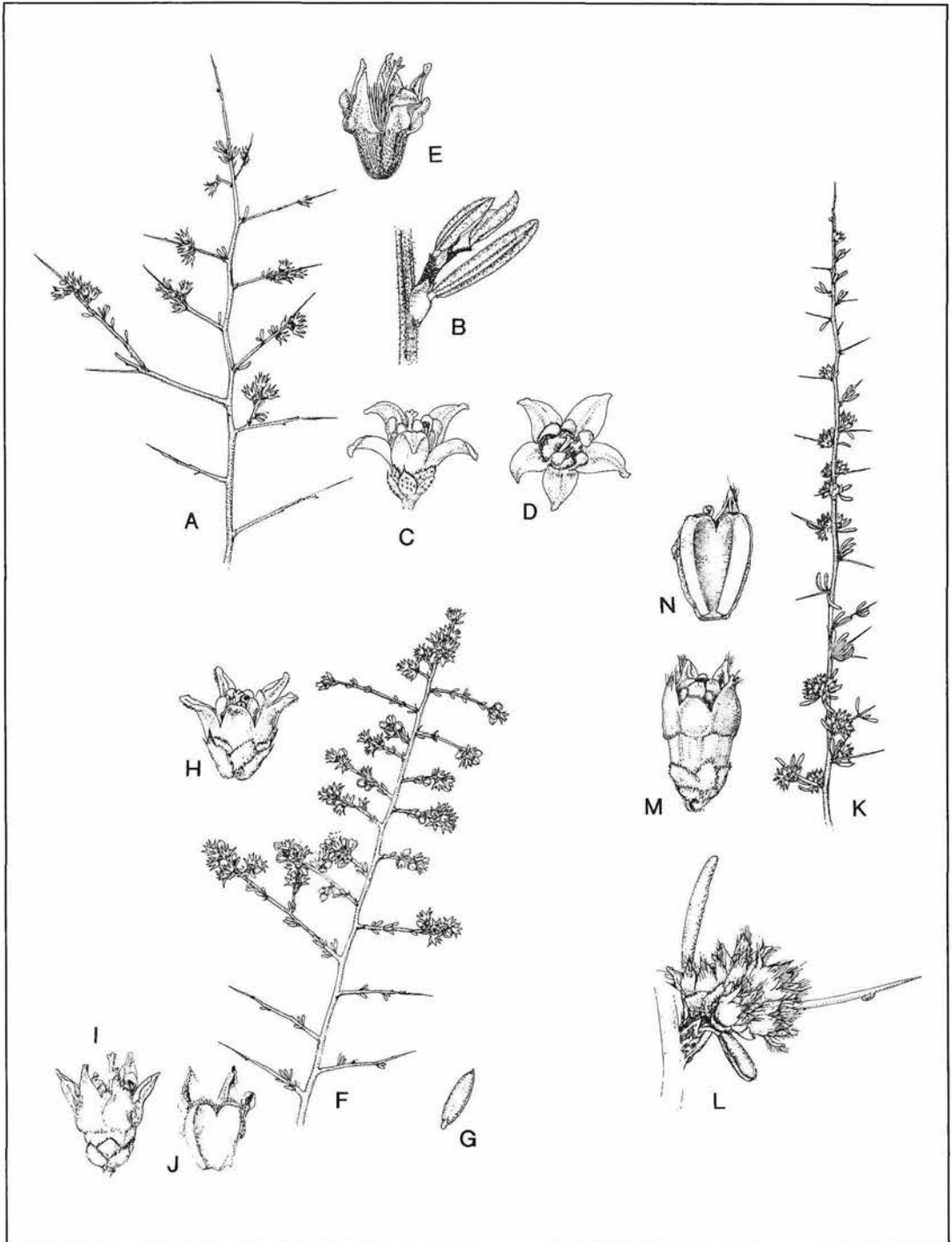
*Distribution.* Extends from Mt Day east to near Lake Cowan and with an isolated occurrence near Ravensthorpe, southern Western Australia.

*Habitat.* Occurs in shallow sandy soil overlying granite or occasionally quartzite, often on granite outcrops or hills.

*Flowering period.* July-October. Fruits recorded October-November.

*Conservation status.* Not considered to be at risk.

*Etymology.* From the modern word *granite* - combined with the Latin *-cola* - inhabitant, referring to its occurrence in granitic habitats.



**Figure 5.** A-E - *Cryptandra glabriflora*. A - flowering branch (x1), B - leaf cluster (x6), C - flower and bracts (x6), D - top view of flower (x6), E - schizocarp (x6); F-J - *C. graniticola*. F - flowering branch (x1), G - young leaf (x7), H - flower and bracts (x7), I - schizocarp and bracts (x6), J - dehiscent fruitlet (x6); K-N - *C. scoparia* var. *microcephala*. K - flowering branchlet (x1), L - flower cluster (x6), M - schizocarp (x7), N - dehiscent fruitlet (x7). Drawn from D. & B. Bellairs 1753 (A,B,E), D. & B. Bellairs 2300 (C,D), R.D. Royce 3483 (F-H), K.R. Newbey 6395 (I,J), H. Demarz 56 (K,L) and A.C. Burns 11 (M,N).

*Notes.* Closely related to *Cryptandra myriantha*, which lacks spinescent branchlets and has coarser more discrete hairs on the young stems, more fragile bracts and usually more hairy sepals. There is also a habitat difference, with *C. graniticola* occurring mainly in sandy soil over granite and *C. myriantha* hardly ever recorded near granite, but occurring on sandy or clayey soils, often in lateritic habitats. There is only a slight overlap in the ranges of the two taxa. At 0.4-1.5 m high, *C. graniticola* tends to be a larger plant than *C. myriantha*, which is 0.1-0.7(1) m high, and usually has more spreading branchlets, arising at c. 90 degrees to the main stem.

In its glabrous or subglabrous flowers and spinescent habit, *C. graniticola* resembles another close relative, *C. glabriflora*, but the latter is readily distinguished by its shorter free portion of the floral tube and very long hairs on the summit of the schizocarp.

One specimen (*G.L. Webster* 18721) of *C. graniticola* has most flowers with a 4-lobed stigma instead of the usual 3 stigmatic lobes and at least one flower with 5 stigmatic lobes. There are two distinct variants, the typical spinescent one extending from Mt Day to Lake Cowan and an atypical variant known only from two localities close to Ravensthorpe, the latter with less widely spreading, non-spinescent branchlets. The atypical variant needs further study to assess its taxonomic status.

***Cryptandra intonsa* Rye, sp. nov.**

Stipulae 4-7 mm longae; folia acumine apicali prominenti recurvo; flores dense fasciculati; tubus floralis 3-4 mm longus, minute stellato-pubescent et pilis longioribus simplicibus instructus.

*Typus:* S of Rons Rd, near a track leading S to Middle Iron Cap, Western Australia, 28 September 1993, *V. English* 149 (*holo:* PERTH 04174356, *iso:* CANB).

*Shrub* erect or spreading, 0.3-0.6 m high. *Branchlets* not spinescent. *Young stems* densely stellate-hairy. *Stipules* prominent, 4-6.5 mm long, long-acuminate or -attenuate, usually appearing glabrous but often sparsely and minutely hairy or ciliate. *Petioles* 0.5-0.8 mm long, hairy on undersurface. *Leaf blades* linear or narrowly oblong, 5-7 x 0.6-1 mm, with a prominent recurved apical point 0.2-0.5 mm long; lower surface densely hairy but usually concealed; upper surface minutely papillose. *Floral bracts* 6-9 per flower, ovate or narrowly ovate, 2.5-3.5 mm long, acute or shortly acuminate, ciliate, the longest cilia 0.3-0.4 mm long; outer surface minutely hairy along the midvein and often throughout the distal half. *Pedicels* c. 0.4 mm long, densely hairy. *Flowers* usually 7-15 per branchlet, in a head-like cluster 9-14 mm wide, white to cream. *Floral tube* 3-3.5 mm long (enlarging to c. 4 mm in fruit), minutely stellate-hairy and with some simple hairs 0.3-0.4 mm long; adnate portion of tube 0.7-0.9 mm long, densely hairy; free portion of tube c. 2.5 mm long, sparsely to moderately densely hairy towards base, becoming more densely hairy towards the top. *Sepals* 1.8-2.3 mm long, densely hairy; largest hairs 0.4-0.5 mm long. *Petal claw* c. 0.2 mm long. *Disc* with hairs c. 0.3 mm long. *Ovary summit* with hairs 0.2-0.3 mm long. *Style* c. 4 mm long. *Schizocarp* c. half-inferior, 2.5-3 x c. 1.8 mm; superior portion concealed within the free floral tube, densely stellate-hairy. *Seeds* not seen at maturity but at least 1.5 x 0.6 mm. (Figure 4E-I)

*Other specimens examined.* WESTERN AUSTRALIA: 3.26 km S of Rons Rd and 30 m W of the track leading S to Middle Iron Cap, 29/11/1993, *V. English*; Hatters Hill exploration lease, 7/12/1993, *V. English* 986; Seagull Liquid Acrobat exploration lease, 28/9/1993, *A. O'Connor* 1300.

*Distribution.* Extends from near Middle Iron Cap south east to near Hatters Hill, southern Western Australia.

*Habitat.* Occurs in clay with ironstone gravel, in heathland with scattered mallees.

*Flowering period.* September-December. Fruits recorded November-December.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 1. Despite being a more conspicuous plant than many other members of its family, this species was only discovered in 1993. Extensive populations have been located in the Hatters Hill area, with a total of over 1,000 plants (Val English & Alice O'Connor pers. comm.). These are located 35-40 km south east of the smaller populations near Middle Iron Cap. Although common in the area, the species appears to have a very restricted geographical range and, being known only from sites with mining leases, could be under threat from mining.

*Etymology.* From the Latin *intonsus* - unshaved, bristly, referring to the long-acuminate stipules which persist after the leaves have been shed and give the young stems a bristly appearance.

*Notes.* This species has a striking and distinctive appearance, with large conspicuous stipules, prominently pointed leaves and densely clustered flowers. It does not appear to have any very close relatives.

***Cryptandra minutifolia* Rye, nom. nov.**

*Cryptandra parvifolia* Turcz., *nom. illeg. non Cryptandra parvifolia* (Hook.) Hook.f., Bull. Soc. Imp. Nat. Moscou 31: 459 (1858). *Type:* New Holland [Western Australia], Drummond 4th coll. 156 (PERTH 01599313)

*Shrub* usually spreading, 0.2-0.7(1.2) m high. *Branchlets* not spinescent. *Young stems* densely hairy at first with a matted white indumentum, soon becoming glabrous. *Stipules* 0.8-2 mm long, usually ciliate, often hairy along midvein outside or with hairs more widespread outside. *Petioles* 0.2-0.3 mm long, concealed by united base of stipule pair. *Leaf blades* appearing sessile, oblong to elliptic or narrowly so, 0.8-1.5(2.5) x 0.6-0.8 mm, with a recurved mucro; lower surface concealed; upper surface minutely papillose or glabrous. *Floral bracts* 8-14, broadly ovate to broadly obovate, 2-3.5 mm long, obtuse, ciliate; outer surface glabrous or with a few hairs on midvein or rarely with a hairy central area; inner surface hairy along the midvein or central area in the distal half. *Floral tube* 1.5-3.5 mm long; adnate portion of tube 0.5-0.7 mm long, densely stellate-hairy; free portion of tube 1.0-2.8 mm long, glabrous to moderately densely hairy on basal half, usually becoming more densely hairy towards the summit like the indumentum on the base of the sepals, but sometimes hairy or subglabrous throughout, the indumentum occurring both on and between the ribs or at least on the ribs. *Sepals* 1.5-3.7 mm long, densely stellate-hairy and with larger simple hairs at least along the midvein or towards the apex. *Disc* with hairs 0.1-0.3 mm long. *Ovary summit* with hairs 0.2-0.4 mm long. *Style* 0.7-3.6 mm long, if long then often with a swollen stellate-hairy base up to 1 mm long. *Schizocarp* up to half (one third to half) inferior; superior portion moderately densely or densely hairy, concealed within the free floral tube.

*Distribution.* Extends from Manmanning east to near Carrabin, south to Dumbleyung and south east to Ravensthorpe Range, southern Western Australia.

*Habitat.* Occurs on sand or clayey soils, usually on plains, in mallee vegetation or sometimes shrubland.

*Flowering period.* Mainly June-September. Fruits recorded September-November.

*Etymology.* From the Latin *minutus* - small and *folium* - leaf, referring to the leaves being very small in relation to the size of the flowers.

*Notes.* This species and its close relative, *Cryptandra aridicola*, are similar to *C. leucopogon*, which differs in its longer leaves and longer hairs on the sepals and ovary.

***Cryptandra minutifolia* subsp. *brevistyla* Rye, subsp. nov.**

A *Cryptandrae minutifoliae* subsp. *minutifoliae* floribus pluremque multo numerosis, bracteis floralibus minus numerosis, stylis brevioribus differt.

*Typus:* 2 km SW of Mt Madden, which is 22 km SE of Lake King township, Western Australia, 6 August 1968, P.G. Wilson 6813 (*holo:* PERTH 01507540; *iso:* CANB, MEL).

*Stipules* usually 1.5-2 mm long, acuminate or attenuate. *Leaf blades* 1-3(3.5) mm long. *Floral bracts* (8)9-11(12), 2-3 mm long, usually prominently ciliate, the cilia (0.2)0.4-0.6 mm long. *Flowers* usually 3-10 (sometimes 1 or 2) per branchlet, in a spike-like or head-like cluster 7-11 mm wide, white or occasionally pink. *Floral tube* 1.5-2 mm long (enlarging to 1.8-2.5 mm in fruit); free portion of tube 1.0-1.3 mm long. *Sepals* 1.5-2.6 mm long; simple hairs 0.4-0.6 mm long. *Petal claw* 0.1-0.3 mm long. *Style* 0.7-1.7(2.2) mm long. *Schizocarp* 2-2.5 x 1.5-1.6 mm. *Seeds* c. 1.5 x 0.8-1.1 mm, orange brown with some paler patches laterally or prominently mottled with those colours. (Figure 3F-K)

*Selected specimens examined.* WESTERN AUSTRALIA: Dunn Rock Nature Reserve, 15/4/1984, D.J. Backshall 92; 26 miles [41.9 km] W of Coolgardie, 9/3/1970, E.M. Bennett 3265; Lake Barker Reserve, 11/1971, W.H. Butler; 1.3 km SSW of Griggs Rd on Fields Rd, 14/9/1992, G.F. Craig 2124; 320 mile peg [c. 13 km W of Bullabulling], Great Eastern Highway, 10/10/1974, H. Demarz 5269; c. 75 km ENE of Norseman, 9/9/1973, N.N. Donner 4655; Fitzgerald River below Roes Rock, 14/7/1970, A.S. George 10016; Kumarl, 8/1935, L.A. Horbury 76; 19 km SSW Queen Victoria Rock, 24/9/1993, G.J. Keighery 12954; Pingrup, 27/8/1964, F. Lullfitz 3655; Frank Hann National Park, 6/8/1978, D. Monk 241; Bendinger Reserve A20338, 25/5/1975, B.G. Muir 274; 26 km SE of Karonie, 12/8/1981, K.R. Newbey 8500.

*Distribution.* Extends from west of Coolgardie south west to Stirling Range and from there east to near Karonie, southern Western Australia.

*Conservation status.* Not considered to be at risk at present.

*Etymology.* From the Latin *brevis* - short and *stylus* - style, the style usually being very short in relation to the size of the flowers.

*Notes.* Usually easily distinguished from subsp. *minutifolia*, which has fewer larger flowers and more numerous floral bracts so that the the flowers appear to be more discrete, and has longer floral tubes, styles and sepals. Subsp. *minutiflora* also tends to have shorter stipules and leaves. Despite their fairly major differences, the two taxa do not appear to have diverged quite to the point of becoming separate species. In the area where they overlap, some specimens are somewhat intermediate, especially the

Pingrup specimen (*F. Lullfitz* 3655) included here, with the style 2-2.2 mm long, and another specimen noted under the other subspecies.

### ***Cryptandra minutifolia* Rye subsp. *minutifolia***

*Stipules* 0.8-1.2(1.5) mm long, acute or acuminate. *Leaf blades* 0.8-1.5(2.5) mm long. *Floral bracts* 12-14, 2.5-3.5 mm long, with cilia 0.2-0.3 mm long. *Flowers* solitary or few (usually 2-5) per branchlet, in a spike-like cluster 9-14 mm wide, white. *Floral tube* 2.5-3.5 mm long (enlarging to 3 mm or more in fruit); free portion of tube 1.8-2.8 mm long. *Sepals* 2.7-3.7 mm long; simple hairs 0.2-0.4 mm long. *Petal claw* 0.2-0.4 mm long. *Style* 2.5-3.6 mm long. *Schizocarp* not seen at maturity. (Figure 3L-N)

*Selected specimens examined.* WESTERN AUSTRALIA: Kulin, 9/1946, *A. Ashley* 72; Hyden, 7/9/1966, *M. Barrow* 72; 184 miles [c. 6 km W of Carrabin] on Great Eastern Highway, 6/9/1966, *E.M. Bennett* 715; Nungarin, 28/7/1953, *H.F. & M. Broadbent* 1119; 12 km E of Kings Rock, 5/10/1975, *M.L. Clark* 213; Nungarin, 24/8/1930, *C.A. Gardner* 197; Dumbleyung, 18/6/1920, *C.A. Gardner* 518; c. 1 km E of Babakin, NE of Corrigin, 18/8/1979, *L. Haegi* 1829; 1 mile [0.6 km] SW of Manmanning, 1/8/1992, *B.H. Smith* 1603; 1 km S of Lake King township, 9/8/1968, *P.G. Wilson* 6939.

