

**Acacia miscellany 19. The taxonomy of some Western Australian species of *Acacia* section *Juliflorae* with 4-merous flowers (Leguminosae: Mimosoideae)**

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**Abstract**

Maslin, B.R. and Chapman, A.R. *Acacia* miscellany 19. The taxonomy of some Western Australian species of *Acacia* section *Juliflorae* with 4-merous flowers (Leguminosae: Mimosoideae). *Nuytsia* 12(3): 469–486 (1999). Nine new Western Australian taxa of *Acacia* are described, namely, *A. aprica* Maslin & A.R. Chapman, *A. arcuatilis* R.S. Cowan & Maslin, *A. cochlocarpa* subsp. *velutinosa* Maslin & A.R. Chapman (a description is also provided for *A. cochlocarpa* W. Fitzg. subsp. *cochlocarpa*), *A. cracentis* R.S. Cowan & Maslin, *A. isoneura* Maslin & A.R. Chapman (comprising subsp. *isoneura* and subsp. *nimia* Maslin & A.R. Chapman), *A. lirellata* Maslin & A.R. Chapman (comprising subsp. *lirellata* and subsp. *compressa* Maslin & A.R. Chapman) and *A. tetraeneura* Maslin & A.R. Chapman. The differences between the closely related species pair *A. filifolia* Benth. and *A. tratmaniana* W. Fitzg. are elucidated and a description of each species is provided. All these species are characterized by having 4-merous flowers arranged in  $\pm$  sessile heads or spikes and most have terete to quadrangular phyllodes (flat in *A. cochlocarpa* and *A. lirellata* subsp. *compressa*, and sometimes in *A. tetraeneura*). A key to the species described in this paper is provided.

**Introduction**

This paper deals with a number of Western Australian species of *Acacia* Mill. (Leguminosae: Mimosoideae) that have 4-merous flowers arranged in more or less sessile heads or spikes. Many of the species also have slender, terete or quadrangular phyllodes with 4 or 8 longitudinal nerves. In the past, some plants with this combination of characters were called *A. filifolia* which is shown here to be a relatively uncommon species. Not all species with the above-mentioned floral attributes are included in this paper. Indeed, the taxa presented here are grouped largely for convenience in order that the new names can be made available for use in the forthcoming "Flora of Australia" Volume 11.

Plurinerved phyllodinous acacias are classified as belonging to section *Juliflorae* (Benth.) C. Moore & Betche when the flowers are arranged in cylindrical spikes, and section *Plurinerves* (Benth.) C. Moore & Betche when the flowers are in globular heads (Pedley 1978). As discussed by Maslin & Stirton (1998), in many ways this distinction is largely artificial. Some species included in the present paper have globular heads, others cylindrical spikes, and yet others are intermediate with obloid heads. A similar range of variation in head shape occurs in other groups of closely related species in the Australian *Acacia* flora, e.g. the *A. stigmatophylla* group (Tindale 1980).

Independently of the present study, Cowan and Maslin had prepared descriptions of two new species, *A. arcuatis* and *A. cracentis*. These species are published here because they are clearly related to others included in this paper.

