

Studies in the genus *Acacia* (Mimosaceae)—8

A revision of the *Uninerves-Triangulares*, in part (the tetramerous species)

By B. R. Maslin

Abstract

A taxonomic revision of part of *Acacia* Series *Uninerves* is presented. Included are those species with 4-merous flowers and triangular-shaped phyllodes. The seventeen species comprising this group are endemic to south-west Western Australia. Eight new species and one new variety are described: *A. delphina* sp. nov., *A. littorea* sp. nov. (syn. *A. decipiens* auct.), *A. phaeocalyx* sp. nov., *A. phlebopetala* sp. nov., *A. phlebopetala* var. *pubescens* var. nov., *A. pycnocephala* sp. nov., *A. robinae* sp. nov., *A. semitrullata* sp. nov. and *A. uliginosa* sp. nov. A new name, *A. chrysocephala*, is given to the taxon *A. biflora* var. *aurea* E. Pritzel. Three names previously in common use have been relegated to synonymy: *A. cuneata* Benth. and *A. decipiens* (C. Koen.) R.Br. are now *A. truncata* (Burm.f.) Hort. ex Hoffmannsegg while *A. vernicosa* W. V. Fitzg. is *A. incrassata* Hook.

Keys to species and varieties are provided, all taxa are illustrated and their distribution mapped.

Introduction

The present revision is based on Bentham's 1864 and 1875 treatments of the "*Uninerves-Triangulares*" (see below) but treats only those species with 4-merous flowers. Thus only Western Australian taxa are considered. The species included by Bentham but excluded here are *A. acanthoclada* F. Muell., *A. bidentata* Benth., *A. dilatata* Benth. and *A. gunnii* Benth. (syn. *A. vomeriformis* A. Cunn. ex Benth.). Three species and two varieties described since 1875 are included here, viz. *A. inops* Maiden et Blakely, *A. mooreana* W. V. Fitzg., *A. vernicosa* W. V. Fitzg. (= *A. incrassata* Hook.), *A. biflora* var. *aurea* E. Pritzel (= *A. chrysocephala* nom. et stat. nov.) and *A. horridula* var. *hastulatooides* E. Pritzel (= *A. uliginosa* sp. nov.). In addition, eight new species and one new variety are described.

The terminology used to describe plant communities is that presented by Aplin (1976). This is a slightly modified version of the system proposed by Specht (1970).

All illustrations appearing in this work have been drawn from pressed herbarium specimens.

Only a selection of specimens is cited under each taxon. A list of the numbered specimens seen is given at the end of this paper. Some of the unnumbered specimens seen are cited in the text.

Historical perspective

Bentham (1842) described the *Triangulares* as one of the eleven major subdivisions of his Series *Phyllodineae* and included species with both uninerved and plurinerved phyllodes. Meisner (1844 and 1848), Bentham (1855) and Mueller (1859) later described new taxa which were referred to the *Triangulares*. In 1864 Bentham reconsidered his earlier classification of *Acacia*. In this work he raised the Series *Phyllodineae* to the rank of Division and at the same time divided the species previously included in the *Triangulares* among the

Series *Uninerves* and *Plurinerves*. Bentham (1864, p. 349) stated: "As in the case of the *Armatae*, I had previously established the *Triangulares* as a distinct series (actually a sub-division of a series—B.R.M.), but it now appears more natural to separate the many-nerved from the one-nerved species, and consider them as a subseries only of the *Plurinerves* and *Uninerves*." In his final treatment of *Acacia*, Bentham (1875) reverted to his 1842 classification, but with some modifications. As in 1842 the *Phyllodineae* were regarded only as a Series, but the 1864 treatment of splitting the uninerved from the plurinerved *Triangulares* was maintained. The species considered by me here are among those placed by Bentham (1875) in the *Triangulares*, this being one of six subdivisions of the Subseries *Uninerves* within the Series *Phyllodineae*. Throughout the present work I refer to this group simply as the "*Uninerves-Triangulares*". It is inappropriate at the present time to give a formal name to this group as this would entail the selection of a lectotype and the designation of rank. Such procedures are best done in the context of an overall revision of *Acacia*.

Morphology

1. *Habit*: Most of the species are small, rigid, erect, perennial shrubs 0.3–0.6 m or sometimes 1 m in height. However, there are some exceptions. *Acacia inops* has weak, filiform branches which scramble over and entangle themselves in the associated vegetation. Three allied species, *A. hastulata*, *A. pycnocephala* and *A. uliginosa* are shrubs with erect branches which, although being more robust than those of *A. inops*, sometimes grow entangled in the associated vegetation. *Acacia littorea* and *A. truncata* are the tallest members of the group, reaching 2–3 m in height.

2. *Indumentum*: Most of the species have hairy branches and glabrous phyllodes. Neither the presence or absence of hairs nor the type of covering can be employed very successfully to differentiate taxa. The indumentum terminology used here has been discussed previously (Maslin 1975, p. 389). Only *A. littorea* has consistently glabrous branches, although they are normally also found in *A. phaeocalyx*. The branches in the other taxa are either always hairy or vary from glabrous to hairy. *Acacia phlebopetala* var. *pubescens* is the only taxon with consistently hairy phyllodes. Although hairy phyllodes are normal for *A. biflora*, some glabrous individuals do occur. The rest of the species usually have glabrous phyllodes.

3. *Stipules*: Except for *A. littorea* and sometimes *A. delphina*, a pair of stipules is present at the base of most phyllodes on the young branches. These stipules have scarios laminae and thickened bases except for *A. phaeocalyx* and often *A. divergens* where they are pungent. In *A. phlebopetala* and *A. robiniae* the persistent bases can be more or less pungent.

4. *Phyllodes*: (Many of the terms given below are illustrated in Figure 1.) Phyllode shape is one of the principal characters used to divide the *Uninerves-Triangulares* into subgroups. The basic shape is triangular but due to differences in the relative length and curvature of the three sides, widely varying shapes are produced, some of which are very asymmetric. Because of this asymmetry, difficulties often arise in using established terminology to describe these shapes. Where possible I have used the terms given in Radford *et. al.* (1974). In addition, the term semitrullate is applied to phyllodes which are acuminate, broadest below the middle at some distance above the base, and angled on the adaxial margin only (trullate phyllodes are the same except that they are angled on both the adaxial and abaxial margins). Semitrullate phyllodes occur in four closely related species viz. *A. horridula*, *A. pycnocephala*, *A. semitrullata* and *A. uliginosa*.

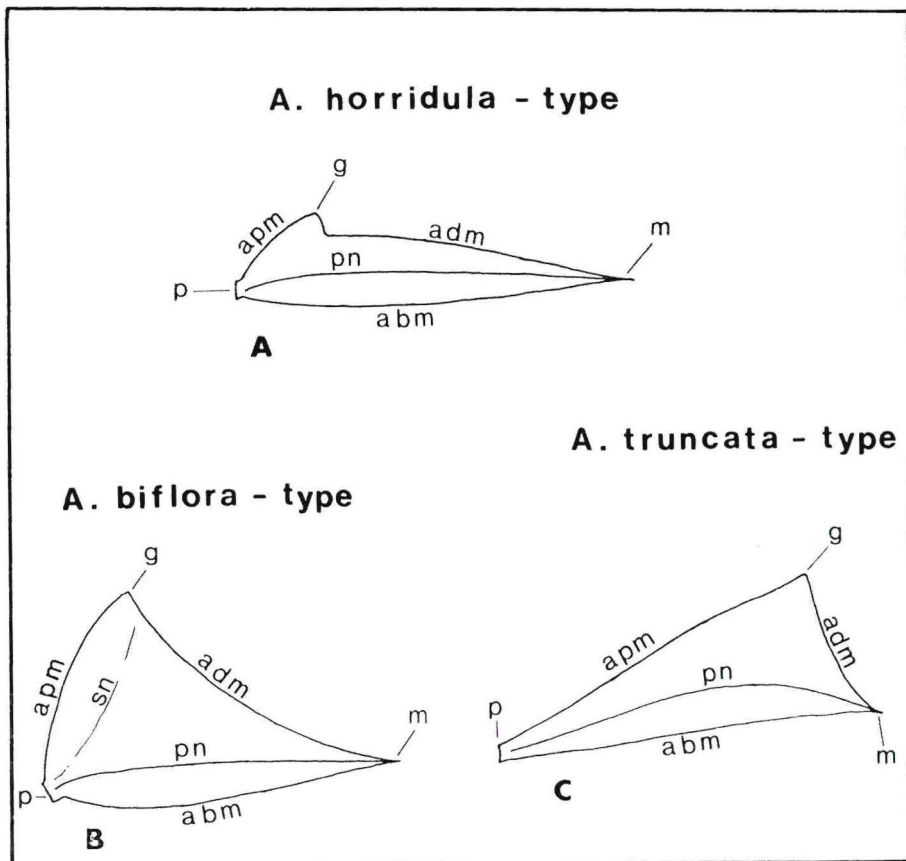


Figure 1. Principal phyllode types of the Uninerves-Triangulares. A—*A. horridula*-type (phyllode semitrullate). B—*A. biflora*-type (phyllode obliquely obdeltate). C—*A. truncata*-type (phyllode obtriangular). abm—abaxial margin; adm—adaxial distal margin; apm—adaxial proximal margin; g—gland; m—apical mucro; p—pulvinus; pn—principal nerve; sn—secondary nerve.

The phyllodes have a principal nerve that extends from the pulvinus (which is normally rather obscure) to the normally pungent apical mucro. Often a less obvious secondary nerve extends towards the gland from near the base of the principal nerve. A gland occurs at the apex of an angle on the adaxial margin of the phyllode. That portion of the adaxial margin between the gland and the pulvinus is termed the adaxial proximal margin while the portion between the gland and the apical mucro is termed the adaxial distal margin. The abaxial margin is the side below the principal nerve between the pulvinus and the mucro.

5. *Inflorescences*: Inflorescence characters are very useful in distinguishing species within the *Uninerves-Triangulares*. The most important character is the number of flowers per head, but other useful characters include peduncle length, bud shape and petal nervature.

The majority of species have simple (i.e. not compound) inflorescences which are normally solitary at the nodes along the upper branches. Only the two closely related taxa, *A. littorea* and *A. truncata*, have racemose inflorescences. Here the raceme axis is very reduced.

(a) *Flower heads*: Most species have globular heads which vary from pale yellow to white. Only in *A. delphina* and sometimes in *A. uliginosa* are the heads obovoid; in *A. chrysocephala*, *A. delphina*, *A. incrassata*, *A. phaeocalyx* and *A. pycnocephala* they are golden.

In *A. biflora*, *A. robiniae* and normally also *A. chrysocephala*, the heads are consistently 2-flowered. At the other end of the scale is *A. delphina* with 18–32 flowers per head. The remaining species have from 4 to 16 flowers per head.

(b) *Flowers*: All species considered here have 4-merous flowers.

The calyx in most taxa is divided for between $\frac{1}{4}$ and $\frac{1}{2}$ its length into triangular lobes. The length of the calyx normally varies from about $\frac{1}{4}$ – $\frac{1}{3}$ that of the corolla.

The petals in most species are 1-nerved but there are some notable exceptions. *Acacia phaeocalyx* has finely striate petals the nervature of which is identical to that found in *A. dilatata*. *Acacia biflora* and *A. phlebopetala* have 3–7-nerved petals with the central nerve being more prominent than the flanking ones.

(c) *Pollen*: Pollen of all taxa (except *A. inops*) was examined by Ph. Guinet, Université des Sciences et Techniques du Languedoc, Montpellier, France. The information provided by Guinet proved extremely useful in determining relationships between the taxa. The pollen-based groups were not at variance with my own groups determined from gross morphology. Guinet's results are noted throughout the text under the appropriate taxa and also in the section below dealing with interspecific relationships.

6. *Legumes*: Based on their legume morphology, the *Uninerves-Triangulares* (excluding *A. delphina* and *A. phaeocalyx* whose real affinities are unknown) can be divided into two subgroups. These subgroups correspond well with those groups established from an overall consideration of morphological attributes (see below). The members of the first subgroup have very distinctive legumes which are curved, terete, tapered at both ends, not (or barely) contracted between the seeds, longitudinally finely striate, red-brown in colour and with non-thickened margins. With one exception (*A. phaeocalyx*) the species possessing this legume type all occur in the *Acacia horridula* group. The second subgroup includes those species of the closely related *A. biflora* and *A. truncata* groups. The legumes here are flat, narrowly oblong, slightly curved, only slightly raised over the seeds, non-striate, brown to black in colour and with margins that are not (or barely) contracted between the seeds and which are unequally thickened (the outer edge being slightly broader than the inner one).

Relationships within the *Uninerves-Triangulares*

The *Uninerves-Triangulares* as defined here are certainly not a natural taxonomic group. Species affinities are established principally on comparative morphology with supporting evidence derived from pollen studies by Ph. Guinet and limited seedling studies by myself. Interspecific relationships are presented diagrammatically in Figure 2. The seventeen species comprising the *Uninerves-Triangulares* are contained in four groups.

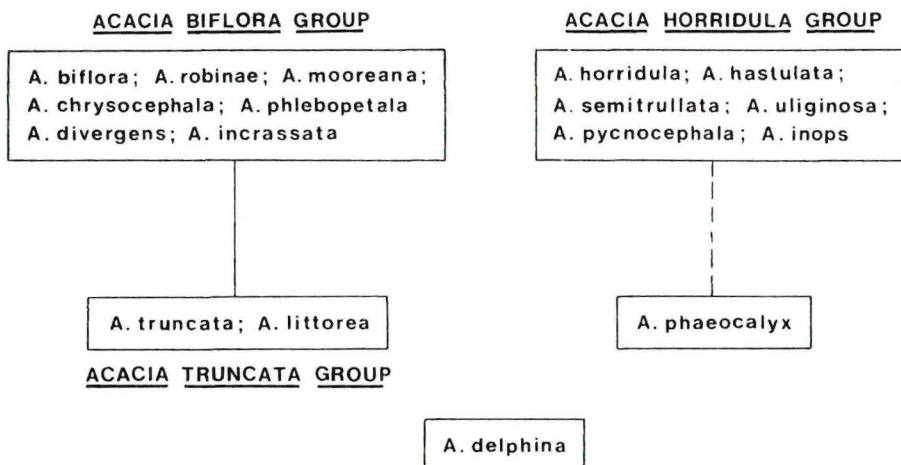


Figure 2. Affinities in the *Uninerves-Triangulares*. Species blocked are closely related; a solid line indicates probable close relationship; a broken line indicates uncertain affinity.

1. *Acacia horridula* group

Included species:—*A. hastulata*, *A. horridula*, *A. inops*, *A. pycnocephala*, *A. semitrullata* and *A. uliginosa*. (On account of its legume morphology, *A. phaeocalyx* (see group 4 below) has some affinities here, but this species differs markedly in its vegetative and floral morphology.)

The *A. horridula* group is a distinctive one and its members are not closely related to any of the other species considered in this revision. The unifying characters of the species in this group are mainly those of the phyllodes and legumes. The phyllodes are frequently semitrullate or sometimes very narrowly triangular or asymmetrically trullate, they are broadest below the middle and taper into sharp apices, they rarely exceed 10 mm in length and their principal nerves are more or less centrally situated. The legumes (not known for *A. inops*) are very distinctive in being terete, tapered at both ends, red-brown in colour and longitudinally striate. Seedling studies, although of a preliminary nature, reveal the following trends in the sequence of leaf development (seedlings not known for *A. inops* and *A. pycnocephala*):—first leaf always solitary and pinnate with 2 pairs of pinnules; next 1–3 (5) leaves bipinnate with one pair of pinnae; subsequent leaves reduced to phyllodes. Pollen studies by Ph. Guinet (pers. comm.) confirm the uniformity of the *A. horridula* group as defined here (N.B. pollen of *A. inops* was not studied).

Within the *A. horridula* group, the species *A. horridula*, *A. pycnocephala*, *A. semitrullata* and *A. uliginosa* are more closely related to one another than to *A. hastulata* and *A. inops*. This first subgroup forms an interrelated species-complex the members of which are rather similar vegetatively but differ in floral morphology and distribution. It could be argued that these taxa should be treated as subspecies of the one variable species, *A. horridula*.

2. *Acacia biflora* group

Included species:—*A. biflora*, *A. chrysocephala*, *A. divergens*, *A. incrassata*, *A. mooreana*, *A. phlebopetala* and *A. robiniae*.

The members of this group are united principally by their phyllode and legume morphology. *Acacia divergens* and *A. incrassata* both possess some characters which render them a little atypical for the *A. biflora* group. However, considered on a broad basis, it seems best to include these two species here rather than with the *A. truncata* group to which they independently show some affinity.

5a.	Flowers consistently 4 per head	6
b.	Flowers more than 4 per head	7
6a.	Flower heads golden yellow and \pm sessile (peduncles 1.5–3 mm long); seeds minutely roughened; legumes to 40 (45) mm long; phyllodes (1.5) 2–4 mm wide. (Narrogin-Kojonup to Lake King-Ravensthorpe)	4. <i>A. pycnocephala</i> (Fig. 6)
b.	Flower heads very pale yellow and distinctly pedunculate (peduncles 5–10 mm long); seeds smooth; legumes to 75 mm long; phyllodes 1.5–2.5 mm wide. (Maddington to Serpentine)	3. <i>A. horridula</i> (Fig. 5)
7a.	Stipules rather spreading; petals hairy (sometimes sparsely) and 1-nerved; flowering peduncles 3–8 mm long; flower heads globular with 5–8 flowers. (Busselton-Donnybrook to Harvey)	5. <i>A. semitrullata</i> (Fig. 7)
b.	Stipules distinctly ascending; petals glabrous and nerveless; flowering peduncles 1–3 mm long; flower heads globular to slightly obloid with 8–15 flowers; legumes glabrous or glabrescent. (Near Albany to near Augusta)	6. <i>A. uliginosa</i> (Fig. 8)
8a.	Flowers 2 per head	9
b.	Flowers 4 or more per head	11
9a.	Petals 3–7-nerved*; peduncles (2) 3–8 mm long; flower heads white (normally drying orange-brown); phyllodes hairy or sometimes glabrous; aril not shiny. (Albany to near Esperance)	7. <i>A. biflora</i> (Fig. 9)
b.	Petals 1-nerved; peduncles 0.5–2 (4) mm long; phyllodes normally glabrous	10
10a.	Flower heads golden yellow; mature phyllodes frequently barely pungent, distinctly ascending AND/OR with a discernible secondary nerve in addition to principal nerve; legumes hairy or sometimes glabrous; aril slightly shiny but not waxy looking. (Narrogin-Mount Barker to near Esperance)	12. <i>A. chrysocephala</i> (Fig. 14)
b.	Flower heads \pm white (normally drying orange-brown); mature phyllodes very pungent, patent, secondary nerve absent; legumes glabrous; aril obviously shiny and waxy looking. (Near Albany to Mount Manypeaks)	8. <i>A. robinac</i> (Fig. 10)
11a.	Flowers 4–6 per head	12
b.	Flowers more than 6 per head	16
12a.	Petals 3–7-nerved*; flower heads creamy white; peduncles 7–12 mm long; upper branches moderately to densely (often minutely) hairy and rather obscurely nerved; phyllodes 5–10 mm long and 5–11 (18) mm wide. (South coast: Pallinup River to Munglinup)	9. <i>A. phleboteta</i> (Fig. 11)
b.	Petals 1-nerved (nerve sometimes obscure); other characters not combined as above	13
13a.	Flowers 4 per head; peduncles 1–3 mm long	14
b.	Flowers more than 4 per head; peduncles 3.5–10 mm long	15
14a.	Calyx lobes and bracteoles prominently acuminate; flower heads pale yellow; branchlets glabrous to sparsely (rarely densely) hairy. (Near Bunbury to near Augusta)	11. <i>A. mooreana</i> (Fig. 13)
b.	Calyx lobes and bracteoles not acuminate; flower heads bright golden yellow. These are 4-flowered variants of a species with normally 2 flowers per head. (Narrogin-Cranbrook to near Ravensthorpe)	12. <i>A. chrysocephala</i> (Fig. 14)
15a.	Phyllodes broadest below the middle and tapered into acuminate, straight, pungent apices; flower heads cream to pale yellow; shrub to 2.3 m tall. (Walebing to Augusta and Stirling Range)	10. <i>A. divergens</i> (Fig. 12)
b.	Phyllodes broadest above the middle, \pm obliquely truncate at apex; flower heads golden yellow; dwarf shrub 20–30 cm tall. (New Norcia to Serpentine)	13. <i>A. incrassata</i> (Fig. 15)
16a.	Flower heads obloid with 18–32 flowers; gland (on angle along adaxial margin of phyllode) overtopped by a short, slightly pungent mucro. (South coast: Mount Maxwell to Israelite Bay)	17. <i>A. delphina</i> (Fig. 19)
b.	Flower heads globular with 5–16 flowers; gland not overtopped by a mucro	17
17a.	Phyllodes broadest below (or near) middle and acuminate with straight and very pungent apices; stipules frequently pungent; branchlets finely ribbed	18
b.	Phyllodes broadest above the middle and with \pm obliquely truncate apices; apical mucro less pungent than above; stipules (when present) not (or scarcely) pungent; branchlets normally coarsely ribbed	19

* Observe apex of petal when dry at not less than x 10 magnification; midrib normally more prominent than flanking nerves,

- 18a. Flower buds large (3 mm long); calyx very dark brown; petals finely striate; stipules spiny and \pm recurved; branchlets frequently pruinose; legumes terete, red-brown, longitudinally striate. (Tammin to Wongan Hills) **16. *A. phaeocalyx*** (Fig. 18)
- b. Flower buds small (1-1.7 mm long); calyx not very dark brown; petals obscurely 1-nerved; stipules often spiny, but not significantly recurved; branchlets never pruinose; legumes flat, dark brown to black, not striate. (Walebing to Augusta and Stirling Range) **10. *A. divergens*** (Fig. 12)
- 19a. Stipules caducous (present only on very young shoots); adaxial proximal margin of phyllodes ascendent (lying \pm parallel to branch); phyllodes not above twice as long as broad (frequently about as long as broad), principal nerves always obviously excentric; glands 1-2 per phyllode. (Near Busselton south to Bremer Bay; Rottneest Island) **14. *A. littorea*** (Fig. 16)
- b. Stipules persistent at base of most (or all) phyllodes on mature branchlets OR if caducous (rarely in *A. truncata*) then phyllodes 2-5 times longer than broad; glands 1 (rarely 2) per phyllode **20**
- 20a. Dwarf shrub 20-30 cm tall; bracteoles acuminate; flower heads golden yellow; phyllodes 5-12 mm long, ascending, principal nerves obviously excentric. (New Norcia to Serpentine) **13. *A. incrassata*** (Fig. 15)
- b. Tall shrub 0.5-2.3 m high; bracteoles obtuse; flower heads pale yellow; phyllodes 9-25 (30-40) mm long, patent to ascending, principal nerves \pm central (rarely obviously excentric). (Near Bunbury north to Leeman) **15. *A. truncata*** (Fig. 17)

1. *Acacia hastulata* Sm. in Rees, Cyclopaedia 39: sub *Acacia* (1818)—Figure 3.
Type: King George's Sound, west coast of New Holland, lat. 35°, *Menzies* (holo: LINN; iso: BM).

Acacia cordifolia Sweet, Hort. Brit. ed.2, p. 165 (1830), nom. nud.; Bentham, London J. Bot. 1:332 (1842) "*A. cordifolia* Hortul.", pro syn. sub *A. hastulata*.

Acacia cordifolia R.Br. ex Lémon, Ann. Fl. Pomone 1836-1837 : 378 (1837). *Type*: based on a cultivated plant (n.v.).

Acacia cordata Sweet ex Steud., Nom. Bot. ed.2, 1:4 (1840), nom. nud.; Regel, Cat. Plant. Hort. Aksakov. p. 2 (1860) "*A. cordata* Hort.", pro syn. sub *A. hastulata*.

Acacia corelata Hort. ex Seemann, Verh. Gartenbau-Ges. Wien 1846:19 (1846), nom. nud., pro syn. sub *A. hastulata*.

Erect to spreading, rather weak, intricate *shrub* to 2 m tall, sometimes entangled among associated vegetation, terminal branches often sparsely divided and quite often arching downwards; *branches* reddish to orange-brown; *branchlets* terete, obscurely nerved (nerves yellow, not raised), sparsely to moderately short-pilose (occasionally antrorsely puberulous), normally green between nerves. *Stipules* very narrowly triangular, often setaceous, 1.5-3 mm long, persistent, scarious but slightly thickened at base, not pungent, ascending, slightly curved, glabrous or ciliate, brown. *Phyllodes* asymmetrically trullate or occasionally almost cordiform, 3.5-6 mm long, 2-3 (3.5) mm wide at broadest point, patent, rigid, congested, normally glabrous, dark green (when dry), base unequally lobed (lobes slightly undulate); *apical mucro* (terminating principal nerve) pungent, ca. 1 mm long, straight, light brown; *principal nerve* centrally situated, \pm raised (when dry), yellowish; *pulvinus* very reduced, 0.1-0.2 mm long. *Gland* not prominent, situated on adaxial angle of phyllode. *Inflorescences* simple, 1 per node, shorter than or slightly exceeding phyllodes; *peduncles* 2-4 mm long, glabrous; *basal peduncular bract* solitary; *flower heads* cream, globular, with (3)4(5) flowers, ca. 2.5 mm diam. just prior to anthesis. *Bracteoles* sessile, 0.5 mm long (\pm equal in length to calyx); laminae ovate, concave, with a short blunt callosity abaxially at base, ciliolate otherwise \pm glabrous. *Flowers* 4-merous; buds \pm attenuated and slightly angular (when dry); *calyx* often cupular, $\frac{1}{4}$ - $\frac{1}{3}$ length of corolla, divided for ca. $\frac{1}{2}$ its length into triangular sparsely ciliolate lobes, tube glabrous; *petals* 1-1.5 mm long, glabrous, 1-nerved; *ovary* glabrous. *Legumes* terete, to 55 mm long, 1.5-2 mm wide, curved, tapered at both ends, firmly chartaceous to slightly coriaceous, glabrescent, red-brown, longitudinally striate; *marginal nerve* not thickened. *Seeds* longitudinal in legume, obloid to slightly ellipsoid,

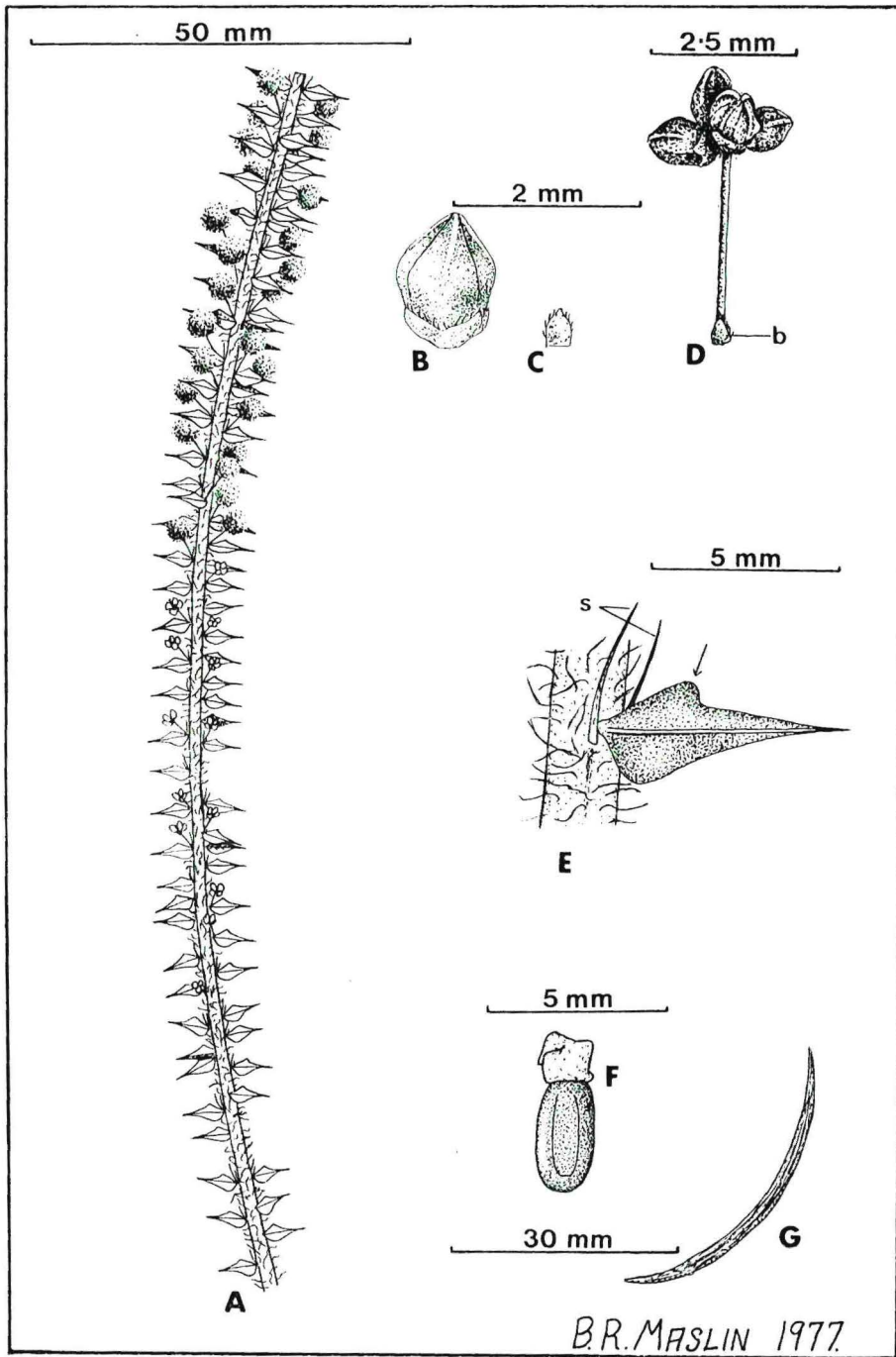


Figure 3. *Acacia hastulata*. A—Portion of branch. B—Flower. C—Bracteole. D—Inflorescence showing peduncle subtended by a solitary basal bract (b). E—Node showing stipules (s) and patent, asymmetrically trullate phyllode (gland position arrowed). F—Seed. G—Legume (terete and longitudinally striate).

A, E from C. A. Gardner 3323; B–D from A. S. George 2639; F–G from A. M. Ashby 4265.

2.5–3.5 mm long, 1–1.5 mm wide, turgid, brown, rather shiny; *pleurogram* fine, open towards the hilum; *areole* ca. 2 mm long and 0.5 mm wide; *funicle* filiform, 0.5 mm (or less) long, withering as seed matures, expanded more or less abruptly into a fleshy once-folded, cream or whitish \pm translucent *aril* to ca. 1 mm long.

Distribution: (Figure 21) South-west Western Australia: Southern regions from Albany west-northwest to the Donnelly River (30 km west of Pemberton).

Habitat: Sand or loam near creeks and in swampy places often in thick scrub associated with *Leptocarpus scariosus*, *Agonis parviceps*, *Ag. linearifolia*, *Astartea fascicularis* and *Evandra aristata*.

Flowering period: Most flowering specimens at hand were gathered from late July to November but there are a few collected between December and February.

Fruiting period: Legumes with mature seeds have been collected in mid-December and January.