*Distribution.* Extends from Manmanning east to near Carrabin, south to Dumbleyung and south east to Ravensthorpe Range, southern Western Australia.

*Conservation status.* Not considered to be at risk at present.

*Notes.* The leaves are very short in subsp. *minutifolia*, except for an odd specimen from Kellerberrin (*A.E. Lankester* 4/9/1897) with leaves 2-2.5 mm long. A specimen from Ravensthorpe Range (*E.M. Bennett* 2396) with a relatively short style, c. 2.5 mm long, appears to belong to this taxon because of its long floral tube and 13 bracts per flower, but has more numerous flowers than usual, so is somewhat intermediate between this and subsp. *brevistyla*.

### ***Cryptandra nola* Rye, sp. nov.**

*Cryptandrae arbutiflorae* simile sed caulibus foliis floribusque stellato-pilosis, petiolis brevioribus, unguibus petalorum longioribus differt.

*Typus:* 1.4 km E of railway crossing E of Mullewa, Western Australia, 6 August 1994, *S. Patrick* 1945 (*holo:* PERTH 04160169; *iso:* CANB, MEL).

*Shrub* erect or spreading, 0.3-1 m high. *Branchlets* spinescent. *Young stems* minutely and inconspicuously stellate-hairy, soon becoming glabrous. *Stipules* 0.7-1.5 mm long, acute, minutely ciliate and minutely hairy along midvein. *Petioles* 0.2-0.4 mm long. *Leaf blades* oblong to elliptic or narrowly so, 1.2-2.2 x 0.4-0.6 mm, obtuse or with a minute mucro; lower surface densely hairy but largely concealed; upper surface densely minutely stellate-hairy to glabrous. *Floral bracts* c. 8, broadly ovate-elliptic or very broadly so, c. 1.5 mm long, minutely ciliate; outer surface densely stellate-hairy along the midvein, glabrous along the margins, somewhat lobed-toothed or with a short broad apical tooth but not prominently pointed. *Flowers* sometimes solitary, usually 2-8 per branchlet, in a loose spike-like cluster 7-11 mm wide, white. *Floral tube* 2-2.5 mm long (not seen in fruit),



minutely stellate-hairy; adnate portion of tube c. 0.5 mm long, densely hairy; free portion of tube 1.5-2 mm long, sparsely to moderately densely hairy towards base, becoming more densely hairy towards the top. *Sepals* c. 1.5 mm long, densely minutely stellate-hairy. *Petal claw* c. 0.3 mm long. *Disc* with hairs c. 0.2 mm long. *Ovary* about half inferior; summit with hairs c. 0.2 mm long. *Style* 2-2.5 mm long. *Schizocarp* unknown. (Figure 4J-M)

*Other specimens examined.* WESTERN AUSTRALIA: East Yuna Reserve, 5/6/1966, A.C. Burns 14; Kowald's property, off Arrinooka Rd, Canna, 15/8/1990, G.J. Keighery & J.J. Alford 2048; Mullewa Common, 22/6/1994, E. Leyland 005; Mullewa Shire Common, 6/8/1994, S. Patrick 1935-1938.

*Distribution.* Extends from East Yuna Reserve south to Canna, southern Western Australia.

*Habitat.* Usually occurs on sandy soil overlying granite or granite conglomerate.

*Flowering period.* June-August.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 2. Known from several populations on two nature reserves and one from privately-owned land. The species has a range of c. 100 km and is locally common at populations sampled recently (1990-94).

*Etymology.* From the Latin *nola* - small bell, referring to the shape of the flowers.

*Notes.* Similar to *Cryptandra arbutiflora*, which differs in having simple hairs on the young stems and leaves (or glabrous leaves), longer petioles, glabrous flowers and shorter petal claws.

***Cryptandra polyclada*** Diels in Diels & E. Pritzel, Bot. Jahrb. Syst. 35: 358-359 (1904). *Type:* Near Tammin, Western Australia, 21 May 1901, L. Diels 2877 (PERTH 01136232, 01136240)

*Notes.* Occurs near Tammin and extends from Boorabbin National Park south to east of Lake King. *C. polyclada* has recently been included on the Priority Flora List with a Priority 3 coding. Since then, several additional specimens have been identified as this species and the typical subspecies no longer appears to be at risk, but the new subspecies described below appears to need a higher priority. No attempt has been made to survey either subspecies.

***Cryptandra polyclada*** subsp. ***aequabilis*** Rye, subsp. nov.

A *Cryptandrae polycladae* subsp. *polycladae* folius magis manifeste mucronatis, floribus magis aequabiliter pilosis differt.

*Typus:* 50 miles/80 km E of Southern Cross, 10 October 1931, W.E. Blackall 940 (*holo:* PERTH 01514156; *iso:* CANB, MEL).

*Shrub* low and spreading, dense, 0.1-0.4 m high. *Leaf blades* 1.8-2.8 mm long; mucro prominent, fairly erect, c. 0.2 mm long. *Flowers* white, with a fairly uniform indumentum of minute stellate hairs and larger simple antrorse hairs, the largest hairs 0.2-0.3 mm long. *Floral tube* c. 1.0 mm long (not seen in fruit), densely stellate-hairy; adnate portion of tube c. 0.4 mm long; free portion of tube c. 0.6 mm long. *Sepals* c. 0.8 mm long, with a dense indumentum of minute stellate hairs and a few larger antrorse simple hairs. (Figure 6A-C)

*Other specimens examined.* WESTERN AUSTRALIA: 276 mile peg on Great Eastern Highway, 10/10/1974, H. Demarz 5266.

*Distribution.* Known only from in or near Boorabbin National Park.

*Habitat.* Recorded on sand.

*Flowering period.* October.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 2. Known from two collections probably less than 5 km apart, both apparently in a national park.

*Etymology.* From the Latin *aequabilis* - consistent, referring to the uniform indumentum on the outside of the flowers in comparison with the typical subspecies.

*Notes.* Subsp. *polyclada* differs in its less prominently mucronate leaves and in the longer indumentum on the outside of the flowers, with a marked contrast between the very densely hairy sepals and subglabrous upper floral tube. Subsp. *aequabilis* has a shorter and fairly uniform indumentum on the upper floral tube and sepals.

#### ***Cryptandra polyclada* Diels subsp. *polyclada***

*Shrub* varying from a mat-like form *c.* 0.1 m high to a more erect form up to 0.7 m high. *Leaf blades* 2.1-4.1 mm long; mucro *c.* 0.1 mm long. *Flowers* white or cream, much more densely hairy on the sepals than on the free portion of the floral tube, the largest hairs 0.4-0.8 mm long. *Floral tube* 0.7-1.1 mm long (enlarging to 1.4 mm or more in fruit); adnate portion of tube 0.3-0.4 mm long, usually densely hairy with a mixture of minute stellate hairs and large antrorse simple, sometimes sparsely hairy with mainly simple hairs; free portion of tube 0.5-0.7 mm long, with a sparse indumentum of large antrorse simple hairs or glabrous. *Sepals* 0.6-1.1 mm long, very densely hairy, with a mixture of minute stellate hairs and large antrorse simple hairs. (Figure 6D-F; also illustrated in Diels & Pritzel 1905, Figure 45B-D)

*Distribution.* Occurs near Tammin and extends from east of Hyden south to east of Lake King.

*Habitat.* Recorded from sandplains.

*Flowering period.* January-May, also recorded August. Fruits recorded in May.

*Conservation status.* Known from seven collections, probably including a nature reserve near Tammin, its range *c.* 300 km. It appears to flower predominantly during summer and early autumn, which may account for the paucity of collections.

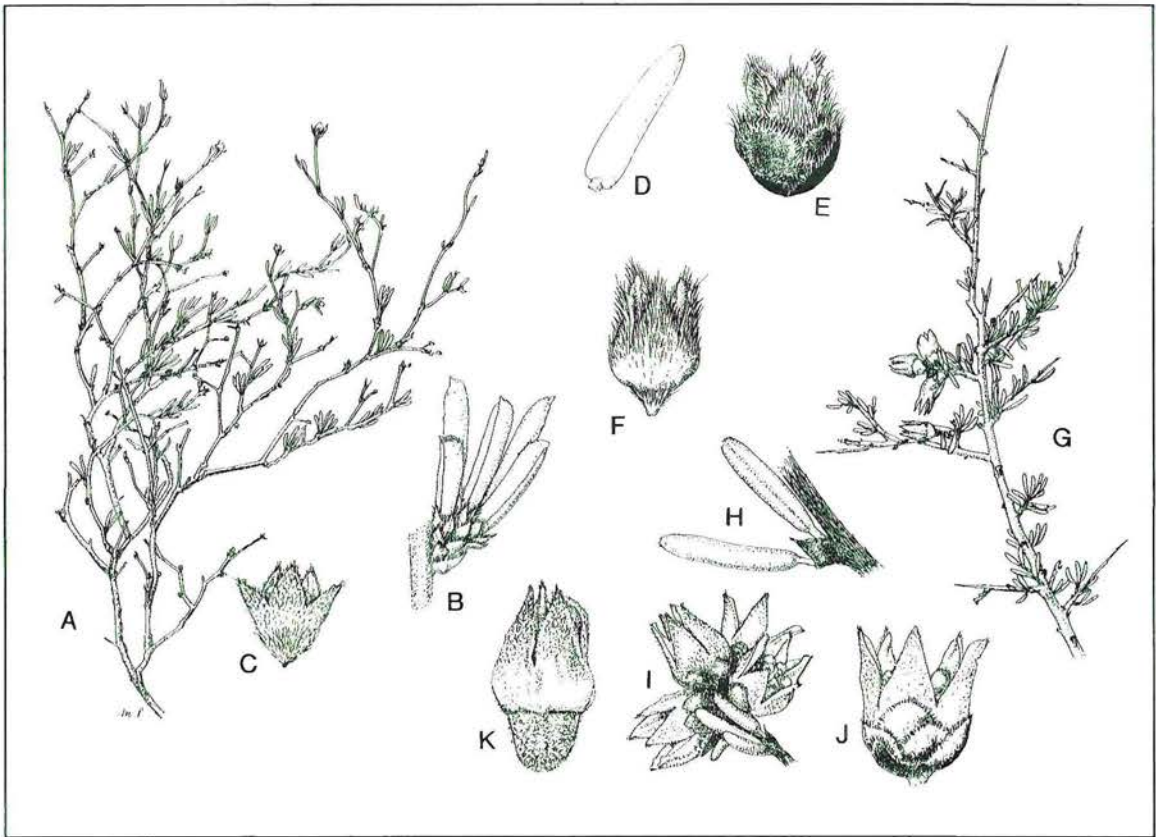
*Notes.* The Tammin specimens are the largest, with leaves *c.* 4 mm long and flower clusters 5-7 mm wide, compared with leaves 2.1-3.2 mm long and flower clusters 3-4.5 mm wide in the other specimens.

***Cryptandra recurva* Rye, sp. nov.**

*Cryptandrae nutans* arcte affine sed caulibus foliisque minute stellatis (non pilis simplicibus), apice folium valde recurvo, bracteis magis pubescentibus differt.

*Typus*: 30 km W of 90 mile tank on Salmon Gums-Lake King road, Western Australia, 18 June 1974, T.E.H. Aplin 5920 (*holo*: PERTH 01516183; *iso*: CANB, MEL).

*Shrub* 0.2-0.7 m high. *Branchlets* not spinescent. *Young stems* densely minutely stellate-hairy. *Stipules* 0.5-1 mm long, acute or shortly acuminate, minutely stellate-hairy, often minutely ciliate. *Petioles* 0.2-0.3 mm long, usually densely hairy on both surfaces, rarely glabrous on upper surface. *Leaf blades* narrowly oblong-elliptic or narrowly obovate, 2-3.8 x 0.5-0.8 mm, obtuse, the apex distinctly recurved; lower surface very densely hairy, largely or completely concealed; upper surface usually densely minutely stellate-hairy, sometimes glabrous. *Floral bracts* c. 5 per flower, very broadly or broadly ovate, 1-1.5 mm long, acute or obtuse, ciliate, the cilia 0.1-0.25 mm long; outer surface stellate-hairy, usually densely so except on the margin. *Flowers* usually 3-15 per branchlet, in a spike-like or head-like cluster 5-8 mm wide, white or cream to distinctly off-white or occasionally pale pink. *Floral tube* 1.2-1.5 mm long (enlarging to 1.8-2.3 mm in fruit), minutely densely stellate-hairy, usually also with short simple hairs 0.2-0.3 mm long; adnate portion of tube 0.5-0.8 mm long,



**Figure 6.** A-C - *Cryptandra polyclada* subsp. *aequabilis*. A - flowering branch (x1), B - leaf cluster (x6), C - flower (x7.5); D-F - *Cryptandra polyclada* subsp. *polyclada*. D - leaf (x6), E - flower with bracts (x7), F - flower (x7); G-K - *C. wilsonii*. G - fruiting branchlet (x1), H - leaf cluster (x6), I - flower cluster (x4), J - flower with bracts (x6), K - schizocarp (x6). Drawn from W.E. Blackall 940 (A-C), C.A. Gardner 31/1/1940 (D-F), Spjut et al. 7243 (G,K) and G. Perry 235 (H-J).

more densely hairy than free portion; free portion of tube 0.5-0.7 mm long. *Sepals* 0.8-1.3 mm long, densely minutely stellate-hairy, usually with simple hairs 0.2-0.3 mm long towards the apex. *Petal claw* c. 0.1 mm long. *Disc* with hairs 0.1-0.2 mm long. *Ovary summit* with hairs 0.1-0.3 mm long. *Style* 0.5-0.8(1) mm long. *Schizocarp* half or slightly less than half inferior, 2-2.5 x 1.5-2 mm; superior portion densely or very densely stellate-hairy, the apex reaching or protruding above the base of the sepals. *Seeds* 1.3-1.5 x 0.8-0.9 mm, orange-brown. (Figure 1O-S)

*Selected specimens examined.* WESTERN AUSTRALIA: Dunn Rock Nature Reserve, 15/4/1984, D.J. Backshall 160; 50 miles [80 km] E of Southern Cross, 10/10/1931, W.E. Blackall 940; Mt Holland road, 11/1931, W.E. Blackall 1247; 34 km due NNW of Clyde Hill, 7/8/1983, M.A. Burgman 1832 & S. McNee; 12 km E of Kings Rock, 5/10/1975, M.L. Clark 208; c. 21 miles [33.8 km] S of Cocklebiddy, 11/7/1974, A.S. George 11860; Kumarl, 8/1938, L.A. Horbury 104; Frank Hann National Park, 5/8/1978, D. Monk 213; 18 km NE of Scadden, 17/8/1982, P. van der Moezel 119; 9 km SW of Peak Charles, 2/11/1980, K.R. Newbey 7835; tributary of Young River, 28/9/1968, P.G. Wilson 8050; Fitzgerald River Reserve, 7/10/1970, P.G. Wilson 10210.

*Distribution.* Extends from between Southern Cross and Coolgardie southwards and from Fitzgerald River National Park east to Cocklebiddy, southern Western Australia.

*Habitat.* Occurs on sandy soils.

*Flowering period.* Mainly June-September. Fruits recorded August-November.

*Conservation status.* Widespread and apparently common.

*Etymology.* From the Latin *recurvus* - curved backwards, referring to the leaf apex.

*Notes.* Closely related to *Cryptandra nutans*, which differs in having longer simple hairs on the stems and often also on the leaves, a more erect apical point on the leaves and glabrous or less densely hairy bracts. The flowers of *C. recurva* have a whiter and often somewhat denser indumentum than those of *C. nutans*, and their long hairs are more curved and spreading. In areas where the two taxa overlap in range, *C. nutans* appears to have an earlier flowering time.

Two specimens of *C. recurva* from Fitzgerald River National Park (A.S. George 10025, P.G. Wilson 10210) are unusual in having distinctly papillose leaves, but otherwise have the typical features of the species. In *C. nutans* the leaves are often papillose.

***Cryptandra scoparia* var. *microcephala*** Benth., Fl. Austral. 1: 439 (1863). *Type:* Murchison River, [Western Australia], Oldfield (MEL 227043).

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 3. Classed as a Priority 2 taxon on the 1991 Priority Flora List under the phrase name *Cryptandra* sp. *Kalbarri* (A.S. George 2364). It has now been collected from three sites in Kalbarri National Park, and from four other localities, including a nature reserve near Geraldton. A recent collection from Nerren Nerren Station has slightly extended its known range to c. 155 km. It may be favoured by infrequent fires as young plants were common at a site surveyed in 1994, where the bush was regenerating following a fire. (Figure 5K-N)

*Notes.* This shows only minor morphological differences from the type variety. *Cryptandra scoparia* Reissek var. *scoparia* occurs from near Mt Lesueur south to Perth and is distinguished mainly by its longer spinescent branchlets.