### Key to taxa described in this paper

- 1 Phyllodes flat, 1.5–6 mm wide
  - 2 Phyllodes 1-nerved on each face, straight to shallowly incurved, (2–3 mm wide) ..... **A. tetraneura**
  2. Phyllodes 3–7-nerved on each face, shallowly to strongly incurved
    - 3 Phyllodes 1.5–2(3) mm wide; pods  $\pm$  straight (branchlets glabrous) ..... **A. lirellata** subsp. **compressa**
    3. Phyllodes 3–6 mm wide; pods tightly spirally or  $\pm$  irregularly coiled
      - 4 Branchlets, pods and phyllodes glabrous ..... **A. cochlocarpa** subsp. **cochlocarpa**
      4. Branchlets, pods and normally phyllode nerves hairy .... **A. cochlocarpa** subsp. **velutinosa**
1. Phyllodes terete to quadrangular, 0.5–1.5 mm wide
  - 5 Phyllodes decurrent on branchlets ..... **A. lirellata** subsp. **lirellata**
  5. Phyllodes not decurrent on branchlets
    - 6 Flowers 30–55 in sub-globular to obloid heads or cylindrical spikes; phyllodes 5–20(25) cm long
      - 7 Flowers in cylindrical spikes or sometimes obloid heads 4–5 mm wide (when dry); phyllodes straight to shallowly incurved, (7–12(14) cm long)
        - 8 Phyllodes slender (0.5–0.6 mm diam.), soft and flexible, with nerves 0.2 mm wide; spikes mostly paired in axil of phyllode ..... **A. isoneura** subsp. **isoneura**
        8. Phyllodes thick (0.8–1.2 mm diam.), rigid, with nerves 0.3 mm wide; spikes single in axil of phyllode ..... **A. isoneura** subsp. **nimia**
      7. Flowers in sub-globular to obloid heads 5–8 mm wide (when dry); phyllodes shallowly to strongly incurved or sometimes irregularly sigmoid or serpentinous
        - 9 Phyllodes mostly 5–11 cm long; diffuse shrub 1.5–2 m tall; upper branches commonly spreading  $\pm$  horizontally ..... **A. aprica**
        9. Phyllodes mostly 12–20 cm long; wispy, erect shrub 1.5–3 m tall; terminal branchlets sometimes subpendulous ..... **A. filifolia**
    6. Flowers less than 30 in globular to obloid heads; phyllodes 2.5–8(–11) cm long
      - 10 Phyllodes quadrangular with a broad, flat nerve along each angle ..... **A. tratmaniana**
      10. Phyllodes terete (occasionally slightly quadrangular) with 4 or 8 equal, broad nerves
        - 11 Phyllodes 4-nerved, deeply furrowed between nerves ..... **A. tetraneura**
        11. Phyllodes 8-nerved, very shallowly furrowed between nerves
          - 12 Phyllodes shallowly to strongly incurved (sometimes into a circle), grey-green to subglaucous (ignore new growth); heads normally twinned in axil of phyllode ..... **A. arcuatis**
          12. Phyllodes straight to very shallowly incurved, dark green to milky green; heads normally single in axil of phyllode ..... **A. cracentis**

## Descriptions

### *Acacia aprica* Maslin & A.R. Chapman, *sp. nov.*

Frutex diffusus, apertus, ad 2 m altus. Ramuli leniter flexuosi, inter costas dense argenteo-sericei. Phyllodia teretia ad subquadrangularia,  $\pm$  sessilia, 5–11 cm longa, 1–1.5 m lata, parce ad valde incurva, 8-nervia, nervis latis, applanatis, sulcis vadosis fuscis segregatis. Inflorescentia simplex; capitula sessilia ad subsessilia (pedunculo ad 2 mm longo), subglobosa ad oblongoidea. Flores 4-meri. Sepala c. dimidio unita. Legumen lineare, ad 6 cm longum, c. 2 mm latum, sericeum, marginibus latis, glabris. Semina longitudinalia; arillus parvus.

*Typus*: near Coorow [precise locality withheld for conservation reasons], Western Australia, 2 June 1976, B.R. Maslin 4126 (*holo*: PERTH 00156086; *iso*: CANB, K, MEL, NSW).