Selected specimens: WESTERN AUSTRALIA: A few miles west of Albany airport, *A. M. Ashby* 1640 (PERTH); Near Torbay, Albany area, *A. M. Ashby* 4265 (PERTH); In sylvia inter Princess Royal Harbour et Cape Flow prope Portum Regis Georgii III, *R. Brown* s.n. (BM, Bennett distribution number 4308—this sheet bears Brown's ms name "Mimosa sylvicola"); Denmark River, *C. A. Gardner* 3323 (BM, K, PERTH); About 6 mi S of Northcliffe, *A. S. George* 2639 (PERTH); King George's Sound, *W. H. Harvey* s.n., Jan., Feb., 1854 (K); Stewart Road, 6 km NW of Nannup-Pemberton road (ca. 30 km due SW of Nannup), *B. R. Maslin* 3786 (AD, PERTH); About 2 km E of Denmark towards Albany, *B. R. Maslin* 4022 (PERTH); King George Sound, *Oldfield* 463 (MEL, PERTH); In solo arenoso—turfaceo ad Stirling's Terrace (Plantagenet) d.21. Sept. 1840, Herb. *Preiss* No. 959 (G, GOET, HBG, K, L, MEL, NY, STR).

The legume, inflorescence and general phyllode characters place *A. hastulata* within the *A. horridula* group (p. 270). This conclusion is supported by Ph. Guinet (pers. comm.) who reported that while the pollen of *A. hastulata* is very distinctive, its morphology suggests a relationship to the *A. horridula* group, especially with the species *A. horridula*. *Acacia hastulata* is readily distinguished from the other members of this group by its asymmetrically trullate phyllodes. Another character useful in recognising *A. hastulata* is its glabrous peduncles (puberulous in all other members of the group except *A. inops*).

2. *Acacia inops* Maiden et Blakely, J. Roy. Soc. W. Austral, 13:4 t.3 ff. 6–11 (1927)—Figure 4.

Type: Vasse-Karridale, October 1898, *A. Lea* s.n. (holo: NSW; iso: K, MEL, PERTH-fragment).

A very weak, scrambling *shrub*; *branches* filiform, terete, obscurely nerved (nerves not raised above branch surface, yellow), glabrous or occasionally sparsely antrorsely puberulous, green. *Stipules* very narrowly triangular, 1–2 mm long, persistent, scarious but slightly thickened near base, not pungent, ascending, straight, sparsely ciliolate, light brown. *Phyllodes* \pm narrowly triangular but unequal at base due to a short blunt gland-bearing spur on adaxial margin, deflexed, 5–7 mm long, 0.5–1 mm wide at broadest point, rather distant, straight to slightly curved, glabrous; *apical mucro* (terminating principal nerve) pungent, short (< 1 mm long), straight, light brown; *principal nerve* centrally situated but curved slightly towards abaxial margin at base of phyllode; *pulvinus* very reduced (almost absent). *Gland* situated on adaxial spur of phyllode, lip not prominent. *Inflorescences* simple, 1 per node;

peduncles 3.5–5 mm long, very slender, glabrous; *basal peduncular bract* solitary, ciliate; *flower heads* cream to white, globular, with 5–9 flowers, ca. 3 mm diam. just prior to anthesis. *Bracteoles* sessile, 0.5 mm long (equal in length to calyx), ovate to oblong, acuminate, ciliate. *Flowers* 4-merous; buds attenuated; *calyx* $\frac{1}{4}$ – $\frac{1}{3}$ length of corolla, divided for $\frac{1}{2}$ – $\frac{3}{4}$ its length into coarsely ciliate \pm triangular lobes; *petals* 1.2–1.5 mm long, connate for $\frac{1}{5}$ their length, glabrous or sometimes very sparsely strigose, very obscurely 1-nerved; *ovary* sessile, glabrous (sparsely papillose in very young legumes). Mature *legumes* and *seeds* not seen.

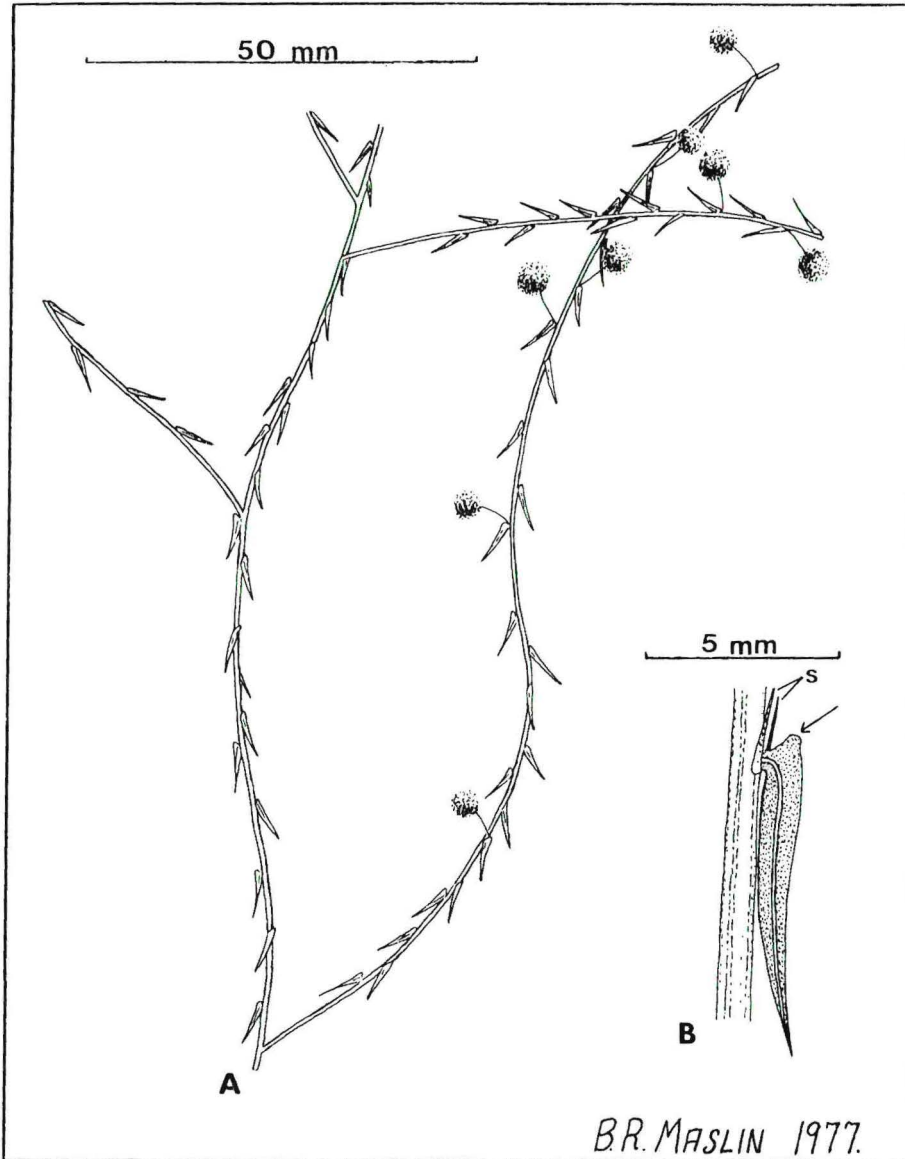


Figure 4. *Acacia inops*. A—Upper part of plant showing weak, filiform branches. B—Node showing stipules (s) and deflexed, \pm narrowly triangular phyllode bearing a basal gland-bearing spur (arrowed). All from R. D. Royce 3913.

Distribution: (Figure 20) South-west Western Australia: Restricted to a small area from Margaret River north to Cowaramup and east-northeast to Osmington.

Habitat: Although I have not studied the species in the field it appears to be restricted to damp areas along creeks and in swamps.

Flowering period: All the flowering specimens at hand were collected in October. Judging from these it is likely that the flowering season would extend from early October to about the end of November.

Selected specimens: WESTERN AUSTRALIA: Margaret River, 21 Oct. 1898, *A. Morrison* s.n. (K, PERTH); Osmington, Margaret River district, *R. D. Royce* 3913 (CANB, MEL, PERTH).

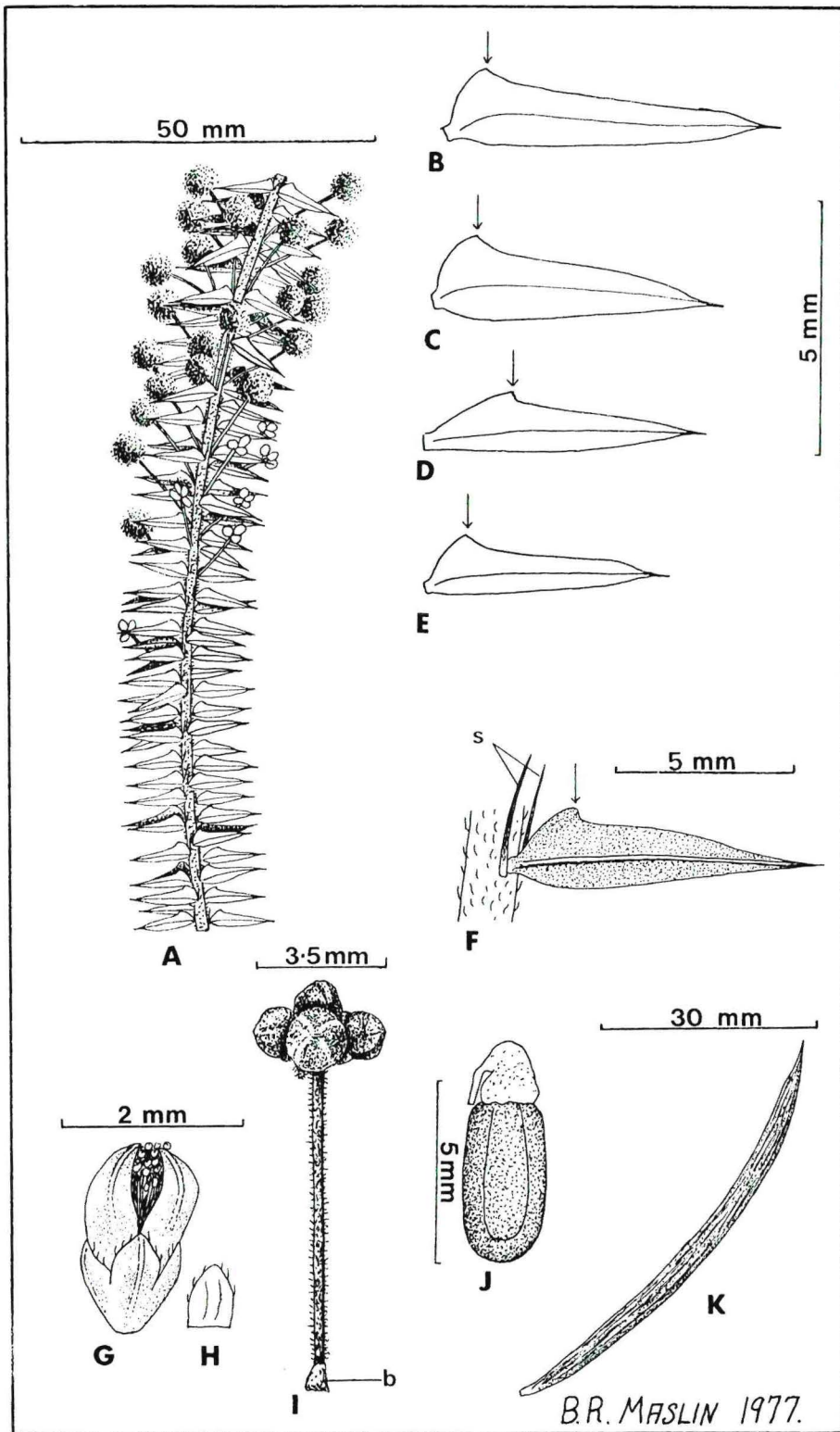
Although legumes of *A. inops* have not been seen it is probable that the species is related to *A. horridula* and its allies (p. 270) and not to *A. ingrata* Benth. as Maiden and Blakely suggested in their original description. *Acacia ingrata* is readily distinguished from *A. inops* by its 5-merous flowers, its \pm patent phyllodes which lack conspicuous basal spurs, its more woody and robust branches and its erect habit. *Acacia inops* is distinguished from all other members of the *A. horridula* group by a combination of the following characters: branches very weak and filiform, phyllodes prominently deflexed and very narrow (0.5–1 mm wide at broadest point) and peduncles very slender and glabrous.

It will be seen from comparing the above description with the protologue of *A. inops* that a number of discrepancies occur. My description is based on a number of gatherings of the species housed at PERTH and elsewhere, including an isotype; the holotype at NSW has also been inspected. The following errors in the original description are noted: (1) the stipules are persistent (not "deciduous"); (2) the phyllodes are 5–7 mm long (not "8–12 mm"); (3) the gland itself is not prominent though the spur upon which it is situated is pronounced; (4) the peduncles are 3.5–5 mm long (not "10–25 mm").

3. *Acacia horridula* Meisn. in Lehm., Plant. Preiss. 1:9 (1844)—Figure 5.

Type: In arenosis ad fl. Canning (Perth). Frutex 2.5 pedalis. d. 4 Dec. 1839, legit. *L. Preiss* No. 1151 (lecto: NY; iso: G, MEL, P, PERTH—fragment, W), *lecto. nov.*

Shrub to 0.6(1) m tall, single-stemmed, normally sparsely branched in lower $\frac{1}{2}$ of plant but much branched in upper $\frac{1}{2}$ (laterals ascending, sparsely divided and commonly \pm whorled); *branches* terete, obscurely nerved, moderately to densely puberulous (hairs \pm patent to antrorse), normally light brown to reddish brown. *Stipules* very narrowly triangular to setaceous, 2.5–4 mm long, persistent, not pungent, slightly thickened at base, ascending to somewhat spreading (not exceeding an angle of ca. 45° with branch), glabrous, light brown. *Phyllodes* narrowly semitrullate, 6–8 mm long, 1.5–2.5 mm wide at broadest point, patent, rigid, congested, straight, glabrous; *apical mucro* (terminating principal nerve) pungent, ca. 1 mm long, straight; *principal nerve* centrally situated, slightly curved towards abaxial margin near base of phyllode, raised (when dry); *pulvinus* distinct, 0.3–0.5 mm long. *Gland* not prominent, situated on a slight angle on adaxial margin of phyllode 1.5–2.5 mm above pulvinus. *Inflorescences* simple, 1 per node; *peduncles* 5–10 mm long, moderately to densely puberulous (hairs patent to antrorse), thickening considerably when in fruit; *basal peduncular bract* solitary; *flower heads* pale yellow, globular, ca. 3.5 mm diam. just prior to anthesis, with 4 flowers. *Bracteoles* sessile, ovate, 0.5–0.7 mm long (shorter than calyx), concave, ciliolate, otherwise glabrous. *Flowers* 4-merous; buds not (or slightly) attenuated; *calyx* $\frac{1}{2}$ length of corolla, divided for ca. $\frac{1}{2}$ its length into broadly triangular ciliolate lobes, 5-nerved (nerves not particularly prominent), tube glabrous; *petals* \pm 2 mm



long, glabrous, 1-nerved (nerve most prominent at apex of petals); ovary densely tomentose. Legumes terete, to 75 mm long and 3.5 mm wide, curved, tapered at both ends, barely contracted between seeds, hard and brittle, sparsely and minutely strigose, red-brown, longitudinally striate; marginal nerve not thickened. Seeds longitudinal in legume, obloid, 4–5 mm long, 2–3 mm wide, turgid, dark brown, dull; pleurogram open towards the hilum, situated near periphery of seed on each face; areole oblong, 4–4.5 x 1 mm; funicle expanded into a once-folded, thickened, medium dull yellow, conical aril.

Distribution: (Figure 20) South-west Western Australia: From the Canning River at Maddington on the Swan Coastal Plain (16 km SE of Perth) south to the Serpentine River in the Darling Range (about 50 km SE of Perth).

Habitat: Although *A. horridula* grows close to Perth, very little is known of its ecology. Most gatherings have been made in the Darling Range but there are a few records from the adjacent Swan Coastal Plain. At the one locality in the Darling Range where I have seen it, the species grows among granite rocks on hillsides in woodland dominated by *Eucalyptus calophylla*. The under-storey is a low, dense, sclerophyll scrub comprising species of *Acacia*, *Hakea*, *Daviesia*, *Macrozamia*, etc.

Flowering period: Late May to early August.

Fruiting period: Legumes begin to form in early August and mature in early November.

Selected specimens: WESTERN AUSTRALIA: Barrington Quarry, H. Demarz S841 (PERTH); Maddington, 6 Aug. 1904 (K, PERTH) and 26 Aug. 1908, A. Morrison s.n. (PERTH); Armadale, 18 mi (29 km) S of Perth, 28 May 1967, Shoemith s.n. (PERTH); Darling Range, 24 June 1974, M. Wittwer s.n. (PERTH).

Meisner (1844) based his original description of *A. horridula* on two Preiss collections, viz. no. 1151 and no. 965. I have inspected both these collections in Meisner's Herbarium at NY and it is apparent that they represent different taxa—*A. horridula* (sensu lectotypico) and *A. pycnocephala* sp. nov. respectively. The description of *A. horridula* is based on both collections. As Preiss 965 is very fragmentary and represented (as far as I am aware) only at NY, while Preiss 1151 is a better gathering and represented at G, MEL, NY, P, PERTH and W, I have selected the latter as the lectotype.

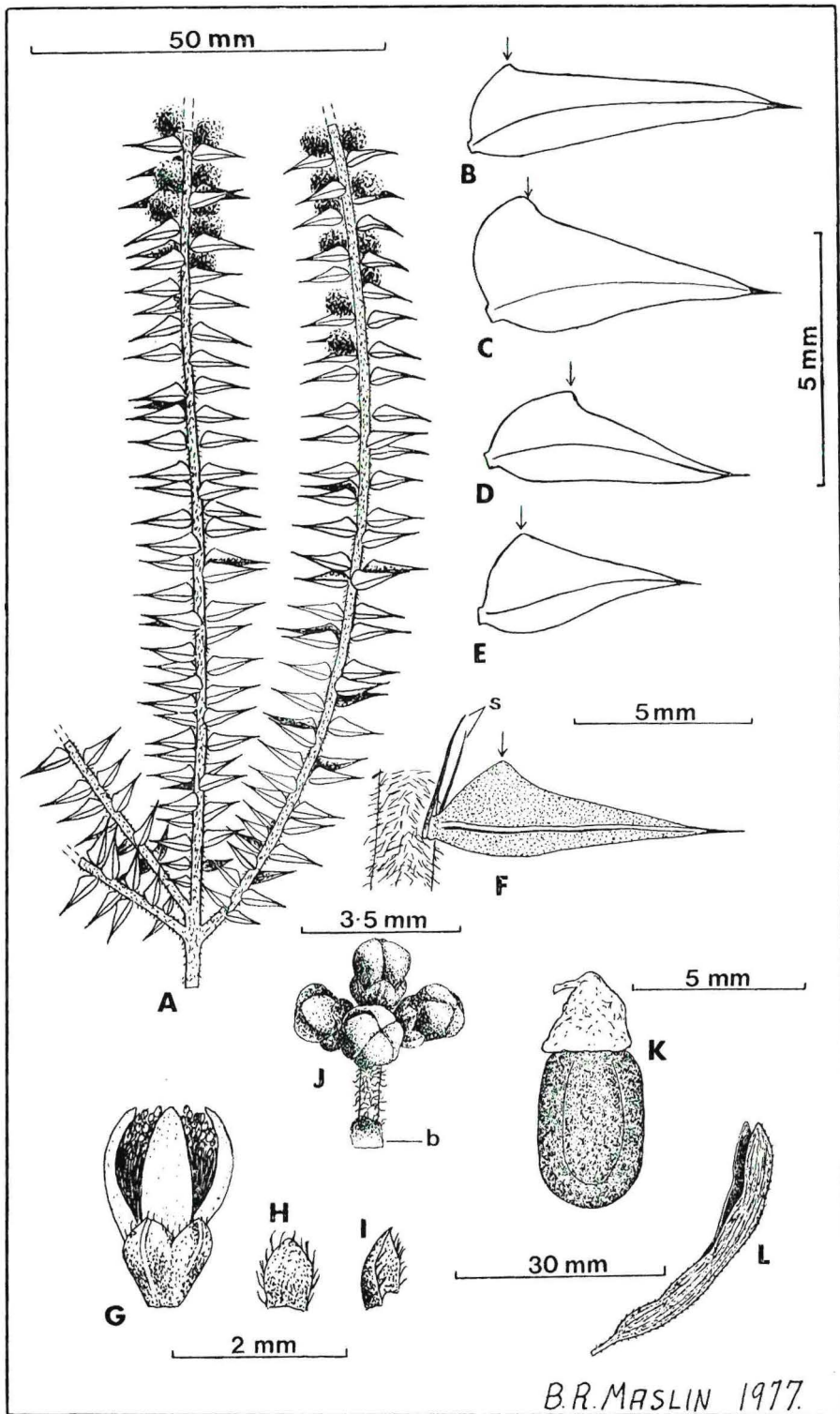
Under *A. horridula*, Bentham (1864, p. 350) cited four specimens, viz. "Drummond; Preiss n. 1151; Canning river, Preiss n. 965; Harvey river, Oldfield". Of these, Preiss 1151 is the lectotype of *A. horridula*, Preiss 965 (syn-type of *A. horridula*) is *A. pycnocephala* sp. nov. while Drummond s.n. and Oldfield s.n. are *A. semitrullata* sp. nov.

As pointed out on p. 270, *A. horridula* is placed in the group of closely related species referred to as the "Acacia horridula group". These species are united by their 4-merous flowers and their general legume and phyllode characters. In the past, many members of this group had simply been called "A. horridula". From the morphological and ecological evidence now available it seems best to divide *A. horridula* into four species, three of which are described here as new.

Acacia horridula is most closely allied to *A. pycnocephala* from which it is distinguished by its longer peduncles (5–10 mm compared with 1.5–3 mm), pale yellow flower heads (not golden yellow), longer and less hairy legumes and smooth seeds (not minutely rugose to verruculose).

Figure 5. *Acacia horridula*. A—Portion of branch. B to E—Phyllodes showing shape and size variation (gland position arrowed). F—Node showing stipules (s) and patent, semitrullate phyllode (gland position arrowed). G—Flower. H—Bracteole. I—Inflorescence showing long peduncle (subtended by a solitary basal bract—b) and 4-flowered head. J—Seed. K—Legume (terete and longitudinally striate).

A, C, G–I from Shoemith s.n.; B from A. Morrison s.n., 26 Aug. 1908; D, J–K from H. Demarz S841; E from A. Morrison s.n., 6 Aug. 1904; F from M. Wittwer s.n.



4. *Acacia pycnocephala* Maslin sp. nov.—Figure 6.

Acacia horridula Meisn. in Lehm., Plant. Preiss. 1:9 (1844), pro parte, (as to Preiss 965, NY), not as to lectotype; Bentham, Flora Austral. 2:350 (1864), pro parte, as to Preiss 965.

Frutex 0.3–0.6 m altus; *ramuli* dense puberuli. *Stipulae* ± persistentes. *Phyllodia* anguste semitrullata, 6–11 mm longa, (1.5) 2–4 mm lata, pungentia, nervo principali ad centrum posito. *Pedunculi* 1.5–3 mm longi, dense puberuli; *capitula* aurea, globulosa, 4 floribus. *Flores* 4-meri; *calyx* 5-nervatus; calycis lobi late triangulares; *petala* 2–2.5 mm longa, glabra, enervia. *Legumina* teretia, ad 40 (45) mm longa, ca. 3 mm lata, curva, striata, badia. *Semina* in legumine longitudinalia, obloidea ad ellipsoidea, 3.5–4.5 mm longa, 2.5–3 mm lata, rugulosa ad verruculosa; arillus conicus.

Type: 19.5 km S of Lake King towards Ravensthorpe, Western Australia. "Spindly erect shrub much branched at ground level, 0.6 m tall; flower heads yellow. Light brown loam on a rise near a salt lake." 28 Aug. 1973, B. R. Maslin 3440 (holo: PERTH; iso: CANB, K, MEL, NY).

Rather harsh *shrub* normally 0.3–0.6 m tall, either single-stemmed or dividing at ground level into a number of slender erect or spreading branches, often growing entangled among the associated low sclerophyll shrubs; *branches* orange to light (reddish) brown but grey near base; *branchlets* terete, very obscurely nerved, densely puberulous (hairs white, patent to slightly retrorse). *Stipules* very narrowly triangular, often setaceous, 2–4 mm long, ± persistent, scarious (but slightly thickened, especially near base), not pungent, ascending, ± straight, glabrous or ciliolate, brown. *Phyllodes* narrowly semitrullate, 6–11 mm long, (1.5) 2–4 mm wide at broadest point, patent to slightly reflexed, rigid, congested, straight, glabrous or sometimes sparsely puberulous, olive green, tapered towards apex into a pungent straight light brown mucro 1.5–2.5 mm long; *principal nerve* centrally situated, slightly curved towards abaxial margin near base of phyllode, ± raised when dry; *pulvinus* 0.2–0.3 mm long. *Gland* not prominent, situated on a slight angle on adaxial margin of phyllode 1.5–3 mm above the pulvinus. *Inflorescences* simple, 1 per node, shorter than phyllodes, numerous and congested along upper branchlets; *peduncles* 1.5–3 mm long, densely puberulous; *basal peduncular bract* solitary; *flower heads* golden yellow, globular, with 4 flowers. *Bracteoles* sessile, ovate, ca. 1 mm long (less than calyx in length), concave, ciliolate, ± obscurely 1-nerved. *Flowers* 4-merous; buds not (or only very slightly) attenuated; *calyx* $\frac{1}{2}$ length of corolla, divided for $\frac{1}{3}$ – $\frac{1}{4}$ its length into broadly triangular ciliolate lobes which are sometimes imbricate near their bases, tube glabrous and 5-nerved (nerves sometimes obscure); *petals* 2–2.5 mm long, glabrous, nerveless; *ovary* densely tomentose. *Legumes* terete, to 40(45) mm long, ca. 3 mm wide, curved, ± abruptly tapered at both ends, slightly contracted between seeds, firmly chartaceous to slightly coriaceous, moderately minutely puberulous, red-brown, longitudinally striate; *marginal nerve* not thickened. *Seeds* longitudinal in legume, obloid to ellipsoid, 3.5–4.5 mm long, 2.5–3 mm wide, shape and size variable even on same plant, turgid, surface minutely rugose to verruculose, dark brown to almost black, ± dull; *pleurogram* fine, open towards the hilum; *areole* 3–3.5 mm long, ca. 1 mm wide; *funicle* filiform, 1.5–2 mm long, withering as seed matures, expanded into a thickened conical white or yellow *aril*.

Figure 6. *Acacia pycnocephala*. A—Portion of branch. B to E—Phyllodes showing shape and size variation (gland position arrowed). F—Node showing stipules (s) and patent, semitrullate phyllode (gland position arrowed). G—Flower. H and I—Bracteoles (H—abaxial view; I—side view). J—Inflorescence showing short peduncle (subtended by a solitary basal bract—b) and 4-flowered head. K—Seed (minutely rugose). L—Legume (terete and longitudinally striate).

A, F–I from B. R. Maslin 637; B from B. R. Maslin 3440 (the type); C from B. R. Maslin 658; D from C. A. Gardner s.n.; E, K–L from B. R. Maslin 3992; J from A. S. George 6253.

Distribution: (Figure 20) South-west Western Australia: Narrogin south to near Yeriminup (about 60 km S of Kojonup towards Rocky Gully) then east to the Ravensthorpe-Lake King district. *Acacia pycnocephala* is distributed further inland than the other members of the *A. horridula* group.

Habitat: This species favours laterite (or sand or loam over laterite) in either open-heath or high open-shrubland. The areas where it occurs are drier than those for the other members of the *A. horridula* group.

Flowering period: May-September.

Fruiting period: Legumes with mature seeds have been collected in mid-December. According to Ken Newbey (pers. comm.) mature seeds also occur in late November.

Selected specimens: WESTERN AUSTRALIA: Narrogin, Aug. 1925, C. A. Gardner s.n. (PERTH); South Stirlings Rd, 36 mi (57.5 km) E of Borden rd, A. S. George 6253 (PERTH); 34 mi (55 km) S of Kojonup towards Rocky Gully, B. R. Maslin 637 (CANB, PERTH) and 3992 (PERTH); $\frac{1}{2}$ mi (0.5 km) N of Highbury (between Wagin and Narrogin), B. R. Maslin 658 (NSW, PERTH); 6 km N of Mount Madden towards Lake King, B. R. Maslin 4063 (PERTH); 10 km NNW of Mount Groper, K. Newbey 4196 (PERTH).

Meisner (1844) based the name *A. horridula* on two collections viz. Preiss 965 and Preiss 1151. The former collection represents *A. pycnocephala* while the latter is *A. horridula* sensu lectotypico (see p. 279).

Acacia pycnocephala is placed in the *A. horridula* group (p. 270) and is distinguished by its golden yellow flower heads (cream or white in the other species) and its minutely rugose to verruculose seeds (smooth in the other species). Other characters useful in recognising *A. pycnocephala* include its short, densely puberulous peduncles, its consistently 4-flowered flower heads, its smooth, glabrous and nerveless petals and its branches which are densely white-puberulous towards their apices. Its general phyllode and flower morphology render *A. pycnocephala* closer to *A. horridula* than to the other species within the *A. horridula* group.

According to Ken Newbey (pers. comm.) *A. pycnocephala* regenerates after fire from suckers; seedlings are rarely seen.

The specific epithet refers to the inflorescences which are numerous and congested towards the extremities of the branchlets.

5. *Acacia semitrullata* Maslin sp. nov.—Figure 7.

[*Acacia horridula* auct. non Meisn.: Bentham, Flora Austral. 2:350 (1864) pro parte, as to Swan River, Drummond and Harvey River, Oldfield.]

Frutex \pm debilis, 0.3–1 (1.5) m altus; *ramuli* sparsim ad dense antrorse puberuli ad strigiosi. *Stipulae* persistentes, \pm patentes. *Phyllodia* plerumque anguste semitrullata, interdum triangularia, 5–10 mm longa, 1.3–2 mm lata, patentia vel plerumque deflexa, pungentia, nervo principali ad centrum posito. *Pedunculi* 3–8 mm longi (modice) dense puberuli; *capitula* globulosa, 5–8 floribus. *Flores* 4-meri; *calycis* lobi triangulares; *petala* \pm 1.5 mm longa, modice (sparsim) puberula, 1-nervia. *Legumina* teretia, ad 60 (75) mm longa, 2–3 mm lata, curva, striata, badia. *Semina* in legumine longitudinalia, obloidea ad parum ellipsoidea, 4 mm longa, 2 mm lata; *arillus* conicus.

Type: Between Harvey and Myalup, Western Australia. "Shrub to 0.3 m tall; normally growing erect among associated vegetation; branches slender; heads cream. Dark grey sandy loam in semi-swamp area." 20 Aug. 1976, B. R. Maslin 4193 (holo: PERTH; iso: CANB, K, MEL).