***Cryptandra wilsonii* Rye, sp. nov.**

*Cryptandrae polycladaeae* affine sed indumento cauli minus implicato, petiolis manifeste a vagino stipuli exserto colore foliorum fusciore differt.

*Typus:* N of Cape Riche Beach, Western Australia, 8 August 1974, G. Perry 235 (*holo:* PERTH 03118509; *iso:* CANB, MEL).

*Shrub* 0.15-0.9 m high. *Branchlets* sometimes spinescent. *Young stems* usually with fine indumentum of appressed to antrorse simple hairs 0.2-0.4 mm long, sometimes with minute stellate hairs instead or with a mixture of simple and stellate hairs. *Stipules* 0.8-1.4 mm long, acute or shortly acuminate; outer surface glabrous or with hairs along the midvein; inner surface glabrous on margins, with a dense indumentum within of simple hairs 0.3-0.4 mm long, the hairs sometimes protruding from the sides and resembling cilia. *Petioles* 0.3-0.5 mm long. *Leaf blades* oblong-elliptic or narrowly so, 1.8-3.2 x 0.5-0.7 mm, with an erect mucro; lower surface completely or largely concealed, densely hairy; upper surface usually glabrous and minutely tuberculate at least on the margins, sometimes more prominently tuberculate or with minute coarse patent hairs. *Floral bracts* 6 or 7 per flower, broadly ovate, 1.2-1.6 mm long, acute, with cilia c. 0.1-0.3 mm long; outer surface glabrous or rarely with few stellate hairs towards apex. *Flowers* solitary or 2-6 in a loose spike-like or head-like cluster 4-8 mm wide, white. *Floral tube* 1.4-1.9 mm long (enlarging to c. 3 mm in fruit); adnate portion of tube c. 0.5 mm long, densely minutely stellate-hairy; free portion of tube 0.9-1.4 mm long, sparsely to moderately densely minutely stellate-hairy. *Sepals* 1.2-1.6 mm long, densely minutely stellate-hairy, often also with simple hairs 0.2-0.3 mm long towards the apex. *Petal claw* 0.1-0.3 mm long. *Disc* with hairs 0.1-0.2 mm long. *Ovary summit* with hairs 0.2-0.3 mm long. *Style* 0.7-1.3 mm long. *Schizocarp* half or slightly less than half inferior, c. 3 x 2.2 mm; superior portion concealed within the free floral tube, densely stellate-hairy. *Seeds* not seen at maturity. (Figure 6G-K)

*Other specimens examined.* WESTERN AUSTRALIA: 15 miles [24.2 km] NE of Wialki, no date, J.M. Arnold; 20.75 km due SE of Mt Burdett, 3/8/1983, M.A. Burgman 1684 & S. McNee; South Stirlings road, 35 miles [56.4 km] E of Borden road, 27/5/1964, A.S. George 6250; c. 14 km SE of Kulin, 16/7/1977, R. Hnatiuk 770401; 13 km NNW of Chillinup Pool, 7/5/1974, K.R. Newbey 4131A; 7 km NNW of Point Charles, Fitzgerald River National Park, 16/7/1980, K.R. Newbey 6816; Fitzgerald River Reserve, 12/7/1970, R.D. Royce 8938; 2 km SW of Manmanning, 19 July 1978, B. & M. Smith; 3-5 km E of Merredin along Great Eastern Highway, 29/9/1981, R. Spjut, G. White, R. Phillips & L. Lacy 7243; Mt Madden 6/8/1968, P.G. Wilson 6776.

*Distribution.* Extends from north east of Wialki south to near Cape Riche and eastwards from there to east of Gibson, southern Western Australia.

*Habitat.* Recorded in sandy soils or in clay, with one record from gravel, sometimes in mallee scrub.

*Flowering period.* May-August. Fruits September-October.

*Conservation status.* Fairly widespread and apparently not at risk at present.

*Etymology.* Named in honour of Paul G. Wilson, a botanist prominent in studies of Australian plants. His collection of this *Cryptandra* species in 1968 was the earliest one with a date. An undated collection by J.M. Arnold may have preceded it.

*Notes.* Related to *Cryptandra polyclada*, which differs in its very fine matted indumentum on the stems, in having petioles concealed at first (and often remaining concealed) by the long stipule sheaths and in its paler green leaves. *C. polyclada* also tends to be a smaller plant with more intricate branching, is never spinescent and generally has longer cilia on the bracts and longer hairs on the flowers.

Specimens of *C. wilsonii* from the more inland areas usually have spinescent branchlets, while those occurring near the south coast usually lack spinescent branchlets.

### Species included in the reinstated genus *Stenanthemum* Reissek

The genus is predominantly Western Australian but some species extend into other states and there are a few species restricted to other parts of Australia, such as *Stenanthemum leucophractum* (Schledl.) Reissek. A total of 21 Western Australian species are included in the genus at this stage and all are listed below except for *Stenanthemum humile* Benth. and *S. pomaderroides* (Reissek) Reissek.

### Implicit characters for *Stenanthemum*

*Indumentum* white or clear. *Branchlets* not spinescent. *Stipules* persistent, brown, each pair free on lower (abaxial) side of the petiole and either connate at the base or free (but meeting) on the upper side of the petiole. *Leaves* conduplicate in bud, spreading but remaining partially folded or with an indented midvein at maturity, entire; lower surface pale green, hairy; upper surface green. *Flowers* sessile or subsessile, several to many aggregated into dense head-like clusters surrounded by brown bracts and leaves, each flower subtended by at least two floral bracts. *Floral tube* extended into a free tube above the ovary summit. *Disc* lining floral tube and scooped between the stamens or stamen traces, glabrous. *Ovary* 3-celled. *Style* glabrous (sometimes with a few stellate hairs at the base if ovary is hairy); stigmatic lobes 3. *Fruit* a schizocarp, inferior or largely inferior; fruitlets crustaceous, opening over the summit and down inner surface, with a basal hole where attached to the peduncle or receptacle. *Seeds* with a dark base seated on an aril; aril with three prominent acute lobes, one inner (adaxial) lobe and two lateral lobes.

### *Stenanthemum bilobum* Rye, sp. nov.

*Stenanthemo notiali* simile sed stipulis libris, foliis marginem magis recurvis ad apice manifeste 2-lobatis differt.

*Typus:* 262 km from Mt Magnet on Geraldton road, Western Australia, 20 August 1963, D.W. Goodall 1840 (*holo:* PERTH 01539698).

*Shrub* small, height not recorded. *Young stems* densely stellate-hairy. *Stipules* free or very shortly united at base, pale brown or whitish; outer surface densely stellate-hairy. *Petioles* c. 0.5 mm long, very densely hairy. *Leaf blades* obcordate or narrowly obcordate, c. 5 x 3 mm, 2-lobed at apex, with the midvein indented, the margins recurved, pale green and densely hairy on both surfaces, apparently

with mainly stellate hairs but also some simple hairs; simple hairs mostly 0.3-0.4 mm long. *Bracts* narrowly triangular or subulate, c. 1 mm long, pale brown, ciliate; outer surface densely hairy, the hairs c. 0.3 mm long. *Flower clusters* 2-3 mm wide, their colour unknown but probably white or cream. *Floral tube* c. 0.7 mm long (enlarging to c. 1.7 mm in fruit), densely stellate-hairy and with simple antrorse hairs 0.2-0.3 mm long; free portion of tube c. 0.4 mm long. *Sepals* c. 0.5 mm long, very densely stellate-hairy and with simple antrorse to spreading hairs 0.2-0.3 mm long. *Disc* shallowly scooped between the stamens. *Ovary summit* stellate-hairy; hairs 0.1-0.2 mm long. *Style* c. 0.5 mm long. *Schizocarp* seen only when immature, c. 1.5 x 1 mm, densely stellate-hairy and also with antrorse simple hairs 0.4-0.5 mm long. (Figure 7A-E)

*Specimens examined.* None other than the type.

*Distribution.* Recorded from near Tenindewa, west of Mullewa, southern Western Australia.

*Habitat.* Unknown.

*Flowering period.* August.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 1. Apparently at risk as it is known from only one collection, probably from a road verge. This poorly known species urgently needs to be surveyed.

*Etymology.* From the Latin *bi* - two and *lobus* - lobe, referring to the prominently 2-lobed leaves.

*Notes.* The leaves of this species are very distinctive and immediately distinguish it from all other members of the genus. It could be confused with *Stenanthemum notiale*, which differs in having stipules connate for about a quarter to half their length, flat or less prominently recurved leaf margins and either an entire or acutely toothed leaf apex.

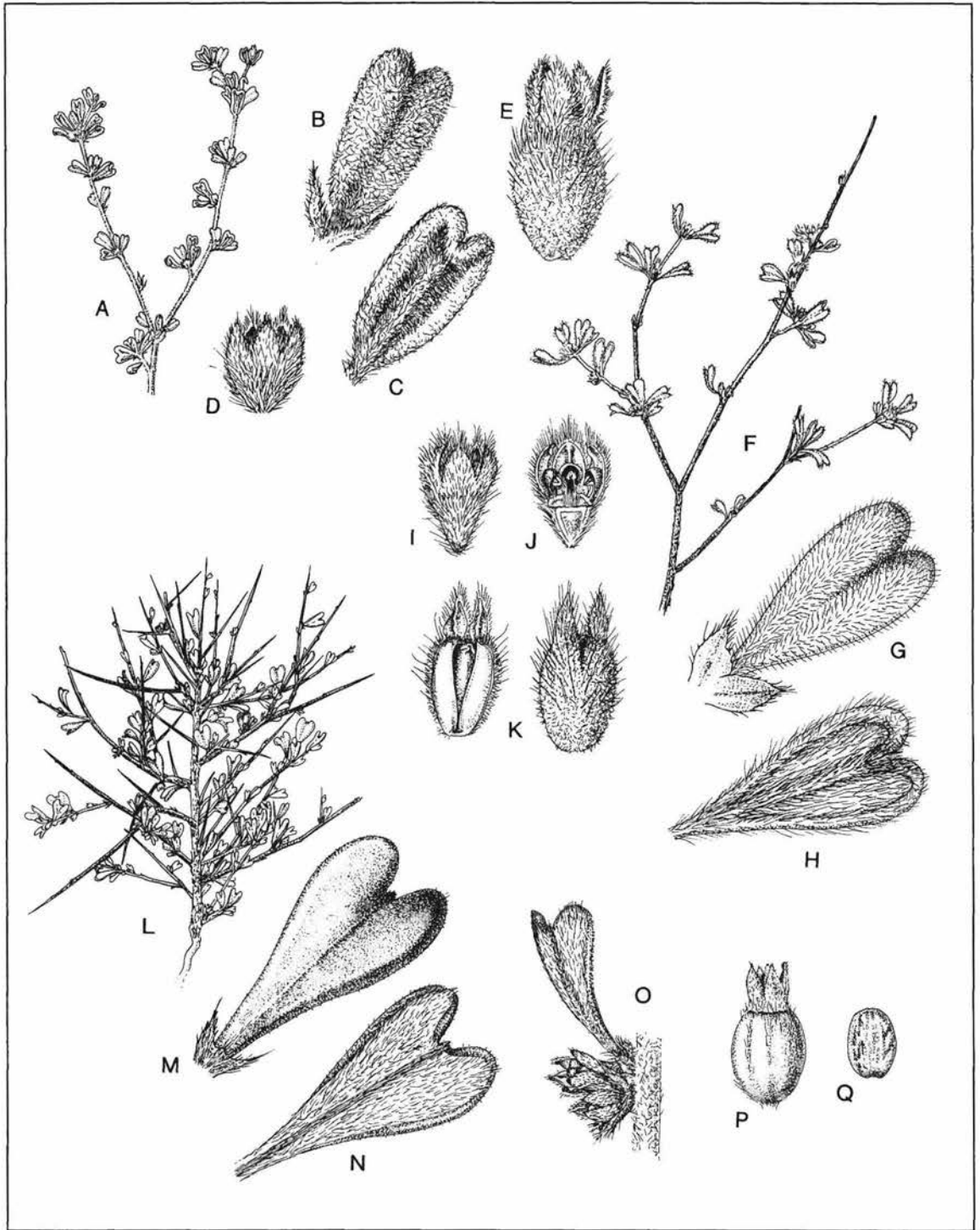
***Stenanthemum complicatum*** (F. Muell.) Rye, nov. comb.

*Spyridium complicatum* F. Muell., *Fragm. Phyt. Austral.* 3: 78 (1862). *Type:* Murchison River, [Western Australia], *Oldfield* (*holo:* MEL 90946).

*Conservation status.* Not considered to be at risk at present.

***Stenanthemum coronatum*** (Reissek) Reissek, *Linnaea* 29: 295 (1858) - *Cryptandra coronata* Reissek in *Lehm., Pl. Preiss.* 2: 288 (1848). *Type:* [Western Australia], *J. Drummond* 2nd coll. 722 (MEL 227036).

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 3. Included on the 1994 Priority Flora List with a priority 2 code but several additional populations have been reported since then. Known from eight localities with a range of c. 200 km, extending from Mokine Nature Reserve south to near Duranillan (south of Darkan). The species is apparently not common at any of these locations, but has some degree of protection as at least two populations are on nature reserves. (Figure 8A-C)



**Figure 7.** A-E - *Stenanthemum bilobum*. A - flowering branch (x1), B - stipules and upper surface of leaf (x6), C - lower surface of leaf (x6), D - flower (x12), E - schizocarp (x12); F-K - *S. cristatum*. F - flowering branch (x1), G - stipules and upper surface of leaf (x6), H - lower surface of leaf (x6), I - flower (x9), J - half flower (x9), K - inner and outer surfaces of a dehiscent fruitlet (x6); L-Q - *S. divaricatum*. L - flowering branch (x1), M - stipules and upper surface of leaf (x6), N - lower surface of leaf (x6), O - flower cluster and leaves (x6), P - schizocarp (x8), Q - seed (x8). Drawn from D.W. Goodall 1840 (A-E), C.A. Gardner 2947 (F-J), C.A. Gardner 1406 & W.E. Blackall (K), A.S. Weston 10609 (L-O), A.S. George 11501 (P) and A.S. George 10154 (Q).



**Stenanthemum cristatum** Rye, sp. nov.

*Stenanthemo imbricato* et *S. notiali* simili sed pilis florum magis longioribus, disco ad apice magis plano differt.

*Typus*: Near East Mt Barren, Western Australia, 25 November 1931, C.A. Gardner 2947 (*holo*: PERTH 01541900; *iso*: CANB, MEL).

*Shrub* spreading to prostrate, 0.05-0.2 m high. *Young stems* with short stellate hairs and antrorse to spreading simple hairs 0.5-0.7 mm long. *Stipules* united for about half their length, ciliate; outer surface with simple antrorse hairs along the midrib and sometimes a few hairs on each side. *Petioles* c. 1 mm long, very densely hairy at first. *Leaf blades* obcordate or broadly so, 5-8 x 3.5-5.5 mm, with a tooth on each side of the apex or appearing to be 2-lobed at apex, the margins distinctly recurved; lower surface densely stellate-hairy and with simple, sometimes ferruginous hairs 0.7-1 mm long; upper surface with simple patent hairs 0.3-0.4 mm long. *Bracts* variable but often broadly ovate, 1-2 mm long, long-ciliate, the cilia 0.3-0.5 mm long; outer surface with hairs 0.5-0.8 mm long densely covering the midvein, sparsely hairy or glabrous on each side. *Flower clusters* 4-6 mm wide, white. *Floral tube* c. 1 mm long (enlarging to c. 2.5 mm in fruit), densely stellate-hairy and with simple antrorse hairs 0.8-1.2 mm long; free portion of tube c. 0.5 mm long. *Sepals* c. 0.7 mm long, with a dense indumentum of simple antrorse hairs c. 0.5 mm long. *Disc* more or less level at the summit. *Ovary summit* stellate-hairy; hairs c. 0.3 mm long. *Style* c. 0.6 mm long. *Schizocarp* c. 2.4 x 1.8 mm, densely stellate-hairy and with simple hairs c. 1 mm long. *Seeds* not seen at maturity. (Figure 7F-K)

*Other specimens examined*. WESTERN AUSTRALIA: Plains near Mid Mt Barren, 25/11/1931, C.A. Gardner & W.E. Blackall 1406.

*Distribution*. Occurs near Mid Mt Barren and East Mt Barren, Fitzgerald River National Park, southern Western Australia.

*Habitat*. Recorded in gravelly soil.

*Flowering and fruiting period*. November.