Diffuse, open *shrub* 1.5–2 m tall, dividing near ground level into 2 to many spreading main stems, the upper branches often spreading  $\pm$  horizontally. *Bark* dark grey, smooth except fine fissures towards base of stems. *Branchlets* slightly flexuose, not or scarcely pendulous, red-brown, densely silvery sericeous between the often-resinous ribs. *Stipules* not seen. *Phyllodes* terete to sub-quadrangular, 5–11 cm long, rarely very few to 14 cm, 1–1.5 mm diam., rather stout and sparse, moderately to strongly incurved or sometimes shallowly serpentinous, silvery sericeous when young (especially between nerves), commonly glabrous at maturity except appressed hairs at base, dull, green to grey-green; *longitudinal nerves* 8, broad (0.2–0.3 mm wide),  $\pm$  flat-topped, not or scarcely raised and separated by an equal number of shallow and narrow yet distinct, dark longitudinal furrows, the nerves of  $\pm$  uniform width and prominence; *apex* acute with a dark brown point; *pulvinus* very indistinct. *Gland* situated on upper surface of phyllode 1–3 mm above base, obscure, slightly swollen. *Inflorescence* simple, single or paired in axil of phyllode. *Heads* subglobular to obloid, sessile to subsessile (peduncle to 2 mm long, densely hairy), 7–10 mm long and 7–8 mm wide when dry, densely 40–55-flowered, golden; *bracteoles* persistent, spatulate, c. 1 mm long, with a narrow stipe and a rhomboid, acute, dark lamina. *Flowers* 4-merous; *sepals* 1/2 to 2/3 length of petals, c. 1/2 united, the lobes narrow, thickened at apex, dark and puberulent along midrib; *petals* 1.5–2 mm long, viscid, without an obvious midrib. *Ovary* sessile, puberulous; style sub-lateral. *Pods* linear, shallowly to moderately constricted between seeds, flat, 2.5–6 cm long, c. 2 mm wide, thinly crustaceous, straight to shallowly curved, red-brown, silvery sericeous on faces; margins broad, glabrous, yellow or red-brown. *Seeds* longitudinal, obloid-ellipsoid, 2.5–3 mm long, 1.5–2 mm wide, 1 mm thick, glossy, pale brown mottled yellow (pale yellowish prior to maturity); *funicle* filiform, expanded into a small, terminal, cream (dry) aril measuring 1/4–1/3 length of seed.

*Selected specimens examined*. WESTERN AUSTRALIA, all near Coorow [precise localities withheld for conservation reasons]: 1 July 1962, C. Chapman s.n. (BRI, PERTH); B.R. Maslin 6406 (NY, PERTH); D. Papenfus DP 451 (PERTH); D. Papenfus DP 456 (PERTH).

*Distribution*. Occurs in the south-west of Western Australia where it is restricted to a small area near Coorow.

*Habitat*. Grows in gravelly or clayey sand or loam in scrub and low woodland.

*Phenology*. Flowering recorded from June to August; mature pods collected in mid-December.

*Conservation status*. CALM Conservation Codes for Western Australian Flora: Declared Rare.

*Etymology.* The specific epithet is derived from the Latin *apricus* (lying open, exposed to the sun) and alludes to the open, diffuse habit of the shrubs.

*Affinities.* Related to *A. arcuatilis* (which is distinguished by generally shorter, more slender phyllodes, fewer-flowered heads and normally a lower stature) and *A. lirellata* subsp. *lirellata* (which is most readily distinguished by its decurrent, deeply furrowed phyllodes and obtuse bracteoles). Also closely related to *A. filifolia* which can be distinguished by its wispy, taller habit and longer, generally thinner phyllodes. *Acacia aprica*, *A. filifolia* and *A. lirellata* subsp. *lirellata* all occur in the Coorow area.

**Acacia arcuatilis** R.S. Cowan & Maslin, *sp. nov.*

Frutex effusus 0.4–0.8 m altus. Ramuli versus apices sericei inter costas resinosas rubescentes. Phyllodia teretia, plerumque 3–6 cm longa, 0.6–1.2 mm lata, parum ad valde incurva (interdum omnino in circulo), nervis 8, latis, appianatis, non vel parum elevatis, sulcis vadosis angustis adpresso-puberulis. Inflorescentia simplex; capitula sessilia, ± globosa. Flores 4-meri. Sepala pro 2/3 vel 3/4 unita. Legumen lineare, ad 6 cm longum, 1.5–2 mm latum, in quoque pagina minute adpresso-puberulum, marginibus latis. Semina longitudinalia, maculata.

*Typus:* 6.5 km south of Kulin, Western Australia, 27 August 1973, B.R. Maslin 3424 (*holo:* PERTH 00158461; *iso:* AD, CANB, K, MEL, NSW, NY).