Rather weak, erect *shrub* 0.3–1(1.5) m tall, not scrambling, either single-stemmed or dividing at ground level into a number of slender orange-brown branches; *branchlets* terete, finely nerved (nerves yellowish), sparsely to densely

antrorsely puberulous to strigose (hairs not restricted to nerves), greenish between nerves. *Stipules* very narrowly triangular, sometimes setaceous, 1–2 mm long, persistent, \pm rigid but not pungent, quite spreading and generally curved upwards (best observed when fresh), glabrous or slightly hairy, brown. *Phyllodes* normally narrowly semitrullate, sometimes very narrowly triangular, 5–10 mm long, 1.3–2 mm wide (at broadest point), patent or sometimes deflexed to a maximum angle of 45° with branch, rigid, \pm congested, normally straight, glabrous (or sparsely hairy on margin and midrib), medium to dark green; *apical mucro* (terminating principal nerve) pungent, 0.5–1 mm long, straight, light brown; *principal nerve* \pm centrally situated (curved towards abaxial margin near base of phyllode), raised (when dry); *pulvinus* 0.2–0.5 mm long, slightly dilated at base, yellow. *Gland* not prominent, situated on a very slight angle on adaxial margin of phyllode 0.5–1.5 (2) mm above pulvinus. *Inflorescences* simple, 1 per node; *peduncles* 3–8 mm long, (moderately) densely puberulous (hairs straight and patent); *basal peduncular bract* solitary; *flower heads* cream to white, globular, with 5–8 flowers. *Bracteoles* more or less sessile, \pm 1 mm long (equal to or exceeding calyx in length); laminae concave, acuminate. *Flowers* 4-merous; buds \pm attenuated; *calyx* $\frac{1}{4}$ – $\frac{1}{3}$ length of corolla, divided for $\frac{1}{2}$ its length into triangular ciliolate lobes, tube sparsely puberulous and obscurely 5-nerved; *petals* \pm 1.5 mm long, connate for ca. $\frac{1}{2}$ their length, moderately (sparsely) puberulous (hairs straight and ascending), 1-nerved (fairly apparent when dry); *ovary* glabrous but becoming densely appressed white tomentose as soon as legumes begin to develop. *Legumes* terete, to 60 (75) mm long, 2–3 mm wide, curved, tapered at both ends, slightly contracted between seeds, firmly chartaceous to somewhat coriaceous, moderately and finely strigillose (densely white-hairy when young), reddish-brown, longitudinally striate; *marginal nerve* not thickened. *Seeds* longitudinal in legume, obloid to slightly ellipsoid, 4 mm long, 2 mm wide, turgid, dark brown, dull; *pleurogram* open towards the hilum, situated near the periphery of seed on each face; *areole* ca. 3 x 1 mm; *funicle* filiform, withering as seed matures, short (ca. 1 mm long), expanded into a conical slightly shiny thickened pale yellow (greenish at base) *aril* which is either not folded or with a very short fold at the apex.

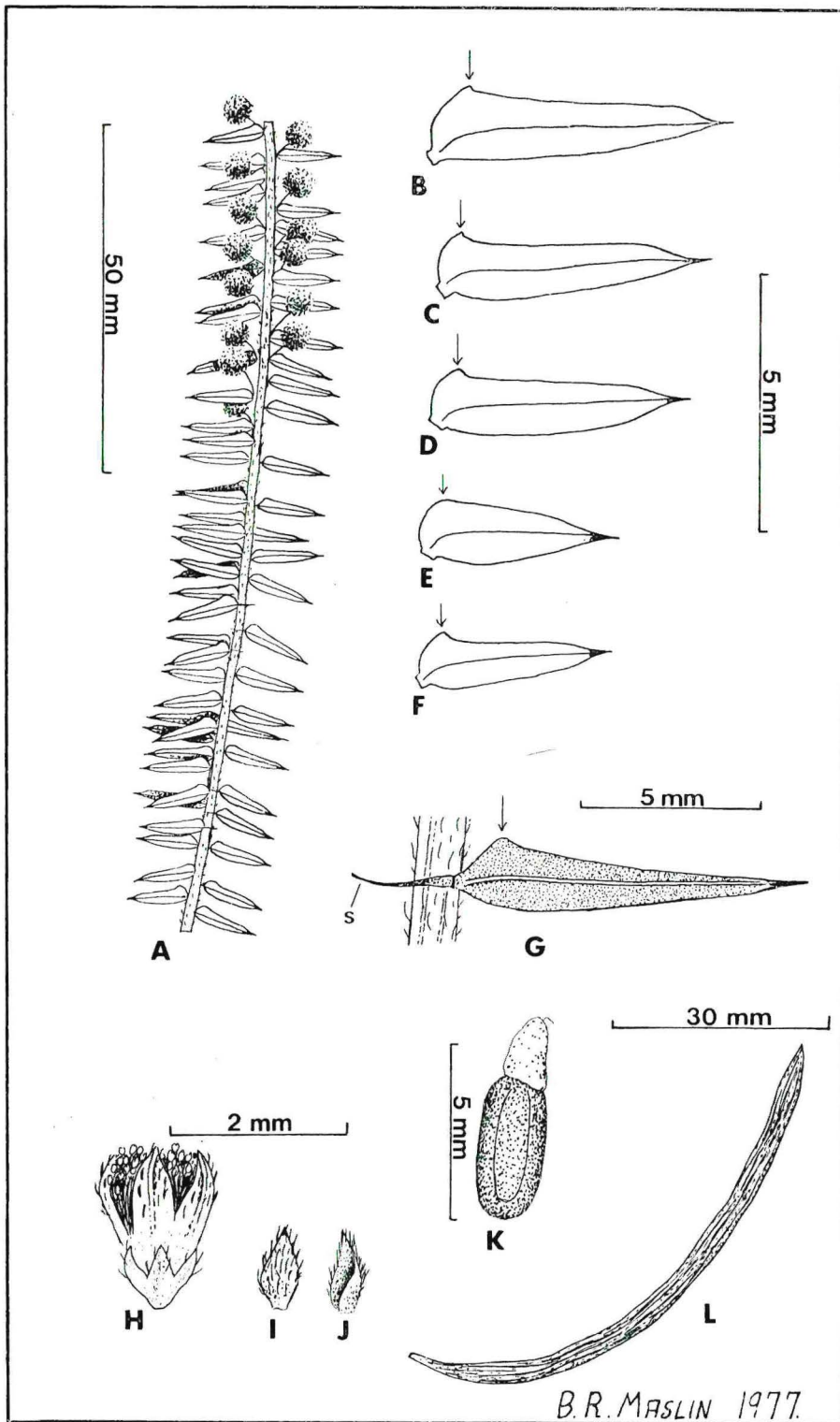
Distribution: (Figure 20) South-west Western Australia: Extending from the Whicher Range (between Busselton and Nannup) northeast to the Donnybrook area and north-northwest to near Harvey.

Habitat: *Acacia semitrullata* has been collected from the southern portion of the Swan Coastal Plain and from areas of the adjacent Darling Range (around Donnybrook). On the Swan Coastal Plain it frequently grows adjacent to swamps in the deep, dark grey sands of the Bassendean Soil Association (Bettenay *et al.*, 1960). The vegetation here is frequently open-heath with emergent *Melaleuca preissiana* and *Nuytsia floribunda*. The heath formation is dominated by species such as *Leptospermum ellipticum*, *Adenanthos obovatus*, *Hypocalymma angustifolium* and *Euchilopsis linearis*. In the Darling Range *A. semitrullata* favours sand over laterite in slight depressions in open-forest dominated by *Eucalyptus marginata*.

Flowering period: May–September (October).

Fruiting period: It takes about 14 weeks from anthesis for mature seeds to develop; these have been collected in mid-December.

Selected specimens: WESTERN AUSTRALIA: Western Australia, *Drummond* s.n. (MEL); Western Australia, *Drummond* 14 (MEL, PERTH); Near Myalup plantation, west of Harvey, *J. Havel* 348 (PERTH); 2 mi (3.2 km) SW of Donnybrook, *B. R. Maslin* 448 (NSW, NY, PERTH); 3 km from Donnybrook towards Capel, *B. R. Maslin* 3796 and 3988 (PERTH); About 6 km S of Busselton on Gales Road, *B. R. Maslin* 4196 (PERTH); Blackwood River, 1873, *Mrs. McHard* s.n. (MEL); Harvey River, *Oldfield* s.n. (MEL—seen by Bentham, PERTH—fragment); Bunbury district, 1902, *A. C. Vaughan* s.n. (PERTH).



In the past *A. semitrullata* has often been confused with *A. horridula* Meisn. For example, under *A. horridula*, Bentham (1864, p. 350) cited four collections two of which are *A. semitrullata* viz. Swan River, Drummond and Harvey River, Oldfield. Although future study may indicate that *A. semitrullata* is best treated as an infraspecific taxon of *A. horridula*, for the present I consider it distinct enough to warrant specific rank.

Acacia semitrullata is placed in the *A. horridula* group (p. 270) and is recognised by a combination of the following characters: phyllodes patent or sometimes deflexed to 45°, normally narrowly semitrullate with an obscure gland-bearing angle on adaxial margin 0.5–1.5(2) mm above the pulvinus; stipules quite spreading (best observed when fresh); peduncles 3–8 mm long and normally densely puberulous; flowers cream to white and 5–8 per head; petals hairy (hairs sometimes sparse) and 1-nerved.

Within the *A. horridula* group, *A. semitrullata* is most closely allied to *A. uliginosa* sp. nov. Vegetatively the two species are quite similar but *A. semitrullata* is recognised by its often denser branchlet indumentum (hairs not restricted to the ribs as they often are in *A. uliginosa*), its spreading stipules which are generally curved upwards (this character is best observed in fresh material; in *A. uliginosa* the stipules are distinctly ascending and more or less straight), its normally slightly broader phyllodes, its longer peduncles, its fewer flowers per head (but the flowers themselves slightly larger than in *A. uliginosa*), its hairy, 1-nerved petals (glabrous and nerveless in *A. uliginosa*), its more hairy legumes and its duller and darker brown seeds. *Acacia semitrullata* occurs further north than *A. uliginosa* and although their distributions are not known to overlap the species do grow relatively close to one another in the region of the Whicher Range (Margaret River-Donnybrook area)—Figure 20.

The specific epithet refers to the shape of the phyllodes which are normally half-trullate i.e. angled (albeit obscurely) only on the adaxial margin (0.5–1.5(2) mm above the pulvinus).

6. *Acacia uliginosa* Maslin sp. nov.—Figure 8.

Acacia horridula Meisn. (sphalm. “*horridula* Benth.”) var. *hastulatoidea* E. Pritzel, Bot. Jb. 35:297 (1904). *Type citation*: “Hab. in distr. Stirling pr. Marbellup in fruticetis arenosis humidis, flor. m. Jul. (Diels 3393)”—n.v.

Frutex serpens vel erectus; *ramuli* plerumque sparsim antrorse puberuli. *Stipulae* persistentes, ascendentes. *Phyllodia* plerumque peranguste triangularia, interdum peranguste semitrullata, 5–9 mm longa, 1–1.5 mm lata, patentia, pungentia, nervo principali ad centrum posito. *Pedunculi* 1–3 mm longi (ad 5 mm ubi in fructo), puberuli; *capitula* globulosa ad leviter obloidea, 8–15 floribus. *Flores* 4-meri; *calycis* lobi triangulares; *petala* 1–1.5 mm longa, glabra, enervia. *Legumina* teretia, ad 70 mm longa, ad 2 mm lata, curva, striata, badia. *Semina* in legumine longitudinalia, obloidea ad parum ellipsoidea, 3–4 mm longa, ca. 2 mm lata; *arillus* conicus.

Type: Marbellup, about 15 km W of Albany towards Denmark, Western Australia. “Low scrambling shrub, branches slender and filiform, light brown; phyllodes patent; flower heads ± cream-coloured. Swampy area in grey loamy soil.” 29 Aug. 1975, B. R. Maslin 3778 (holo: PERTH; iso: CANB, K, MEL, NSW, NY).

Figure 7. *Acacia semitrullata*. A—Branch. B to F—Phyllodes showing shape and size variation (gland position arrowed). G—Node showing spreading stipule (s) and patent, semitrullate phyllode (gland position arrowed). H—Flower. I and J—Bracteoles (I—adaxial view; J—side view). K—Seed. L—Legume (terete and longitudinally striate).

A–B, H–J from A. C. Vaughan s.n.; C from J. Havel 348; D from B. R. Maslin 4196; E from B. R. Maslin 3796; F from B. R. Maslin 4193 (the type); G from B. R. Maslin 448; K–L from B. R. Maslin 3988.

Shrub either scrambling (with long slender branches to 1 m) or erect (30–60 cm tall) with normally 3–6 (sometimes more) thin stems arising from a subterranean root stock; *branchlets* terete, finely nerved (nerves barely raised above branch surface, yellow), normally sparsely antrorsely puberulous with hairs restricted to nerves (occasionally densely puberulous with hairs not restricted to nerves), green. *Stipules* very narrowly triangular to setaceous, 1.5–2.5 mm long, persistent, scarious (but slightly thickened, especially near base), not pungent, distinctly ascending, \pm straight, glabrous, brown. *Phyllodes* normally very narrowly triangular (but base unequal—more rounded on adaxial margin than abaxial margin), sometimes very narrowly semitrullate, 5–9 mm long, 1–1.5 mm wide at broadest point, \pm patent, rigid, frequently rather distant, straight to slightly curved, glabrous, medium green; *apical mucro* (terminating principal nerve) pungent, ca. 1 mm long, straight, light brown; *principal nerve* centrally situated and slightly curved towards abaxial margin near phyllode base, sometimes raised (when dry); *pulvinus* very reduced. *Gland* not prominent, situated on adaxial margin of phyllode (sometimes on a very slight angle) 0.5–1 mm above the pulvinus. *Inflorescences* simple, 1 per node; *peduncles* 1–3 mm long (to 5 mm when in fruit), puberulous; *basal peduncular bract* solitary and ciliate; *flower heads* pale yellow to cream, globular to slightly obloid, with 8–15 flowers, ca. 3 mm diam. just prior to anthesis. *Bracteoles* more or less sessile, \pm 1 mm long (exceeding calyx in length); laminae concave, acuminate, ciliate. *Flowers* 4-merous; buds attenuated; *calyx* $\frac{1}{2}$ to almost $\frac{1}{2}$ length of corolla, divided for $\frac{1}{2}$ its length into triangular ciliate lobes, tube glabrous and nerveless; *petals* 1–1.5 mm long, glabrous, nerveless; *ovary* densely tomentose. *Legumes* terete, to 70 mm long and 2 mm wide, curved, tapered at both ends, slightly contracted between seeds, firmly chartaceous to somewhat coriaceous, glabrous or glabrescent, red-brown, longitudinally striate; *marginal nerve* not thickened. *Seeds* longitudinal in legume, obloid to slightly ellipsoid, 3–4 mm long, ca. 2 mm wide, turgid, medium brown, slightly shiny; *pleurogram* open towards the hilum, situated near periphery of seed on each face; *areole* 2.5–3 x 1–1.3 mm; *funicle* minute (ca. 0.5 mm long), withering as seed matures, expanded into a once or twice-folded conical slightly shiny pale yellow thickened *aril* to 2.5 mm long.

Distribution: (Figure 20) South-west Western Australia: Near Witchcliffe south to near Augusta then southeast through Northcliffe to Marbellup (about 15 km west of Albany).

Habitat: Seasonally swampy conditions prevail in most places where this species grows. Between Witchcliffe and Augusta it has been collected from shallow depressions in open-forest dominated by *Eucalyptus marginata* and *E. calophylla*. The soil here is sand, sandy loam or lateritic loam. To the south-east (between Northcliffe and Marbellup) *A. uliginosa* occurs in loam in better defined, seasonally swampy areas. Here some of the associated species include *Actinodium cunninghamii*, *Agonis parviceps*, *Anarthria scabra* and *Evandra aristata*.

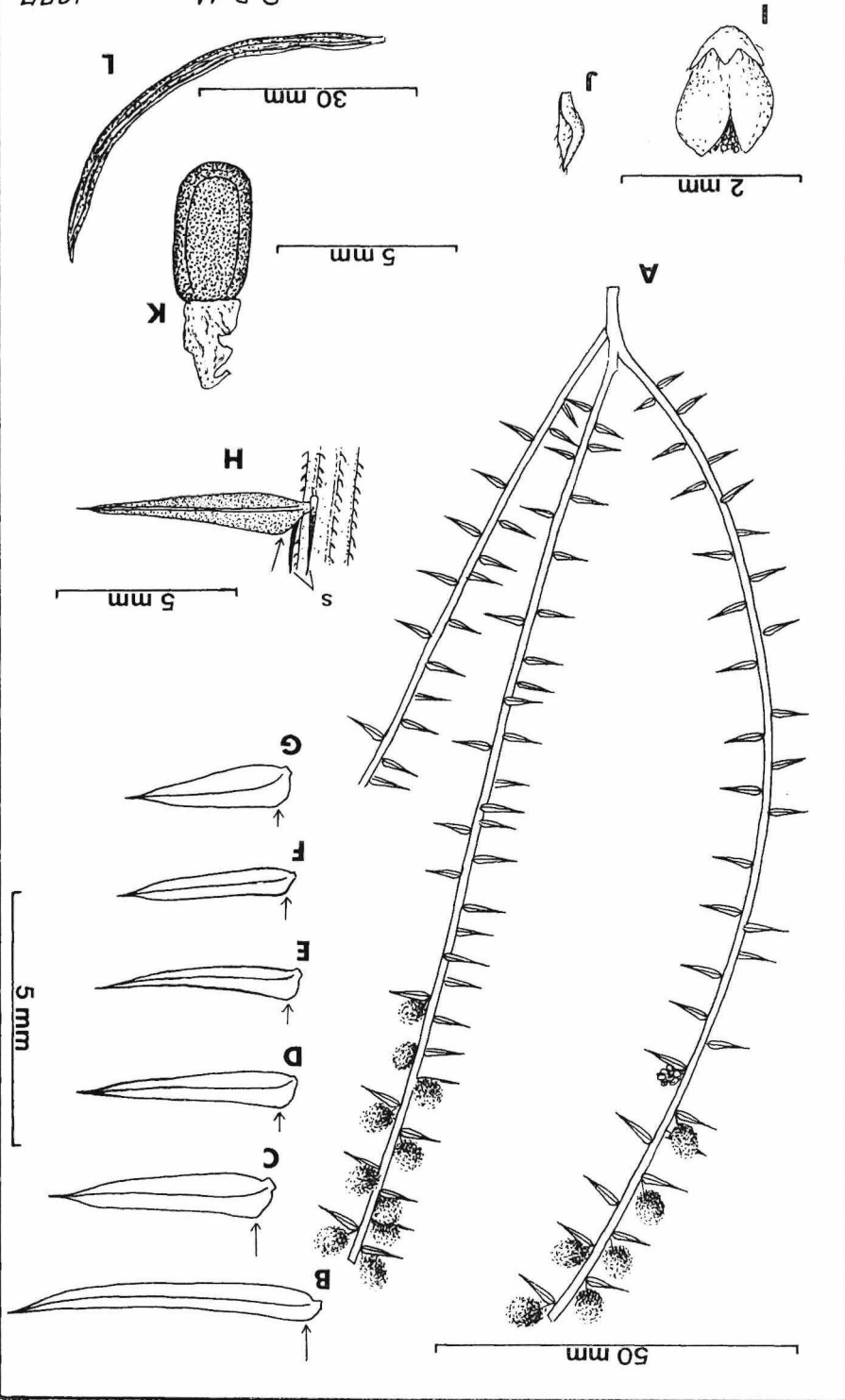
Flowering period: August–October.

Fruiting period: It takes about 14 weeks from anthesis for mature seeds to develop; these have been collected in mid-December.

Figure 8. *Acacia uliginosa*. A—Upper part of branch. B to G—Phyllodes showing shape and size variation (gland position arrowed). H—Node showing ascending stipules (s) and patent, semitrullate phyllode (gland position arrowed). I—Flower. J—Bracteole. K—Seed. L—Legume (terete and longitudinally striate).

A, C and I from B. R. Maslin 3778 (the type); B from B. R. Maslin 474; D from E. M. Scrymgeour 1198; E from B. R. Maslin 2880; F from R. T. Lange 257; G–H, J from B. R. Maslin 3785; K–L from B. R. Maslin 4018.

B R M A S L I N 1 9 7 7



Selected specimens: WESTERN AUSTRALIA: 3 mi (4.8 km) N of Northcliffe, *R. T. Lange* 257 (PERTH); 187 mi peg on Margaret River-Augusta road, *B. R. Maslin* 474 (CANB, NSW, PERTH); Near Augusta, *B. R. Maslin* 2880 (PERTH); 2 km N of Northcliffe towards Manjimup, *B. R. Maslin* 3785 (AD, BRI, G, K, PERTH, RSA); Marbellup, ca. 15 km W of Albany towards Denmark, *B. R. Maslin* 4018 (PERTH); 21 mi (33.5 km) W of Walpole on road to Northcliffe, *E. M. Scrymgeour* 1198 (PERTH).

Acacia horridula var. *hastulatoides* E. Pritzel is treated here as a taxonomic synonym of *A. uliginosa*. Although Pritzel's description is very brief it seems to fit my new species quite well. It is noted that the types of both taxa were collected from the same locality, viz. Marbellup. It is doubtful that the type of var. *hastulatoides* is extant for it is neither at the Botanisches Museum, Berlin (B) nor among the many fragments of Diels and Pritzel specimens held at the Western Australian Herbarium (PERTH).

Acacia uliginosa is placed in the *A. horridula* group (p. 270) and is most closely related to *A. semitrullata* (see p. 285 for details). This species is recognised by a combination of the following characters: phyllodes patent, normally very narrowly triangular, rounded (or sometimes insignificantly angled) on the adaxial margin 0.5–1 mm above the pulvinus; flowering peduncles 1–3 mm long; flower heads globular to slightly obloid (always strictly globular in the other species) with 8–15, pale yellow to cream flowers; petals glabrous and nerveless. Other characters useful in recognising *A. uliginosa* include its normally sparsely puberulous branchlets (hairs normally restricted to branchlet ribs), its relatively small flowers with narrow calyx lobes and its often diffuse, sprawling habit.

This species is of variable habit. Under definite swampy conditions (e.g. Northcliffe-Marbellup) it is a sprawling shrub with weak and slender branches which scramble over (and through) the associated dense vegetation. Further north (e.g. Witchcliffe-Augusta) where less obviously swampy conditions prevail and where the associated vegetation is not as thick, *A. uliginosa* grows as an erect shrub with shorter, more rigid branches which do not scramble over the associated species. Intermediate forms have been observed.

The specific epithet alludes to the species' preference for swampy habitats.

7. *Acacia biflora* R.Br. in Ait. f., Hort. Kew. ed.2, 5:463 (1813)—Figure 9.

Lectotype: "Mimosa scalena Bay I South Coast in coli . . . apric: Jany. 1802" (BM—upper right-hand specimen on sheet bearing Bennett distribution number 4309; iso: K), lecto. nov.

Mimosa biflora (R.Br.) Poir., Encycl. Meth. (Bot.) Suppl. 5:530 (1817)—based on *Acacia biflora* R.Br.

Acacia triangularis Benth. in Endl. *et al.*, Enum. Plant. Hueg. 42 (1837); Bentham, Flora Austral. 2:351 (1864). *Type:* Australia, *Bauer* s.n., ex Herb. Vind. 1837 (holo: K; iso: W).

Shrub 0.3–0.6 (1) m tall, either open and single-stemmed (or sparsely branched at base) with spreading-erect branches, or dense round and intricate (forming clumps to 1.5 m diam.) and much branched at base; *new shoots* light green but tinged red at apex; *branches* greyish; *branchlets* terete, obscurely nerved, sparsely to densely puberulous to shortly pilose (indumentum variable—hairs retrorse to antrorse). *Stipules* narrowly triangular to very narrowly triangular, 1–2.5 (3) mm long, scarious but thickened at base (bases persistent after phyllodes have fallen, scarcely pungent), glabrous or ciliolate, straight or rarely slightly recurved, dark brown. *Phyllodes* obliquely obdelatate to obliquely obtriangular, prominently angled on adaxial margin, 3–7 (8) mm long (as measured along abaxial margin), 3–8 (13) mm wide (as measured along adaxial distal margin), slightly undulate, normally slightly ascending (as indicated by angle of principal nerve with branch), slightly thickened, moderately puberulous or shortly pilose (hairs \pm patent, sometimes tubercule-based),

sometimes glabrous, medium green to dark green or olive green, margins slightly thickened (when dry) and sometimes yellowish; *apical mucro* (terminating principal nerve) pungent, 1–1.5 mm long, straight to slightly recurved, dark brown; *adaxial proximal margin* slightly convex, ascendent and \pm parallel to the branch, (3) 4–10 (15) mm long; *adaxial distal margin* straight to slightly concave, 3–8 (13) mm long; *abaxial margin* convex, 3–7 (8) mm long, often slightly shorter than either of the adaxial margins; *principal nerve* excentric (situated near the abaxial margin), raised (when dry), slightly curved, a second (less obvious) nerve normally arising from adaxial side of principal nerve near its base and extending towards the gland, other lateral nerves absent. *Gland* \pm obliquely situated at apex of adaxial angle of phyllode, circular, < 0.5 mm diam., orifice dark coloured. *Inflorescences* simple, 1 per node; *peduncles* (2) 3–8 mm long, glabrous to sparsely puberulous or shortly pilose; *basal peduncular bracts* solitary; *flower heads* pale cream to white (normally drying orange-brown), with 2 flowers. *Bracteoles* sessile, ovate to oblong, ca. 1 mm long (\pm equal to calyx in length), slightly concave, minutely ciliolate otherwise glabrous, persistent (i.e. present on fruiting receptacles). *Flowers* 4-merous; buds ovoid, attenuate, 2–3.5 mm long; *calyx* $\frac{1}{3}$ length of corolla, divided for ca. $\frac{1}{4}$ its length into broadly triangular ciliolate lobes, 4-nerved (nerves sometimes obscure), tube glabrous; *petals* narrowly ovate to narrowly oblong, 2–3.5 mm long, 3–7-nerved (midrib more prominent than its flanking nerves; all nerves more prominent at apex of petals—especially when dry), glabrous, apex acute and thickened; *ovary* glabrous, minutely stipitate. *Legumes* narrowly oblong but normally slightly curved and sometimes twisted, to 55 mm long, 4–5 mm wide, flat but slightly raised over seed (umbo often pale), glabrous or sparsely puberulous, dark brown to red-brown (green or maroon when young), apex abruptly or gradually narrowed and normally uncinatate, basal stipe \pm absent or to 10 mm long; *margins* thickened (outer edge slightly broader than the inner one), not (or only slightly) contracted between seeds, often pale-coloured. *Seeds* variable, longitudinal in legume, obloid (sometimes almost square in plane view) to slightly ellipsoid, 3–3.5 mm long, 2–3 mm wide, slightly to prominently greyish brown, an obscure dark-coloured band of tissue sometimes extends around the periphery, glossy; *pleurogram* open towards the hilum, sometimes bordered by a band of pale tissue; *areole* slightly or prominently darker than rest of seed, 1.5–2.5 mm long, 1 mm wide; *funicle* filiform and ca. 1 mm long, \pm gradually expanded into a curved or once-folded dull or very slightly shiny yellow *aril* which is frequently greenish near attachment to seed.

Distribution: (Figure 22) South-west Western Australia: Sporadic in southern regions from Albany north to the Mount Barker and Stirling Range districts then east-northeast to near Esperance.

Habitat: Although the species appears to favour well drained sandy soil it has been collected from lateritic gravel. In some places, e.g. near Albany and Mount Barker, *A. biflora* occurs in or near semi-swampy areas in association with *Eucalyptus marginata* and Paper barks (*Melaleuca* sp.). Further east e.g. south of Jerramungup, it occurs in drier habitats in dense harsh sclerophyll scrub.

Flowering and fruiting period: The main flowering period seems to extend from November–December to April–May but some bushes have a few flowers as early as October. Legumes containing mature seeds have been collected from early to mid-December; these bushes also bear the current year's crop of buds, some of which are at anthesis.

Selected specimens: WESTERN AUSTRALIA: Esperance-Kalgoorlie road, 547 mi peg, *H. Demarz* 3639 (PERTH); Swan River, *Drummond* (? coll. 4) no. 2 (BM, K, MEL, PERTH) and coll. 4, no. 3 (BM, K, MEL, PERTH—fragment); Albany, Nov. 1896, *R. Helms* s.n. (PERTH); 19.5 km S of Grass Patch towards Esperance, *B. R. Maslin* 2507 (PERTH); 16 km

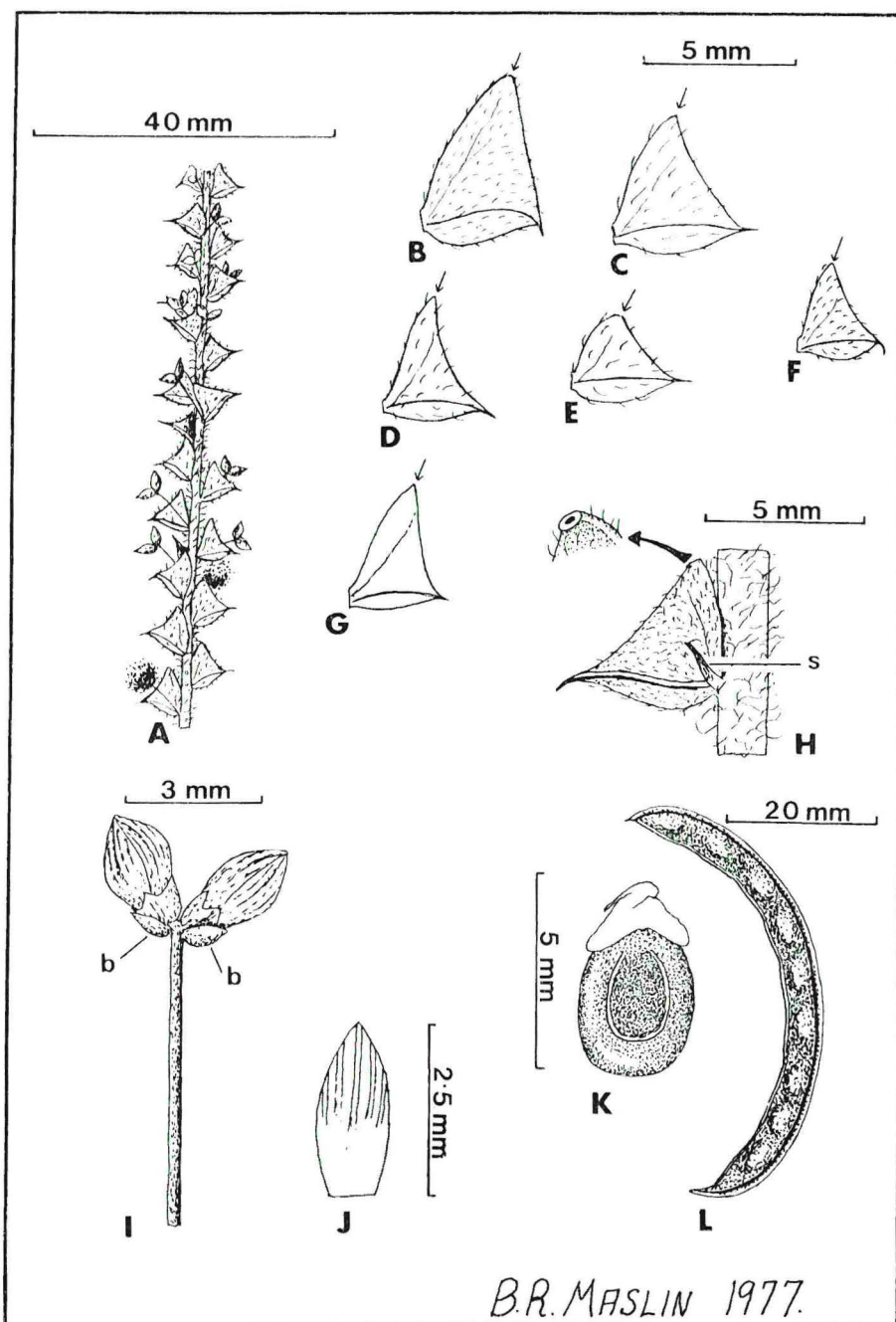


Figure 9. *Acacia biflora*. A—Upper part of branch. B to G—Phyllodes showing shape, size and indumentum variability; gland position arrowed. H—Node with insert showing gland (s = stipule). I—Inflorescence (b = bracteole). J—Petal showing 5 nerves. K—Seed. L—Legume with broad outer margin and narrow inner margin.