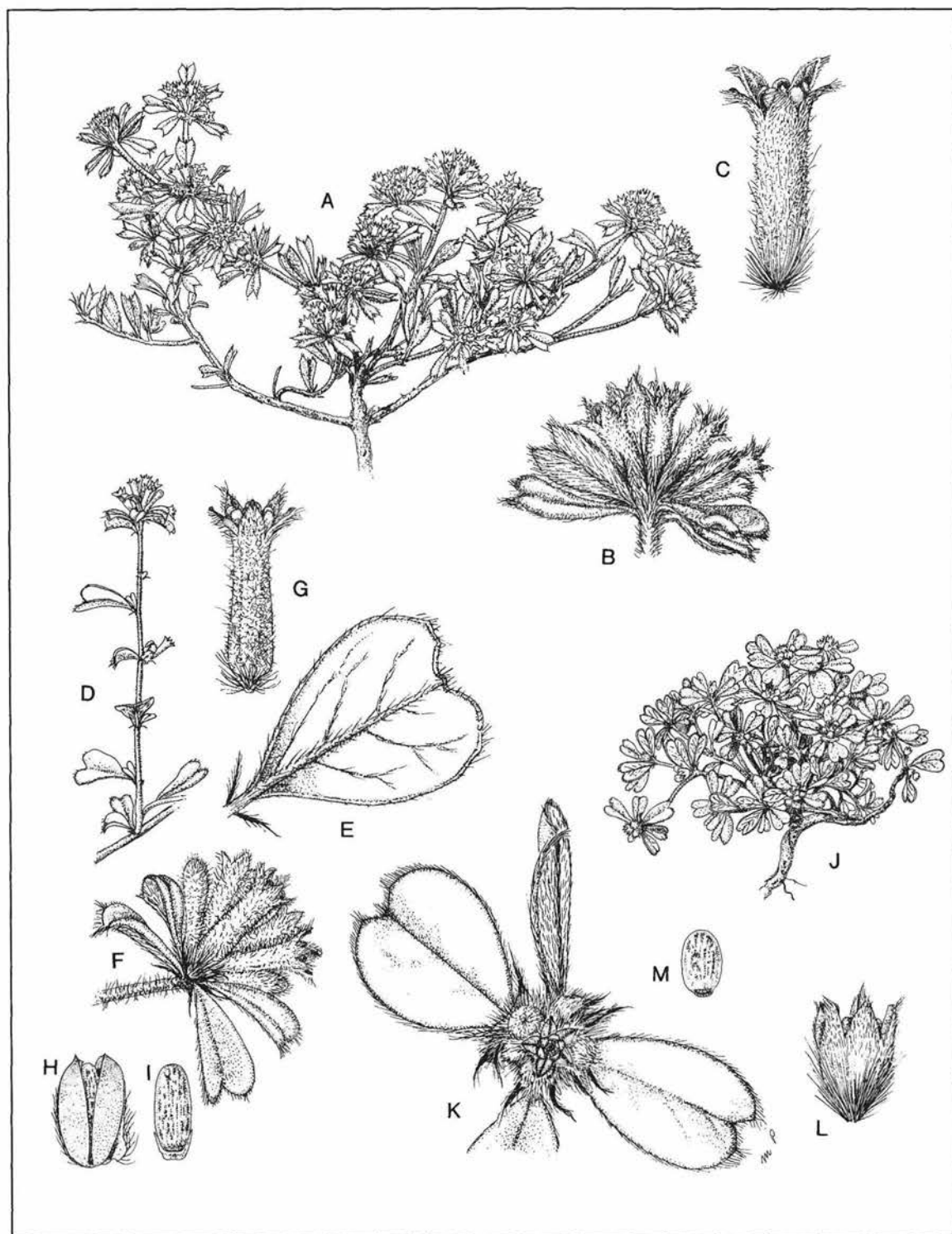
*Conservation status*. CALM Conservation Codes for Western Australian Flora: Priority 2. Only known from two collections, both made in 1931 from a large national park, collected near two mountains that are c. 35 km apart. This poorly known taxon needs to be surveyed.

*Etymology*. From the Latin *cristatus* - tufted or crested, referring to the long hairs on the sepals forming an apical tuft.

*Notes*. This species could be confused with *Stenanthemum imbricatum* and *S. notiale*, which differ in having shorter floral hairs and a shallowly scooped disc. Of all the *Stenanthemum* species, *S. cristatum* shows the closest approach to the type of disc found in the genus *Spyridium*.

**Stenanthemum divaricatum** (Benth.) Rye, nov. comb.

*Spyridium divaricatum* Benth., Fl. Austral. 1: 427 (1863). *Type*: Dirk Hartog Island, [Western Australia], Milne (*n.v.*); Murchison River, [Western Australia], Oldfield (MEL 227041).



**Figure 8.** A-C - *Stenanthemum coronatum*. A - whole plant (x1), B - flower cluster (x3), C - flower (x6); D-I - *S. limitatum*. D - flowering branch (x1), E - stipules and lower surface of leaf (x4), F - flower cluster (x4); G - flower (x6), H - dehiscent fruitlet (x7), I - outer surface of seed and aril (x7); J-M - *S. nanum*. J - whole plant (x1), K - flower cluster (x6), L - flower (x10), M - seed (x7). Drawn from G.J. Keighery & J.J. Alford 448 (A-C), A.S. George 12893 (D-H), C.A. Gardner 8471 (I) and A. Strid 21106 (J-M).

*Conservation status.* Listed as a Priority 3 species on the Priority Flora List of 1994 but additional collections seen since then indicate that it no longer needs to be given priority for conservation. Now known from eight coastal locations, with a geographical range of over 360 km. Three of the known populations are on large islands and one or two of the mainland populations are in a national park. (Figure 7L-Q)

***Stenanthemum emarginatum* Rye sp. nov.**

*Stenanthemo divaricato* arcte affine sed spinis destitutis, lobis apicalibus foliorum acutioribus, folius infra magis dense pilosis differt.

*Typus:* Whoogarup Range, south west of Ravensthorpe, Western Australia, 2 December 1960, A.S. George 1900 (*holo:* PERTH 01541838; *iso:* CANB).

*Shrub* spreading to prostrate, 0.05-0.1 m high. *Young stems* sparsely hairy and papillose; hairs simple, appressed to antrorse, c. 0.5 mm long. *Stipules* united for about a third to half of their length, ciliate; outer surface with hairs along midvein. *Petioles* 0.5-1.5 mm long, glabrous or with a few hairs on undersurface. *Leaf blades* usually narrowly obtriangular, rarely obtriangular, 4.5-11 x 1.5-3.5(5) mm, emarginate and 3-toothed at apex, the margins recurved; lower surface usually white, rarely pale green, with stellate hairs and antrorse simple hairs 0.4-0.7 mm long; upper surface papillose. *Bracts* ovate or broadly ovate, with an apical point; outer surface hairy along midvein. *Flower clusters* 3-5 mm wide, white or cream. *Floral tube* 0.6-0.9 mm long (enlarging to 2-2.5 mm in fruit); adnate portion of tube with a very dense indumentum of antrorse simple hairs 0.3-0.5 mm long; free portion of tube 0.3-0.5 mm long, stellate-hairy and tending to be covered by the long simple hairs of the adnate portion. *Sepals* 0.6-1 mm long, with a dense indumentum of minute stellate hairs and antrorse simple hairs c. 0.3 mm long. *Disc* shallowly scooped between the stamens. *Ovary summit* minutely stellate-hairy. *Style* c. 0.5 mm long. *Schizocarp* 1.8-2.2 x 1.5-1.7 mm, with simple hairs 0.5-0.8 mm long and usually also a few stellate hairs especially towards the summit. *Seeds* 0.9-1.2 x c. 0.7 mm, very pale brown, with distinct medium to reddish brown spots. (Figure 9A-F)

*Other specimens examined.* WESTERN AUSTRALIA: Bobakine Hills, 4 km NE of Clackline, 30/9/1986, J.J. Alford 968; E of Brand Highway, S of Wannamal West Rd, 16/12/1992, E.A. Griffin 8469; Near Moir Hill, Stirling Range, 15/11/1982, G.J. Keighery 5854; Kelmscott, 21/12/1899, A. Morrison; Armadale, Canning River, 21/12/1901, A. Morrison; Dryandra State Forest, 15/11/1987, D.M. Rose 504; Ridge Hill Rd, Helena Valley, 11/1977, J. Seabrook 621.

*Distribution.* Extends from north of Gingin south to Dryandra State Forest, with isolated records from Stirling Range and Whoogarup Range, southern Western Australia.

*Habitat.* In clay or sandy clay.

*Flowering and fruiting period.* September-December.

*Conservation status.* Seems to be uncommon but reasonably widespread and occurs in a large national park and a nature reserve.

*Etymology.* From the Latin *e* - out of and *margo-inis* - margin, referring to the notched (emarginate) apical margin of the leaf.

*Notes.* Closely related to *Stenanthemum divaricatum*, which differs in commonly having spinescent branchlets and in the obtuse apical lobes and sparser undersurface of its leaves.

***Stenanthemum intricatum* Rye, sp. nov.**

*Stenanthemo notiali* affine sed foliis supra indumento sparso brevi, sepalis et parte libera tubi floralis magis aequabilibus, a *S. tridentato* tubo floralis inferi et fructo magis pubescentibus differt.

*Typus:* 6 km S of Kalbarri township, Western Australia, 7 May 1968, *P.G. Wilson* 6581 (*holo:* PERTH 01539701; *iso:* CANB).

*Shrub* dense, often wiry, erect to widely spreading, 0.1-0.7 m high, intricately branched. *Young stems* stellate-hairy, sometimes also with a few simple antrorse hairs 0.3-0.6 mm long. *Stipules* united for about a third to half of their length, usually ciliate, the cilia 0.1-0.3 mm long; outer surface usually hairy along the midvein, sometimes appearing almost glabrous. *Petioles* 0.3-0.8 mm long, densely hairy at first, sometimes becoming sparsely hairy. *Leaf blades* obovate to obcordate or broadly so, 2.5-8 x 2-8 mm, the margins flat or recurved, with 1 or 2 teeth on each side of the apical tooth; lower surface densely hairy at first, sometimes becoming sparsely hairy; upper surface with simple, patent to widely antrorse hairs 0.05-0.2 mm long, rarely also with a few antrorse simple hairs c. 0.3 mm long. *Bracts* ovate or broadly ovate, prominently ciliate, often toothed; outer surface usually with a few hairs along the midvein, sometimes moderately densely hairy on midvein. *Flower clusters* 3-5 mm wide, usually white to cream, rarely greenish white. *Floral tube* 0.8-1.0 mm long (enlarging to 2.3-3 mm in fruit), densely stellate-hairy and with simple hairs 0.2-0.5 mm long at first, sometimes becoming sparsely hairy; free portion of tube (0.4)0.5-0.6 mm long. *Sepals* 0.5-0.7 mm long, densely stellate-hairy, with simple hairs 0.1-0.3 mm long towards the apex. *Disc* shallowly scooped between the stamens. *Ovary summit* densely stellate-hairy; hairs 0.2-0.3 mm long. *Style* 0.5-0.8 mm long. *Schizocarp* 1.8-2.5 x 1.6-2 mm, densely stellate-hairy and with simple hairs usually 0.3-0.4 mm long. *Seeds* c. 1.4 x 0.8 mm, very pale brown, with dark red-brown markings. (Figure 9G-N)

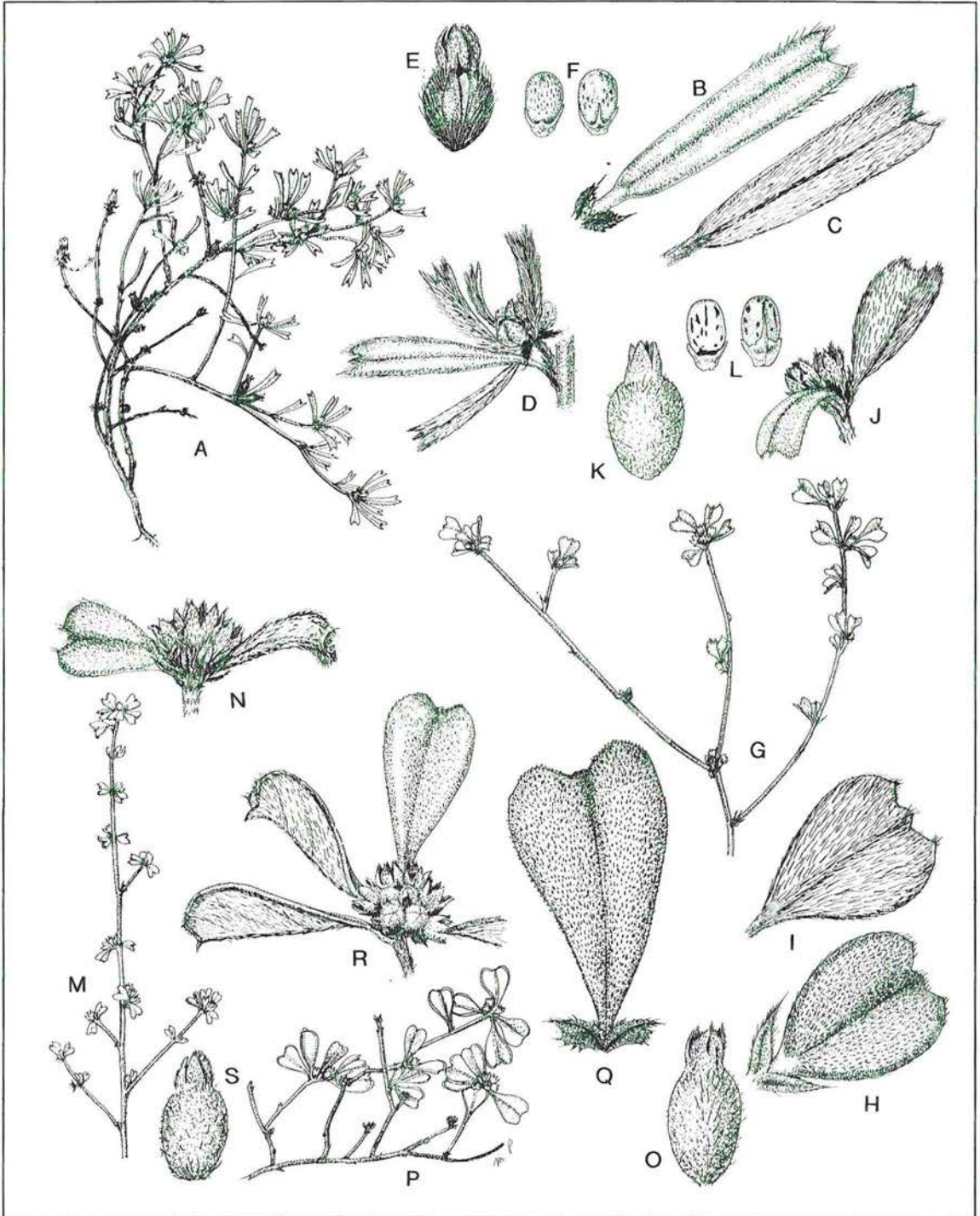
*Selected specimens examined.* WESTERN AUSTRALIA: Durokoppin Nature Reserve, 12/11/1986, *L. Darlington* HLA76; Wongan Hills, 12/1924, *C.A. Gardner*; c. 5 miles [8.5 km] W of Mogumber Mission, 11/4/1964, *A.S. George* 6174; Masons Rd, NE of Watheroo, 27/10/1992, *E.A. Griffin* 7726; Kalbarri road, E of Kalbarri National Park, 7/8/1976, *R.J. Hnatiuk* 760555; Mokine Nature Reserve, 7/6/1985, *G.J. Keighery & J.J. Alford* 858; Mt Ridley, 9/3/1980, *K.R. Newbey* 6695; at entrance of track to Junga Dam, Kalbarri National Park, 2/6/1994, *S. Patrick* 1833; 17 miles [27.4 km] W of Dalwallinu, 4/5/1955, *R.D. Royce* 5037; 6.5 km S of intersection of Grey and Clotworthy streets, Kalbarri, on road to Eagle Gorge, 5/7/1991, *B.L. Rye* 91006.

*Distribution.* Extends from Kalbarri National Park south east to Mokine Nature Reserve and near Kellerberrin, with an isolated record from Mt Ridley.

*Habitat.* Occurs on sandy or clayey soils, sometimes associated with laterite, often in low-lying or relatively damp situations. The isolated Mt Ridley specimen came from clayey sand on the apron of a granite monolith.

*Flowering and fruiting period.* March-November.

*Conservation status.* Widespread and not considered to be at risk.



**Figure 9.** A-F - *Stenanthemum emarginatum*. A - whole plant (x1), B - stipules and upper surface of leaf (x7), C - lower surface of leaf (x7), D - flower cluster (x4), E - dehiscent schizocarp (x8), F - outer and inner surfaces of seed and aril (x9); G-L - typical *S. intricatum*. G - flowering branch (x1), H - stipules and upper surface of leaf (x6), I - lower surface of leaf (x6), J - flower cluster (x5), K - schizocarp (x6), L - outer and inner surfaces of seed and aril (x7); M, N - atypical *S. intricatum*. M - flowering branch (x1), N - flower cluster (x7); O - *S. notiale* subsp. *notiale* schizocarp (x6); P-S - *S. notiale* subsp. *chamelum*. P - flowering branch (x1), Q - stipules and upper surface of leaf (x5), R - flower cluster (x4), S - schizocarp (x7). Drawn from A.S. George 1900 (A-F), R.J. Hnatiuk 760555 (G-L), Y. Chadwick 1738 (M,N), R. Pullen 9786 (O-Q), J. Dodd 5/9/1978 (R) and G.J. Keighery 9673 (S).

*Etymology.* From the Latin *intricatus* - entangled, referring to the intricate branching pattern characteristic of this species.