Low, spreading, sometimes ± flat-topped *shrub*, usually 0.4–0.8 m tall and 0.4–1.3 m across, occasionally 1–2 m tall. *New shoots* resinous. *Bark* dark grey or grey-brown, longitudinally fissured (sometimes only at base of stems) exposing light brown underlayer. *Branchlets* silvery sericeous between the red-brown or yellow-brown resin-ribs at extremities, the new shoots resinous. *Stipules* minute (0.5–1 mm long), triangular, persistent. *Phyllodes* terete, (2.5)3–6(7) cm long, 0.6–1.2 mm diam., sometimes quite stout, shallowly to strongly incurved (sometimes into a complete circle) or sometimes shallowly sigmoid, resinous, minutely appressed- or sub-appressed-puberulous between nerves (hairs sometimes sparse and difficult to see, observe at magnification), grey-green to sub-glaucous (light green on new growth); *longitudinal nerves* 8, broad (0.2–0.3 mm wide), of uniform width and prominence, ± flat-topped, not or scarcely raised, separated by very narrow, shallow, longitudinal furrows; *apex* acute or obtusely mucronate with a straight or sometimes oblique, dark brown point; *pulvinus* indistinct, *c.* 0.5 mm long. *Gland* situated on surface of phyllode at its base, small, not always evident. *Inflorescence* simple, paired (occasionally 3) in axil of phyllode, very rarely a specimen with all heads solitary; *peduncles* 0.5–1 mm long, hairy. *Heads* globular to very shortly obloid or widely ellipsoid, 4–6 mm long and 4–5 mm diam. when dry, 10–22-flowered, golden; *buds* resinous; *bracteoles* 0.5–1 mm long, dark, obtuse to shortly acuminate. *Flowers* 4-merous; *sepals* 1/2 or more of petal length, 2/3–3/4-united; lobes triangular, glabrous; *petals* glabrous. *Ovary* densely hairy. *Pods* linear, slightly raised over and constricted between seeds, 2.5–6 cm long, 1.5–2 mm wide, very thinly coriaceous, straight to very shallowly curved, resinous, minutely appressed-puberulous on lateral faces; margins broad (but not thickened), glabrous. *Seeds* longitudinal in pod, ellipsoid, 2–2.5 mm long, 1–1.3 mm wide, glossy, mottled dark brown on grey and with a dark brown peripheral nerve; *pleurogram* U-shaped; *areole* small, pale; *aril* terminal, bluntly conical, about as long as seed, drying a pale waxy yellow.

*Selected specimens examined.* WESTERN AUSTRALIA: Swan River colony, *J. Drummond* 5: 2 (MEL, PERTH); 3 miles [4.8 km] W of Corrigin on road to Brookton, *B.R. Maslin* 500 (NY, PERTH); 7 km S of Kulin towards Kukerin, *B.R. Maslin* 4376 (PERTH); 9 km W of Piawaning on road to Great Northern

Highway, *B.R. Maslin* 4967 (CANB, K, MEL, PERTH); about 2 km due W of Camel Peaks, *B.R. Maslin* 5770 (BRI, G, MEL, PERTH); about 12 km due SE of Quairading, *B.R. Maslin* 7675 (PERTH); 20 km NW of Ongerup, *N. Stephens* KRN9492-1 (MELU, PERTH); intersection off Kulin-Wickepin road, 30 miles [48 km] to Pingaring and 30 miles [48 km] to Harrismith, *M.D. Tindale* 3746 (BRI, CANB, K, MEL, NSW, PERTH); Reserve No. 26381, 10 km NNW of Nyabing, 4 Sep. 1984, *K.J. Wallace s.n.* (PERTH).

*Distribution.* Occurs in south-west Western Australia in three disjunct areas, between Bindi Bindi and Piawaning in the north, Ongerup and Nyabing in the south, and from Quairading and Wickepin east to just north of Hyden.

*Habitat.* Grows in sand and loam, sometimes with gravel or quartzite, in mallee scrub or low heath.

*Phenology.* Flowering recorded from June to September; mature pods collected in December.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Two.

*Etymology.* The specific epithet is chosen because of the curvature of the phyllodes, from the Latin *arcuatilis* (curved like a bow).

*Affinities.* *Acacia arcuatilis* is very closely related to *A. cracentis* and the two could perhaps be treated as subspecies of a single species, as they share the same basic phyllode nervature, inflorescence structure and carpological features. Normally *A. cracentis* is distinguished by its more slender, straighter, greener phyllodes with only a single head in the axil. However, when the phyllodes of *A. arcuatilis* are only shallowly curved, this species can be difficult to distinguish from *A. cracentis*. Apart from the number of heads per axil, other characters helpful in recognizing *A. cracentis* include its commonly glabrous phyllodes and taller growth habit.