A, I–J from B. R. Maslin 3524A; B from B. R. Maslin 2507; C from J. Drummond 2; D from R. Helms s.n.; E from K. Newbey 1328; F from B. R. Maslin 2589; G from H. Demarz 3639; H from B. R. Maslin 4038; K–L from B. R. Maslin 4005.

S of Jerramungup, *B. R. Maslin* 2589 (CANB, K, PERTH); about 24 km N of Albany, *B. R. Maslin* 3524A (PERTH); Albany-Borden road between Stirling and Porongurup Ranges, *B. R. Maslin* 3768 (PERTH); Stirling Range, Red Gum Pass, *B. R. Maslin* 4005 (PERTH); 3 km NE of Pallinup River on Albany-Jerramungup road, *B. R. Maslin* 4036 (PERTH); 26 km S of Jerramungup, *B. R. Maslin* 4038 (PERTH); 10 mi (16 km) N of Mount Groper, *K. Newbey* 1328 (MEL, PERTH).

Manuscripts by Robert Brown at BM contain a description of *Acacia biflora* based on material grown at Kew from seed gathered at "King Georges Sound" but no specimens have been found preserved at BM or K. In the protologue Brown's citation "Nat. of the South-west coast of New Holland. Robert Brown, Esq." implies reference to wild (naturally occurring) material. Accordingly a lectotype has been selected from a sheet of specimens at BM collected by Brown from Bay I, South Coast (i.e. Lucky Bay, east of Esperance). It is noted that the lower right hand specimen on the type sheet (which is pencilled-off from the others) is *A. robiniae* sp. nov. and is simply annotated (not by Brown) "A. biflora R.Br." Without using speculative arguments this specimen cannot be considered a type. Isotypes at Kew are mounted on a sheet with the holotype of *A. triangularis*—see below.

Having compared the lectotype of *A. biflora* R.Br. (1813) at BM with the holotype of *A. triangularis* Benth (1837) at K, I have no hesitation in regarding the latter species as a synonym of the former. *Acacia triangularis* was described from material collected by Ferdinand Bauer in "Australia". Bauer visited Western Australia in 1801–02, and again briefly in 1803, while employed as botanical artist to Matthew Flinders' expedition. Robert Brown was also a member of this expedition. It is interesting to note that the types of both *A. biflora* and *A. triangularis* were probably collected by members of Flinders' expedition and that these species were subsequently described by Brown and Benth at different times and under two different names. This occurred because when Benth described *A. triangularis* as a new species he differentiated it from what he considered to be typical *A. biflora* based on a Hügel specimen also collected at Albany. Although I have not seen Hügel's specimen, it probably represents the taxon I have described below as *A. robiniae* sp. nov. Therefore, Benth misapplied the name *A. biflora* and re-described this species as *A. triangularis*. In 1842 (p. 331) Benth still maintained *A. biflora* and *A. triangularis* as separate species, but in 1864 (p. 351) and 1875 (p. 463) he treated them as conspecific.

Diels and Pritzel (1905, p. 635) list the collection, Pritzel 356, as typical *A. biflora*. I have inspected this gathering in a number of herbaria (B, E, G, K, L, PR) and found it to be *A. robiniae*.

Acacia biflora is a member of the "A. biflora group (p. 270) and is recognised by a combination of the following characters: flower heads pale cream to white and borne on peduncles (2)3–8 mm long; flowers 2 per head; petals 2–3.5 mm long and 3–7-nerved.

The two species with which *A. biflora* is most likely to be confused are *A. chrysocephala* sp. nov. and *A. robiniae* sp. nov. (see discussion below). *Acacia biflora* also has close affinities with *A. mooreana* W. V. Fitzg. and *A. phlebopetala* sp. nov. but is distinguished from both these species by its heads being 2-flowered (see *A. mooreana* and *A. phlebopetala* for further details). All the above species are vegetatively variable and sometimes superficially similar but upon close inspection they can be distinguished quite easily using inflorescence characters.

As indicated above *A. biflora* is closely related to *A. robiniae*. From present indications it appears as though *A. robiniae* is restricted to an area of about 40 km radius from Albany. Although *A. biflora* is more widely distributed (Fig. 22) it does occur within the range of *A. robiniae* but I know of

no area where these species grow sympatrically. The most reliable characters for distinguishing the two species are those of the inflorescence but there are also differences in the phyllodes and seeds. In addition, *A. biflora* flowers mainly in the summer-autumn period while *A. robiniae* flowers later in the year (late autumn to early spring). In *A. biflora* the flower buds are 2–3.5 mm long and ovoid while in *A. robiniae* they are narrower, slightly longer (3–4 mm) and \pm cylindrical to narrowly ovoid—compare Figures 9 and 10. In addition, the petals in *A. biflora* are 3–7-nerved while in *A. robiniae* they are 1-nerved (this character is best observed in dry specimens). Other characters useful in recognising *A. biflora* include its phyllode shape (see below) and indumentum (normally puberulous in *A. biflora*, always glabrous in *A. robiniae*), its longer peduncles ((2) 3–8 mm compared with 1–2.5 mm), and its dull, curved or once-folded aril (waxy looking and once- or twice-folded in *A. robiniae*). Although the phyllodes in both these species vary from obliquely obdeltate to obliquely shallowly obtriangular, the curvature and relative lengths of their margins vary thus producing different shapes—compare Figures 9 and 10. Also, in *A. biflora* the apical mucro is straight or slightly recurved while in *A. robiniae* it is always straight. Finally, in *A. biflora* a second nerve (in addition to the principal nerve) normally diverges from the base of the phyllode and extends towards the gland. This nerve is absent or obscure in *A. robiniae* (except in juvenile foliage).

For much of their range *A. biflora* and *A. chrysocephala* have corresponding distributions and in places e.g. the Stirling Ranges, they grow sympatrically. In the field *A. biflora* is easily distinguished from *A. chrysocephala* by its pale cream to white flower heads (not bright medium golden yellow). Flower heads in dried specimens of *A. chrysocephala* normally retain their original (fresh state) colour but in *A. biflora* they turn orange-brown. Other inflorescence characters useful in distinguishing *A. biflora* include its glabrous, 3–7-nerved petals* (1-nerved and glabrous or hispidulous in *A. chrysocephala*), its flowers always 2 per head (frequently 2 but sometimes 4 per head in *A. chrysocephala*) and its normally longer peduncles. In addition, *A. biflora* can often be distinguished by the following characters: branchlets frequently less prominently ribbed, phyllodes frequently slightly larger and more patent (as indicated by angle of midrib with branch), legumes normally longer and less hairy (N.B. glabrous legumes do occur in both species) and seeds slightly larger.

8. *Acacia robiniae* Maslin sp. nov.—Figure 10.

[*Acacia biflora* auct. non R.Br.: Bentham in Endl. *et al.*, Enum. Plant. Hueg. 41 (1837); Diels and Pritzel, Bot. Jb. 35:635 (1905)—as to Pritzel 356.]
[*Acacia divergens* in sched.—PERTH.]

Frutex ad 0.6 m altus; *ramuli* sparsim ad modice pilosi et/vel antrorse puberuli. *Stipulae* 1.5–2.5 mm longae, basibus persistentibus et \pm pungentibus. *Phyllodia* oblique obdeltata ad oblique late obtriangularia 3–7 (8) mm longa, 3–5 (8–10) mm lata, patentia, pungentia, glabra, nervo principali excentrico. *Pedunculi* 1–2.5 mm longi; *capitula* \pm alba 2 floribus. *Flores* 4-meri; *alabastra* \pm cylindracea ad anguste obloidea, 3–4 mm longa; *calycis* lobi triangulares, *petala* 3–4 mm longa, glabra, 1-nervia. *Legumina* anguste oblonga sed parum curva, ad 60 mm longa, 3–4 mm lata, plana. *Semina* in legumine longitudinalia, 2.5–3 (3.5) mm longa, ca. 2 mm lata, nitida; *arillus* ceraceus.

Type: Mount Manypeak, Western Australia. “Low intricately branched shrub 1–2 ft., flowers white. Granite rocks.” 5 Sept. 1935, C. A. Gardner 3324 (holo: PERTH; iso: BM, CANB, K, PERTH).

* Best to observe apex of petals when dry at not less than x 10 mag.; sometimes the flanking nerves on either side of the central nerve are poorly developed.

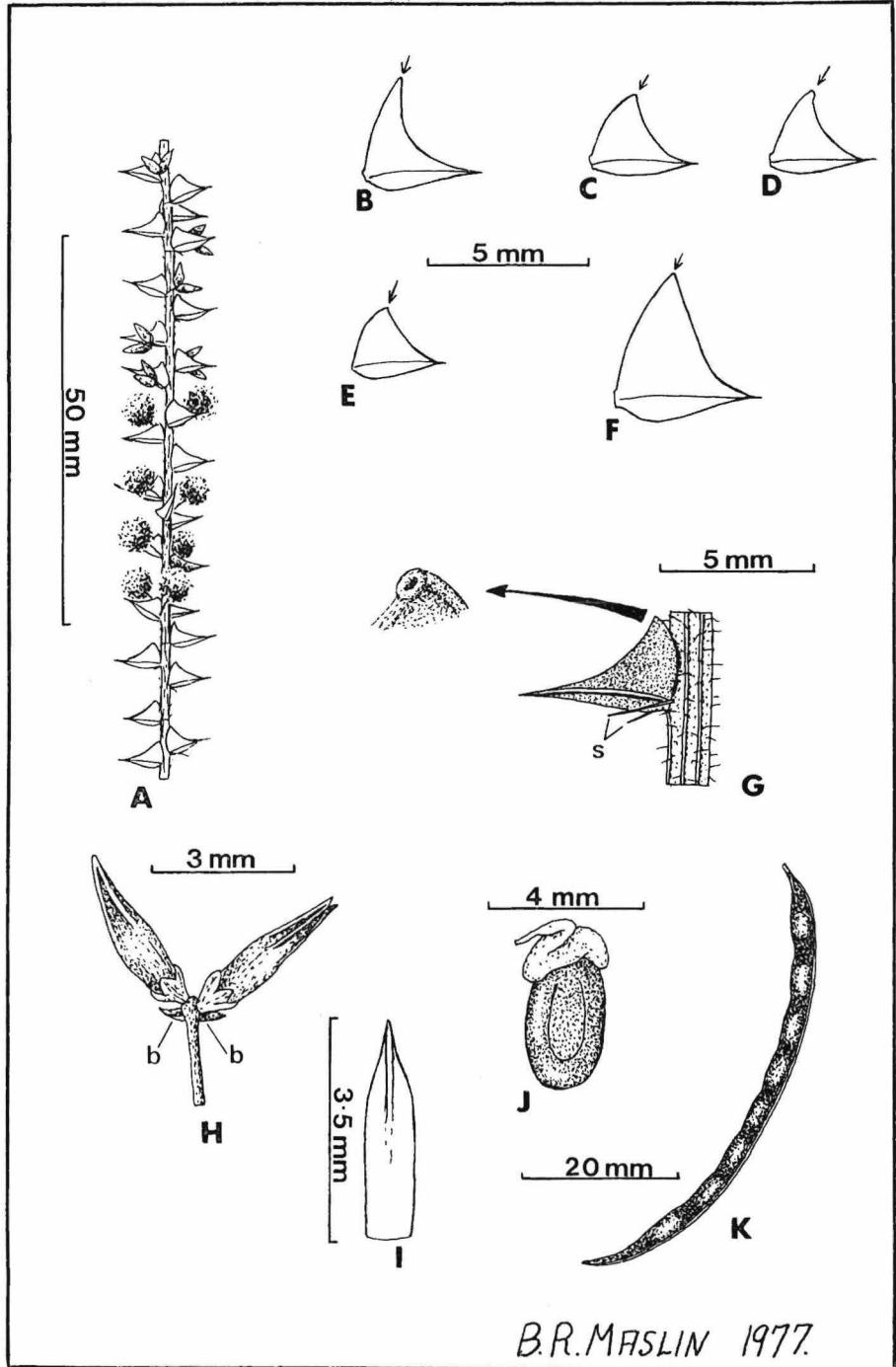


Figure 10. *Acacia robiniae*. A—Upper part of branch. B to F—Phyllodes showing shape and size variation (F—juvenile phyllode); gland position arrowed. G—Node with insert showing gland (s = stipules). H—Inflorescence (b = bracteoles). I—Petal showing prominent central nerve. J—Seed. K—Legume.

A from B. R. Maslin 3781; B, H-I from A. S. George 6328; C from B. R. Maslin 1081; D from A. M. Ashby 4481; E, G from R. D. Royce 4261; F from B. R. Maslin 3766; J-K from B. R. Maslin 2600.

Harsh, spreading, open *shrub* to 0.6 m tall, single-stemmed or much branched near base; bark reddish brown towards base of plant, greenish on branches; *new shoots* light green with phyllode margins reddish; *branchlets* terete, finely ribbed (ribs yellowish), sparsely to moderately shortly pilose and/or antrorsely puberulous, greenish. *Stipules* very narrowly triangular to setaceous, 1.5–2.5 mm long, thickened towards base (persistent stipule bases somewhat pungent), glabrous to sparsely hairy. *Phyllodes* obliquely obdeltate to obliquely shallowly obtriangular (shape somewhat variable but generally rather similar to *A. divergens*), prominently angled on adaxial margin, 3–7 (8) mm long (as measured along abaxial margin), 3–5 (8–10) mm wide (as measured along adaxial proximal margin), slightly undulate, patent (as indicated by angle of principal nerve with branch), glabrous, dark green; *apical mucro* (terminating principal nerve) pungent, 1–1.5 mm long, straight, brown; *adaxial proximal margin* convex, ascendent and \pm parallel to branch, 3–5 (8–10) mm long; *adaxial distal margin* \pm concave, 3–7 (9) mm long; *abaxial margin* convex, 3–7 (8) mm long; *principal nerve* excentric, slightly curved, raised (when dry), secondary nerve (arising from adaxial side of principal nerve near its base) obscure or absent (more obvious on juvenile plants); *pulvinus* obscure. *Gland* obliquely situated at apex of adaxial angle of phyllode, circular, \leq 0.5 mm diam., orifice dark coloured. *Inflorescences* simple, 1 per node; *peduncles* 1–2.5 mm long, glabrous or sometimes glabrescent; *basal peduncular bracts* 2, unequal; *flower heads* \pm white, with 2 flowers. *Bracteoles* sessile, ovate, 0.5 mm long (shorter than calyx), concave, minutely ciliolate otherwise glabrous. *Flowers* 4-merous; buds \pm cylindrical to narrowly ovoid, 3–4 mm long, straight or sometimes curved at apex, prominently attenuate, minutely pedicellate; *calyx* $\frac{1}{4}$ length of corolla, divided for $\frac{1}{4}$ – $\frac{1}{2}$ its length into broadly triangular ciliolate lobes, tube glabrous and obscurely 4-nerved; *petals* narrowly oblong but narrowed involute and thickened at apex, 3–4 mm long, reflexed at anthesis, glabrous, 1-nerved (nerve thickened and prominent at apex of petals—when dry); *ovary* glabrous, minutely stipitate. *Legumes* narrowly oblong but slightly curved and sometimes slightly twisted, to 60 mm long, 3–4 mm wide, flat but slightly raised over seeds (umbo yellow), glabrous, dark brown, apex acute and slightly uncinuate, basal stipe short; *margins* thickened (outer edge broader than the inner one), not (or only slightly) contracted between seeds, pale-coloured. *Seeds* longitudinal in legume, obloid, 2.5–3 (3.5) mm long, ca. 2 mm wide, pure dark brown (greyish brown before maturity), glossy; *pleurogram* with a narrow opening towards the hilum; *areole* ca. 2.5 mm long and 1 mm wide, not darker than rest of seed; *funicle* filiform and 0.5–1 mm long, abruptly expanded into a once- or twice-folded shiny (waxy looking) *aril* which at first is pale yellow but then darker (sometimes drying orange) towards attachment to seed.

Distribution: (Figure 23) South-west Western Australia: Restricted to the Albany district from Marbellup (15 km west of Albany) to Mount Manypeaks (about 40 km due northeast of Albany).

Habitat: Most collections of this species have been made from laterite or sand over laterite in open-forest dominated by *Eucalyptus marginata* and species of *Casuarina* and *Banksia*. Some of the sandy areas where *A. robiniae* grows are seasonally wet. At the eastern limit of its known range (i.e. Mount Manypeaks) the species is recorded from granite rocks.

Flowering and fruiting period: Flowers from May to August–September. Legumes with mature seeds have been collected in mid-December.

Selected specimens: WESTERN AUSTRALIA: Without details, mounted with type of *A. biflora* (BM); Albany, *A. M. Ashby* 4481 (PERTH); Mount Gardner, east of Albany, *A. S. George* 6328 (PERTH); 9 mi (14.5 km) NE of Albany on the road to Jerramungup, *B. R. Maslin* 1081 (PERTH); Eastern side of Oyster Harbour, Albany, *B. R. Maslin* 2600 (PERTH); Western

side of Oyster Harbour, Albany, *B. R. Maslin* 3766 (PERTH); Marbellup, ca. 15 km W of Albany towards Denmark, *B. R. Maslin* 3781 (PERTH); District south-west Plantagenet, *E. Pritzel* 356 (B, BM, E, G, K, L, PR); 2 mi. (3.4 km) E of King River, *R. D. Royce* 4261 (PERTH).

As noted on p. 291, there is an unlabelled specimen of *A. robinae* on the type sheet of *A. biflora* at BM. It is probable that Brown had in mind both species when he published the name *A. biflora*. The problems involved in typifying Brown's *Acacia* names published in Aiton's *Hortus Kewensis* will be the subject of a forthcoming paper by the present author.

Acacia robinae is placed in the *A. biflora* group (p. 270) and is distinguished by a combination of the following characters: flower heads more or less white and borne on very short peduncles 1–2.5 mm long; flowers 2 per head; flower buds 3–4 mm long, cylindrical to narrowly ovoid and prominently attenuate. This species appears most closely allied to *A. divergens*, *A. phlebopetala* and *A. biflora*. From the first two species *A. robinae* is readily distinguished by its flower heads consisting of 2 flowers and from the last species by its narrower and slightly longer flower buds and 1-nerved petals (see *A. divergens*, *A. phlebopetala* and *A. biflora* for further details).

This species is named in honour of my friend, Miss Robin Wilkie, in appreciation of her technical assistance especially during my 1975 tour of Europe where numerous *Acacia* collections were examined.

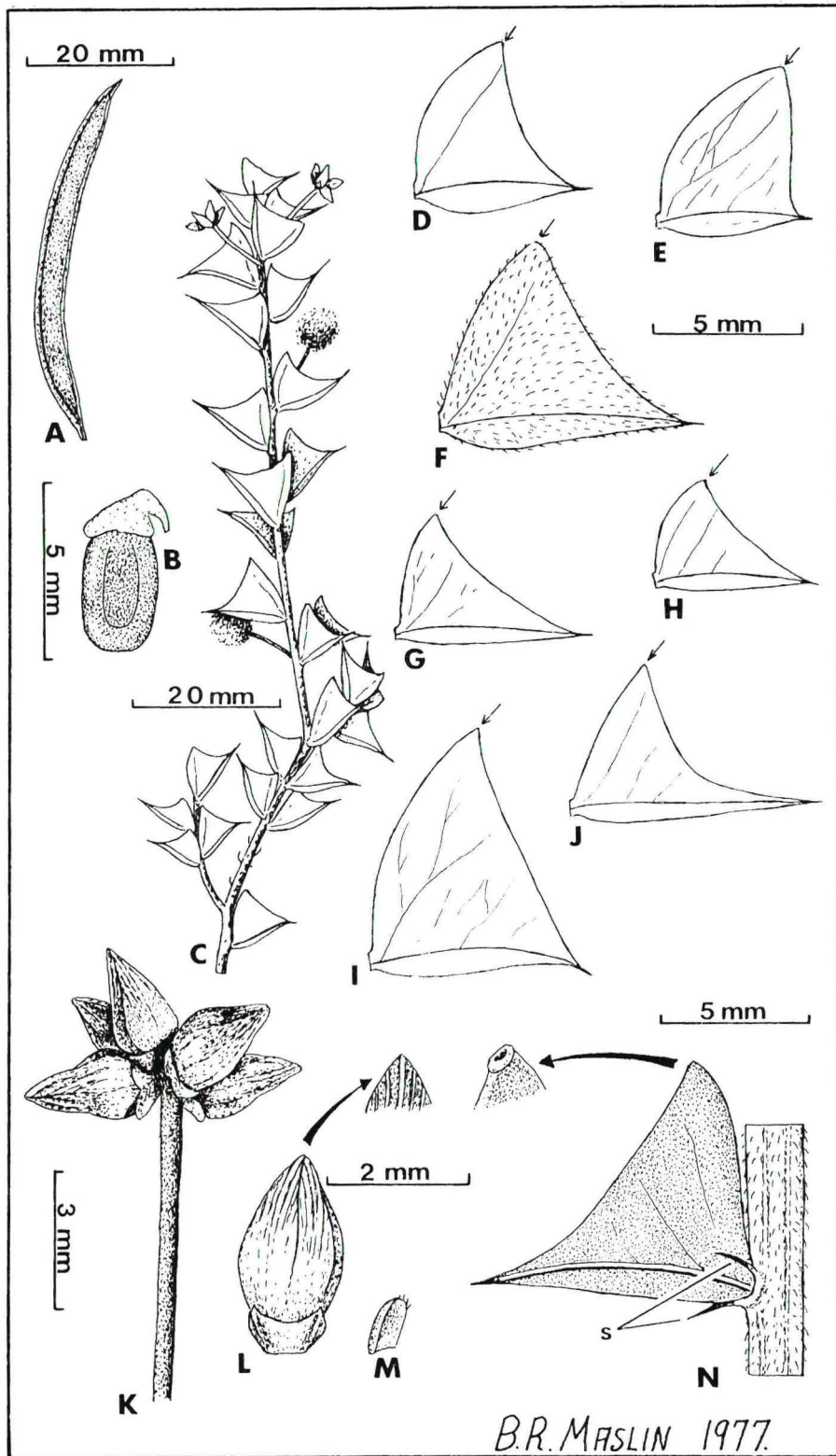
9. *Acacia phlebopetala* Maslin sp. nov.—Figure 11.

[*Acacia biflora* in sched.—PERTH.]

Frutex 0.4–1 (1.5) m altus; *ramuli* pilosi. *Stipulae* 2–3.5 mm longae. *Phyllodia* ± oblique obdeltata ad ± oblique late obtriangularia, 5–10 mm longa, 5–11 (18) mm lata, glabra vel puberula, pungentia, nervo principali excentrico. *Pedunculi* 7–12 mm longi; *capitula* eborina, globulosa, 4–6 floribus. *Flores* 4-meri; *calycis* lobi triangulares; *petala* 2.5–3 mm longa, 3–7-nervia. *Legumina* anguste oblonga sed ± curva, 35–70 mm longa, 3–5 mm lata, plana. *Semina* in legumine longitudinalia, obloidea ad ellipsoidea, 2.5–4 mm longa, 2 (2.5) mm lata, nitida.

Type: 24.1 mi (39 km) E of Ravensthorpe, Western Australia. "A fairly dense bush, 90 cm high and 1.5 m across, with long branchlets and cream-coloured flowers. Growing only at edge of road. Soil grey sand. Vegetation very diverse heath with *Banksia*, *Adenanthos*, mallee eucalypts, etc." 29 July 1976, *M. E. Trudgen* 1708 (holo: PERTH; iso: CANB, K, MEL, NSW, NY, PERTH).

Shrub either spindly, erect, openly branched and 0.4–1 (1.5) m tall, or rather dense and spreading to 0.6 m tall and ca. 1–1.5 m diam. and with main branches ± prostrate; *bark* grey or sometimes brownish grey, smooth but sometimes finely longitudinally fissured; *new shoots* light green but reddish on very young phyllodes and also margins of slightly more mature ones; *branchlets* terete, finely ribbed (ribs often obscure), hairy (hairs patent or retrorse). *Stipules* narrowly triangular to setaceous, 2–3.5 mm long, scarious to ± rigid, thickened especially at base (stipule bases often persistent on old wood after phyllodes have fallen, sometimes ± pungent), straight or very slightly recurved, glabrous or sparsely ciliolate, brown. *Phyllodes* variable in shape, ± obliquely obdeltate to ± obliquely shallowly obtriangular, prominently angled on adaxial margin, 5–10 mm long (as measured along abaxial margin), 5–11 (18) mm wide (as measured along adaxial distal margin), ± rigid, ± undulate, patent to slightly ascending (as indicated by angle of principal nerve with branch), somewhat congested at ends of branches, somewhat fugaceous, glabrous or puberulous, olive green to dark green, margins very slightly thickened and ± yellowish; *apical mucro* (terminating principal nerve) pungent, 1–2 mm long, straight, dark brown; *adaxial proximal margin*



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convex, ascendent and \pm parallel to branch, 5–10 mm long; *adaxial distal margin* \pm straight to slightly concave, 5–11 (18) mm wide; *abaxial margin* \pm straight to convex, 5–10 mm long; *principal nerve* excentric (situated near abaxial margin), straight to slightly curved, raised (when dry), often \pm yellowish, a second (less obvious) nerve arising from adaxial side of principal nerve near its base and extending towards the gland, other lateral nerves arising from adaxial side of principal nerve few obscure and sometimes sparsely anastomosing; *pulvinus* obscure (< 0.5 mm long), dilated at base. *Gland* obliquely situated at apex of adaxial angle of phyllode, circular, ca. 0.5 mm diam., lip yellow, orifice well defined. *Inflorescences* simple, 1 per node, often not numerous; *peduncles* 7–12 mm long, glabrous or puberulous; *basal peduncular bracts* ovate, 2 but the outer one (which is $\frac{1}{3}$ as long as inner one) often caducous, inner bract 1–1.5 mm long; *flower heads* creamy white, globular, with 4–6 flowers. *Bracteoles* sessile, ovate (sometimes nearly oblong), 1 mm long, concave, sparsely ciliolate, otherwise glabrous, somewhat persistent (i.e. often present on fruiting receptacles). *Flowers* 4-merous; buds somewhat attenuate; *calyx* $\frac{1}{3}$ – $\frac{1}{4}$ length of corolla, divided for $\frac{1}{4}$ – $\frac{1}{3}$ its length into broadly triangular sparsely ciliolate lobes, nerveless to obscurely 4-nerved, slightly angular (when dry), tube glabrous; *petals* 2.5–3 mm long, connate for up to $\frac{1}{3}$ their length but readily separating, glabrous, 3–7-nerved (midrib more prominent than flanking nerves; all nerves more prominent at apex of petals than near base and more prominent when dry); *ovary* minutely stipitate (stipe ca. 0.5 mm long), glabrous. *Legumes* narrowly oblong but \pm curved and often twisted, to 35–70 mm long, 3–5 mm wide, hard and brittle, flat, barely raised over seeds, sometimes hooked at apex, glabrous or puberulous, greyish to dark brown (almost black), basal stipe 1–2 mm long; *margins* thickened (outer edge broader than the inner one), not (or slightly) contracted between seeds, pale. *Seeds* longitudinal in legume, obloid to ellipsoid, 2.5–4 mm long, 2 (2.5) mm wide, medium brown to almost black (greyish brown prior to maturity), often with an obscure dark peripheral band, glossy; *pleurogram* fine, open towards the hilum, sometimes bordered by a narrow band of yellowish tissue; *areole* 1.5–3 mm long, ca. 1 mm wide, frequently very slightly darker than rest of seed; *funicle* filiform, \pm abruptly expanded into a fleshy \pm obliquely conical once- or twice-folded yellow aril.

Acacia phlebopetala is placed in the *A. biflora* group (p. 270) and is distinguished by a combination of the following characters:—flowers creamy white, 4–6 per head and aggregated on peduncles 7–12 mm long, petals 2.5–3 mm long and 3–7-nerved. The three species to which *A. phlebopetala* appears most closely related are *A. biflora*, *A. robiniae* and *A. divergens*. Vegetatively the four taxa often look rather similar but their inflorescences are quite different. From the first two species *A. phlebopetala* is readily distinguished by its 4–6 flowers per head (2 per head in *A. biflora* and *A. robiniae*) and its frequently larger phyllodes and longer peduncles. From *A. divergens*, *A. phlebopetala* is distinguished by its larger, paler yellow flowers which are normally less numerous in the heads, its longer, 3–7-nerved petals (1-nerved in *A. divergens*) and its broader legumes. Also *A. phlebopetala* is a slightly smaller shrub than *A. divergens*, its branches are frequently more hairy and less obviously nerved,

Figure 11. *Acacia phlebopetala*. (All drawn from the "typical variant" of var. *phlebopetala* unless otherwise stated.) A—Legume with broad outer margin and narrow inner margin. B—Seed. C—Upper part of branch. D to J—Phyllodes showing variation in shape, size and indumentum (D and E—var. *phlebopetala* "maritime variant"; F—var. *pubescens*); gland position arrowed. K—Inflorescence. L—Flower with insert showing apex of petal with 5 nerves. M—Bracteole (side view). N—Node with insert showing gland (s=stipules).

A–B, J from B. R. Maslin 4048; C, K, M from A. S. George 7616; D from B. R. Maslin 3882; E from B. R. Maslin 4058; F (var. *pubescens*) from B. R. Maslin 4057 (the type); G, L from M. E. Trudgen 1708 (the type); H, N from B. R. Maslin 2557; I from A. S. George 3668.

the adaxial distal margins of its phyllodes are often less obviously concave and its seeds are slightly larger and darker. Distributionally the two species are well separated (Figure 22).

Acacia phlebopetala is rather polymorphic and two varieties are recognised here with the typical one containing two distinct variants.

Key to varieties:

- 1a. Phyllodes, peduncles and legumes glabrous var. **phlebopetala**
- b. Phyllodes, peduncles and legumes minutely puberulous var. **pubescens**

9a. var. *phlebopetala*—Figure 11.

Shrub 0.4–0.6 (1.3) m tall, either spindly, erect, open (with foliage restricted to upper portions of branches) and single-stemmed to moderately branched at base (“typical variant”) or dense (foliage \pm to ground), much branched, spreading (with main branches \pm prostrate) and forming clumps ca. 1–1.5 m diam. (“maritime variant”); *branchlets* puberulous to strigose with \pm retrorse hairs (“typical variant”) or moderately to densely puberulous to shortly villous with \pm patent hairs (“maritime variant”). *Phyllodes* \pm obliquely obdeltate to \pm obliquely shallowly obtriangular, 6–10 mm long, 6–11 (18) mm wide, glabrous. *Peduncles* glabrous. *Legumes* to 35–55 (70) mm long, (3) 3.5–5 mm wide, glabrous. *Seeds* 2.5–3.5 mm long, brown to almost black; *areole* 1.5–2 mm long.