*Notes.* The closest relative is *Stenanthemum notiale*, which tends to have longer petioles and larger leaves, with its upper leaf surface either tuberculate or more densely hairy, and sepals distinctly exceeding the free portion of the floral tube. The difference in the relative lengths of the sepals and free part of floral tube is usually more evident in fruit than in flower and is a less reliable character than the vegetative differences. In Western Australia, *S. notiale* also differs in its usually open branching pattern and commonly has more yellowish flowers.

*Stenanthemum intricatum* could also be confused with the three species in the *S. tridentatum* species group, which differ in their less hairy lower floral tube and fruit and their paler seed mottling.

Two atypical specimens (*Y. Chadwick* 1738 from east of Geraldton and *F.W. Went* 79 from south west of Yuna) have particularly small leaves with margins more recurved than usual. Whereas typical specimens have only short patent to antrorse hairs 0.05-0.2 mm long on the upper leaf surface, the atypical variant also has a few antrorse hairs *c.* 0.3 mm long. This variant is illustrated in Figure 9M,N.

***Stenanthemum limitatum* Rye sp. nov.**

*Stenanthemo coronato* arcte affine sed planta grandiore, bracteis brevioribus, floribus minus dense pubescentibus differt.

*Typus:* Mt Lesueur, Western Australia, 16 October 1946, *C.A. Gardner* 8471 (*holo:* PERTH 01516957; *iso:* CANB).

*Shrub*, erect to decumbent, 0.15-1 m high. *Young stems* with large stellate and simple hairs; large simple hairs more or less patent, 0.4-0.7 mm long. *Stipules* connate for about a quarter of their length, persistent or shed about the same time as the leaves, attenuate or acuminate, with a few large cilia; outer surface usually with a few large hairs mainly on the midvein. *Petioles* 0.5-1 mm long, usually with a few large simple hairs on undersurface. *Leaf blades* usually broadly obovate to broadly obtriangular, sometimes obovate to obtriangular, 5.5-16 x 3-8 mm, with 1 or 2 (rarely more) teeth on each side of the apex, the margins recurved; lower surface with 1-3 lateral veins on each side of midrib, densely stellate-hairy and with large simple hairs at first, soon becoming sparsely hairy, with simple hairs *c.* 1 mm long persisting mainly on the midvein; upper surface sparsely hairy on the margins or glabrous, the marginal hairs 0.4-1 mm long. *Involucral bracts* subulate or narrowly triangular, 1.5-2 mm long, attenuate, prominently ciliate, the larger cilia usually *c.* 0.6 mm long; outer surface sparsely hairy or glabrous. *Floral bracts* apparently deciduous, similar to involucral bracts but smaller. *Flower clusters* 5-10 mm wide, white or cream. *Floral tube* 3-3.5 mm long (enlarging to 5-6 mm in fruit); adnate portion of tube densely hairy with a mixture of short stellate hairs and coarse antrorse simple hairs *c.* 0.7 mm long; free portion of tube 2.5-3 mm long, with a sparse to moderately dense indumentum of stellate and simple hairs. *Sepals* 1.1-1.5 mm long, rather sparsely stellate-hairy and with antrorse or spreading simple hairs *c.* 0.5 mm long. *Disc* deeply v-shaped between the stamen traces. *Ovary summit* minutely stellate-hairy. *Style* 3-4 mm long. *Schizocarp* 2.5-3.3 x 1.5-1.8 mm, with a mixture of minute stellate hairs and antrorse to almost patent simple hairs 0.4-0.8 mm long. *Seeds* *c.* 2 x 0.8 mm, very pale brown, with mid brown markings. (Figure 8D-I)

*Other specimens examined.* WESTERN AUSTRALIA: summit of Mt Lesueur, 13/10/1974, A.S. George 12893; western slope of Mt Lesueur, 17/7/1979, E.A. Griffin 1883; 2 km N of Mt Lesueur, 11/10/1979, E.A. Griffin 2354; 8 km NE of Mt Lesueur, 12/10/1979, E.A. Griffin 2533; Jurien Bay, 4/11/1962, R.D. Royce 7746.

*Distribution.* Occurs in the Mt Lesueur area, southern Western Australia.

*Habitat.* Recorded mainly on laterite, with one record from sandstone.

*Flowering and fruiting period.* October-November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 2. Included on the 1991 Priority Flora List under the phrase name *Cryptandra* sp. *Lesueur* (A.S. George 12893). This species has been included in a survey of rare taxa in the Moora District. Known localities are restricted to an 8 km range and include a national park.

*Etymology.* From the Latin *limito -atus* enclose within limits, referring to the very restricted geographic range of the species.

*Notes.* Closely related to *Stenanthemum coronatum*, which differs in being a smaller, more prostrate plant with longer bracts and more densely hairy flowers. *S. coronatum* also tends to have smaller, more densely clustered leaves and less elongate fruits and also has a glabrous ovary summit.

***Stenanthemum mediale*** Rye, sp. nov.

Folia late obovato-conduplicata, parva, integra; bractae latae; flores in amplitudine medii; disci sinibus v-formati; ovarium stellato-pubescentis.

*Typus:* Yeelirrie Station, Western Australia, 3 May 1990, H. Pringle 2755 (*holo:* PERTH 02937778; *iso:* CANB, MEL).

*Shrub* erect, c. 0.35 m high. *Young stems* with a dense indumentum of minute stellate hairs and appressed simple hairs, the largest simple hairs 0.4 mm or more long. *Stipules* connate for about a third to half of their length, acute or acuminate; outer surface usually hairy on midvein. *Petioles* c. 1 mm long, densely hairy. *Leaf blades* obovate to very broadly obovate, 3.5-7 x 2.5-4.5 mm, entire, the apex recurved; lower surface with a very dense indumentum of long appressed hairs, usually with 3 or 4 lateral veins (sometimes scarcely visible) on each side of midrib; upper surface glabrous or minutely papillose. *Involucral bracts* ovate or broadly ovate, 3-4 mm long, usually acuminate; outer surface hairy on the margins and midvein, glabrous in between, prominently ciliate. *Floral bracts* very broad, often toothed, c. 1.5 mm long, hairy on midvein, long-ciliate. *Flower clusters* 5-8 mm wide, colour unknown. *Floral tube* 1.5-2.5 mm long (enlarging to 3-4 mm long in fruit), with a dense indumentum of minute stellate hairs and rather coarse simple hairs, the simple hairs antrorse and becoming smaller towards the summit of tube, the basal ones commonly c. 0.6 mm long; free portion of tube 1-2 mm long. *Sepals* 1.3-1.7 mm long, with an indumentum like that at summit of floral tube but with the simple hairs mostly c. 0.2 mm long. *Disc* v-shaped between the stamen traces, the base of each v being 0.5-0.8 mm above base of free tube. *Ovary summit* densely stellate-hairy. *Style* 1.5-2 mm long. *Schizocarp* 3-3.5 x c. 2.5 mm, densely hairy. *Seeds* not seen at maturity. (Figure 10A-E)

*Other specimens examined.* Black Hill Station, 31/7/1993, D.A. Blood 3751.

*Distribution.* Known from Yeelirrie Station and Black Hill Station, central Western Australia.

*Habitat.* Recorded from red clayey sand.

*Flowering and fruiting period.* April-August.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 1. First listed in 1994 under the phrase name *Stenanthemum* sp. *Yeelirrie* (Pringle 2755). Known from two specimens collected from pastoral stations.

*Etymology.* From the Latin *medialis*- in the middle, referring to the occurrence of the species in the middle of Western Australia.

*Notes.* This species has a disk similar to *Stenanthemum coronatum* and its allies, but those species differ in their leaves usually being toothed on each side of the apex and their flowers either shorter or longer, with a number of other differences which vary according to the species. *Stenanthemum petraeum* appears to overlap in range with *S. medialis* but has larger and more shiny leaves, finer and more spreading hairs on the floral tube, a shorter disc and a different habitat.

#### ***Stenanthemum nanum* Rye, sp. nov.**

*Stenanthemo coronato* arcte affine sed floribus parvioribus, bracteis latioribus, apice ovarium stellato-pubescenti differt.

*Typus:* 50.5 miles [88.5 km] SE of Perth on Brookton Highway, Western Australia, 25 November 1965, A.S. George 7368 (*holo:* PERTH 0154307; *iso:* CANB).

*Shrub* spreading, more or less prostrate to 0.05 m high. *Young stems* with stellate and simple hairs both common or with mainly simple hairs; larger simple hairs antrorse to almost patent, 0.4-0.7 mm long. *Stipules* connate for about a third of their length, attenuate, long-ciliate; outer surface with some long simple hairs mainly on the midvein. *Petioles* 0.8-2 mm long, hairy at first on undersurface, becoming sparsely hairy or subglabrous. *Leafblades* broadly obovate or sometimes obovate, 5-8 x 3-5 mm, with a tooth on each side of the apex, the margins flat; lower surface with a dense indumentum of small stellate and antrorse simple hairs 0.5-0.7 mm long; upper surface often with a brown or reddish margin, papillose. *Bracts* ovate or broadly ovate, 2-3 mm long, prominently ciliate, the cilia 0.5-0.6 mm long; outer surface with long antrorse simple hairs along the midvein. *Flower clusters* 4-6 mm wide, white or cream. *Floral tube* 1.6-1.8 mm long (enlarging to 3-3.5 mm in fruit), with a very dense indumentum of minute stellate hairs and antrorse simple hairs *c.* 1 mm long; free portion of tube *c.* 0.9 mm long. *Sepals* *c.* 1 mm long, with a dense indumentum of minute stellate hairs and antrorse to spreading simple hairs *c.* 0.4 mm long. *Disc* v-shaped between the stamen traces. *Ovary* summit stellate-hairy; hairs 0.1-0.2 mm long. *Style* *c.* 0.7 mm long. *Schizocarp* 2.2-2.5 x *c.* 2 mm, densely stellate-hairy and with some simple hairs *c.* 1 mm long. *Seeds* *c.* 1.5 x 0.8 mm, very pale brown with distinct medium brown markings. (Figure 8J-M)

*Other specimens examined.* WESTERN AUSTRALIA: No collection data, 01543415; Worsley Mine Site, 10 km S of Boddington, 23/4/1982, K.J. Atkins 172; 73 km from Perth on Brookton Highway, near Christmas Tree Well, 27/10/1982, A. Strid 21106.





**Figure 10.** A-E. *Stenanthemum mediale*. A - flowering branch (x1), B - connate stipules (x6), C - flower cluster (x4), D - flower (x7), E - half flower showing disc (x7.5); F-J - *Stenanthemum tridentatum*. F - fruiting branch (x1), G - stipules and leaf (x7), H - two views of flower (x6), I - fruit (x7), J - dehiscent fruit (x7). Drawn from H. Pringle 2755 (A-E), P.G. Wilson 6210 (F,G,I,J) and A.S. George 9899 (H).

*Distribution.* Occurs in the Darling Range from Brookton Highway south to near Boddington, southern Western Australia.

*Habitat.* Recorded from laterite and from gravelly clay on granite.

*Flowering and fruiting period.* October-November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 1. Known from three localities with a range of c. 70 km, one from a mining lease and the others probably in state forest.

*Etymology.* From the Latin *nanus* - dwarf, referring to the size of the plants.

*Notes.* Closely related to *Stenanthemum coronatum*, which differs in its larger flowers, narrower bracts and glabrous ovary summit.

***Stenanthemum newbeyi*** Rye, sp. nov.

*Stenanthemo complicato* arcte affine sed apice ovarii glabro, fructo minus pubescenti; *S. stipuloso* arcte affine sed foliis grandioribus multi-venisque supra pilis simplicibus, floribus grandioribus.

*Typus:* Bungalbin Hill, Western Australia, 2 January 1989, D.J. Pearson 559 (*holo:* PERTH 01679538).

*Shrub*, erect or spreading, 1-1.5 m high. *Young stems* with stellate and simple hairs; simple hairs appressed or antrorse, 0.4-0.6 mm long, sometimes ferruginous. *Stipules* free or very shortly connate at the base; outer surface hairy. *Petioles* 2-2.5 mm long, densely hairy. *Leaf blades* obovate or sometimes broadly obovate, 10-15 x 6-8 mm, entire, the margins flat or incurved; lower surface pale green or ferruginous, with 6-9 main lateral veins on each side of midvein; upper surface with long antrorse simple hairs at first, at maturity with minute patent simple hairs. *Involucral bracts* variable, commonly broadly ovate, c. 3 mm long, with an apical point, hairy inside along midvein; outer surface densely hairy, with a mixture of minute stellate hairs and appressed simple hairs c. 0.5 mm long, the indumentum sometimes ferruginous. *Flower clusters* 6-11 mm wide, pale yellow, each flower either subsessile or on a short hairy pedicel 0.3-1 mm long. *Floral tube* c. 1.5 mm long (enlarging to c. 3.8 mm in fruit), with a very dense indumentum of simple hairs 0.8-1 mm long; free portion of tube c. 1 mm long. *Sepals* c. 0.6 mm long, with a very dense indumentum of antrorse or spreading hairs 0.4-0.5 mm long. *Disc* apparently absent or shallowly scooped between the stamens. *Ovary summit* glabrous. *Style* c. 1.2 mm long. *Schizocarp* c. 3 x 2 mm, with simple hairs 0.7-1 mm long at first, apparently becoming glabrous with age. *Seeds* not seen at maturity. (Figure 11A-C)

*Other specimens examined.* WESTERN AUSTRALIA: 3 km N of Bungalbin Hill, 6/9/1989, R.J. Cranfield & P.J. Spencer 7773; 10 km N of Bungalbin Hill, 15/9/1979, K.R. Newbey 5922.

*Distribution.* Known only from Bungalbin Hill and nearby hills, southern Western Australia.

*Habitat.* On rocky slopes of ironstone or lateritic hills.

*Flowering and fruiting period.* August-September, December-January.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 1. Known from three localities, with a range of only 10 km, in a mining area.

*Etymology.* After Ken R. Newbey, a prominent collector of Western Australian plants and the first person to collect this taxon.

*Notes.* Closely related to *Stenanthemum complicatum* and *S. stipulosum*, the former with a densely hairy ovary summit and more hairy fruits, the latter having smaller, few-veined leaves with a dense indumentum of minute stellate hairs on the upper surface and also smaller flowers.

***Stenanthemum notiale*** Rye, sp. nov.

*Stenanthemum intricato* arcte affine sed sepalis parte libera tubi floralis manifeste longioribus, insuper uno subspecierum ramificationis ordinatione magis aperto, alter subspecierum folio supra magis pubescenti differt.

*Typus:* c. 17 km NNW of Young River crossing on Ravensthorpe-Esperance road, Western Australia, 27/9/1968, E.N.S. Jackson 1296 (*holo:* PERTH 01541315; *iso:* AD, CANB).

*Shrub* subprostrate to erect, up to 0.5 m high. *Stipules* united for about a quarter to half of their length, usually ciliate, the cilia 0.1-0.3 mm long; outer surface usually hairy along the midvein. *Petioles* 0.5-2.0 mm long. *Leaf blades* narrowly to broadly obovate to obcordate, 2.5-15 x 2.5-9 mm; lower surface densely hairy with small stellate hairs and simple appressed to antrorse hairs 0.3-1.0 mm long. *Bracts* narrowly to broadly ovate, prominently ciliate, often toothed. *Flowers clusters* 4-7.5 mm wide. *Floral tube* 0.6-1 mm long (enlarging to 2-2.8 mm in fruit), densely stellate-hairy and with simple hairs 0.2-0.5 mm long; free portion of tube 0.3-0.4(0.5) mm long. *Sepals* 0.6-0.9 mm long, densely minutely stellate-hairy and with simple hairs 0.05-0.3 mm long. *Disc* shallowly scooped between the stamens. *Ovary summit* densely stellate-hairy; hairs 0.1-0.3 mm long. *Style* 0.5-0.8 mm long. *Schizocarp* 1.8-2.4 x 1.5-1.8 mm, densely stellate-hairy and with simple hairs 0.3-0.7 mm long.