*Acacia arcuatilis* is also related to *A. aprica* and *A. lirellata* subsp. *lirellata* (see discussion under these taxa). Specimens of *A. arcuatilis* with particularly thick phyllodes may superficially resemble *A. obesa* R.S. Cowan & Maslin which is readily distinguished by its striate, 12-16-nerved phyllodes, 5-merous flowers and strongly curved pods. A general similarity between *A. arcuatilis* and *A. pinguiculosa* subsp. *teretifolia* R.S. Cowan & Maslin may be noted but that subspecies is readily recognized by its longer peduncles (5-10 mm), 5-merous flowers and glabrous, thickly textured pods.

*Variation.* Most specimens have distinctive, markedly curved phyllodes, but a few have shallowly curved phyllodes and then resemble *A. cracentis* (see above). Judging from the relatively few field data, it appears that *A. arcuatilis* is normally a low, spreading shrub 0.4-0.8 m tall; however, specimen label information on *Stevens* KRN9492-1 and *Maslin* 500 suggest that under some circumstances plants can reach 1-2 m in height.

*Acacia cochlocarpa* Meisner, *Bot. Zeitung* (Berlin) 13:10 (1855). *Type*: "Drumm. Coll. VI n. 6: Nov. Holl. Australi - occid. inter flum. Moore et Murchison" [between Moore River and Murchison River, Western Australia], *J. Drummond* coll. 6:6, comm. *Shuttleworth* 1854 (*holo*: NY; *iso*: BM, CGE, LD (sphalm. "coll. 3"), OXF, P, PERTH 00745162 - fragment of unknown origin). See Maslin & Cowan (1994) for details of typification.

Sprawling low shrub 0.3–0.7 m high, 1.5–3 m across. Bark smooth or slightly stringy, reddish-grey. Branchlets straight to shallowly flexuose, ribbed and yellow-brown at extremities, glabrous or pubescent (with short,  $\pm$  straight, patent, soft hairs). Stipules early caducous (scars only seen) or persistent. Phyllodes narrowly oblong-elliptic, 2.5–7.5 cm long, 3–6 mm wide, coriaceous, flat, shallowly to strongly incurved, erect, hairy on nerves or glabrous, green; longitudinal nerves prominent, 3–7 per face, the midrib broader and more evident than the rest, the nerves rather widely spaced (distinct inter-nerve spaces between) and commonly a few not extending full length of phyllode; apex acute or obtuse, mucronate; pulvinus 1–3 mm long, yellow-brown,  $\pm$  smooth. Gland on upper margin of phyllode 0–1 mm above pulvinus, often obscured by hairs in subsp. *velutinosa*, elliptic, 0.5–0.6 mm long, 0.3–0.4 mm wide, yellow-brown. Inflorescences simple, paired in axil of phyllode. Heads sub-globular to shortly cylindrical, 5–10 mm long and 5–6 mm diam. (dry), subdensely flowered, golden; bracteoles persistent, ovate or obovate, 0.7–1.8 mm long, 0.5–0.8 mm wide, red-brown, obtuse or acute to acuminate. Flowers 4-merous; sepals 0.8–1.2 mm long *c.* 1/2 length of petals, lobed to 1/2 their length. Petals 1.6–2.2 mm long,  $\pm$  free, yellow; nerves not evident. Ovary sessile, puberulous, style  $\pm$  central. Pods tightly spirally or  $\pm$  irregularly coiled; valves 3–4 mm wide, chartaceous, smooth, brown, glabrous or  $\pm$  velutinous (the hairs dense, moderately long, sub-straight, patent and soft); margins broad, yellow, glabrous. Seeds longitudinal in pod, spherical to obloid, 1.5–2.5 mm long, 1.5–2.5 mm wide, *c.* 1 mm thick, glossy, grey with brown speckling and a dark peripheral nerve; pleurogram fine, circular, open 0.2 mm at hilar end; areole *c.* 0.2 mm long, 0.2 mm wide; funicle short, filiform, straight, expanded into a terminal, cream (dry) aril.