Distribution: (Figure 22) South-west Western Australia: Pallinup River east-northeast to Munglinup (80 km east of Ravensthorpe towards Esperance).

Habitat: As noted below, two variants of var. *phlebopetala* are recognised here. One is restricted to coastal and near coastal areas from the Pallinup River to the Hamersley River (the “maritime variant”) while the other extends further inland from East Mt Barren to Munglinup (the “typical variant”). The “maritime variant” occurs in closed-heath or open-heath in shallow sand over quartzite on cliffs or in deep sand on stabilised dunes. Some of the associated species include *Acacia cedroides*, *A. cochlearis*, *Pimelea ferruginea*, *Platysace compressa*, *Templetonia retusa* and *Westringia dampieri*. This variant has also been recorded from some coastal creeks where it grows in sand or silt in closed-scrub dominated by *Eucalyptus eremophila*. The “typical variant” grows in sand in high-shrubland often dominated by *Eucalyptus tetragona*. The understory consists of low, harsh, sclerophyll scrub which includes species such as *Daviesia teretifolia*, *Grevillea hookerana* and *G. patentiloba*.

Flowering and fruiting period: This variety often has two flowering periods. The first is in June and July while the second occurs from December to February. Legumes with mature seeds have been collected in November and December. Sometimes these legumes are present on the bushes at the same time as the next season’s flowers reach anthesis.

Selected specimens: WESTERN AUSTRALIA: East Mount Barren, *A. S. George* 3668 (PERTH); 24 mi (38.5 km) E of Ravensthorpe, *A. S. George* 7616 (PERTH); 18 km W of Munglinup (Ravensthorpe-Esperance road), *B. R. Maslin* 2557 (PERTH); Fitzgerald River National Park, *B. R. Maslin* 3882 and 4058 (PERTH); About 2.5 km due NW of No Tree Hill, 20 km due NW of Hopetoun, *B. R. Maslin* 4048 (PERTH).

Within var. *phlebopetala* two variants are recognised and these can generally be distinguished by a combination of branch indumentum and habit (see description above). The “typical variant” extends inland from East Mount Barren to the Munglinup district (80 km E of Ravensthorpe) while the “maritime variant” occurs on (or near) coastal cliffs and dunes between the Pallinup and Hamersley Rivers.

9b. var. pubescens Maslin var. nov.—Figure 11.

Frutex ad 1 (1.5) m altus, diffusus; *ramuli* dense puberuli. *Phyllodia* 5–8 mm longa, 5–8 mm lata, puberula. *Pedunculi* puberuli. *Legumina* puberula.

Type: Fitzgerald River National Park, western side of Whoogarup Range, Western Australia. "Open shrub to 1 m tall; young phyllodes light green with red margins; most plants in bud; flowers creamy white; legumes straight or twisted at maturity. Scattered but common along water course." 15 Dec. 1975, *B. R. Maslin* 4057 (holo: PERTH; iso: CANB, K).

Spindly, erect, open *shrub* to 1 (1.5) m tall, single-stemmed or sparsely branched at base, foliage restricted to upper portions of the slender branches; *branchlets* densely puberulous (hairs patent); *phyllodes* slightly obliquely obdeltate or shallowly obdeltate, 5–8 mm long, 5–8 mm wide, slightly thickened, uniformly puberulous (hairs fine and minute). *Peduncles* sparsely to moderately puberulous. *Legumes* to 70 mm long, 4 mm wide, pendulous, puberulous. *Seeds* 3–4 mm long, medium to dark brown; *areole* 2–3 mm long.

Distribution: (Figure 22) South-west Western Australia: Known only from the Fitzgerald River National Park in the vicinity of Whoogarup Range.

Habitat: Clay soil along water courses in open-scrub dominated by mallee eucalypts with a dense ground cover consisting of sclerophyll shrubs.

Flowering and fruiting period: Because of the few collections it is difficult to accurately establish the range of flowering and fruiting for var. *pubescens*. The main flowering season seems to occur in December-January but some bushes have been observed with a few flowers at anthesis as early as October. Legumes containing mature seeds have been collected in December (when plants are in full flower). It is not known whether these legumes are a result of the previous January's flowering period or whether a second flowering period occurs in the middle of the year as often happens in the typical variety.

Selected specimens: WESTERN AUSTRALIA: Whoogarup Range, *A. S. George* 1901 (PERTH); Fitzgerald River National Park, western lower slopes of Whoogarup Range, *B. R. Maslin* 3879 (MEL, PERTH).

Except for its minutely puberulous phyllodes, peduncles and legumes, var. *pubescens* is very similar to var. *phlebotepala*. In the region of the Whoogarup Range (the only area known for var. *pubescens*) the two varieties grow a mile or so apart. Morphological intermediates have not been observed.

10. *Acacia divergens* Benth., London J. Bot. 1:331 (1842)—Figure 12.

Type: Vasse River, *Mrs Molloy* (holo: K; iso: CGE—see discussion below)

Acacia divergens Benth. var. *hirsuta* Domin, Mém. Soc. Sci. Bohême 1921–1922, 2:44 (1923), *synon. nov.* *Type:* Yallingup and Cape Naturaliste, *A. A. Dorrien-Smith* s.n. (holo: K—sheet incorrectly annotated by Domin as "*Acacia decipiens* v. *hirsuta*", see discussion below). *Acacia divergens* Benth. forma *pauciflora* Domin, l.c.—nom.nud.

Harsh, diffuse, erect, single-stemmed *shrub* to 2.3 m tall, much branched but terminal branches often relatively long and undivided and frequently tending to arch downwards; *bark* smooth, grey or brown; *new shoots* light green but tinged with red at apex; *branchlets* finely ribbed (ribs yellow), rather angular towards apex, glabrous to moderately short pilose or sparsely antrorsely puberulous. *Stipules* persistent, subulate to very narrowly triangular, 2–4 mm long, spreading, normally rigid and often pungent, sometimes ± scarious, brown (yellowish at base). *Phyllodes* obliquely shallowly obdeltate to obliquely shallowly obtriangular, prominently angled on adaxial margin, 6–10 mm long (as measured along abaxial margin), 3–8 (10) mm wide (as measured along adaxial proximal margin), very slightly undulate, patent to slightly ascending

(as indicated by angle of principal nerve with branch), glabrous or rarely sparsely puberulous on midrib and margins, dark green, margins slightly thickened (when dry) and frequently yellowish (red when young); *apical mucro* (terminating principal nerve) pungent, 1–1.5 mm long, straight, brown; *adaxial proximal margin* \pm straight to convex, ascendent and \pm parallel to branch, 3–8 (10) mm long; *adaxial distal margin* concave, 5–10 mm long; *abaxial margin* straight to slightly convex, 6–10 mm long; *principal nerve* excentric (situated near abaxial margin), \pm straight, prominently raised (when dry), 1 (2) obscure nerves normally arising from near base of principal nerve and extending towards the gland (these secondary nerves sometimes bifurcate), other lateral nerves few or absent; *pulvinus* \pm absent. *Gland* obliquely situated at apex of adaxial angle of phyllode, circular, 0.3–0.5 mm diam., lip slightly raised and yellow, orifice shallow. *Inflorescences* simple, 1 (rarely more) per node; *peduncles* 3.5–10 mm long, glabrous or sometimes sparsely antrorsely puberulous; *basal peduncular bracts* 2, ovate, inner bract (0.5 mm long) ca. twice as large as the outer; *flower heads* globular, cream to pale yellow, with (4) 5–10 flowers. *Bracteoles* \pm sessile, broadly oblong to broadly elliptic, ca. 0.5 mm long, slightly concave, sparsely minutely ciliolate otherwise glabrous. *Flowers* 4-merous; buds obtuse or sometimes abruptly contracted into a short apical point; *calyx* ca. $\frac{1}{4}$ length of corolla, divided for about $\frac{1}{4}$ its length into obtuse or broadly triangular sparsely ciliolate lobes, tube angular (when dry) nerveless and glabrous; *petals* 1–1.7 mm long, free to base, glabrous, obscurely 1-nerved; *ovary* minutely stipitate, glabrous. *Legumes* narrowly oblong but curved and often slightly twisted (especially after dehiscence), to 70 mm long, 2–3 mm wide, firmly chartaceous yet somewhat brittle, flat but very slightly raised over seeds (umbo oblong and pale), glabrous, dark brown to black, tapered at both ends; *margins* thickened (outer edge slightly broader than the inner one), slightly contracted between seeds, light brown to yellow. *Seeds* longitudinal in legume, obloid to slightly ellipsoid, 2.5–3 mm long, 1.5 mm wide, medium brown (light greyish brown before maturity), with a dark coloured band around periphery; *pleurogram* with a narrow opening towards the hilum; *areole* 2–2.5 x ca. 1 mm, very slightly darker than rest of seed (excluding periphery); *funicle* filiform (ca. 0.5 mm long) and reflexed below a curved or once-folded cream slightly shiny (when dry) *aril* which is tinged orange at point of attachment to seed.

Distribution: (Figure 22) South-west Western Australia: Most collections of this species have been made from Perth south to near Augusta then east to the Stirling Range. However, there are two gatherings from north of Perth viz. Wongan Hills (Gilbert 188) and near Walebing (Blackall s.n.).

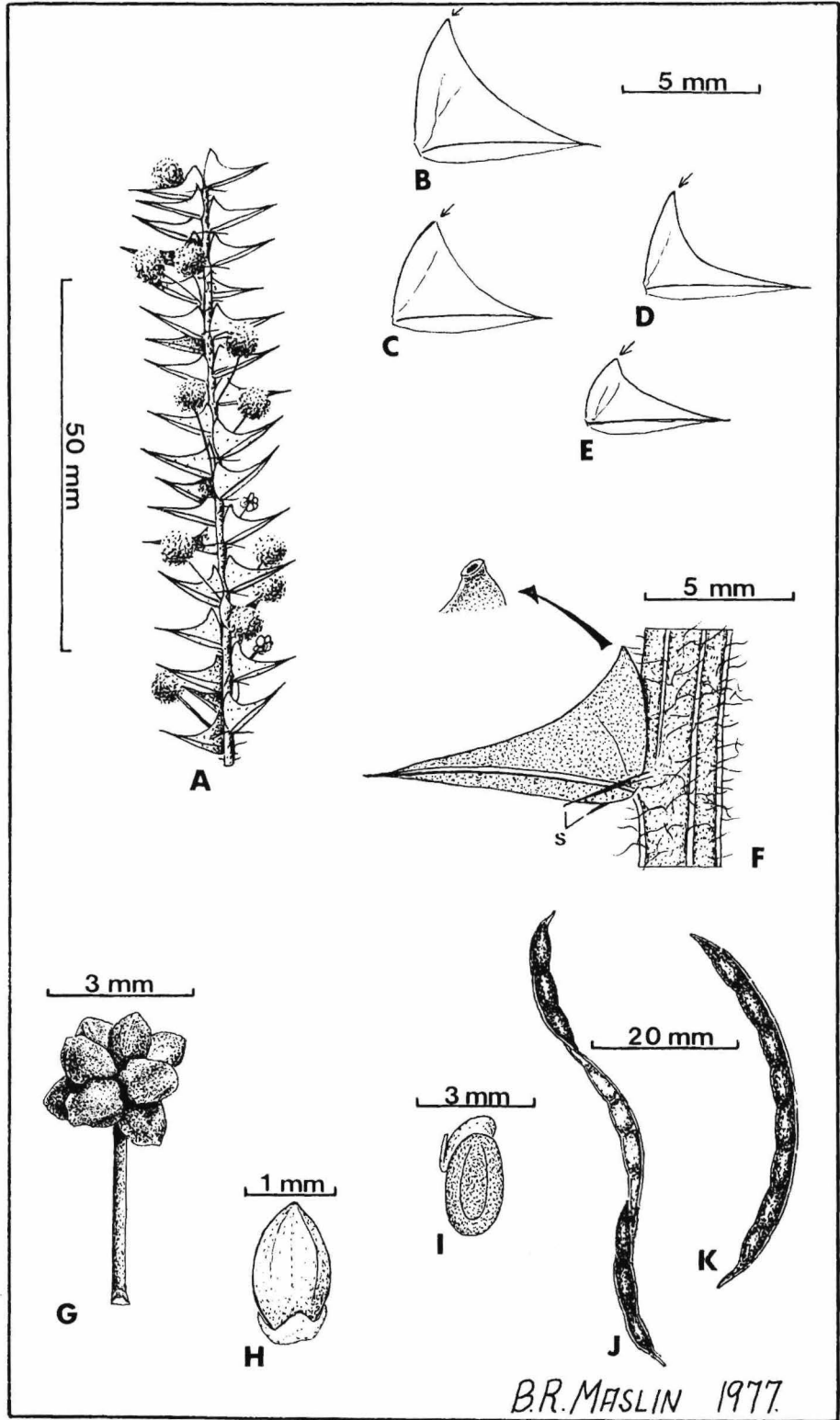
Habitat: Normally occurring along creeks and near swamps in open-forest dominated by *Eucalyptus marginata* but also occurring in loamy laterite away from these moist areas. Other *Eucalyptus* species recorded in association with *A. divergens* are *E. calophylla*, *E. diversicolor* and *E. megacarpa*. Around Augusta *A. divergens* occurs in coastal heath in sand over limestone.

Flowering and fruiting period: Normally flowering from late August to November but the Walebing specimen (see above) was flowering in June. Both mature and immature legumes have been seen in mid-December.

Selected specimens: WESTERN AUSTRALIA: 8 km S of Walebing, 20 km E of Moora, June 1932, W. E. Blackall s.n. (PERTH); Mt. Toolbrunup [Stirling Range], A. A. Dorrien-Smith s.n. (K); Swan River, Drummond coll.2, no. 159 (BM, CGE, E, G, G-DC, K, MEL, P, PERTH: often simply given as "159"); Western Australia, Drummond 168 (MEL); 4 mi

Figure 12. *Acacia divergens*. A—Upper part of branch. B to E—Phyllodes showing shape and size variation; gland position arrowed. F—Node with insert showing gland (s = stipules). G—Inflorescence. H—Flower. I—Seed. J—Legume valve (dehiscid). K—Legume (not dehiscid).

A from F. M. C. Schock 72; B from S. Paust 154; C from B. R. Maslin 2806; D from A. Morrison s.n.; E, G from B. R. Maslin 3792; F from P. G. Wilson 3725; H from A. R. Fairall 622; I–K from B. R. Maslin 4014.



(6.4 km) W of Denmark on Manjimup road, *A. R. Fairall* 622 (PERTH); Blackwood River, Western Australia, *J. Forrest* s.n. (MEL); Wangan [Wongan] Hills, *Gilbert* 188 (BM); Meelup, near Cape Naturaliste, *B. R. Maslin* 2806 (ADW, PERTH); 8.5 km S of Witchcliffe on Bussel Highway, *B. R. Maslin* 3792 (K, PERTH); Stirling Range, Chester Pass, *B. R. Maslin* 4014 (PERTH); Ellens Peak [Stirling Range], 18 Oct. 1902, *A. Morrison* s.n. (K, PERTH); Just north of Ellen Brook on Caves Road, west of Gracetown, *S. Paust* 154 (PERTH); Near Warren River, *F. M. C. Schock* 72 (PERTH); Darling Range, near Waroona Dam, ca. 6 km E of Waroona, *P. G. Wilson* 3725 (NSW, PERTH).

The designation of a type for *A. divergens* poses some difficulties. In the protologue it is given simply as "Vasse River, Mrs Molloy". The description deals mostly with vegetative characters but some reference is made to the inflorescences and legumes. At Kew (K) and Cambridge (CGE) there are specimens of *A. divergens* which can be regarded as part of the type. These are labelled Vasse River, Mrs. Molloy and are vegetative except for some persistent fruiting peduncles. In addition, the Cambridge specimen has a legume valve on the sheet but not actually attached to the receptacle. Bentham has annotated the Kew specimen "*Acacia divergens*" but there is no indication that he saw the Cambridge one. Although it is possible that flowering type material of *A. divergens* is extant, this is not very probable. It is likely that the inflorescences described in the protologue were very young (because Bentham did not describe the individual flower parts as he normally did) and that these have been knocked off the surviving specimens. Therefore, on this basis I have determined the Kew specimen as the holotype of *A. divergens* and Cambridge one an isotype.

In 1923 Domin described *A. divergens* var. *hirsuta* from material collected by Captain A. A. Dorrien-Smith from "Yallingup and Cape Naturaliste". This variety was distinguished from the typical variety by its hirsute branches and branchlets. I have looked for the type of var. *hirsuta* at both Kew (K) and Prague (PR), these being the two most likely herbaria at which it would be housed. No type was found at Prague but at Kew there is a specimen which accords with Domin's very brief protologue. This sheet bears the type annotation except that Domin has written the specific epithet as "decipiens" (instead of "divergens"). As both these species occur in the *Uninerves-Triangulares*, I regard Domin's annotation as an unintentional error. The Kew specimen is therefore treated as the holotype of *A. divergens* var. *hirsuta*. Having now studied the variation in *A. divergens*, I see no justification in maintaining var. *hirsuta* as a distinct taxon. Both hairy and glabrous individuals occur throughout the range of this species.

Based on its overall gross morphology (including pollen characters—Ph. Guinet, pers. comm.) *A. divergens* is placed in the *A. biflora* group (p. 270). However, it is noted that in two inflorescence characters, i.e. (4) 5–10 flowers per head and normally obtuse flower buds, it has affinities with the *A. truncata* group (p. 271). *Acacia divergens* is distinguished from the other members of the *A. biflora* group by a combination of the following characters: heads of (4) 5–10, cream to pale yellow flowers borne on peduncles 3.5–10 mm long; petals 1–1.7 mm long and obscurely 1-nerved; flower buds obtuse or sometimes abruptly contracted at apex (not significantly attenuate). The species grows taller than the other members of the *A. biflora* group, reaching 2.3 m in height. Other characters useful in recognising *A. divergens* include its finely ribbed branchlets (ribs yellow), its often pungent stipules, its phyllodes with acuminate pungent apices, conspicuous gland-bearing angles and concave adaxial distal margins, its relatively narrow legumes (2–3 mm wide) and its small seeds (2.5–3 x 1.5 mm).

The two species to which *A. divergens* seems most closely related are *A. phlebopetala* and *A. robinae*. From the former species it is distinguished by smaller flowers which are normally more numerous in the head and obscurely 1-nerved petals (see p. 297 for further details). In phyllode shape *A. divergens* often bears a striking resemblance to *A. robinae* but is readily distinguished by

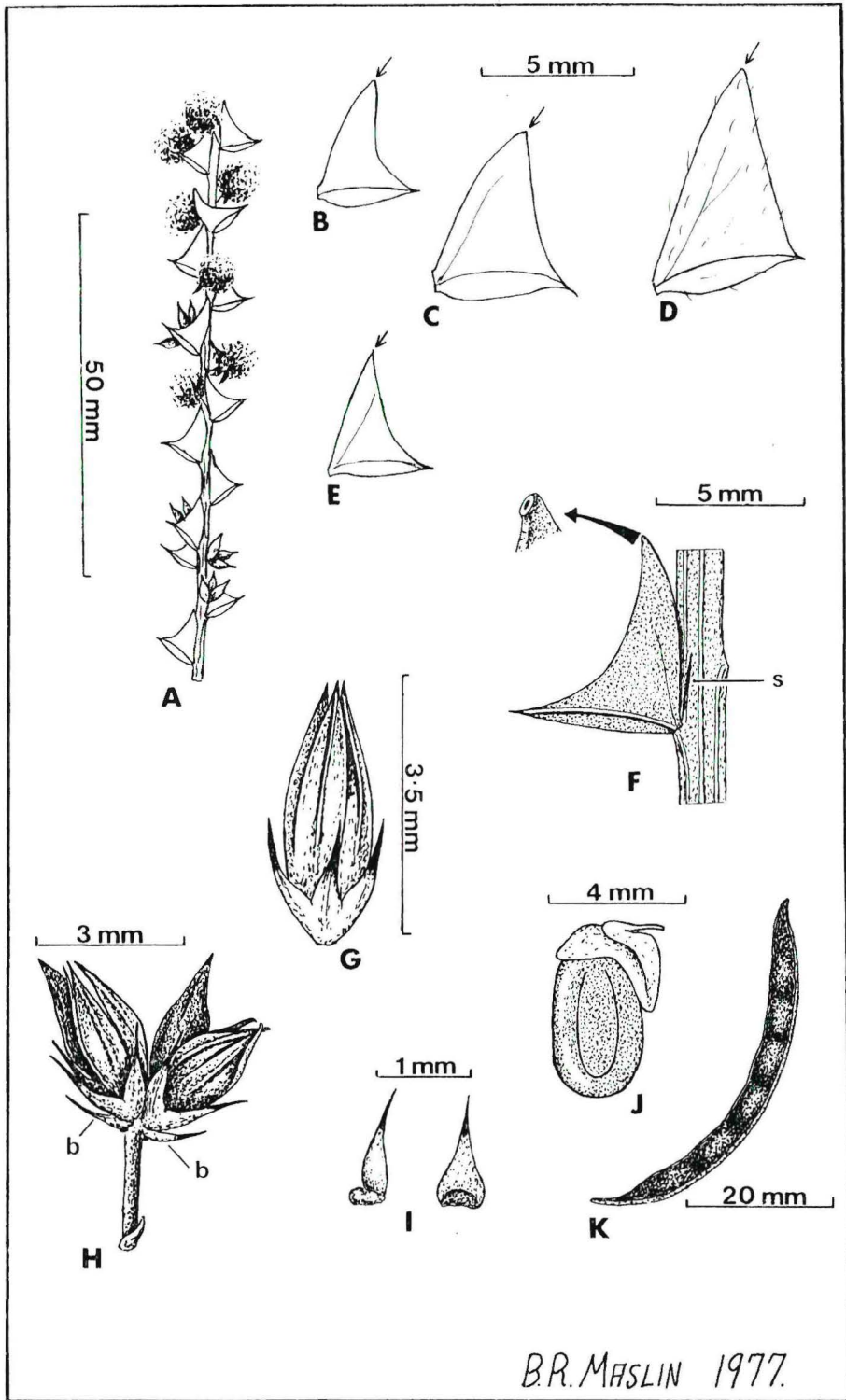
its heads of (4) 5–10 flowers (2 per head in *A. robiniae*). Vegetative characters useful in distinguishing *A. divergens* from *A. robiniae* include its frequently slightly larger phyllodes, its more rigid, frequently longer and pungent stipules and its taller habit. *Acacia divergens* is more widely distributed than *A. robiniae* and although the known ranges do not overlap they do come close together in the Albany-Denmark area (Figures 22 and 23).

11. *Acacia mooreana* W. V. Fitzg., Journ. W. Austral. Nat. Hist. Soc. No. 1:10 (1904)—Figure 13.

Type: Capel River, June 1903, *W. V. Fitzgerald* s.n. (K, PERTH).

[*Acacia biflora* auct. non R.Br.: Meisn. in Lehm., Plant. Preiss. 2:201 (1848)].

Shrub to 0.6 (1) m tall, either single-stemmed or moderately divided at base; *branches* straight and erect, normally sparsely divided, slender yet rather rigid, reddish or brownish; *branchlets* ribbed (ribs yellow), glabrous to sparsely antrorsely puberulous, occasionally moderately shortly pilose, green. *Stipules* persistent, not prominent, narrowly to very narrowly triangular, 1–2.5 mm long, scarious but slightly thickened at base, ascending, light brown. *Phyllodes* \pm obliquely shallowly obdeltate to \pm obliquely shallowly obtriangular, conspicuously angled on adaxial margin, (3) 4–6 (8–9) mm long (as measured along abaxial margin), (3) 4–7 (11–12) mm wide (as measured along adaxial margin), slightly thickened (sometimes slightly wrinkled when dry), flat or very slightly undulate, slightly ascending (as indicated by angle of principal nerve with branch), glabrous or rarely puberulous, margins slightly thickened (when dry) and normally yellowish; *apical mucro* (terminating principal nerve) pungent, 1 mm long, straight, brown; *adaxial proximal margin* 4–8 (12–13) mm long, \pm straight to slightly convex, ascendent and lying \pm parallel to branch; *adaxial distal margin* (3) 4–7 (11–12) mm long, concave (sinus normally oblique) or occasionally straight; *abaxial margin* (3) 4–6 (8–9) mm long, slightly convex, often slightly shorter than either of the adaxial margins; *principal nerve* excentric (situated near abaxial margin), raised (when dry), a second (obscure) nerve normally arising from near base of principal nerve and extending towards the gland, other nerves obscure or absent; *pulvinus* obscure. *Gland* obliquely situated at apex of adaxial angle of phyllode, circular, \leq 0.5 mm diam., lip narrow and yellow, orifice shallow. *Inflorescences* simple, 1 per node; *peduncles* 2–3 mm long, glabrous; *basal peduncular bracts* 2 (inner one broadly ovate, ca. 0.5 mm long, bifid, minutely ciliolate, brown; outer one $\frac{1}{4}$ – $\frac{1}{3}$ as large, triangular to ovate); *flower heads* globular, pale yellow, with 4 flowers. *Bracteoles* sessile, ovate to narrowly ovate, acuminate, 1–1.5 mm long (slightly shorter than calyx lobes), concave (at base), glabrous or very sparsely ciliolate, persistent (i.e. present on fruiting receptacles), brown at apex otherwise yellowish, with a thickened protrusion on abaxial surface at extreme base. *Flowers* 4-merous; buds prominently acuminate and rather angular when dry; *calyx* \pm $\frac{1}{2}$ length of corolla, divided for $\frac{1}{2}$ – $\frac{1}{3}$ its length into very narrowly triangular prominently acuminate glabrous or minutely ciliolate 1-nerved lobes which are brown at their apices, tube glabrous and yellow; *petals* 3–3.5 mm long, glabrous, narrowed at apex, prominently 1-nerved (nerve raised when dry), margins slightly thickened, yellow but brown at extremities; *ovary* glabrous, \pm sessile. *Legumes* narrowly oblong but curved, to 70 mm long, 3.5–4 mm wide, flat but slightly raised over seeds, hard and brittle, glabrous, dark grey to black, tapered at both ends; *margins* thickened (outer edge slightly broader than the inner one), not contracted between seeds, blackish or yellow. *Seeds* longitudinal in legume, obloid to slightly ellipsoid, 3–4 mm long, 2–2.5 mm wide, medium brown to dark brown, with an obscure dark line around periphery, glossy; *pleurogram* open towards the hilum, often bordered by a band of pale tissue; *areole* 2.5–3 mm long, 0.5–1 mm wide; *funicle* filiform and ca. 1 mm long, reflexed below and gradually expanded into a thick slightly shiny yellow or pale orange once-folded *aril*.



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Distribution: (Figure 21) South-west Western Australia: Extending from the vicinity of Boyanup (16 km S of Bunbury) southwest to near Karridale (16 km N of Augusta).

Habitat: *Acacia mooreana* grows mainly in sandy soil in swamps (or semi-swamps) and along creeks in open-forest dominated by *Eucalyptus marginata* and *Eucalyptus calophylla*. In places throughout its range the species is a common roadside invader. Some of the ground-cover shrubs found in association with *A. mooreana* include *Eutaxia epacridioides*, *Hakea ambigua*, *Hypocalymma angustifolium*, *Leptospermum ellipticum* and *Petrophile squamata*.

Flowering and fruiting period: Flowering begins in about June and seems to extend to August-September. Legumes with mature seeds have been collected from mid-December to early January.

Selected specimens: WESTERN AUSTRALIA: Argyle, June 1929, *E. Dell* s.n. (K, PERTH); Swan River, *Drummond* coll.2, no. 160 (BM, G, K, MEL, P, PERTH: often given as "160"); 12.6 mi (20 km) W of Donnybrook on the road to Capel, *B. R. Maslin* 456 (NY, PERTH) and 456a (CANB, PERTH); 187 mi peg on Margaret River to Augusta road, *B. R. Maslin* 475 (MEL, PERTH); Near Blackwood River, ca. 2 mi (3.4 km) W of junction of Rosa Brook (east of Karridale), *B. R. Maslin* 1606a (PERTH); About 10 km W of Nannup-Busselton road on Sabina Road, *B. R. Maslin* 2824 (PERTH); Stewart Road, 12 km NW of Nannup-Pemberton road (ca. 30 km SW of Nannup), *B. R. Maslin* 3788 (PERTH); Stewart Road, ca. 9 km SE of Brockman Highway (ca. 30 km due SW of Nannup), *B. R. Maslin* 3789 (K, PERTH).

Acacia mooreana is placed in the *A. biflora* group (p. 270) but is readily distinguished from all other taxa considered in the present revision, by its prominently acuminate calyx lobes. Other characters useful in recognising *A. mooreana* include its pale yellow flower heads borne on short peduncles (2–3 mm long), its consistently 4 flowers per head, its prominently acuminate flower buds and bracteoles, its prominently 1-nerved petals, its normally glabrous or sparsely hairy branchlets and its phyllodes which normally have an ascendent, attenuated, gland-bearing angle along the adaxial margin. An unusual floral feature found in *A. mooreana* is the presence of a protrusion on the abaxial surface of the bracteoles at their bases (Figure 13 I).

In its phyllode morphology *A. mooreana* is frequently very similar to *A. biflora* but is readily distinguished by its acuminate calyx lobes and bracteoles, 4 flowers per head, 1-nerved petals, dark grey to black legumes and generally less hairy but more obviously nerved branchlets. The geographical distributions of these two species do not overlap (Figures 21 and 22).

12. *Acacia chrysocephala* nom. et stat. nov., based on *A. biflora* R.Br. var. *aurea* E. Pritzl—Figure 14.

Acacia biflora R.Br. var. *aurea* E. Pritzl, Bot. Jb. 35:298 (1904).

Lectotype: District N. West Plantagenet. In arenosis. VI.1901. leg. *E. Pritzl* 341—sheet det. "*Acacia decipiens*" (B; iso: BM, E, G, K, L, PR, US, W) lecto. nov.

[*Acacia triangularis* auct. non Benth.: Meisn. in Lehm., Plant Preiss. 1:10 (1844), as to *Preiss* 963 and 966.]

[*Acacia biflora* auct. non R.Br.: Bentham, Flora Austral. 2:351 (1864), pro parte, as to *Preiss* 963 and 966.]

Figure 13. *Acacia mooreana*. A—Upper part of branch. B to E—Phyllodes showing shape and size variation; gland position arrowed. F—Node with insert showing gland (s = stipule). G—Flower showing prominently nerved petals and acuminate calyx lobes. H—Inflorescence (b = bracteole). I—Bracteoles (side and abaxial views) showing basal protrusion. J—Seed. K—Legume.

A from *B. R. Maslin* 3789; B from *B. R. Maslin* 456; C from *B. R. Maslin* 475; D from *J. Drummond* 160; E, I from *B. R. Maslin* 3788; F–H from *B. R. Maslin* 2824; J–K from *B. R. Maslin* 1606a.

Rather harsh, much branched, compact, domed *shrub* 0.3–0.5 (0.6) m tall, dividing at ground level into 2 to many rigid branches; *new shoots* light green; *bark* grey; *branchlets* terete, ribbed (ribs coarse or fine), indumentum variable, sparsely to moderately puberulous (hairs often restricted to ribs), occasionally glabrous, brownish or green. *Stipules* very narrowly triangular, 1–2 mm long, persistent, scarious but thickened towards base, not pungent, straight and ascending or sometimes slightly recurved and slightly spreading, dark brown.