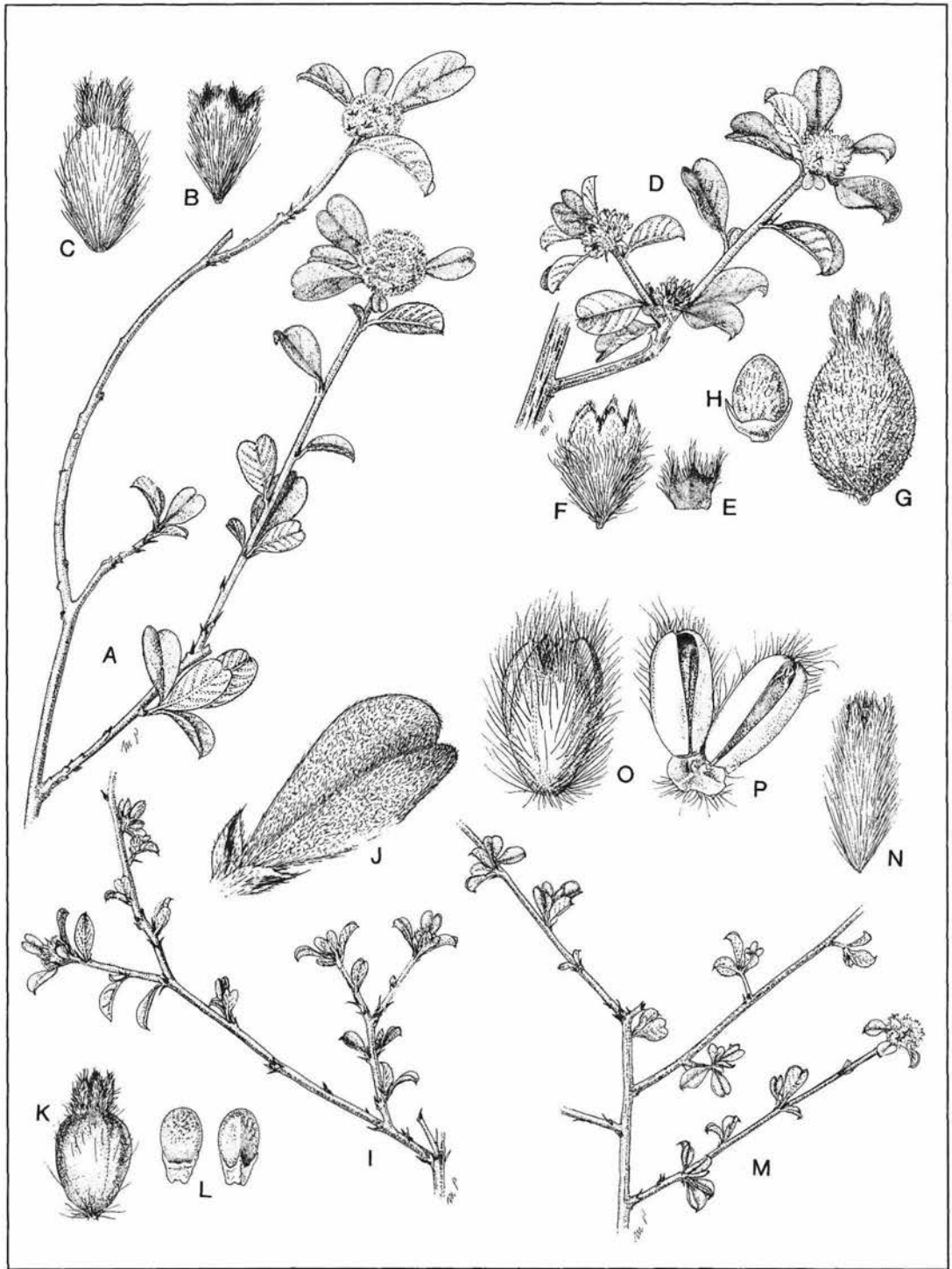
*Distribution.* Widely distributed in the south-west of Western Australia between Kalbarri National Park and Cocklebiddy and occurring also in South Australia and Victoria.

*Etymology.* From the Latin *notialis* - southern, referring to the southern distribution of the species in mainland Australia, with representation in each of the three southern states.

*Notes.* Closely related to *Stenanthemum intricatum*, which differs in having sepals and the free portion of the floral tube similar in length. In comparison with most Western Australian specimens of *S. notiale*, *S. intricatum* also tends to differ in habit, being a denser, more intricately branched shrub. It usually has shorter petioles and leaf blades, which have a sparse indumentum of short hairs on the upper surface.

***Stenanthemum notiale*** subsp. ***chamelum*** Rye, nom. et stat. nov.

*Cryptandra tridentata* var. *tomentosa* Reissek in Lehm., Pl. Preiss. 2: 288 (1848). *Type:* Mt Eliza, Perth, [Western Australia], 25 September 1839, L. Preiss 1216 (LD).



**Figure 11.** A-C - *Stenanthemum newbeyi*. A - flowering branch (x1), B - flower (x8), C - schizocarp (x6); D-H - *S. petraeum*. D - flowering branch (x1), E - floral bract (x8), F - flower (x8), G - schizocarp (x7), H - outer surface of seed and aril (x6); I-L - *S. stipulosum*. I - flowering branch (x1), J - stipules and upper surface of leaf (x6), K - schizocarp (x7), L - outer and inner surfaces of seed and aril (x7); M-P - *Stenanthemum* sp. Mt Clifford (R. Cumming 1267). M - flowering branch (x1), N - flower (x7), O - dehiscent schizocarp (x7), P - two fruitlets dehiscent (x6). Drawn from D.J. Pearson 559 (A-C), A.S. George 8323 (D), P.K. Latz 2337 (E,F), R. Bates (G,H), C.A. Gardner 13868 (I,J), R.J. Cranfield 2457 (K,L) and R. Cumming 1267 (M-P).

*Shrub* subprostrate, forming a ground cover, up to 0.15 m high. *Young stems* with large stellate and simple hairs; simple hairs usually antrorse, 0.3-0.4(0.8) mm long. *Stipules* united for about a third to half of their length, usually ciliate, the cilia 0.1-0.2 mm long; outer surface usually hairy towards base and along the midvein, sometimes appearing almost glabrous. *Petioles* 0.8-1.5 mm long, hairy at first. *Leaf blades* obcordate to ovate or narrowly so, 5-15 x 3-9 mm, the margins recurved, with 1-3 (rarely more) teeth on each side of the apex; lower surface densely hairy at first with stellate hairs and antrorse simple hairs 0.3-1.0 mm long; upper surface papillose or rarely with patent to antrorse simple hairs 0.05-0.1 mm long, usually also with a few long appressed simple hairs towards the base along the midvein. *Bracts*: outer surface usually with a few hairs along the midvein. *Flower clusters* 4-5 mm wide, off-white or cream. *Floral tube* sometimes much less densely hairy on free portion than on adnate portion. *Sepals* with simple hairs 0.05-0.2 mm long. *Seeds* not seen at maturity. (Figure 90-R; also illustrated in Bennett 1988, Figure 131).

*Other specimens examined.* WESTERN AUSTRALIA: No collection details, *C. Andrews*; Claremont, 3/1902, *C. Andrews*; Moore River State Forest, 5 km along old Bennies Rd, 5/9/1978, *J. Dodd* 18; Moore River State Forest, 6.5 km along Bennies Rd, E of Lancelin turnoff, 18/11/1979, *J. Dodd* 59; Yanchep, 21/5/1963, *A.S. George* 4379; 3 miles [4.8 km] S along Wanneroo Rd, 18/10/1961, *D.W. Goodall* 3760; Nilgen Nature Reserve, 27/9/1991, *W. Greuter* 22261; between Lancelin and Guilderton, near the Ledge Point turnoff, 1/12/1974, *R. Pullen* 9786.

*Distribution.* Occurs along the coast from near Lancelin and Moore River south to Perth.

*Habitat.* Occurs in deep sand or sand over limestone, on the western side of the coastal plain, generally in the Spearwood soil type.

*Flowering and fruiting period.* Probably all year, recorded September-March and May.

*Conservation status.* Although fairly restricted in range, occurring on a coastal strip c. 110 km long, this taxon does not appear to be at risk at present. It has been recorded from at least eight localities, including nature reserves. In Kings Park, the species is described as "common in bushland" and "often forming a dense ground cover" (Bennett 1988: 70).

*Etymology.* From the Greek *chamelos* - on the ground or creeping, referring to the habit of the subspecies.

*Notes.* *Stenanthemum notiale* subsp. *chamelum* has a subprostrate habit, forming a ground cover, and leaves with usually 1-3 teeth on each side of the apex and the upper surface papillose or minutely sparsely hairy. Subsp. *notiale* differs in its more erect habit and usually has all or some of the leaves entire with the upper surface always hairy. Specimens of subsp. *notiale* occurring near the coast in the Illawong-Jurien area have a short dense stellate indumentum on the upper surface of the leaves and a more erect habit than subsp. *chamelum*, but sometimes have all their leaves toothed. Inland specimens have at least a small proportion of the leaves entire and the upper surface with longer hairs. One coastal specimen in particular (*R.J. Cranfield & P.J. Spencer* 8252) is somewhat intermediate between the two subspecies, as it is the only known specimen of subsp. *notiale* to have leaves with more than one tooth on each side of the apex.

Like the typical subspecies, subsp. *chamelum* has a more densely hairy floral tube and fruit than *S. tridentatum*, in which it was previously included as var. *tomentosum*. Its closer relative,

*S. intricatum*, has a more erect and more intricately branched habit and usually longer hairs on the upper leaf surface.

### ***Stenanthemum notiale* Rye subsp. *notiale***

*Shrub* usually erect or spreading, 0.1-0.5 m high. *Young stems* with simple and stellate hairs both common or with mainly stellate hairs; simple hairs usually antrorse, 0.3-0.8 mm long. *Stipules*: outer surface densely hairy along the midvein at least towards the base, more sparsely hairy or glabrous on the sides. *Petioles* 0.5-2.0 mm long, densely hairy. *Leaf blades* obovate to obovate or broadly so, 2.5-10(13) x 2.5-6(7) mm, the margins flat or recurved, entire or with 1 tooth (very rarely more) on each side of the apex; lower surface densely hairy with simple appressed to antrorse hairs 0.3-0.5 mm long, the marginal hairs and often scattered hairs elsewhere usually ferruginous at first; upper surface with simple appressed to antrorse hairs and/or stellate hairs; simple hairs c. 0.5 mm long. *Bracts*: outer surface densely hairy along the midvein, sometimes sparsely hairy on the sides. *Flower clusters* 4-7.5 mm wide, commonly yellow or yellow-green, sometimes cream or white. *Sepals* with simple hairs 0.1-0.3 mm long. *Seeds* 1.1-1.4 x 0.65-0.8 mm, with dark markings. (Figure 9S; also illustrated in Barker & Dashorst 1988, Figure 1 as *Spyridium tridentatum*)

*Selected specimens examined.* SOUTH AUSTRALIA: WNW of Kimba, 10/10/1981, C.R. Alcock 9086 (AD); Scrubby Peak, Gawler Range, 9/9/1983, R. Bates 3353 (AD); Hundred of Parilla, 22/7/1968, B. Copley 1952 (AD); c. 2 km WNW of Mt Bosanquet, 27/10/1987, P.J. Lang 8675 (AD); c. 12 km WSW of Waddikee, 18/7/1985, P.J. Lang 8834 (AD); 5-7 km NE Corrobinnie Hill, 5/10/1981, M. Lewis 91 (AD).

VICTORIA: Hattah and near Mildura, 8/1951, J.H. Willis (AD).

WESTERN AUSTRALIA: 22 miles [35.4 km] N of Lake Grace, 26/7/1968, *anonymous*; Mt Ney, 30/8/1984, M.A. Burgman 3172 & C. Layman; Jurien Bay turnoff, Brand Highway, 21/12/1978, R.J. Cranfield 1208; West Moresby Range, 22/8/1983, R.J. Cranfield 2804; 8 km SE of Mt Adams, 25/10/1993, R.J. Cranfield & D. Kabay 8951; Wicherina, 9/10/1945, C.A. Gardner 7733; 8 miles [12.9 km] N of Bremer River, 28/11/1960, A.S. George 1743; Dandaragan survey area [near Moore River North], 30/9/1988, E.A. Griffin 5341; Reserve 42477, Illawong, 11/11/1991, E.A. Griffin 6697; Kamballup Golf Course, 25/10/1985, N. Hoyle 1293; 11 km E of York then 5 km along Tammin road, 12/12/1974, K.F. Kenneally 2418; Mt Lesueur Reserve 15018, 1/11/1973, D. Kitchener 89; 21 km SW of 90 Mile Tank, Frank Hann National Park, 13/11/1979, K.R. Newbey 6514; 7 km S of Pell Bridge over Irwin River, 27/9/1971, A.E. Orchard 4209; c. 23 km SSW of Cocklebidy, 1/12/1967, R. Parsons 155 (AD); 15 km E of Kalbarri, Kalbarri National Park, 2/6/1994, S. Patrick 1832; foot of Mt Ragged, Cape Arid National Park, 5/12/1971, R.D. Royce 10129.

*Distribution.* Extends from Kalbarri National Park south to Badgingarra and south east to Stirling Range and near Lake Grace, extending east from there to Cape Arid National Park and Cocklebidy, southern Western Australia. Also occurs in South Australia and Victoria.

*Habitat.* Occurs in sand or less commonly in soils with a mixture of sand and clay, those populations occurring near the west coast (also at Cocklebidy) sometimes in sand over limestone. In South Australia, the species appears to be restricted to deep sand, often on dunes.

*Flowering and fruiting period.* Apparently all year, most collections made in July-December but also some in January-June.

*Conservation status.* A common and widespread subspecies.

*Notes.* Most specimens have all leaves entire or a mixture of entire and 3-toothed leaves, but a few specimens have most or all of the leaves toothed. In the northern specimens flower colour is usually given as yellow or yellow-green, while there are only three specimens mentioning colour in the southern part of the species range, one from north of Bremer Bay with cream flowers, one from near Young River with yellow flowers and one from Mt Ragged with white flowers. None of the South Australian and Victorian specimen labels indicates flower colour, nor is flower colour mentioned in the detailed description of the South Australian material provided by Barker & Dashorst (1988).

A very variable subspecies. In most of its Western Australian range, it is a subprostrate to erect shrub, up to 0.5 m high, usually with a very open branching habit, with petioles 0.7-2.0 mm long and leaf blades (4)5-10(13) x 3-6(7) mm. In South Australia, Victoria and Cocklebidy, Western Australia, it is apparently usually a spreading decumbent shrub, with erect branches commonly 0.1-0.2 m high, more intricately branched than in the typical variant, with petioles 0.5-1.5 mm long and leaf blades 2.5-6 x 2.5-4 mm. Some Western Australian specimens occurring in the Fitzgerald River-Cape Arid area are also like the eastern variant or intermediate between the eastern and western variants of the taxon.

***Stenanthemum petraeum* Rye, sp. nov.**

*Stenanthemo complicato* arcte affine sed stipulis magis glabris, foliis magis argenteo-griseis tuberculatis, sepalis indumento magis appresso differt.

*Typus:* 189 km N of Neale Junction, Western Australia, 18 July 1974, A.S. George 12000 (*holo:* PERTH 01515411; *iso:* CANB, MEL).

*Shrub* erect or spreading, 0.4-1 m high. *Young stems* densely hairy at first, sometimes soon becoming glabrous; hairs appressed or antrorse, sometimes ferruginous. *Stipules* free or very shortly connate at the base; outer surface usually sparsely hairy. *Petioles* 1-2 mm long, densely hairy. *Leaf blades* usually broadly obovate to circular, sometimes elliptic, rarely obovate, 5-18 x 5-12 mm, entire, margins flat or incurved; lower surface silvery pale green, with 4-7 main lateral veins on each side of midvein, very densely covered by long appressed hairs; upper surface papillose and sometimes also with a few long appressed simple hairs. *Involucral bracts* broadly oblong or ovate, 1-2 mm long; with an apical point and often some lateral teeth on each side of the apex, long-ciliate; outer surface densely hairy along the midvein, the hairs c. 0.5 mm long. *Floral bracts* 1 or 2 per flower, narrower and paler than the involucral bracts. *Flower clusters* 5-11 mm wide, cream. *Floral tube* 1.5-2.3 mm long (enlarging to 3-3.8 mm in fruit), densely minutely stellate-hairy and with simple hairs usually 0.8-1 mm long; free portion of tube 1.3-2 mm long. *Sepals* 1-1.8 mm long, densely hairy; hairs appressed or antrorse, 0.2-0.3 mm long. *Disc* shallowly scooped between the stamens. *Ovary summit* with stellate hairs 0.2-0.3 mm long. *Style* 1.5-3 mm long. *Schizocarp* c. 2.6 x 2.4 mm, with minute stellate hairs and simple hairs 0.7-1 mm long. *Seeds* c. 1.8 x 1.4 mm, orange-brown, with dark brown spots but these not prominent. (Figure 11D-H)

*Selected specimens examined.* NORTHERN TERRITORY: Shaw River, East Petermann Range, 4/1967, W.H. Butler 5; Glen Edith, 24/6/1959, G. Chippendale 6247; 23 miles [37 km] NE of Docker River Settlement, 29/10/1970, C. Dunlop 1989.

WESTERN AUSTRALIA: Summit of Mt Augustus, 1/8/1984, R. Bates 3936; 3.2 km NNE of Miralga Bore, Yoothapina Station, 14/8/1986, R.J. Cranfield 5678; 53 miles [85.3 km] SW of Warburton

Mission, 30/8/1961, A.S. George 2966; Miss Gibson Hill, 26/8/1962, A.S. George 4074; Near Ediths Marble Bath, Rawlinson Range, 3/10/1966, A.S. George 8271; c. 6.5 km N of Giles, Rawlinson Range, 7/7/1958, R. Hill & T.R.N. Lothian 842; Sir Frederick Range, 8/4/1972, P.K. Latz 2337; Mt Augustus, 26/8/1987, K.R. Newbey 11709; Rawlinson South, 30/7/1972, A. Robinson; Mt Ella, Hamersley Range, 19/5/1995, M.E. Trudgen 12738.

*Distribution.* Occurs in central Western Australia, extending from Mt Augustus and Yoothapinna Station (near Meekatharra) eastwards via the Warburton area into Northern Territory.

*Habitat.* Occurs in rocky or gravelly sites on hills or rock outcrops.

*Flowering and fruiting period.* April-October.

*Conservation status.* Not considered to be at risk at present.

*Etymology.* From the Greek *petraeus* - among rocks, referring to the occurrence of the species in rocky habitats.