*Distribution.* Occurs in the north-central wheatbelt region of south-west Western Australia near Watheroo and Manmanning with an early collection from west of Moora and possibly also from near York.

*Affinities.* *Acacia cochlocarpa* appears to be most closely related to *A. lirellata* and *A. tetraneura* but is sharply distinguished from both these taxa by its tightly coiled pods. The two taxa that superficially most closely resemble one another are *A. cochlocarpa* subsp. *velutinosa* and *A. lirellata* subsp. *compressa* on account of both having flat, curved, strongly multi-nerved phyllodes, sessile, sub-globular to shortly obloid heads and acute to acuminate, dark bracteoles. Apart from its  $\pm$  straight, moniliform pods, subsp. *compressa* is most readily recognized by its glabrous branchlets and by its phyllodes that are narrower (normally 1–2 mm wide) and glabrous.

Until recent years the name *A. neurophylla* W. Fitzg. was commonly but erroneously applied to plants of *A. cochlocarpa*. The two species are not particularly closely related.

*Subspecies.* Two subspecies, subsp. *cochlocarpa* and subsp. *velutinosa*, are recognized within *A. cochlocarpa* and these can be readily distinguished by their branchlet and pod indumentum and other characters (see subspecies descriptions below and key above). Both subspecies have restricted geographic ranges and their distributions do not overlap.

#### ***Acacia cochlocarpa* Meisner subsp. *cochlocarpa***

*Branchlets* glabrous. *Stipules* early caducous. *Phyllodes* (3)4–7.5 cm long, 4–6 mm wide, glabrous, 5–7-nerved with the central nerve equidistant from margins; apex acute. *Heads* obloid to shortly cylindrical, 7–10 mm long (dry); *bracteoles* obovate, 0.7–0.8 mm long, obtuse. *Pods* glabrous.

*Selected specimens examined.* WESTERN AUSTRALIA, near Watheroo [precise localities withheld for conservation reasons]: July–Aug. 1973, C. Chapman *s.n.* (AD, CANB, K, L, PERTH); 18 Nov. 1973,

*C. Chapman s.n.* (B, BFT, BRI, CANB, K, MEL, NSW, NY, PERTH); *C. Chapman* 4 (AD, PERTH); *B.R. Maslin* 4492 (MEXU, PERTH); *D. Papenfus* 462 (CANB, PERTH); westward from Moora, *L. Diels* 3096 (PERTH).

*Distribution.* Occurs in the south-west of Western Australia, restricted to near Watheroo and an early collection west of Moora.

*Habitat.* Grows on clayey sand in open shrubland or scrub with *Allocasuarina campestris*.

*Phenology.* Flowering recorded from June to August; mature pods collected in November and December.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Declared Rare.

***Acacia cochlocarpa* subsp. *velutinosa* Maslin & A.R. Chapman, *subsp. nov.***

Ramuli pubescentes. Phyllodia 2.5–4 cm longa, 3–5 m lata, nervis 3–5(7); stipulae persistentes. Capitula subglobosa; bracteolae acuminatae. Legumen ± velutinum.

*Typus:* Manmanning area [precise locality withheld for conservation reasons], Western Australia, 30 November 1974, *A.S. George* 12926 (*holo:* PERTH 00455644; *iso:* CANB, K, NSW).

*Branchlets* pubescent. *Stipules* persistent, triangular, 1.5–2 mm long, 0.5–0.7 mm wide, scarious, acute, red-brown, sparsely hairy abaxially. *Phyllodes* 2.5–4 cm long, 3–5 mm wide, 3–5(7)-nerved, normally hairy on nerves, the central nerve slightly excentric (slightly closer to adaxial margin); *apex* obtuse or occasionally acute. *Heads* sub-globular, 5–7 mm long (dry). *Bracteoles* ovate, 1.2–1.8 mm long, acute to acuminate. *Pods* ± velutinous.