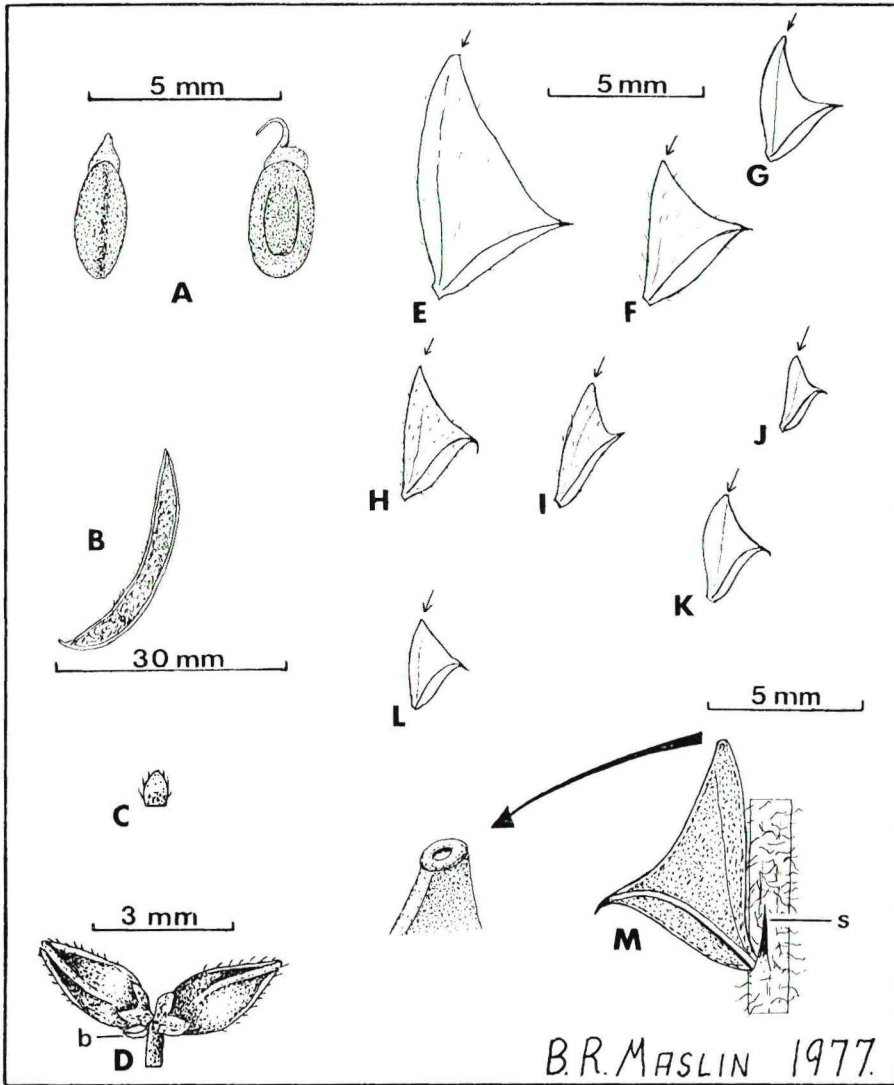


Figure 14. *Acacia chrysocephala*. A—Seeds (end and side views). B—Legume. C—Bracteole. D—Inflorescence showing 2 flowers with prominently nerved petals (b = bracteole). E to L—Phyllodes showing shape, size and indumentum variation; gland position arrowed. M—Node with insert showing gland (s = stipule).

A–B from A. R. Main s.n.; C–D from A. S. George 3104; E from B. R. Maslin 3916; F from R. D. Royce 10271; G from G. Perry 172; H from B. R. Maslin 3839; I from B. R. Maslin 3770; J from B. R. Maslin 2608; K from K. Newbey 270; L from K. Newbey 4162; M from A. Morrison s.n.

Phyllodes rather congested, obliquely obtriangular to obliquely shallowly obtriangular, prominently angled on adaxial margin, 3–8 (12) mm long (as measured along adaxial proximal margin), 2–6 (10) mm wide (as measured along adaxial distal margin), slightly thickened, not (or slightly) undulate, normally ascending (as indicated by angle of principal nerve with branch), glabrous to sparsely puberulous, dark green (but margins frequently yellowish); *apical mucro* (terminating principal nerve) normally pungent, ca. 1 mm long, straight or often recurved, brown; *adaxial proximal margin* 3–8 (12) mm long, normally ca. $\frac{3}{4}$ – $\frac{1}{2}$ as long again as abaxial margin, ascendent and \pm parallel to branch; *adaxial distal margin* 2–6 (10) mm long, \pm straight to shallowly concave (sinus oblique); *principal nerve* excentric (situated near abaxial margin), raised (when dry), a second (less obvious) nerve arising from adaxial side of the principal nerve near its base and extending towards the gland, lateral nerves very obscure; *pulvinus* \pm absent. *Gland* situated at apex of adaxial angle of phyllode, lip yellow, orifice circular and distinct. *Inflorescences* simple, normally 1 per node; *peduncles* 0.5–2 (4) mm long, normally glabrous; *basal peduncular bracts* 2, unequal (external bract much smaller than the internal one); *flower heads* medium bright golden yellow (not cream), globular, with 2 (4) flowers. *Bracteoles* 0.5 mm long, sessile, laminae ovate. *Flowers* 4-merous; buds minutely pedicellate and attenuate; *calyx* ca. $\frac{1}{3}$ length of corolla, divided for $\frac{1}{4}$ – $\frac{1}{2}$ its length into \pm triangular glabrescent to conspicuously ciliolate lobes, tube obscurely 4-nerved and glabrous; *petals* 2.5–3 mm long, somewhat reflexed at anthesis, shortly united at base, narrowed and often involute at apex, glabrous or hispidulous (hairs restricted to midrib), 1-nerved (nerve normally prominently thickened at apex of petal when dry), corolla narrowed at base; *ovary* glabrous. *Legumes* narrowly oblong but slightly curved, to 30 (50) mm long, 2–3 mm wide, hard and brittle, flat but slightly raised over seeds, \pm abruptly narrowed at both ends, moderately puberulous to shortly pilose or sometimes glabrous, dark brown; *margins* thickened (outer edge slightly broader than the inner one), barely contracted between seeds, light brown. *Seeds* longitudinal in legume, obloid to slightly ellipsoid, 2.5–3 mm long, 1.7 mm wide, grey-brown (medium brown), with a dark brown band extending around periphery, shiny; *pleurogram* fine, open towards the hilum; *areole* ca. 1.5 mm long, 0.7 mm wide, may be darker than main body of seed; *funicle* filiform, rather abruptly expanded into a straight (to slightly curved) or once-folded thickened yellowish slightly shiny *aril*.

Distribution: (Figure 23) South-west Western Australia: Sporadic from Mount Barker north to Narrogin and Darkan then east to Scaddan (40 km north of Esperance).

Habitat: This species has been recorded from a variety of habitats. It frequently occurs in open-forest, high-shrubland or high open-shrubland, only occasionally occurring in open-scrub or open-heath. It grows mainly in well drained shallow sand or gravelly sand over clay, but has also been recorded from rocky (sandstone or granite) loam.

Flowering and fruiting period: Most shrubs flower from May to August but a few flowering specimens have been collected in September and October. It takes about four months for seeds to fully develop. Mature seeds have been collected in mid-November.

Selected specimens: WESTERN AUSTRALIA: Below N side of Bluff Knoll, *A. S. George* 3104 (PERTH); Scaddan, *H. E. Knox* 4 (PERTH); Chester Pass, Stirling Range, 3 July 1957, *A. R. Main* s.n. (PERTH); Sukey Hill, ca. 4 km E of Cranbrook, *B. R. Maslin* 2608 (PERTH); Stirling Range, Red Gum Pass, *B. R. Maslin* 3770 (PERTH); 27 km N of Lake Grace towards Kulin, *B. R. Maslin* 3839 (PERTH); 40.5 km E of Ravensthorpe towards Esperance, *B. R. Maslin* 3916 (PERTH); Narrogin, 26 June 1903, *A. Morrison* s.n. (PERTH); 1.5 mi (2.5 km) W of Bremer Bay, *K. Newbey* 270 (PERTH); 10 km W of Toolcalup Swamp, *K. Newbey* 4162 (PERTH); 1 km along Gordon Inlet road past junction with Murray Road, 34° 21' S, 119° 15' E, *G. Perry* 172 (PERTH); In sublimoso-glareosis sterilibus sylvae cis fluv. Gordon (Hay) d.7. Nov. 1840, *Preiss* 963 (NY); In region interior. Australiae merid.-occid., *Preiss* 966 (MEL); Red Gum Pass, Stirling Range, *R. D. Royce* 10271 (PERTH).

Acacia biflora var. *aurea* (the basic name for *A. chrysocephala*) was based on Diels 2956 and Pritzell 341. The Diels syntype has not been seen by me but Pritzell 341 is represented in a number of herbaria viz. B, BM, E, G, K, L, PR, US and W. The lectotype of var. *aurea* is selected from the Pritzell collection and a specimen is housed at Berlin (B). As with most other sheets of Pritzell 341, the lectotype is erroneously labelled "Acacia decipiens R.Br."

Acacia chrysocephala is quite variable and future work may indicate that infraspecific taxa should be recognised. Some of the characters showing significant variation include: (1) Flowers normally 2, but sometimes 4, per head. Individual plants usually bear heads which are either 2-flowered or 4-flowered but sometimes both types occur on the one bush. Specimens with 4 flowers per head are frequently found in the Narrogin area but they are not confined to it. (2) Legumes hairy or sometimes glabrous and quite variable in length. (3) Phyllode size and orientation are quite variable (specimens with 2 flowers per head frequently have smaller and more ascending phyllodes than those with 4 flowers; these small phyllode types sometimes superficially resemble *A. acanthoclada* F. Muell.)

Acacia chrysocephala is placed in the *A. biflora* group (p. 270) and is distinguished by a combination of the following characters: flower heads golden yellow and normally borne on very short peduncles 0.5–2 (4) mm long; flowers 2 (4) per head; petals 1-nerved (nervel frequently sparsely hairy). Other characters useful in recognising *A. chrysocephala* include its dwarf, compact habit, its frequently obviously ribbed branchlet apices (hairs often restricted to these ribs), its frequently obviously ascending phyllodes which possess secondary nerves in addition to their principal nerves, its often recurved phyllode apices and its relatively small seeds.

The species appears to be most closely allied to *A. biflora* but is readily distinguished by its golden flower heads and its 1-nerved petals (see p. 292 for further details). In its dwarf habit and golden flower heads *A. chrysocephala* is similar to *A. incrassata* but is readily distinguished by its fewer flowers per head.

The specific epithet refers to the golden flower heads, a character which enables this species to be distinguished from most other members of the *A. biflora* group.

13. *Acacia incrassata* Hook., Icon. Plant. 4:t.370 (1841)—Figure 15.

Lectotype: Swan River, N. Holland. *Drummond*. (K—upper right hand specimen on sheet stamped "Herbarium Hookerianum 1867"; iso: K), *lecto. nov.*

Acacia decipiens (C. Koen.) R.Br. var. *incrassata* (Hook.) Benth., Lond. J. Bot. 1:330 (1842).

Acacia vernicosa W. V. Fitzg., J. W. Austral. Nat. Hist. Soc. No. 1:11 (1904), *synon. nov.*

Type citation: "Midland Junction and vicinity, fl. July [K, PERTH], fr. Oct. 1901 [n.v.]. Serpentine, fl. Aug. 1902 [n.v.].—W.V.F."

[*Acacia biflora* auct. non R.Br.: Paxton's Mag. Bot. 9, t.221 (1842).]

[*Acacia decipiens* (C. Koen.) R.Br. var. *elongata* auct. non Benth.: Meisner in Lehm., Plant Preiss. 1:9 (1844)—as to *Preiss* 955.]

[*Acacia decipiens* auct. non (C. Koen.) R.Br.: Bentham, Flora Austral. 2:351 (1864), pro parte—as to *Drummond* 296 and *Preiss* 955.]

Dwarf, erect *shrub* 20–30 cm tall, apparently spreading by subterranean runners, single- or multi-stemmed; *branches* prominently ribbed, sparsely to moderately puberulous (hairs patent or antrorse, confined to ribs). *Stipules* very narrowly triangular, 1.5–3 (4) mm long, persistent, indurate, scarcely pungent, ascending, \pm straight, dark brown. *Phyllodes* obdeltate to widely obdeltate (broadest above the middle and obliquely truncate at apex), outline

slightly oblique, 5–12 mm long (as measured along the adaxial proximal margin), (3) 4–10 mm wide (as measured along adaxial distal margin), slightly to prominently undulate, often slightly shiny, ascending (as indicated by angle of principal nerve with branch), glabrous to sparsely puberulous or strigillose (hairs often restricted to margins and principal nerves), dark green when fresh, margins slightly thickened and frequently yellowish; *apical mucro* (terminating principal nerve) rather pungent, 0.5–2 mm long, straight or slightly recurved, brown; *adaxial proximal margin* \pm straight, more or less lying adjacent to the branch, 5–12 mm long; *adaxial distal margin* \pm straight to slightly concave, (3) 4–10 mm long; *abaxial margin* straight to slightly convex except immediately below the apical mucro where it is sometimes obviously concave, (3) 5–9 (14) mm long; *principal nerve* excentric (situated near abaxial margin), prominently raised (when dry), a second (less obvious) nerve normally arising from adaxial side of principal nerve near its base and extending towards the gland, other lateral nerves absent or very obscure; *pulvinus* \pm absent. *Gland* situated at apex of angle along adaxial margin phyllode, very rarely a second gland occurring on another small angle along adaxial proximal margin, orifice shallow and dark coloured. *Inflorescences* apparently simple, 1 (2) per node; *peduncles* 4–8 (10) mm long, sparsely to moderately puberulous to antrorsely strigose; *basal peduncular bracts* 2 and unequal (the external ovate bract is $\frac{1}{4}$ the size of the left internal one which is ca. 1 mm long and 2–3-nerved); *flower heads* golden yellow, globular, with 6–9 flowers. *Bracteoles* 1–2 mm long; claws very short (\pm absent); laminae acuminate, concave at base, ciliolate, often puberulous abaxially, dark brown (especially towards apex). *Flowers* 4-merous, frequently very slightly resinous; buds abruptly attenuate; *calyx* $\frac{1}{3}$ length of corolla, divided for $\frac{1}{4}$ – $\frac{1}{2}$ its length into triangular ciliolate lobes, tube glabrous and nerveless; *petals* ca. 2 mm long, free, glabrous, obscurely 1-nerved. *Legumes* (few seen; the following description supplements the one given in the original description of *A. vernicosa*) narrowly oblong but slightly curved, 25–40 mm long, 4–5 mm wide, hard and brittle, flat, glabrous, dark brown, abruptly contracted at both ends; *margins* thickened (outer edge broader than the inner), barely contracted between seeds, light brown. *Seeds* (mature seed not seen—the following is from original description of *A. vernicosa*) “longitudinal, ovate-oblong, shining, greenish-grey; funicle slender, terminating in a small clavate basilar arillus.”

Distribution: (Figure 24) Western Australia: Near New Norcia south to Serpentine.

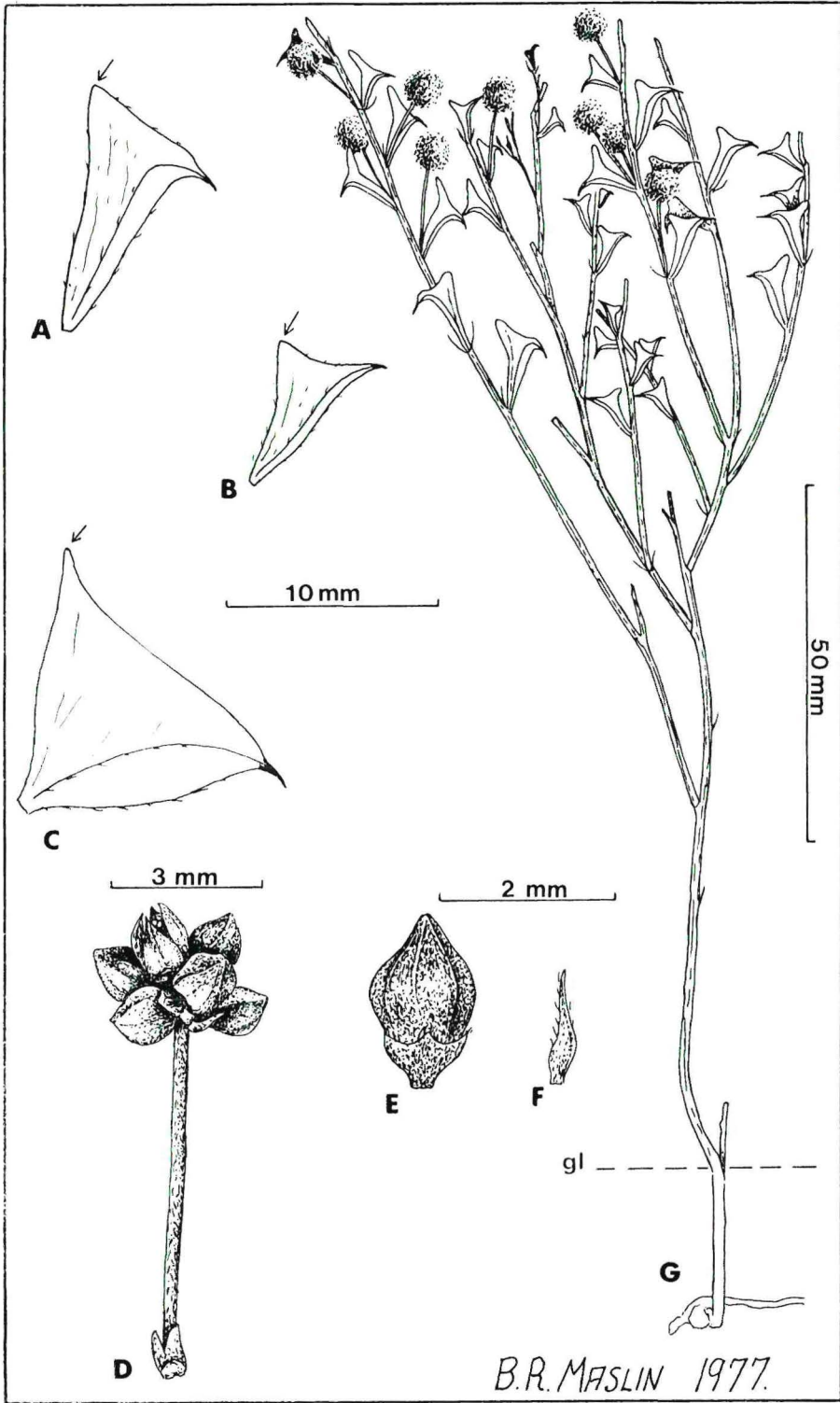
Habitat: In the two localities where I have seen this species it occurred in lateritic loam in woodland dominated by *Eucalyptus wandoo*.

Flowering period: July to August.

Fruiting period: Legumes with mature seeds have not been seen by me. Judging from specimens at hand, seeds would mature towards the end of November.

Selected specimens: WESTERN AUSTRALIA: Midland Junction, Oct. 1903, *C. Andrews* s.n. (PERTH); Mogumber, Aug. 1929, *W. E. Blackall* s.n. (PERTH); Swan River, *Drummond* 296 (BM, G, K, MEL, P, W); New Norcia, 1924, *D. W. Gimenez* s.n. (comm. *C. A. Gardner*: PERTH); Bellevue, 20 Aug. 1898, *R. Helms* s.n. (PERTH); 77 mi peg, Great Northern Highway, 2 Aug. 1957, *R. T. Lange* s.n. (PERTH); Gooseberry Hill, Guildford, 16 July 1904, *A. Morrison* s.n. (PERTH); Janebrook, near Midland Junction, 9 Aug. 1902, *A. Morrison* s.n. (PERTH); In solo sublimoso juxta oppidum Guildford, d.29 June 1839, legit. *L. Preiss* 955 (FI, G, GOET, HBG, K, MEL, NY, P, STR, W); 68 mi peg on Geraldton road, *R. D. Royce* 3839 (PERTH).

The specimen selected here as the lectotype of *A. incrassata* is one of four mounted on a single sheet at Kew (K). The two lower specimens on this sheet are *A. littorea* sp. nov. (see below) while the two upper are *A. incrassata*. The *A. incrassata* specimens are annotated by Hooker thus: “Swan River, N.



Holland. Drummond. *A. incrassata* Hook. Ic. Pl. t.370". I have labelled the right hand specimen as lectotype and the left hand one as iso-lectotype. There are other sheets bearing iso-lectotype material of *A. incrassata* at Kew. The illustration in the protologue may possibly be a composite drawing of the lower portion of the lectotype and the upper portion of the iso-lectotype on the same sheet.

The year following Hooker's publication of *A. incrassata*, Bentham (1842, p. 330) reduced it to a variety of *A. decipiens* (= *A. littorea* sp. nov., see below). In his subsequent works on *Acacia*, Bentham (1864, p. 351 and 1875, p. 463) treated *A. incrassata* as a synonym of *A. decipiens*. Meisner (1844, p. 8) followed Bentham's 1842 interpretation. Of the three specimens cited by Meisner, Drummond 296 is *A. incrassata* but the material I have seen of the other two specimens (Preiss 962-MEL and 967-NY) is very poor and cannot definitely be referred to this species. Interestingly, under *A. decipiens* var. *elongata* Benth, Meisner (l.c., p. 9) cited Preiss 955 which is *A. incrassata*.

Until now this species has generally been known under the name *A. vernicosa* W. V. Fitzg. Although I have seen only one of the three syntypes of this name, viz. Midland Junction, W. V. Fitzgerald s.n. (K, PERTH) I regard it as synonymous with *A. incrassata*. Fitzgerald's description of this species is comprehensive and leaves no doubt as to the application of the name.

On account of its phyllode shape the species has in the past frequently been confused with *A. littorea* (syn. *A. decipiens* auct.). The true affinities of *A. incrassata* are not clear but it seems best to regard the species as close to *A. chrysocephala* in the *A. biflora* group (p. 270) rather than close to *A. littorea* in the *A. truncata* group (p. 271). This contention is supported by Ph. Guinet's pollen analysis of *A. incrassata* (pers. comm.).

The distinguishing features of *A. incrassata* include its dwarf habit, its prominently ribbed and hairy branches (hairs frequently sparse), its obdeltate to widely obdeltate phyllodes which are obliquely truncate, its golden yellow flower heads each bearing 6–9 flowers and its acuminate bracteoles.

14. *Acacia littorea* Maslin sp. nov.—Figure 16.

Acacia decipiens (C. Koen.) R.Br. var. *trapezoidea* DC., Prod. 2:449 (1825). Type: Nouvelle Hollande, côte oriente, Mus. de Paris 1821 (holo: G).

Acacia dolabriformis Colla, Hort. ripul. p. 1 (1824), non H. Wendl. (1820) nec A. Cunn. ex Hook. (1837); Bentham, Flora Austral. 2:351 (1864), pro syn. sub *A. decipiens*. Type: In horto Ripulensi cult. Aug. 1823. Erbario Bertero (holo: TO).

Acacia decipiens (C. Koen.) R.Br. var. *praemorsa* R. Graham, Edinb. New Phil. J. 14:370 (1833); Meisner in Lehm., Plant. Preiss. 1:9 (1844), pro syn. sub *A. decipiens* var. *trapezoidea*. Type: Received in 1831 at Botanic Garden, Edinburgh, from Mr Knight of the Kings Road Nursery (n.v.).

Acacia praemorsa Hort. ex R. Graham, l.c. nom. nud., pro syn. sub *A. decipiens* var. *praemorsa*. *Acacia trapezoidea* DC. ex Steud., Nom. Bot. ed. 2, 1:8 (1840), nom. nud., in syn.

Acacia cuneata Benth. var. *glabra* Meisn. in Lehm., Plant. Preiss. 1:9 (1844), pro parte, as to Rottneest Island, Preiss 954—P, STR, (K, MEL, PERTH: sphalm. "Fremantle, Preiss 956"). "A. decipiens. major Hortul.": Seemann, Europ. Eingef. Acac. 12 (1852), nom. nud., pro syn. sub *A. cuneata* var. *glabra*.

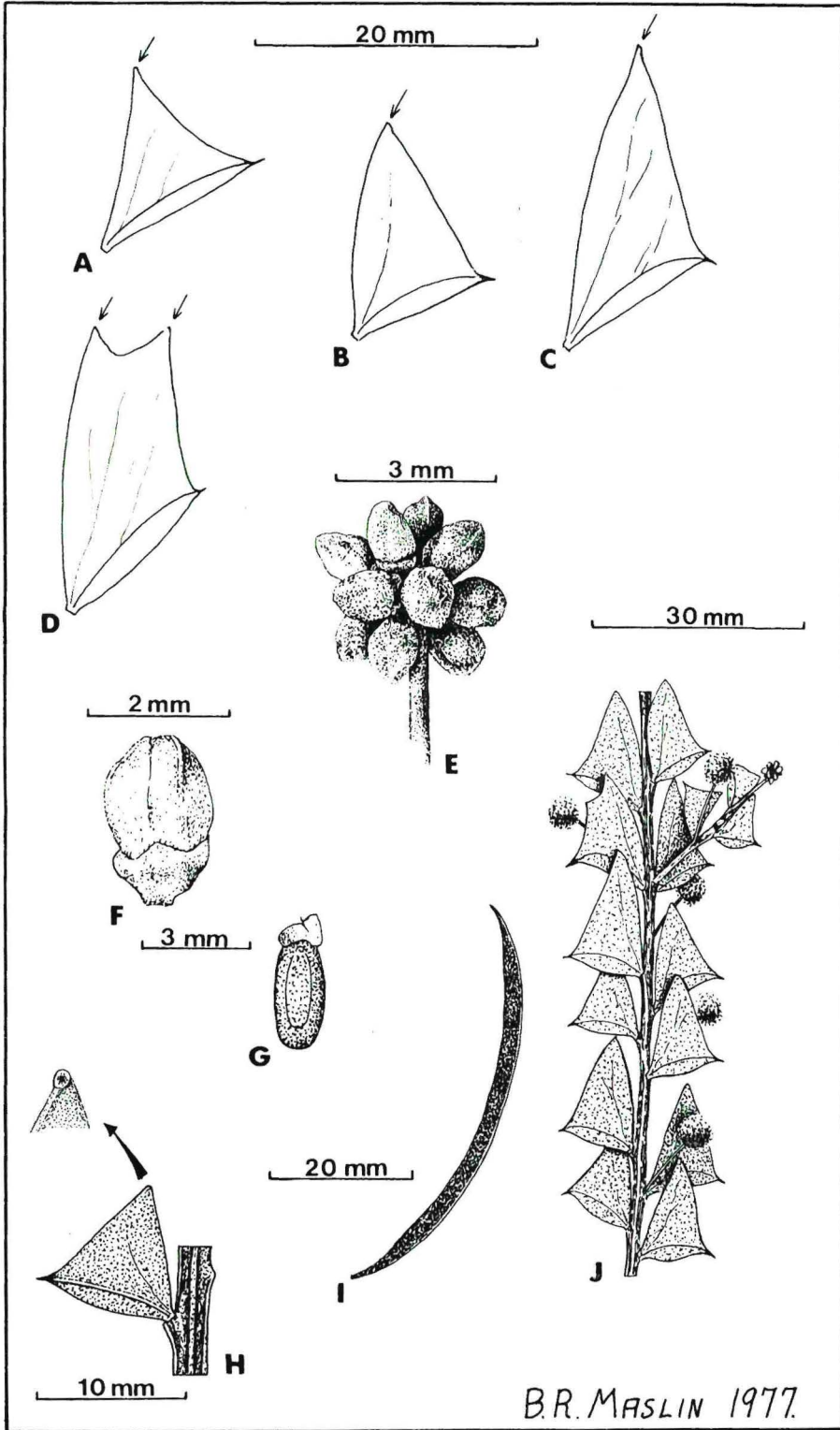
"A. Schottiana Hort. ???": Seemann, l.c., nom. nud., pro syn. sub *A. cuneata* var. *glabra*.

[*Mimosa decipiens* auct. non C. Koen.: C. Koenig, Ann. Bot. Lond. 1:366 t.8 (1804), as to description only (excluding cited synonym, viz. *Adiantum truncatum*).

[*Acacia decipiens* auct. non (C. Koen.) R.Br.: R. Brown in Ait. f., Hort. Kew., ed.2, 5:463 (1813); J. Sims, Bot. Mag. 41 t.1745 (1815); J. E. Smith in Rees, Cyclopaedia 39: sub *Acacia* (1818); G. Bentham, Flora Austral. 2:351 (1864).]

Figure 15. *Acacia incrassata*. A to C—Phyllodes showing shape and size variation (gland position arrowed). D—Inflorescence. E—Flower. F—Bracteole. G—Entire plant (gl = ground level position).

A and G from A. Morrison s.n., 9 Aug. 1902; B from R. D. Royce 3839; C from D. W. Gimenez s.n.; D–F from A. Morrison s.n., 16 July 1904.



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[*Phyllodoce decipiens* auct. non (C. Koen.) Link: Link, Handb. Erk. 2:132 (1831).]

[*Acacia truncata* auct. non (Burm.f.) Hort. ex Hoffmannsegg: E. D. Merrill, Philipp. J. Sci. 19:352 (1921).]

Frutex densus, 1–2 (3) m altus; *ramuli* costati, glabri. *Stipulae* caducae. *Phyllodia* obtriangularia ad obdelata, interdum asymmetricice trapeziformia, apice oblique truncato, 7–17 (20–35) mm longa, 5–15 (18–24) mm lata, glabra, pungentia (mucro 1 mm longa), nervo principali excentrico. *Glans* plerumque 1–2. *Inflorescentia* racemosa brevissima; *pedunculi* 6–12 mm longi, glabri; *capitula* luteola, globulosa, (6) 8–15 floribus. *Flores* 4-meri; alabastra ± obtusa; *calycis* lobi late triangulares; *petala* 2 mm longa, obscurissima 1-nervata, glabra. *Legumine* anguste oblonga sed curva, ad 60 mm longa, 2·5–3 mm lata, nigrescentia. *Semina* in legumine longitudinalia, obloidea ad parum ellipsoidea, 2·5–3 mm longa, 1·5 mm lata, nitida.

Type: Western side of Princess Royal Harbour, Albany, Western Australia. “Shrub to 1·6 m tall; phyllodes ascending or patent; branchlet ribs fairly obvious; flower heads pale yellow. Grey sand.” 29 Aug. 1975, B. R. Maslin 3775 (holo: PERTH).