*Notes.* Closely related to *Stenanthemum complicatum*, which differs in its more hairy stipules, greener leaves with minute patent hairs on the upper surface and spreading hairs on the sepals. The two taxa also differ in habitat.

### ***Stenanthemum poicilum* Rye sp. nov.**

*Stenanthemo pomaderroides* simile sed stipulis basi connatis, foliis brevioribus venis minus numerosis differt.

*Typus:* 12 km E of Jasper Hill, Western Australia, 22 November 1992, R.J. Cranfield 8605 (*holo:* PERTH 03048551; *iso:* CANB).

*Shrub* erect to decumbent, 0.15-0.5 m high. *Young stems* with a dense indumentum of simple and stellate hairs; simple hairs appressed to antrorse, mostly less than 0.5 mm long, a few 0.5-0.8 mm long, sometimes ferruginous. *Stipules* connate at the base for about a quarter of their length, long-acuminate; outer surface hairy. *Petioles* 0.5-1 mm long, densely hairy. *Leaf blades* broadly obovate, 2.5-7 x 2.5-6 mm, entire, the margins more or less flat; lower surface with 2-4 main lateral veins on each side of midvein, minutely stellate-hairy and with antrorse simple hairs c. 0.5 mm long; upper surface minutely stellate-hairy. *Involucral bracts* ovate or broadly ovate, 2.5-3.5 mm long, acuminate, ciliate, the cilia commonly 0.3-0.5 mm long; outer surface hairy. *Floral bracts* ovate, c. 3 mm long, acuminate, hairy. *Flower clusters* 5-12 mm wide, white. *Floral tube* 2.5-3.7 mm long (enlarging to 4-5.5 mm in fruit), with a dense indumentum of small stellate hairs and antrorse to appressed simple hairs 0.4-0.6 mm long; free portion of tube 2-3 mm long. *Sepals* 1.3-1.6 mm long, with a dense indumentum of small stellate hairs and appressed simple hairs 0.3-0.5 mm long. *Disc* apparently absent. *Ovary summit* glabrous. *Style* 2.5-3.5 mm long. *Schizocarp* 2-2.5 x c. 1.5 mm, with antrorse to appressed simple hairs, the longest hairs 0.5-0.6 mm long. *Seeds* 1.3 x 0.8 mm, pale yellow-brown, with prominent dark (almost black) markings. (Figure 12A-F)

*Other specimens examined.* WESTERN AUSTRALIA: Canna, 29/10/1974, J.S. Beard 7204; between Mullewa and Morawa, 24/9/1932, W.E. Blackall 2804; Maggie Hays Hill, Bremer Range,



8/5/1978, G.J. Keighery 1687; Wilroy Reserve, 5/6/1977, B.G. Muir 358.

*Distribution.* Occurs in the Wilroy-Canna and Warriedar Station areas, with an isolated record from Bremer Range, southern Western Australia.

*Habitat.* Recorded in clay or sandy clay, sometimes or often over ironstone.

*Flowering and fruiting period.* May-June, September-November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 2. Included on the 1991 Priority Flora List under the phrase name *Cryptandra* sp. *Canna* (J.S. Beard 7204). Since then, an additional population of the species has been located. The species has been collected from three or four northern localities, extending c. 145 km, and from an isolated south-eastern locality c. 440 km from the remainder of its range. One of these localities is a nature reserve. *C. poecilum* is probably poorly collected rather than rare but this needs confirmation before the species can be removed from the priority list.

*Etymology.* From the Greek *poikilos* - mottled, referring to the conspicuously mottled seeds.

*Notes.* Closely related to *Stenanthemum pomaderroides*, which has free stipules and larger leaves with 5-8 prominent lateral veins on each side of the midvein. *S. pomaderroides* also has a more open branching pattern and different indumentum on the flowers, with the stellate hairs whiter and more predominant.

***Stenanthemum pumilum*** (F.Muell.) Diels in Diels & E. Pritzel, Bot. Jahrb. Syst. 35: 356 (1904). - *Spyridium pumilum* F.Muell., Fragm. Phyt. Austral. 9: 137 (1875). - *Cryptandra pumila* (F. Muell.) F. Muell., Syst. Census Aust. Pl. 61 (1882-1883). *Type:* Stirling Range, [Western Australia], F. Mueller (n.v.).

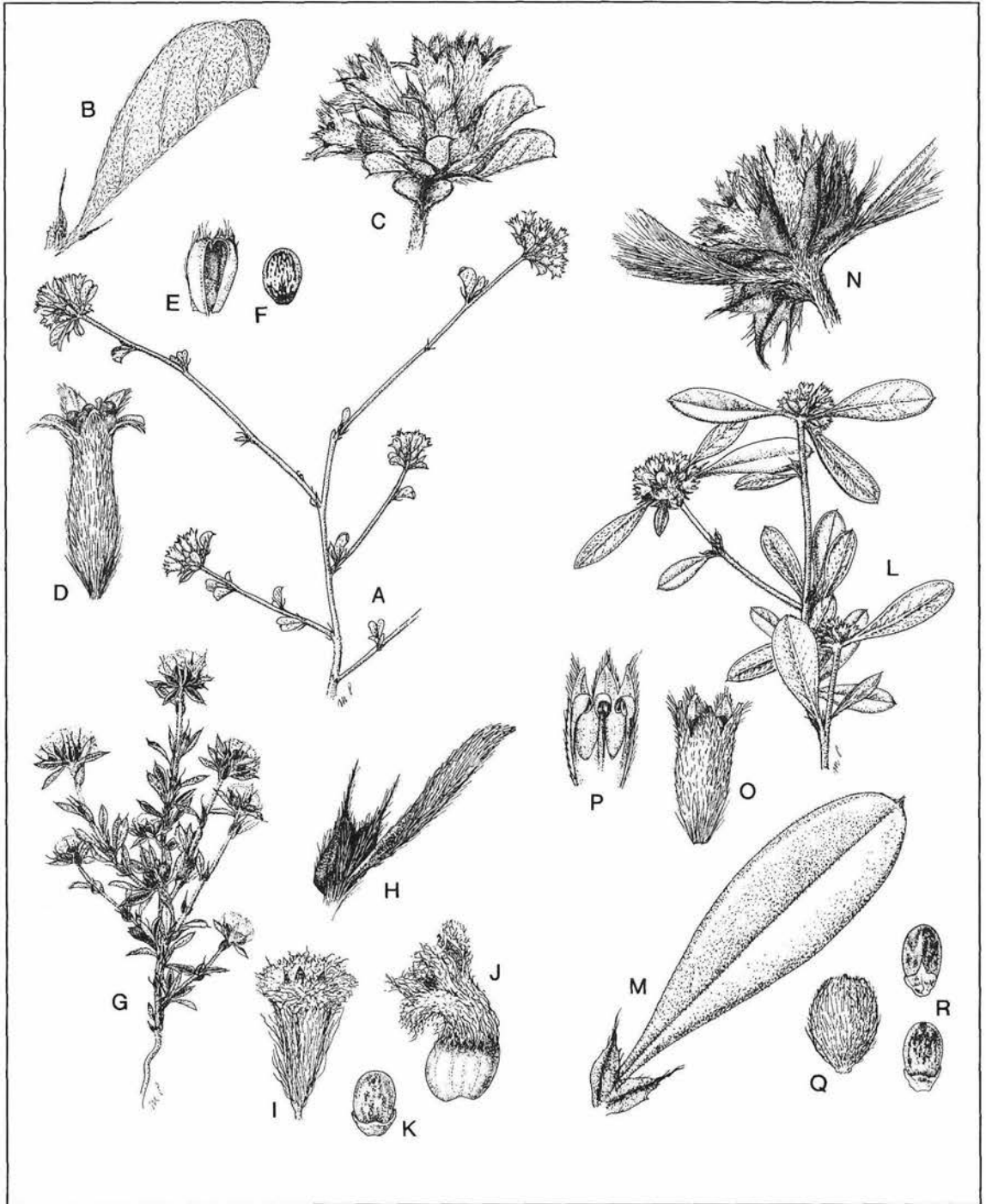
*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 3. First included on the 1994 Priority Flora List. It is known from an area c. 25 km long in Stirling Range National Park, with a very isolated record in Darling Range c. 280 km north-west of the Stirling Range localities. (Figure 12G-K)

***Stenanthemum reissekii*** Rye sp. nov.

*Stenanthemum pomaderroides* simile sed stipulis connatis, foliis margine recurvis, disco florum manifesto.

*Typus:* N of Badgingarra, Western Australia, 29 October 1966, A.S. George 8631 (*holo:* PERTH 01517406; *iso:* CANB, MEL).

*Shrub* erect to decumbent, 0.1-0.5 m high. *Young stems* usually densely hairy at first, soon becoming glabrous with a flaky surface; hairs simple and stellate, appressed or antrorse, sometimes ferruginous. *Stipules* connate for about half or more of their length, acuminate; outer surface hairy on the almost black midvein. *Petioles* 0.5-1.5 mm long, hairy on undersurface at first, becoming glabrous. *Leaf blades* narrowly obovate, 12-24 x 4-7 mm, entire, the margins recurved; lower surface with a dense indumentum of long antrorse ferruginous hairs, with 3-6 lateral veins on each side of



**Figure 12.** A-F - *Stenanthemum poecilum*. A - flowering branch (x1), B - stipules and leaf (x7), C - flower cluster (x4), D - flower (x7), E - fruitlet (x7), F - seed (x7); G-K - *S. pumilum*. G - whole plant (x1), H - stipules and leaf (x7), I - flower (x6), J - schizocarp (x6), K - outer surface of seed and aril (x7); L-R - *S. reissekii*. L - flowering and fruiting branch (x1), M - stipules and upper surface of leaf (x4), N - flower cluster (x4), O - flower (x6), P - inside of flower showing disc (x7), Q - schizocarp (x7), R - outer and inner surfaces of seed and aril (x7). Drawn from R.J. Cranfield 8605 (A-D), W.E. Blackall 2804 (E,F), A.S. George 10918 (G,H), R.J. Cranfield 1971 (I-K) and A.S. George 8631 (L-R).

midrib; upper surface papillose or glabrous; papillae (or very short hairs) simple, patent. *Involucral bracts* ovate or broadly ovate, 3-4 mm long, usually acuminate; outer surface hairy on the margins and midvein, glabrous in between, prominently ciliate. *Floral bracts* ovate, c. 2.5 mm long, hairy on midvein and margins. *Flower clusters* 6-13 mm wide, white or cream. *Floral tube* 2.5-3 mm long (enlarging to c. 3.6 mm in fruit), densely minutely stellate-hairy and with antrorse simple hairs commonly 0.4-0.6 mm long; free portion of tube 1.7-2 mm long. *Sepals* 1.3-1.5 mm long, densely hairy; hairs appressed, c. 0.6 mm long. *Disc* very deeply v-shaped between the stamen traces. *Ovary summit* glabrous. *Style* c. 2 mm long. *Schizocarp* c. 2.4 x 1.6 mm, with a mixture of small stellate hairs and antrorse simple hairs c. 0.6 mm long. *Seeds* c. 1.4 x 0.7 mm, yellow-brown with red-brown markings. (Figure 12L-R)

*Selected specimens examined.* WESTERN AUSTRALIA: Mt Peron, 11/10/1957, C.A. Gardner 10568; summit of Mt Lesueur, 13/10/1974, A.S. George 12895; Brand Hwy, just S of Tootbardi Rd, 1/12/1992, E.A. Griffin 8004B; Mt Benia 26/8/1989, G.J. Keighery 11080; c. 1 km NW of Marchagee-Coomaloo Rd at 1.2 km E of Brand Highway, 18/11/1992, S. Patrick 1411; Cadda Rd, NW of Badgingarra, 20/10/1992, S. Patrick 1314.

*Distribution.* Extends from Mt Peron south to near Badgingarra, southern Western Australia.

*Habitat.* Occurs on the summits and upper slopes of lateritic hills.

*Flowering period.* August-October. Fruits recorded September-November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 3. Included on the 1991 Priority Flora List under the phrase name *Cryptandra* sp. *Mt Benia* (G.J. Keighery 11080). Known from at least five localities, including a national park, and has a geographical range of c. 40 km.

*Etymology.* Named after Siegfried Reissek, the botanist who named the genus *Stenanthemum* and a number of other Western Australian taxa of Rhamnaceae.

*Notes.* This species does not appear to have any very close relatives but could be confused with *Stenanthemum pomaderroides*, which has leaves and inflorescences of a similar size and shape. *S. pomaderroides* differs in having free stipules, leaves with flat margins and a definite apical point, and flowers apparently lacking a disc.

***Stenanthemum stipulosum*** Rye, sp. nov.

*Stenanthemo complicato* affine sed stipulis magis glabris, foliis pusillioribus, fructo magis glabro differt.

*Typus:* 1 mile [1.6 km] east of Boorabbin, Western Australia, 21 October 1945, C.A. Gardner 8039 (*holo:* PERTH 01542931; *iso:* CANB, MEL).

*Shrub* erect to decumbent, (0.05)0.1-1 m high (possibly sometimes taller). *Young stems* with a dense tangled indumentum of simple and stellate hairs; simple hairs 0.3-0.5 mm long, sometimes ferruginous. *Stipules* free or very shortly connate at the base; outer surface hairy. *Petioles* 0.5-2 mm

long, densely hairy. *Leaf blades* obovate to obcordate or broadly so, usually obovate, 3-8.5 x 2.5-4.5(5.5) mm, entire, the margins flat or incurved; lower surface pale green or ferruginous, with 3 or 4 main lateral veins on each side of midvein, densely hairy; upper surface densely minutely stellate-hairy. *Involucral bracts* variable, often broadly linear or broadly 2-lobed, 1.7-3 mm long, often toothed across the broad apex, hairy inside along midvein, long-ciliate; outer surface densely hairy, the hairs c. 0.5 mm long. *Floral bracts* c. 2 per flower, 1.3-2 mm long, with hairs 0.5-1.3 mm long, ovate or broadly ovate, sometimes toothed across the apex. *Flower clusters* 4-8 mm wide, white or cream, each flower subsessile or on a hairy pedicel 0.3-1 mm long. *Floral tube* 0.8-1.2 mm long (enlarging to 2.5-3.5 mm in fruit), very densely hairy, hairs 0.7-1.3 mm long; free portion of tube 0.4-0.8 mm long. *Sepals* 0.5-0.7 mm long, very densely hairy; hairs antrorse, or spreading; 0.3-0.5 mm long. *Disc* apparently absent or shallowly scooped between the stamens. *Ovary summit* glabrous. *Style* 0.7-1.3 mm long. *Schizocarp* 1.8-2.3 x 1.5-1.8 mm, sparsely hairy or glabrous; hairs simple, deciduous, usually 0.7-1 mm long. *Seeds* c. 1.4 x 1 mm, orange-brown, with pale yellow-brown patches and black spots. (Figure 11I-L)

*Selected specimens examined.* WESTERN AUSTRALIA: Bruce Rock district, *E. Bailey* V13; Near Naremben, 9/1929, *W.E. Blackall*; c. 65 km WNW of Norseman, 19/9/1979, *M.D. Crisp* 5938, *J. Taylor & R. Jackson*; 26 km due SW of Bodallin, 17/9/1982, *R.J. Cranfield* 2457; 6 km NE of South Kulin, 2 km SW of Kulin, 25/10/1983, *R.J. Cranfield* 4756; 19.5 km SE of Mt Jackson, Bungalbin Hill track, 2/10/1991, *R.J. Cranfield* 8134; base of North Ironcap, 5/5/1978, *G.J. Keighery* 1647; SW of Adelong Station, 24/10/1989, *G.J. Keighery* 11392; c. 34 km N of Widgiemooltha on Eyre Highway, 30/9/1968, *A.E. Orchard* 1259; 23 miles [37 km] S of Coolgardie, 17/2/1961, *R.D. Royce* 6443.

*Distribution.* Extends from Adelong Station south west to Kulin and south to west of Norseman, southern Western Australia.

*Habitat.* Occurs in deep sandy soils or in shallow soil over ironstone.

*Flowering and fruiting period.* All year, possibly with a peak in September-November.

*Conservation status.* This widespread taxon is not considered to be at risk, but a new variant of it (or new closely related species) currently under the phrase name *Stenanthemum* sp. *Mt Clifford* (*R. Cumming* 1267) was included in 1994 on the Priority Flora List and given a Priority 1 coding. The new taxon is known only from one collection from a rocky hillside near Mt Clifford, north of Leonora.

*Etymology.* From the Latin *stipula* - diminutive of *stipes* (botanical term *stipule*) and *-osus* - plentiful, referring to the closely clustered stipules on the young stems, the stipules usually persisting in a tight arrangement after the leaves are shed.

*Notes.* Related to *Stenanthemum complicatum*, which differs in its more hairy stipules, larger leaves and more hairy schizocarp.

*Stenanthemum* sp. *Mt Clifford* appears to be either a new species or a new subspecies of *S. stipulosum*. It differs from typical *Stenanthemum stipulosum* in its larger flowers and fruits, the floral tube initially 2.5-3 mm long and enlarging to 5.5-6 mm long in fruit, the free tube 2-2.5 mm long and the schizocarps c. 3.5 mm long. More material is needed to assess its taxonomic status and determine how rare it is. It occurs north of the known range of *S. stipulosum* and is illustrated in Figure 11M-P.