Dense, bushy, much branched, normally ± domed *shrub* 1–2 (3) m tall, single-stemmed or sparsely divided at base; main trunk to 10 cm diam. at base; *bark* smooth, grey or greyish brown; *new shoots* arising from axil of a bract on the very short raceme axis, light green; *branchlets* prominently ribbed, glabrous. *Stipules* caducous (present only on very young new shoots). *Phyllodes* obtriangular to obdelate with ± obliquely truncate apices, sometimes asymmetrically trapeziform, L/B = (0·8) 1–2, 7–17 (20–35) mm long (as measured along adaxial proximal margin), 5–15 (18–24) mm wide (as measured along adaxial distal margin), larger on juvenile plants, not (or barely) undulate, normally slightly ascending (as indicated by angle of midrib with branch; N.B. because of the ascendent adaxial proximal margins the overall aspect is that of obviously ascending phyllodes), rather congested at ends of branches, glabrous, dark green (when fresh), margins yellowish and the abaxial ones slightly broader than the adaxial; *apical mucro* (terminating principal nerve) pungent, 1 mm long, straight, brown; *adaxial proximal margin* ± straight, ascendent and lying ± parallel to branch, 7–17 (20–35) mm long; *adaxial distal margin* ± straight, 5–15 (18–24) mm long; *abaxial margin* ± straight, 5–16 mm long, frequently slightly shorter than one or both adaxial margins; *principal nerve* excentric (situated near abaxial margin), slightly curved, raised (when dry), a second (much less obvious) nerve sometimes arising from adaxial side of principal nerve near its base and extending towards the gland, other lateral nerves very obscure or absent; *pulvinus* ± absent. *Glands* 1 or 2 (rarely more) situated on angles along adaxial margin of phyllodes, circular, 0·3–0·5 mm diam., lip not prominent. *Inflorescences* extremely reduced racemes of 1 (3–4) flower heads, 1 (2) per node, numerous towards ends of branches; *raceme axis* minute, ≤ 0·5 (1·5) mm long, subtended by 2 persistent ± ovate bracts ± 0·5 mm long (new shoots developing from axil of one of these bracts); *peduncles* 6–12 mm long, glabrous; *basal peduncular bracts* caducous, solitary, concave and brown; receptacle papillose; *flower heads* pale yellow, globular, with (6) 8–15 flowers. *Bracteoles* ± caducous, ± spatulate, ca. 0·5 mm long. *Flowers* 4-merous, buds ± obtuse (not prominently attenuate); *calyx* $\frac{1}{3}$ length of corolla, shallowly divided (to ca. $\frac{1}{3}$ – $\frac{1}{6}$ its length) into slightly keeled broadly triangular lobes, tube glabrous nerveless and yellowish or light brown; *petals* 2 mm long, connate for ca. $\frac{1}{4}$ their length but readily separating, very obscurely 1-nerved, glabrous; *ovary* glabrescent to shortly and densely tomentose. *Legumes* at maturity obscured by new shoots, to 60 mm long, 2·5–3 mm wide, narrowly oblong but curved and sometimes slightly twisted, dehiscence begin-

Figure 16. *Acacia littorea*. A to D—Phyllodes showing shape, size and gland number variation (gland position arrowed). E—Flower head. F—Flower. G—Seed. H—Node with insert showing gland. I—Legume. J—Portion of branch.

A, G, I from B. R. Maslin 4025; B, H, J from P. G. Wilson 4307; C from F. G. Smith 2384; D from B. R. Maslin 1619; E, F from A. R. Fairall 809.

ning along suture on inner edge, hard and brittle, flat, not (or barely) raised over seeds, tapered at apex, glabrous or glabrescent, dark grey to black; *margins* thickened (outer edge broader than inner one), not (or barely) contracted between seeds, yellowish. *Seeds* longitudinal in legume, obloid to slightly ellipsoid, 2.5–3 mm long, 1.5 mm wide, uniformly medium brown (greyish brown prior to maturity), shiny, dark coloured peripheral band not particularly pronounced; *pleurogram* continuous or open towards the hilum; *areole* 1.5 x ca. 0.7 mm; *funicle* filiform, minute (ca. 0.5 mm long), abruptly expanded into a thickened and curved (barely clavate) or once-folded \pm shiny yellow or \pm orange *aril* which may be orange-coloured (when rest of aril is yellow) at point of attachment to seed.

Distribution: (Figure 24) South-west Western Australia: Coastal regions from Forest Beach (between Bunbury and Busselton) to Bremer Bay (160 km northeast of Albany). It also occurs on Rottnest Island which represents an interesting disjunct distribution.

Habitat: The species grows on coastal dunes in deep, well drained sand and is quite common in places. It occurs in open-heath, low open-heath, closed-scrub, open-scrub or sometimes low open-forest and is commonly associated with *Agonis flexuosa*, *Acacia cochlearis* and *Ac. cyclops*. *Acacia littorea* is not limestone specific like its closest relative, *A. truncata*. The species (under the name *A. cuneata*) is illustrated in its coastal environment by Baglin and Mullins (1968, pp. 14 and 15). The species is sometimes used in sand dune stabilisation programmes.

Flowering and fruiting period: This species flowers from August to November but a few flowers may persist until December. Legumes with mature seeds have been collected in December and January.

Selected specimens: WESTERN AUSTRALIA: In collibus saxosis, Bald Head . . . : prope littorum Portus Regis Georgii III, Dec. 1801, R. Brown s.n. (BM, K—sheet with Bennett distribution number 4310); In collibus sterilibus ad littora Portus Regis Georgii III in ora australi Nova Hollandia, R. Brown (BM, K, E—sheet with Bennett distribution number 4311); Cape Augusta, A. R. Fairall 809 (PERTH); Cape Leeuwin, B. R. Maslin 1619 (PERTH); Albany, western side of Princess Royal Harbour, B. R. Maslin 4025 (PERTH); Vasse River, Mrs. Mollay s.n. (K); In colliculosis arenosis ad litus maris prope Vasse, 25 Dec. 1839, L. Preiss 968 (G, NY); Rottnest Island, Parker Point area, F. G. Smith 2384 (PERTH); Bremer Bay, P. G. Wilson 4307 (AD, E, K, L, MEL, PERTH).

In the past the name *A. decipiens* (C. Koen.) R.Br. has been applied to this new species. However, *A. decipiens* is treated here as a nomenclatural synonym of *A. truncata*. The history of the application of these two names is a little involved and is fully discussed on p. 318. *Acacia littorea* and *A. truncata* are closely related and future work may indicate they should be treated as infra-specific taxa of the one variable species. *Acacia littorea* can usually be distinguished from *A. truncata* by its caducous stipules but there are also differences in the phyllodes, seeds, distribution and flowering times (see p. 319 and Table 1).

Although often only one gland-bearing angle occurs along the adaxial margins of the phyllodes in *A. littorea*, it is not unusual to find, especially on juvenile plants, some phyllodes with two (rarely more) glands. *Acacia decipiens* var. *trapezoidea* DC. and *A. decipiens* var. *praemorsa* R. Graham (see below) were described from specimens with phyllodes containing more than one gland. These variants are treated here as part of the natural range of variation of *A. littorea*. It is interesting to note that De Candolle (1825) erroneously cited the type locality of var. *trapezoidea* as eastern Australia, whereas in fact the type was collected in Western Australia. This error was repeated by Don (1832). The same is true of *A. coriacea* DC., *A. pyrifolia* DC., *A. bivenosa* DC. and *A. hispidissima* DC. (= *A. pulchella* var. *glaberrima* Meisn.—see Maslin, 1975).

In 1833 R. Graham described *A. decipiens* var. *praemorsa* from a specimen grown at the Royal Botanic Garden, Edinburgh. I have searched at Edinburgh (E) but was unable to locate Graham's type. However, the original description is very comprehensive and it is obvious that var. *praemorsa* can be accommodated within the variational limits of *A. littorea*. This treatment is in accordance with that adopted by Meisner (1844, p. 9) who relegated var. *praemorsa* to synonymy under *A. decipiens* var. *trapezoidea*.

When Meisner (1844) described *A. cuneata* var. *glabra* he based the name on two specimens, viz. Preiss 954 (collected on Rottneest Island) and Preiss 956 (collected from the adjacent mainland near Fremantle). These specimens respectively represent *A. littorea* and the sand dune variant of *A. truncata* referred to on p. 319 below. In a number of herbaria (K, MEL, P, PERTH) these collections are mixed with the label for Preiss 954 accompanying the specimen of Preiss 956 and vice versa.

The specific epithet alludes to the species' coastal distribution.

15. *Acacia truncata* (Burm. f.) Hort. ex Hoffmannsegg, Verz. Pflkult. 34 (1824)—Figure 17.

Adiantum ("Adiantum") *truncatum* Burm.f., Flor. Ind. 235 t.66 f.4 (1768).
Type citation: "ex Java. D. Kleinhof. Habitat in India" (n.v.); J. A. Murray in Linnaeus, Syst. Veg. ed. 13, 790 (1774).

Mimosa decipiens C. Koen., Ann. Bot. Lond. 1:366 t.8 (1804) excl. desc., nom. illeg. (superfluous; the name *Adiantum truncatum* was cited as a synonym).

Acacia decipiens (C. Koen.) R.Br. in Ait.f., Hort. Kew. ed. 2, 5:463 (1813), nom. illeg.

Phyllodoce decipiens (C. Koen.) Link, Handb. Erk. 2:132 (1831), nom. illeg.

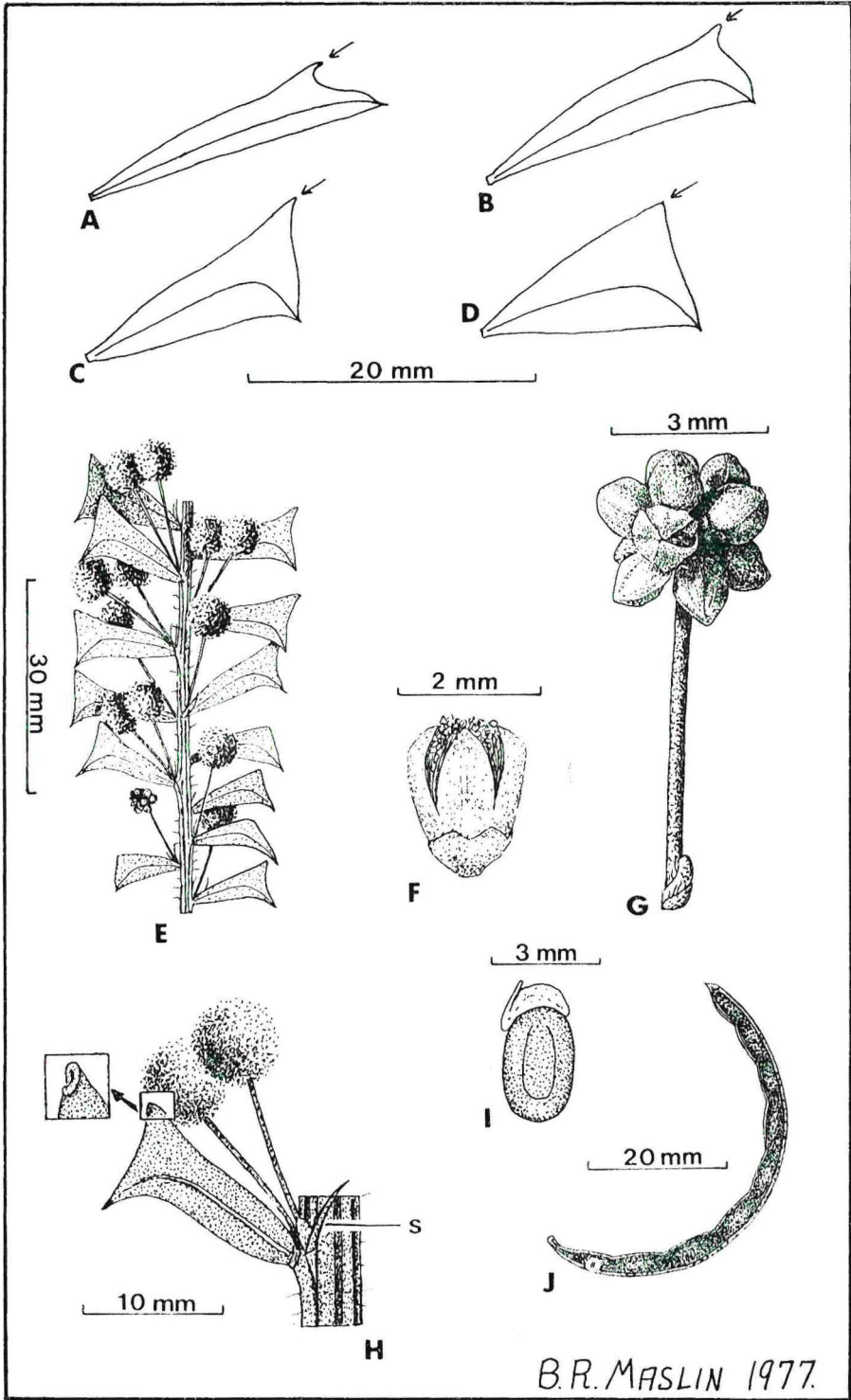
Acacia cuneata Benth. in Endl. *et al.*, Enum. Plant. Hueg. 42 (1837), *synon. nov.* *Type citation*: "Swan-River. (Hügel)"—n.v.

?*Acacia decipiens* (C. Koen.) R.Br. var. *elongata* Benth., London J. Bot. 1:330 (1842), *synon. nov.* *Type citation*: "Swan River, Drummond"—n.v.

Acacia cuneata Benth. var. *glabra* Meisn. in Lehm., Plant. Preiss. 1:9 (1844), pro parte (as to Fremantle, 15 Aug. 1839, Preiss 956—NY, (K, MEL, P, PERTH: incorrectly labelled Rottneest Island, Preiss 954).

[*Acacia decipiens* auct. non (C. Koen.) R.Br.: Steudel, Nom. Bot. 2 (1821).]

Normally dense, bushy, domed *shrub* 0.5–2.3 (3) m tall; trunk to ca. 5 cm diam. at base; *bark* smooth, light grey; *new shoots* arising from axil of a bract on the very short raceme axis, light green; *branches* ascending, normally striate; *branchlets* finely to prominently ribbed, glabrous to moderately shortly pilose. *Stipules* normally persistent on upper branches and often also on old wood after phyllodes have fallen, infrequently caducous, slightly thickened especially near base, narrowly triangular to setaceous, 1.5–3.5 mm long, normally curved upwards. *Phyllodes* cuneate to obtriangular with \pm obliquely truncate apices, L/B = 1.5–2.5(5), 9–25 (30–40) mm long (as measured along adaxial proximal margin), 5–13 (16) mm wide (as measured along adaxial distal margin), straight or rarely curved, very slightly undulate, sometimes slightly wrinkled when dry, spreading to ascending (as indicated by angle of principal nerve with branch), glabrous, medium green to relatively dark green (when fresh), margins often yellowish and with the abaxial ones slightly broader than the adaxial ones; *apical mucro* (terminating principal nerve) acute but barely pungent, 0.5 mm long, yellow (when young) to dark brown; *adaxial proximal margin* neither (or very rarely) ascendent nor lying \pm parallel to branch as in *A. littorea*, \pm straight, 9–25 (30–40) mm long; *adaxial distal margin* straight or sometimes shallowly concave or shallowly sigmoid, 5–13 (16) mm long, shorter than adaxial proximal and abaxial margins; *abaxial margin* \pm straight but sometimes quite concave at apex just below the apical mucro, 9–25 (30) mm long; *principal*



nerve centrally situated or slightly (rarely prominently) excentric, straight but curved towards the mucro at apex of phyllode, lateral nerves obscure or absent; *pulvinus* absent. *Gland* solitary (very rarely 2), situated at apex of an angle(s) along the adaxial margin of phyllode, circular, ca. 0.5 mm diam., lip not prominent. *Inflorescences* extremely reduced racemes of 1 (2) flower heads, 1–2 (rarely more) per node; *raceme axis* minute (0.5–1 mm long), subtended by 2 persistent ovate bracts 0.5–1 mm long (new shoots develop from within axil of one of these bracts); *peduncles* 10–18 mm long, rather slender (often stouter and to 25 mm long when in fruit), glabrous; *basal peduncular bracts* solitary, persistent, narrowly ovate, 1–1.5 mm long; receptacles sparsely papillose; *flower heads* bright pale yellow, globular, with 7–16 flowers. *Bracteoles* rather persistent, ± sessile or shortly stipitate, ca. 0.5 mm long; laminae ovate, concave, ciliolate. *Flowers* 4-merous; buds obtuse; *calyx* $\frac{1}{4}$ – $\frac{1}{3}$ length of corolla, shallowly divided to $\frac{1}{4}$ (or less) its length into broadly triangular ciliolate lobes, tube glabrous nerveless and light brown; *petals* 2 mm long, joined near base, obscurely 1-nerved, glabrous; *ovary* ± glabrous to densely tomentose. *Legumes* at maturity obscured by new shoots, to 65 (90) mm long, 2–4 mm wide, narrowly oblong but curved and sometimes twisted, dehiscence beginning along suture on inner edge, hard and brittle, flat (almost terete when green), not (or barely) raised over seeds, tapered or abruptly contracted at apex, glabrous or glabrescent (rarely shortly pilose), sometimes obscurely reticulate, dark grey to black; *margins* thickened (outer edge broader than inner one), normally slightly contracted between seeds along inner edge, not (or barely) contracted along outer edge, yellowish. *Seeds* longitudinal in legume, obloid to ellipsoid, 3–3.5 mm long, 1.5–2 mm wide, uniformly medium brown but greyish brown prior to maturity, shiny, peripheral dark line obscure or absent; *pleurogram* continuous or with a narrow opening towards the hilum; *areole* 2–2.5 x ca. 0.7 mm; *funicle* filiform, minute (ca. 0.5 mm long), abruptly expanded into a thickened ± clavate and curved slightly shiny yellow *aril* which is sometimes slightly darker yellowish at point of attachment to seed.

Distribution: (Figure 24) South-west Western Australia: Coastal regions from Leeman (250 km north of Perth) to Myalup Beach (100 km south of Perth).

Habitat: *Acacia truncata* grows in coastal regions and is almost entirely restricted to areas of shallow sand over limestone. On the Swan Coastal Plain these limestone areas occur in the Cottesloe Soil Association (Bettenay *et al*, 1960). Only in a few places between Fremantle and Myalup is the species known to grow in deep sand in the coastal sand dunes (Quindalup Soil Association). These dunes normally form the western boundary of the Cottesloe Soil Association. *Acacia truncata* is frequently a dominant element of the coastal heath vegetation.

Flowering and fruiting period: Flowers from June to September. Legumes with mature seeds have been collected between late November and mid-December.

Selected specimens: WESTERN AUSTRALIA: Swan River, *Drummond* 257 (K—in Flora Austral. 2:352, Bentham queried this number as being “297”); Swan River, *Drummond* 297 (BM, G, K, MEL, P, PERTH, W); Mouth of Swan River, 14 Aug. 1897, *R. Helms* s.n. (PERTH); 3 km E of Mullaloo, *J. R. Knox* 650 723 (PERTH); 1.6 km S of Lake Clifton roadhouse, *B. R. Maslin* 2803 (PERTH); Preston Beach (between Bunbury and Mandurah), *B. R. Maslin* 4192 (PERTH); Near Naval Base, *B. R. Maslin* 4404 (PERTH); “In clivulis calcareis juxta oppidum Fremantle, d.19.Jun.1839 Herb. *Preiss* No. 957” (FI, G, GOET, HBG, K, L, MEL, PERTH—fragment, STR, W); Swan District, *E. Pritzel* 598 (BM, G, K,

Figure 17. *Acacia truncata*. A to D—Phyllodes showing shape and size variation (gland position arrowed). E—Portion of branch showing spreading phyllodes. F—Flower. G—Inflorescence. H—Node with insert showing gland (s = stipule). I—Seed. J—Legume. A from B. R. Maslin 2803; B, I–J from B. R. Maslin 4404; C, E–F, H from R. Helms s.n.; D, G from J. R. Knox 650723.

L, PR, W); 23.5 mi (37.5 km) S of Mandurah on coast road, *M. D. Tindale* 3917 (PERTH: according to information on this specimen duplicates are also lodged at A, AD, B, BRI, CANB, K, L, MEL, NSW, RSA, U, UC, US).

Although a thorough search was made at Geneva (G), the type of *Acacia truncata* was not located. As pointed out below, this species was originally described as a fern (*Adiantum truncatum*) by the Dutch botanist, N. L. Burman. In the same paper Burman described *Polypodium spinulosum* (= *Synphea spinulosa* (Burm.f.) Merr.—see Merrill, 1921) the type of which is still preserved at G. It is therefore a little surprising that the type of *A. truncata* is not also present in that herbarium.

The history of the name *A. truncata* and its nomenclatural synonym *A. decipiens* is a little involved yet quite fascinating (see Koenig 1804, Sims 1815, Smith 1818 and Merrill 1921). Burman (1768) using only vegetative material collected supposedly by D. Kleinhof from Java, described this species as a new fern, *Adiantum truncatum*. Jonas Dryander considered that Kleinhof's plant was a species of *Mimosa* and using this information Koenig (l.c.) published the new name *M. decipiens* for it citing *A. truncatum* in synonymy. (In the original text Koenig erroneously gave the provenance of this plant as northwest America, a locality which he later apparently corrected to southwest Western Australia—see Sims, l.c.) The name *M. decipiens* C. Koen. is illegitimate, being superfluous. Ironically, the specimen used by Koenig to compile his description did not represent the same taxon that Burman described. Koenig had therefore misapplied his own illegitimate name. Robert Brown (1813) published the combination *Acacia decipiens*, based on *M. decipiens*, but this name was again misapplied and also illegitimate since he should have used the epithet *truncata*. It is unfortunate that most subsequent authors have followed Brown, thus perpetuating the error. Interestingly, Colla (1826) provided the new name *A. dolabriformis* to replace *A. decipiens* auct., but unfortunately this name is also illegitimate being a later homonym. The taxon to which the name *A. decipiens* has been wrongly applied is described above as *A. littorea* sp. nov. The combination *Acacia truncata* was published by Hoffmannsegg (1824) and, by indirect reference, was based on *Adiantum truncatum* Burm.f. Hoffmannsegg correctly realised that this taxon differed from the one described by Koenig as *Mimosa decipiens*. Hoffmannsegg's interpretation was never adopted by subsequent authors who used the name *A. cuneata* Benth. (1837) for the species which should correctly have been called *A. truncata* (Burm.f.) Hort. ex Hoffmannsegg. Although Merrill (l.c.) was aware of Hoffmannsegg's combination he misapplied the name *A. truncata* to the species *A. decipiens* auct. non (C. Koen.) R.Br. (= *A. littorea*).

Until now *A. truncata* has generally been known as *A. cuneata* and it is unfortunate that this well-used name must go into synonymy. Although I have not seen the type of *A. cuneata*, viz. Swan River, Hügel, the original description is comprehensive and leaves no doubt as to the application of the name.

No specimen positively identifiable as the type of *A. decipiens* var. *elongata* has been seen by me. The original description of this taxon is very brief and the type is merely cited as "Swan River, Drummond". For the present I have treated this name as a synonym of *A. truncata*. However, it could possibly be a synonym of *A. incrassata* (see p. 308).

Acacia cuneata var. *glabra* Meisner (1844) was based on two specimens viz. Preiss 954 (collected on Rottneest Island) and Preiss 956 (collected from the adjacent mainland near Fremantle). These specimens respectively represent *A. littorea* sp. nov. and the sand dune variant of *A. truncata* referred to below. In a number of herbaria, (K, MEL, P, PERTH) these collections are mixed, with the label for Preiss 954 accompanying the specimens of Preiss 956 and vice versa.

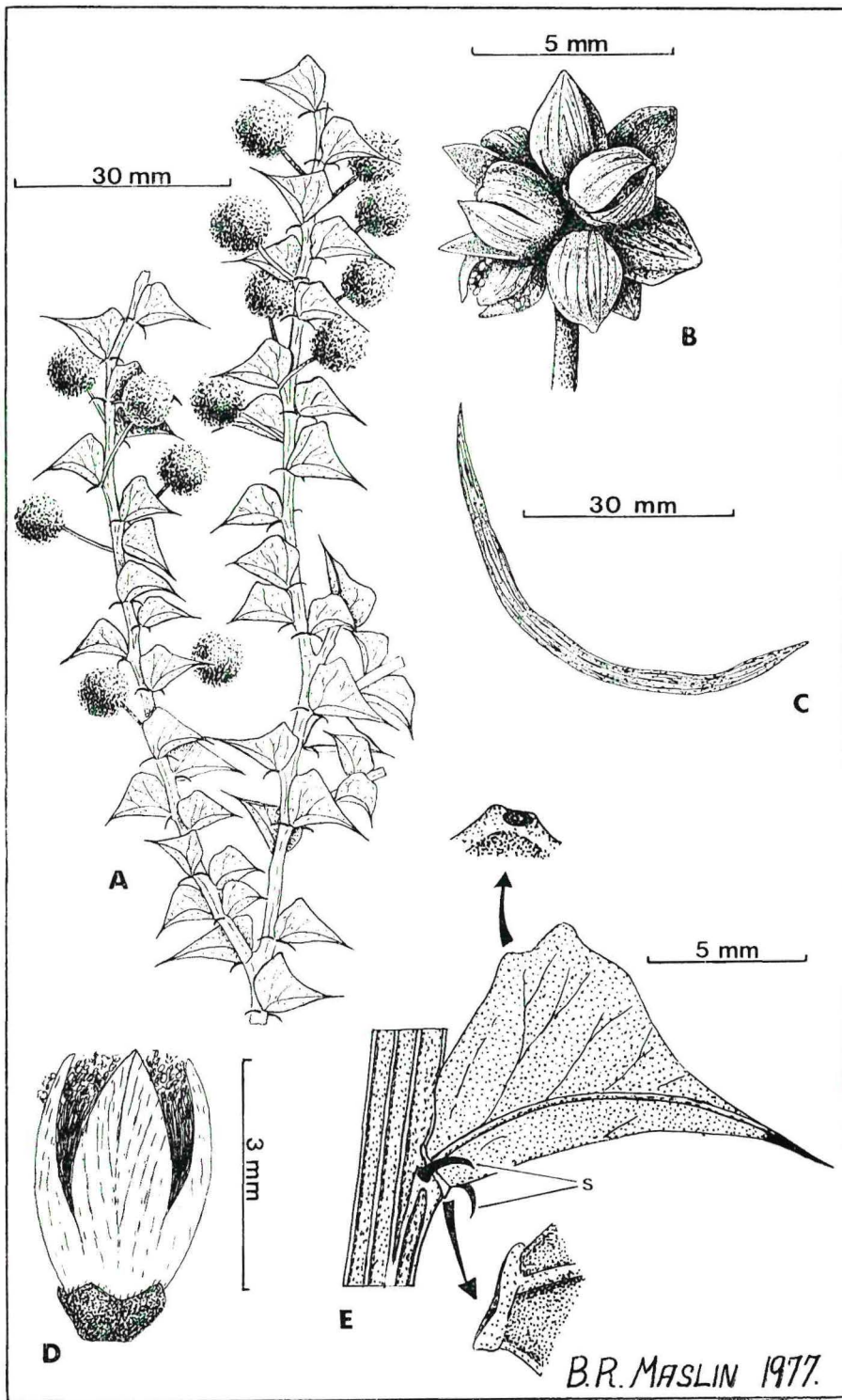
TABLE 1

Character	<i>A. truncata</i>	<i>A. littorea</i>
Branchlets	Glabrous or hairy	Always glabrous
Stipules	Persistent or sometimes caducous	Always caducous (present only on very young new shoots)
Phyllodes: shape	Cuneate to obtriangular, never asymmetrically trapeziform	Obtriangular to obdeltate, sometimes asymmetrically trapeziform
length (mm)	9–25 (30–40)	7–17 (20–35)
width (mm)	5–13 (16)	5–15 (18–24)
L/B	1·5–2·5 (5)	(0·8) 1–2
adaxial proximal margin	Spreading or very rarely ascendent	Always ascendent (i.e. lying \pm parallel to branch)
principal nerve	Centrally situated (rarely excentric)	Always obviously excentric
lateral nerves	Obscure or absent	Sometimes present
apical mucro	Barely pungent	Quite pungent
Glands	1 (very rarely 2)	1–2 (rarely more)
Seeds:		
length (mm)	3–3·5	2·5–3
width (mm)	1·5–2	1·5
Flowering period	June–September	August–November (December)
Distribution	North of Bunbury to Leeman	South of Bunbury to Bremer Bay; also Rottnest Island (disjunct distribution)

Table 1. Principal differences between the two closely related species, *A. littorea* and *A. truncata*.

Traditionally *A. truncata* (under the name *A. cuneata*) and *A. littorea* (under the name *A. decipiens*) have been treated as separate species. This is also the approach adopted here but it is noted that the two are very closely related and future work may indicate that they should be treated as infraspecific taxa of the one variable species. The characters shared by these two coastal species include their basic phyllode shape, extremely reduced racemose inflorescences, flower heads with up to 15–16 flowers, obtuse flower buds, obscurely 1-nerved petals and basic legume and seed morphology. *Acacia truncata* and *A. littorea* can be separated by a combination of morphological characters but distribution and flowering times are also useful aids to identification. The principal differences between the two species are presented in Table 1. In most instances the one character that can be used to separate them is the stipules which are persistent on most mature branchlets in *A. truncata* but absent in *A. littorea* (present only on very young new shoots). There are times, however, when the stipules are also caducous in *A. truncata* and in these cases the species is recognised by its long and narrow phyllodes (15–25 (30–40) mm long, 5–10 (16) mm wide, L/B = 2–5)—see below. *Acacia truncata* occurs north of Bunbury to Leeman (250 km north of Perth) while *A. littorea* occurs south of Bunbury to Bremer Bay (N.B. it also grows on Rottnest Island which represents an interesting disjunct distribution)—Figure 24. *Acacia truncata* begins its flowering season in June, two months before *A. littorea*.

Between Bunbury and Fremantle two variants of *A. truncata* have been recognised and these differ from the typical representatives of the species chiefly in their caducous stipules. The first variant occurs sporadically in deep sand within the coastal foredunes between Fremantle and Myalup Beach. *Acacia truncata* is otherwise restricted to areas of shallow sand over limestone adjacent to, and inland from, the foredunes. One of the syntypes of *A. cuneata* var. *glabra* Meisn. (viz. Preiss 956) is this variant; the other syntype of this variety (viz. Preiss 954) is *A. littorea*. In addition to its lack of stipules, this variant is recognised by its relatively large phyllodes (20–30) (40) mm long,



10–16 mm wide, L/B = 2–2.5) which occasionally possess 2 glands along their adaxial margins (in all other variants of *A. truncata* seen, only one gland has been present). The second variant occurs around Lake Preston and Lake Clifton and grows in shallow sand over limestone in *Eucalyptus gomphocephala*—*Agonis flexuosa* woodland. This variant grows a little taller than is normal for the species (2–3 m) and has a more open growth habit. In addition, its phyllodes are a little longer and narrower than is generally found in *A. truncata* (L/B = 3.3–5).

As mentioned by George (1971) it is possible that *A. truncata* was one of the first two plants ever collected by Europeans in Australia. The other was *Synaphea spinulosa*. Both species were originally described as ferns.

16. *Acacia phaeocalyx* Maslin sp. nov.—Figure 18.

Frutex 0.3–0.6 (1) m altus, intricatus; *ramuli* glabri (vel in axillis tomentulosi), plerumque pruinosi. *Stipulae* persistentes, spineae, recurvae. *Phyllodia* valde asymmetricice late obdeltata, acuminata, 8–15 mm longa, 6–11 (14) mm lata, glabra, interdum glaucescentia, pungentia, nervo principali excentrico. *Pedunculi* 5–10 mm longi, glabri (plerumque basi villosi); *capitula* aurea, globulosa, 7–8 floribus. *Flores* 4-meri; alabastra 3–3.5 mm longa; *calyx* brunneus, obtuse-lobatus; *petala* glabra, subtiliter striata. *Legumina* teretia, ad 50–60 (110) mm longa, 4 mm lata, curva, glabra, badia, striata. *Semina* in legumine longitudinally.

Type: About 4 km N of Wongan Hills towards Ballidu, Western Australia. “Diffuse, much branched shrub ca. 0.3 m tall; bark pink-brown; branchlets white pruinose; heads golden.” 27 May 1976, B. R. Maslin 4111 (holo: PERTH; iso: CANB, K, MEL, NSW, NY, P, PERTH).

Harsh, intricate, diffuse or compact *shrub* 0.3–0.6 (1) m tall; *new shoots* brick red; *branches* terete, finely ribbed, glabrous (but minutely tomentose in angles of phyllodes), brownish (grey with age); *branchlets* frequently conspicuously pruinose. *Stipules* 2–4 mm long, persistent, spiny, slightly to prominently recurved. *Phyllodes* very asymmetrically broadly obdeltate, rounded on adaxial margin, acuminate, 8–15 mm long, 6–11 (14) mm wide (at broadest point), rigid, coriaceous, slightly undulate, patent, glabrous, olive green when dry, sometimes glaucescent, margins yellowish; *apical mucro* (terminating principal nerve) pungent, straight, brown; *principal nerve* excentric (situated near abaxial margin), quite prominent and normally yellowish, lateral nerves diverging from adaxial side of principal nerve apparent but not prominent and sparsely anastomosing, lateral nerves on abaxial side of principal nerve very few or absent; *pulvinus* reduced to a narrow (ca. 0.2 mm wide), slightly dilated, yellow rim of smooth tissue. *Gland* solitary or sometimes 2, situated on a slight angle(s) along adaxial margin of phyllode 6–9 mm above pulvinus, not prominent. *Inflorescences* simple, 1 (2) per node; *peduncles* 5–10 mm long, glabrous but normally villous at extreme base; *basal peduncular bract* solitary, elliptic to triangular, 0.5–0.8 mm long, ciliolate, dark brown; receptacle villous (hair density variable); *flower heads* golden yellow, globular, with 7–8 rather loosely arranged flowers. *Bracteoles* ca. 0.5 mm long (equal in length to calyx), dark brown; claws very short; laminae ovate, slightly keeled and concave, ciliolate, ± strigose abaxially. *Flowers* 4-merous; buds large (3–3.5 mm long) and somewhat attenuate; *calyx* $\frac{1}{3}$ length of corolla, divided for $\frac{1}{4}$ its length into rounded to broadly triangular ciliolate lobes, tube nerveless glabrous and dark brown; *petals* 3–3.5 mm long, connate for $\frac{1}{3}$ (or less) their length, glabrous, very finely striate; *ovary* densely tomentose. *Legumes* (only dehisced and immature legumes seen) terete, to 50–60 (110) mm long, 4 mm wide, curved,

Figure 18. *Acacia phaeocalyx*. A—Upper part of branch. B—Flower head. C—Legume valve. D—Flower showing dark brown calyx and finely striate petals. E—Node with inserts showing gland and pulvinus (s = stipules).

A from B. R. Maslin 4111 (the type); B from B. R. Maslin 215; C–D from B. R. Maslin 4107; E from K. M. Allan 19.

tapered at both ends, not contracted between seeds, hard and brittle, glabrous, red-brown, longitudinally striate; *marginal nerve* obscure. *Seeds* (very few seen, mostly immature) longitudinal in legume, 4–5 mm long, 2–2.7 mm wide, medium brown; *funicle* slightly curved and expanded into a conical non-folded *aril* ca. 2 mm long.

Distribution: (Figure 21) Western Australia: Sporadic in the central wheat-belt region from Wongan Hills to Kellerberrin and Tammin.

Habitat: This species seems to favour areas of sand over laterite in tall shrubland.

Flowering period: April–June.

Fruiting period: Satisfactory fruiting material has not been seen. Present evidence indicates that mature seeds would be present towards the end of November.

Selected specimens: WESTERN AUSTRALIA: 1 mi (1.6 km) W of Wongan Hills, *K. M. Allan* 19 (PERTH); 3 mi (4.8 km) N of Wongan Hills, *B. R. Maslin* 130R (PERTH); Tammin Flora Reserve, 15 mi (24 km) S of Tammin, *B. R. Maslin* 215 (PERTH); 3 km W of Cadoux towards Wongan Hills, *B. R. Maslin* 4107 (PERTH); Charles Gardner Reserve, S of Tammin township, *A. S. Weston* 6999 (PERTH).

Acacia phaeocalyx is a very distinctive species and is readily recognised by a combination of the following characters: stipules spiny and recurved (normally scarious and straight in the other species dealt with here); phyllodes very asymmetrically broadly obdeltate with acuminate, very pungent apices and obviously excentric principal nerves; flower heads golden yellow and composed of 7–8 rather large flowers (3–3.5 mm long at mature bud stage) with yellow, striate petals which contrast with the dark brown calyces; legumes terete, longitudinally striate and red-brown in colour. Other characters useful in recognising the species include its frequently very pruinose branchlets (never pruinose in the other species) and its quite large, coriaceous phyllodes with their more or less rounded adaxial margins and sparsely anastomosing secondary veins.

It is rather difficult to establish the true position of *A. phaeocalyx* within the *Uninerves-Triangulares* as defined here. Its legume morphology certainly suggests an affinity with the *A. horridula* group (p. 270) but the inflorescence and phyllode characters are very different. According to Ph. Guinet (pers. comm.) the pollen of *A. phaeocalyx* shows some affinities with *A. biflora*. Although its inflorescence and vegetative morphology lend support to this idea, its legumes are very different. In many respects (e.g. gross phyllode morphology, petal nervation, legumes) *A. phaeocalyx* is similar to *A. dilatata* Benth., a species included by Bentham in his concept of the *Uninerves-Triangulares* but excluded by me because of its 5-merous flowers. According to Guinet the pollens of *A. phaeocalyx* and *A. dilatata* are obviously different. For the present I feel it best to regard *A. phaeocalyx* as forming a link between those *Uninerves-Triangulares* species possessing 4-merous flowers and those with 5-merous flowers.

The specific epithet refers to the dark brown calyx which contrasts well with the yellow corolla.

17. *Acacia delphina* Maslin sp. nov.—Figure 19.

Frutex 0.5–1 (1.6) m altus, rigidus; *ramuli* teretes, hispiduli vel interdum puberuli, demum glabri. *Stipulae* aliquantum persistentes. *Phyllodia* plerumque delphinata, interdum obdeltata, 8–14 (16) mm longa, 4–10 mm lata, glabra, pungentia. *Glans* obscura, mucrone leviter pungenti superata. *Pedunculi* 4–7 mm longi, glabri; *capitula* aurea, sub anthesi 4–5 mm longa, 18–32 floribus. *Flores* 4-meri; *calycis* lobi ± oblongi; *petala* 1–1.5 mm longa, glabra. *Legumina* ad 45 mm longa, 3–4 mm lata, ± moniliformia. *Semina* in legumine longitudinalia, obloidea ad ellipsoidea, (2.5) 3–4 mm longa, 2–2.5 mm lata; *arillus* conicus, albus.

Type: 2 mi (3.4 km) north of Hopetoun, Western Australia. "Spreading shrub 12 in. tall. In sand." 24 July 1965, K. Newbey 1616D (holo: PERTH; iso: CANB, K, NY).

Rigid, rather openly branched *shrub* 0.5–1 (1.6) m tall, single- or multi-stemmed; *bark* grey, somewhat rough (irregularly fissured); *branches* terete, very obscurely ribbed (frequently apparently ribless), hispidulous or sometimes antrorsely puberulous, soon becoming glabrous, grey (frequently red-brown but overlain by a light grey, longitudinally fissured epidermis towards apex). *Stipules* triangular, 0.5–1 (1.5) mm long, somewhat persistent. *Phyllodes* normally more or less crescent-shaped and acuminate but with a conspicuous triangular spur on adaxial margin, sometimes obdeltate, 8–14 (16) mm long (as measured along abaxial margin), 4–10 mm wide (at broadest point), somewhat congested towards ends of branches, glabrous, olive green to light green when dry; *apical mucro* (terminating principal nerve) pungent, 1–2 mm long, straight, rigid, brown, a second shorter (0.5–0.8 mm) slightly pungent mucro occurring

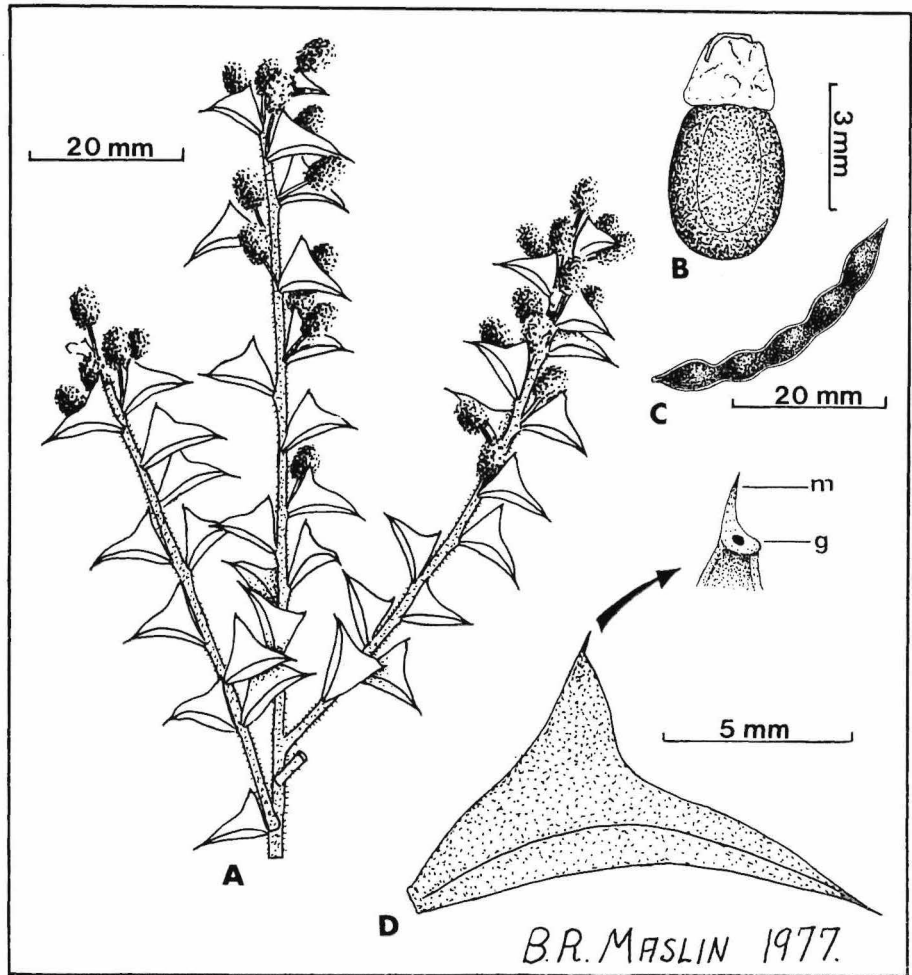


Figure 19. *Acacia delphina*. A—Upper part of branch. B—Seed. C—Legume. D—Phyllode with insert showing mucro (m) overtopping the gland (g).

A from K. Newbey 828; B–C from K. Newbey 4099; D from B. R. Maslin 3479A.

at apex of the adaxial proximal margin and overtopping the gland; *adaxial proximal margin* \pm straight to slightly concave, 7–11 (14) mm long (a little shorter than the abaxial margin); *adaxial distal margin* obliquely concave (sinus normally a little angular), rarely \pm straight, 5–15 mm long; *abaxial margin* \pm straight to concave, 8–14 (16) mm long; *principal nerve* centrally situated or sometimes excentric (normally \pm central but appearing excentric because of phyllode asymmetry), secondary nerves absent; *pulvinus* obscure, smooth or slightly wrinkled, slightly dilated at base. *Gland* obscure, solitary or rarely 2, situated on a conspicuous angle(s) along adaxial margin of phyllode 7–11 (14) mm above the pulvinus, overtopped by a short (0.5–0.8 mm) slightly pungent mucro. *Inflorescences* simple, 1 per node; *peduncles* 4–7 mm long, glabrous; *basal peduncular bract* solitary; receptacle glabrous; *flower heads* golden yellow, obloid, 4–5 mm long just prior to anthesis, with 18–32 flowers. *Bracteoles* ca. 1 mm long, claws narrowly oblong but slightly dilated towards apex, puberulous abaxially; laminae keeled, concave, ciliate. *Flowers* 4-merous; *calyx* $\frac{1}{3}$ – $\frac{1}{2}$ length of petals normally divided for ca. $\frac{3}{4}$ its length into \pm oblong ciliate light brown lobes which are puberulous abaxially; *petals* 1–1.5 mm long, glabrous, very obscurely 1-nerved; *ovary* sessile. *Legumes* to 45 mm long, 3–4 mm wide, straight or slightly curved, firmly chartaceous and somewhat brittle, uniformly raised over seeds (\pm moniliform), glabrous or glabrescent, medium to dark brown; *margins* somewhat contracted between seeds, barely thickened, pale coloured. *Seeds* longitudinal in legume, obloid to ellipsoid, (2.5) 3–4 mm long, 2–2.5 mm wide, turgid, medium brown to dark brown, with a dark line extending around the periphery, dull; *pleurogram* open towards the hilum; *areole* 2–3 mm long, ca. 1 mm wide; *funicle* short and filiform, expanded into a fairly large wrinkled \pm conical (not convoluted) white slightly shiny *aril* ca. 2 mm long.

Distribution: (Figure 24) South-west Western Australia: South coastal regions from the Pallinup River (150 km southwest of Ravensthorpe) east to Israelite Bay (120 km east of Esperance).

Habitat: According to Mr Ken Newbey (pers. comm.) this species normally grows on exposed flats (rarely on slopes) in well drained sand or loam; it is rare in loamy clay. It occurs in low open-woodland and tall open-shrubland or sometimes tall shrubland.

Flowering period: July to September-October.

Fruiting period: Legumes with mature seeds have been collected between late November and late December.

Selected specimens: WESTERN AUSTRALIA: 5 mi (8 km) N of mouth of the Fitzgerald River, K. M. Allan 313 (PERTH); Fitzgerald River area, ca. 112.7 km ESE of Ongerup, T. E. H. Aplin, I. Lethbridge and R. Coveny 3214 (NSW, PERTH); Corner of East Speddingup Road and Highway, 30 mi (48 km) N of Esperance, I. B. Armitage 551 (PERTH); Condingup, T. C. Daniell s.n. (MEL 502977); Lower reaches of Fitzgerald River, B. R. Maslin 3479A (PERTH); 5 mi (8 km) NW of Mount Maxwell, K. Newbey 828 (PERTH); 2 mi (3.4 km) N of Hopetoun, K. Newbey 1616 (PERTH); 2 km S of Mount Maxwell, K. Newbey 4099 (PERTH); Fitzgerald River National Park, 34° 05'S, 119° 32'E, A. S. Weston 6365 (PERTH); Israelite Bay, 27 Nov. 1950, J. H. Willis s.n. (MEL 502989).

Although *A. delphina* has both 4-merous flowers and phyllodes which are basically triangular in outline (although normally very asymmetric), it does not appear to be very closely related to the other members of the *Uninerves-Triangulares*. It is at once recognised by the small mucro which overtops the gland on the adaxial margin of the phyllode (Figure 19D). This character is otherwise unknown to me in *Acacia*. Another character which distinguishes *A. delphina* is its obloid flower heads with 18–32 closely arranged flowers (heads normally globular and flowers not exceeding 16 in the other members of the *Uninerves-Triangulares*). The \pm moniliform, firmly chartaceous legumes are

also atypical for this group. According to Ph. Guinet (pers. comm.) the pollen of this species does not indicate a close relationship with the other members of the *Uninerves-Triangulares* but within this group *A. delphina* seems nearest *A. hastulata* and *A. horridula*. The exine characters of the pollen indicate an affinity with some members of the *Uninerves-Racemosae* (e.g. *A. strongylophylla* F. Muell.).

The specific epithet refers to the phyllodes whose outline normally resembles a plunging dolphin.

Dubious names

Acacia decipiens var. *triangularis* Seringe, Flor. Jard. Lyon 3: 481 (1849).

Acacia decipiens var. *multiflora* Seringe, l.c. This variety together with the preceding were described presumably from cultivated plants. Until the types have been examined I cannot positively refer the names to taxa in the present work, although it is likely that they will eventually prove to be synonyms of *A. littorea* and *A. truncata* respectively.

Acknowledgments

The following people and institutions are gratefully acknowledged for their assistance with the revision: Mr Ken Newbey for his valuable comments on the habit and habitat of a number of species from the Ongerup-Ravensthorpe area; Dr. Ph. Guinet, Université des Sciences et Techniques du Languedoc, Montpellier, France, for his pollen analysis of most species contained herein; the Australian Biological Resources Study Interim Council for providing funds for travel to Europe in 1975 where many type specimens and other valuable material were consulted; the Directors of the many herbaria (both Australian and foreign) for allowing me access to their valuable literature and plant collections.

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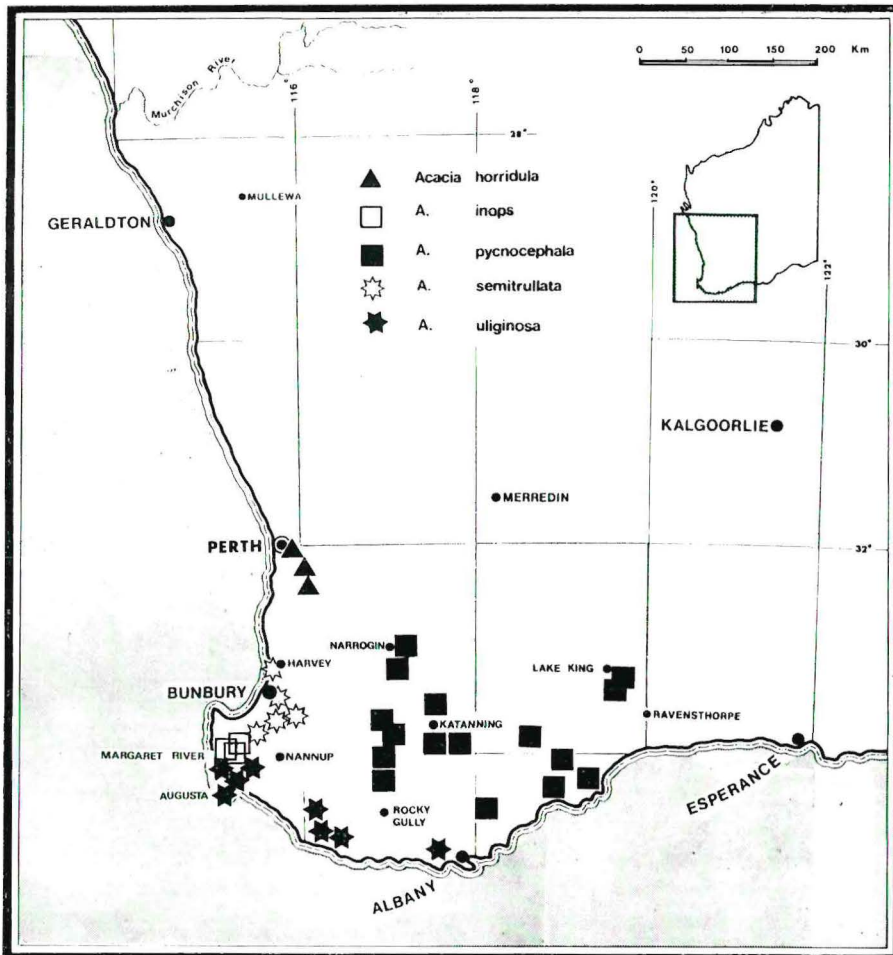


Figure 20. Distribution of *Acacia horridula*, *A. inops*, *A. pycnocephala*, *A. semitrullata* and *A. uliginosa*.

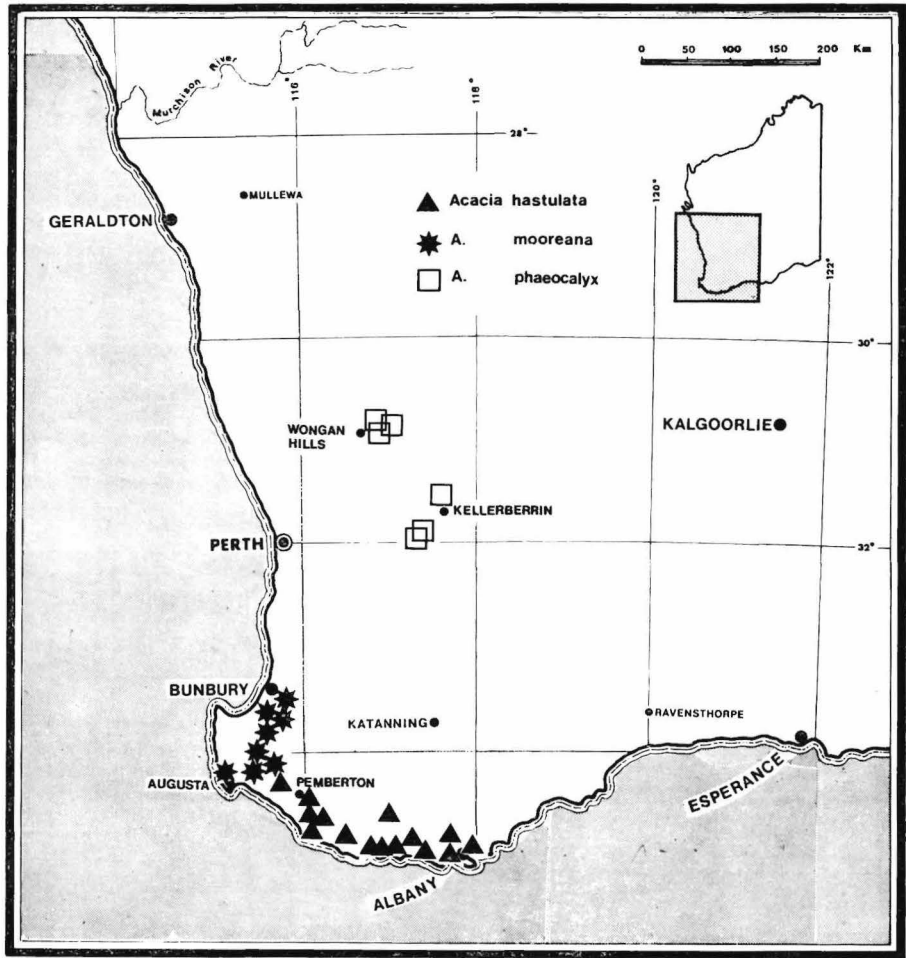


Figure 21. Distribution of *Acacia hastulata*, *A. mooreana* and *A. phaeocalyx*.

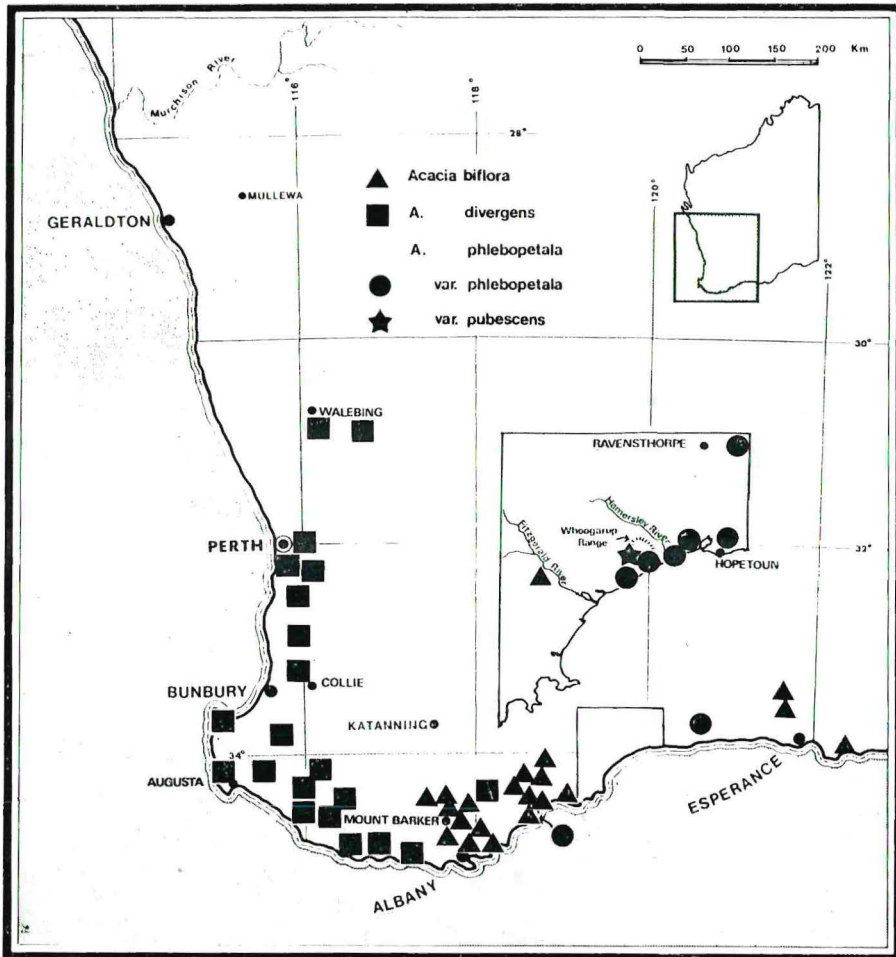


Figure 22. Distribution of *Acacia biflora*, *A. divergens* and *A. phlebopetala*.

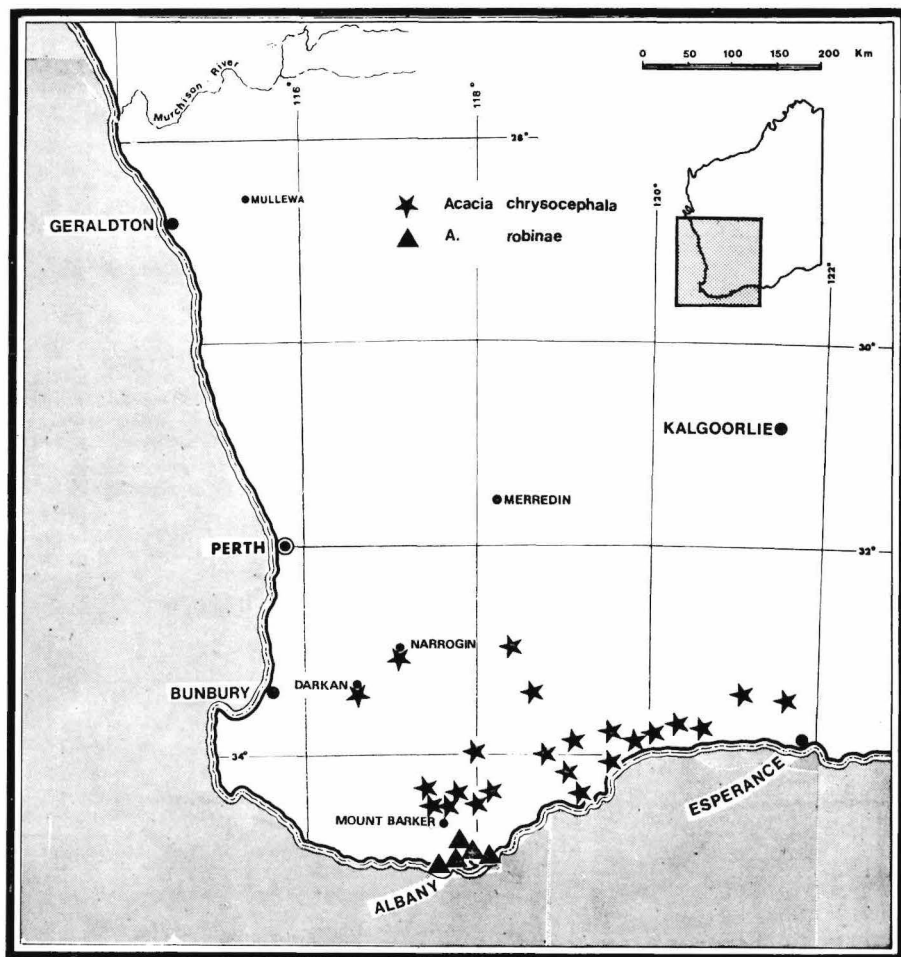


Figure 23. Distribution of *Acacia chrysocephala* and *A. robinae*.

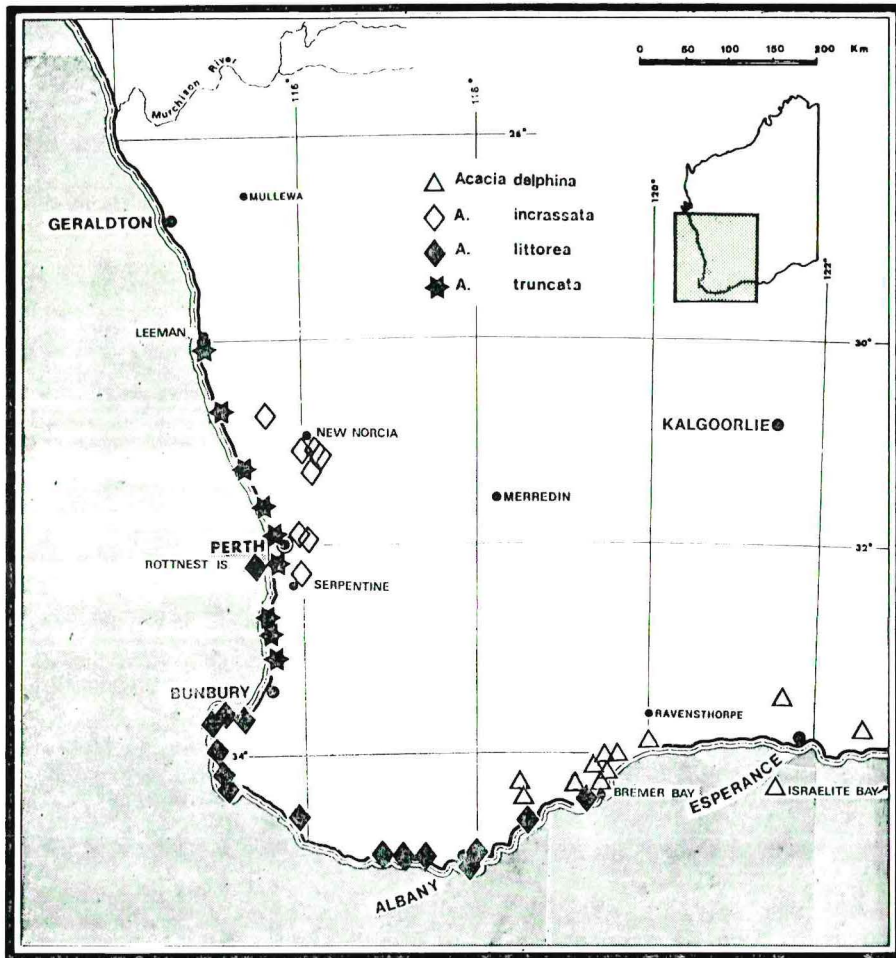


Figure 24. Distribution of *Acacia delphina*, *A. incrassata*, *A. littorea* and *A. truncata*.

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