***Stenanthemum tridentatum*** (Steud.) Reissek, *Linnaea* 29: 295 (1958) - *Cryptandra tridentata* Steud. in Lehm., *Pl. Preiss.* 1: 186 (1845) - *Spyridium tridentatum* (Steud.) Benth., *Fl. Austral.* 1: 427 (1863); *C. tridentata* var. *pubescens* Reissek *nom. illeg.* in Lehm, *Pl. Preiss.* 2: 288 (1848). *Type:* *L. Preiss* 2421 (LD).

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority 3. Known from five scattered localities from Gunyidi to West River, a distance of c. 500 km, including one nature reserve. (Figure 10F-J)

*Notes.* Many other species were previously misidentified as, or believed to belong within, this species, which has generally been treated since Bentham's (1863) treatment as *Spyridium tridentatum*. The two closest species are *S. divaricatum* and *S. emarginatum*, which differ from the other related taxa (e.g. *S. intricatum* and *S. notiale*) in having the lower part of the floral tube only sparsely hairy, although this is often difficult to detect until it matures to a fruit. They also tend to have young stems more papillose (i.e. with fewer stellate hairs or long antrorse simple hairs), shorter ovary hairs and paler markings on the seeds.

### Discussion

There are presently 21% of the typical Western Australian *Cryptandra* species and 55% of the typical *Stenanthemum* species on the Priority Flora List, but none has been included on the Gazetted Rare Flora List. There are also three infraspecific taxa listed for the genus *Cryptandra*. Many of the listed taxa are small and relatively inconspicuous plants, particularly those in the taxa previously lumped under the name '*Spyridium*' *tridentatum*, so are likely to be poorly collected rather than genuinely rare. Most of the priority taxa have been partially surveyed or are presently the subject of field surveys in the Albany, Esperance, Manjimup, Moora and other Wildlife Districts as well as the Midwest Region. With further study, some of these taxa will probably be removed from the priority list.

Further collections are needed of a few unnamed taxa, such as *Stenanthemum* sp. *Mt Clifford*, so that their taxonomic status can be better assessed. Fruiting material with mature seeds is also needed for a number of taxa to complete the descriptions given here.

### Acknowledgements

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***Cryptandra monticola* (Rhamnaceae), a new species from the  
Pilbara region of Western Australia**

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**Abstract**

Rye, B.L. and Trudgen, M.E. *Cryptandra monticola* (Rhamnaceae), a new species from the Pilbara region of Western Australia. Nuytsia 10 (2): 307-310 (1995). A new species, *Cryptandra monticola* Rye & Trudgen, is described and illustrated. It is the only *Cryptandra* species known from the Pilbara region of Western Australia.

**Introduction**

The new species described here is the only member of the genus *Cryptandra* known from the Pilbara region of Western Australia. Most *Cryptandra* species occur in the south-western part of the State, although there is one species, *C. intratropica* W.Fitzg., recorded in the Kimberley region (Wheeler 1992). However, the Kimberley species has an atypical inflorescence and will probably be transferred to a new genus (K. Thiele pers. comm.).

The Pilbara species was apparently first collected in 1974 from Mt Bruce in the Karijini National Park. In 1991, it was given the phrase name *Cryptandra* sp. *Mt Meharry* (S. van Leeuwen 682) and placed on the Priority Flora List with a conservation code of Priority 3\*. Since then, the species has been found from more populations over a wider geographical range and is no longer considered to be at risk. It has therefore been removed from the Priority Flora List.

**Taxonomy**

***Cryptandra monticola* Rye & Trudgen, sp. nov.**

Folia omnino dense pubescentia; bracteis per florum circum 6, manifeste ciliatis; floribus dense pubescentibus, in fasciculo capituloideo aggregatis; parte libera tubi floralis ultra 1 mm longa; seminis atro rubro-brunneis.

\* Definitions of the conservation codes currently being used by the Western Australian Department of Conservation and Land Management are given at the end of each "Nuytsia" issue.

*Typus*: 8.1 km NE of Mt Windell, 17 km ESE of Karijini National Park Headquarters, Western Australia, 4 August 1991, *S. van Leeuwen* 927 (*holo*: PERTH 02842866; *iso*: CANB, MEL).

*Shrub* erect or spreading, 0.5-1.5 m high; indumentum of fine clear-translucent hairs. *Branchlets* not spinescent. *Young stems* densely stellate-hairy at first and usually also with longer simple hairs, becoming glabrous. *Stipules* persistent, each pair shortly united at the base on abaxial side of petiole, 1.3-2.5 mm long, acuminate to long-attenuate, hairy outside at least along midvein, long-ciliate. *Petioles* 0.4-1.3 mm long, densely hairy. *Leaf blades* usually linear or narrowly oblong, sometimes narrowly obovate to elliptic, 3-6.5 x 1-2.5(3.5) mm, the margins recurved, with a short erect mucro often obscured by hairs, which form a point-like terminal tuft, pale green or greyish green; lower surface densely hairy but often only the midvein visible between the recurved margins, the midvein with many long simple hairs; upper surface densely stellate-hairy, with simple antrorse hairs 0.4-0.7 mm long at first, often losing most of the long hairs with age. *Floral bracts* c. 6 per flower, ovate or broadly ovate, 1-3.5 mm long, acute or shortly acuminate, often hairy inside on distal half along the midvein, prominently ciliate, the cilia 0.3-0.8 mm long; outer surface densely hairy along the midvein, becoming less densely hairy towards margins. *Flowers* usually 4-12 per branchlet, in a close head-like cluster 6-13 mm wide, white. *Floral tube* 1.7-2.4 mm long (enlarging to 3-3.5 mm in fruit), the basal 0.6-1.0 mm adnate to the ovary and distal 1.1-1.4 mm free, minutely stellate-hairy throughout but more densely so on adnate portion of tube, sometimes also with a few long simple hairs. *Sepals* 1.3-1.7 mm long, minutely stellate-hairy throughout and with simple antrorse hairs 0.3-0.5 mm long towards apex. *Petals* c. 0.7 mm long, the claw c. 0.2 mm long. *Disc* united to the base of ovary, densely stellate-hairy, undulate at first, becoming a smooth circular shape in fruit. *Ovary* 3-celled, densely stellate-hairy; hairs c. 0.3 mm long. *Style* 1.3-1.6 mm long, usually with a few stellate hairs at base, glabrous above, with 3 small stigmatic lobes at the apex. *Schizocarp* about half inferior, 2.5-3.5 x 1.8-2.2 mm, concealed within the floral tube, stellate-hairy on the superior portion, separating into 3 crustaceous fruitlets which dehisce along the distal half of the outer surface and the full length of the inner surface. *Seeds* 1.6-2.3 x c. 1.0 mm, dark red-brown with a blackened base; aril 3-lobed, translucent. (Figure 1A-E)

Selected specimens examined. WESTERN AUSTRALIA: East Prong, Mt Tom Price, 10/7/1980, *K. Atkins* 694 (KARR); top of Mt Nameless, 31/7/1980, *K.A. Atkins & P. Wurm* 708 (KARR); Mt Bruce, 6/7/1978, *C. Dawe* 42 (PERTH); c. 3.6 km N of Mt Hilditch, 7/5/1995, *M.E. Trudgen* 12522 (PERTH); south slopes of Mt Ella, 19/5/1995, *M.E. Trudgen* 12733 (PERTH); Mt Meharry, 19/4/1990, *S. van Leeuwen* 682 (PERTH); Mt Robinson, 1.3 km W of the summit, 20/9/1990, *S. van Leeuwen* 735 (PERTH); 2.5 km E of Shovelanna Hill, eastern end of Ophthalmia Range, 29/5/1992, *S. van Leeuwen* 1264 (PERTH); Mt Shiela, 27/9/1994, *S. van Leeuwen* 1847 (KARR); Mt Meharry, 10/6/1984, *S. van Leeuwen* 24 & *J. Turner* (PERTH); Mt Bruce, 17/8/1974, *J.H. Willis* (PERTH).

*Distribution*. Occurs in the Eremaean Botanical Province of Western Australia, extending from Mt Shiela and Mt Nameless in the Hamersley Range east to about 50 km east of Newman. (Figure 1F)

*Habitat*. Occurs at altitudes of 800 m or more, most commonly in sheltered sites on south-facing slopes. Sometimes occupies more exposed sites, but in those situations the populations are small.

*Flowering period*. April-August. Fruits July-September.



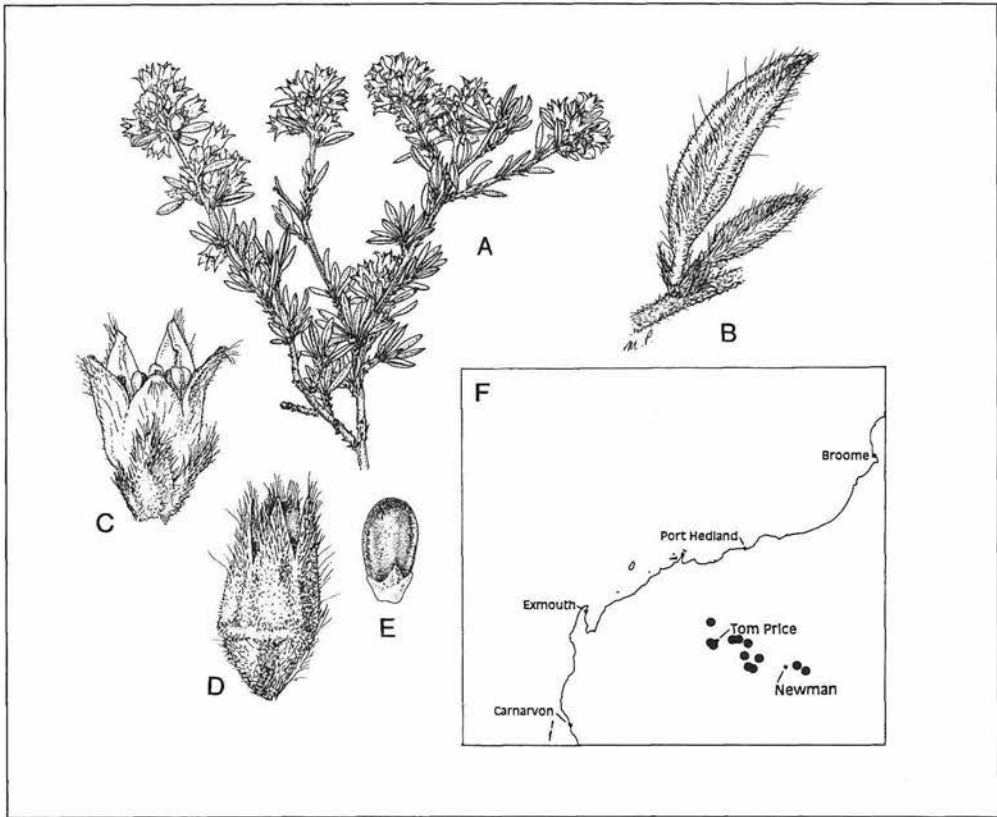


Figure 1. *Cryptandra monticola*. A - flowering branch (x1), B - stipules and leaf undersurface (x6), C - flower and bracts (x7), D - schizocarp (x6), E - inner surface of seed and aril (x8), F - distribution map. Drawn from S. van Leeuwen 24 & J. Turner (A-C) and J.H. Willis 17/8/1974 (D,E).

**Conservation status.** This species is now known from about fifteen locations with a range of over 350 km. Owing to the relatively inaccessible sites it occupies, most of its populations have probably never been visited by botanical collectors. The species appears to be fairly well protected in this habitat, and it occurs in at least one large national park.

**Etymology.** From the Latin *mons*, mountain and *-cola*, inhabitant, the species being restricted to high locations, including the two highest mountains in Western Australia.

**Affinities.** Although it is quite typical of the genus *Cryptandra*, the new species does not appear to have any very close relatives. It can be distinguished readily from the atypical long-pedicellate Kimberley species, *C. intratropica*, by its densely clustered, sessile or subsessile flowers, but it has a similar inflorescence to some of the south-western species.

The five south-western species showing the greatest similarity to *C. monticola* in terms of flower size and density are *C. congesta* Rye, *C. graniticola* Rye, *C. intonsa* Rye, *C. polyclada* Diels and *C. wilsonii* Rye. These are described in the accompanying paper (Rye 1995). All five species have glabrous or subglabrous leaves, in contrast to the conspicuously hairy leaves of *C. monticola*, and each of them shows a number of other obvious differences from *C. monticola*.

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## CONSERVATION CODES FOR WESTERN AUSTRALIAN FLORA

### **R: Declared Rare Flora - Extant Taxa (= Threatened Flora = Endangered + Vulnerable)**

Taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

### **X: Declared Rare Flora - Presumed Extinct Taxa**

Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

#### **1: Priority One - Poorly Known Taxa**

Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

#### **2: Priority Two - Poorly Known Taxa**

Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

#### **3: Priority Three - Poorly Known Taxa**

Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

#### **4: Priority Four - Rare Taxa**

Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

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## Notes for Authors

The aim of *Nuytsia* is to publish original papers on systematic botany with preference given to papers relating to the flora of Western Australia. Descriptions and keys using manuscript or phrase names will not generally be accepted. All papers are refereed and the Editorial Advisory Committee reserves the right to reject papers. Opinions expressed by authors are their own and do not necessarily represent the policies or views of the Department of Conservation and Land Management.

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Great care with layout, spacing and typography must be exercised in the preparation of electronic manuscripts. In particular, note the following. Text is not to be right-justified. Where manuscripts are compiled with software other than MS-WORD all headings and paragraphs are to be left-justified. Within a paragraph two spaces are required between sentences; after colons, semicolons, commas and dashes a single space is required. Where MS-WORD is used, text should be italicised or boldened where appropriate.

Original figures should not be lettered but accompanied by copies indicating lettering. Page proofs will be forwarded to authors for checking. Twenty reprints of each paper will be provided free of charge; no additional copies may be ordered. Style and layout should follow recent numbers of *Nuytsia*, noting particularly the following.

*Title.* Should include the family name of genera or species treated, but not authorities. New taxa should be named if not numerous. The geographic area of study should be given where appropriate.

*Abstract.* The paragraph (or paragraphs) should be indented and commence with bibliographic information. New taxa, combinations and names should be listed. The major contents of the paper should be summarised but no additional material given.

*Headings.* All headings should be in capitals and lower case, major headings being centred and minor ones left-justified.

*Keys.* May be either indented (e.g. *Nuytsia* 5: 277) or bracketed (e.g. *Nuytsia* 5: 84). Indented keys involving more than nine levels of indentation should be avoided.

*Species treatments.* Use of certain named paragraphs, or sets of paragraphs, for matter following the descriptions is encouraged. The desired sequence and examples of commonly used headings are shown below. Recommended headings which are italicised below, should be left-justified, followed by text on the same line.

- (1) Taxon name, synonymy (if any), significant manuscript or phrase names currently in use and type details (for previously published taxa).
- (2) Latin (for new taxa - indented).
- (3) *Typus*: (for new taxa - not indented).
- (4) English description (indented).
- (5) *Other specimens examined* or *Selected specimens examined* as appropriate.
- (6) *Distribution*.
- (7) *Habitat*.
- (8) *Flowering period*.
- (9) *Fruiting period*.
- (10) *Typification* (discussion).
- (11) *Affinities* or *Relationships*.
- (12) *Discussion* or *Comments* or *Notes*.
- (13) *Conservation status*. (Department of Conservation and Land Management conservation codes for rare and threatened (Declared Rare Flora) WA taxa are given in each issue).
- (14) *Etymology*.

*Threatened species.* It is the policy of CALM not to publish precise locality data for threatened species. Authors are therefore requested not to cite precise locality data when describing threatened species. Generalised localities should be given accompanied by the statement - [precise locality withheld].

*Synonymy.* The desired format is that used by P.G. Wilson, *Nuytsia* 4: 135-262.

*Standard abbreviations.* It is suggested that where possible the following standards be followed.

- (1) Author abbreviations - Brummitt, R.K. & Powell, C.E. (1992). *Authors of Plant Names*. (Royal Botanic Gardens: Kew.)
- (2) Book titles in literature citations - Stafleu, F.A. & Cowan, R.S. (1976-83). *Taxonomic Literature*. Edn 2. (I.A.P.T.: Utrecht) (but with capital initial letters.) - Green, J.W. (1985). *Census of the Vascular Plants of Western Australia*. Edn 2. Pp. 20-24. (Department of Agriculture: Perth.)
- (3) Journal titles in literature citations and reference lists - Lawrence, G.H.M. *et al.* (1968). B-P-H (*Botanico-Periodicum-Huntianum*). - Green *loc. cit.*

*Figures.* Numbers should follow a single sequence including maps.

*Structure of papers.* Authors are encouraged to use the conventional structure of scientific papers when a complete study is being reported (e.g. a revision). A *Methods* section should include the method of drawing up the descriptions from specimens, extent of search for types, and discussion of concepts for choice of taxonomic categories. A *Discussion* section should be considered, which would include some or all of the following: a summary of the findings, emphasising the most significant; interpretation of the results in the light of other relevant work; statement of new problems which have arisen; advising of aspects which are to be followed up; suggestion of topics which others might usefully pursue; prediction and speculation.