*Selected specimens examined.* WESTERN AUSTRALIA [precise localities withheld for conservation reasons]: York district, *L. Preiss* 937 (G, NY, LUND, PERTH – photograph); near Manmanning, *B. & M. Smith* 352 (PERTH); 2 May 1974; *B. & M. Smith s.n.* (CANB, PERTH); 20 June 1974, *B. & M. Smith s.n.* (MEL, PERTH).

*Distribution.* Occurs in the south-west of Western Australia, restricted to near Manmanning with an early collection of dubious locality from near York (see Notes below).

*Habitat.* Grows in sandy clay in heath and on sandy laterite in mallee.

*Phenology.* Flowering recorded from May to July; mature pods collected in November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority One.

*Etymology.* The subspecific epithet, from the Latin *velutinus* (velvety) and the suffix *-osus* (indicating full development), alludes to the indumentum on the branchlets, phyllodes and especially the pods.

*Affinities.* Similar to *A. lirellata* subsp. *compressa* (see discussion under other subspecies).

*Notes.* The first gathering of this taxon appears to have been *Preiss* 937 which is a specimen bearing the following annotation: "Frutex 3 pedalis. In planitie arenosis sylvae inter praedia rustica DD. Barker et Lennard. April 12. [18]40". Based on information provided in Marchant (1990) this locality is somewhere between E.P.B. Lennard's property on the Swan River near Guildford and S.A. Barker's property near York. There are no modern collections of subsp. *velutinos* from this region and it is unlikely to occur there because of an absence of suitable habitats; it is therefore probable that the locality given by *Preiss* is an error.

**Acacia cracentis** R.S. Cowan & Maslin, *sp. nov.*

Frutex 0.5–2 m altus. Ramuli versus apices sericei inter costas resinosa. Phyllodia teretia, gracilia, 2.5–6 cm longa, 0.5–0.7 m lata, recta ad parum incurva, nervis 8, latis, applanatis. Inflorescentia simplex; capitula sessilia, globosa ad subglobosa, floribus 12–20. Flores 4-meri. Sepala 3/4 unita. Legumen lineare, ad 5 cm longum, 1–2 mm latum, rectum. Semina longitudinalia, maculata; arillus semen fere aequans.

*Typus:* Chiddarcooping Nature Reserve, Morrison Road, 9 km east of Echo Road, Western Australia, 23 July 1989, *B.R. Maslin* 6383 (*holo:* PERTH 01014366; *iso:* CANB, K, Z).

Bushy, multistemmed, rounded or obconic *shrub* 0.5–2 m tall. *Bark* dark grey, smooth or furrowed. *New shoots* resinous. *Branchlets* with yellow-brown or red-brown resin-ribs at tips, sparsely to densely sericeous between ribs (hairs sometimes difficult to see, lost with age). *Stipules* minute, triangular, persistent. *Phyllodes* terete or sometimes slightly quadrangular, 2.5–5(6) cm long, 0.5–0.7 mm diam., slender, patent to ascending, straight to very shallowly incurved, resinous at least when young, glabrous or sparsely appressed-hairy between nerves (hairs normally difficult to see, observe at magnification), dark green to milky green; *longitudinal nerves* 8, broad (0.2 mm wide), of uniform width and prominence,  $\pm$  flat-topped, not or scarcely raised, separated by very narrow, shallow, dark longitudinal furrows; *pulvinus* indistinct; *apex* acute with an normally oblique, dark brown point. *Gland* situated on upper surface of phyllode at its base, indistinct. *Inflorescence* simple, solitary in axil of phyllode, very rarely a specimens with all heads paired. *Heads* sessile (peduncle sometimes to 0.5 mm long, hairy), globular to subglobular, golden, 4–6 mm diam. when dry, 7–8 mm diam. when fresh, 12–20-flowered; *bracteoles* c. 1 mm long, dark coloured, acute or obtuse. *Flowers* 4-merous, commonly resinous; *sepals* about half as long as petals, 3/4-united; lobes triangular,  $\pm$  puberulous; *petals* free, elliptic, acute, glabrous, 1-nerved. *Ovary* densely hairy. *Pods* linear, slightly raised over and slightly constricted between seeds, 2.5–5 cm long, 1–2 mm wide, mostly erect, very thinly coriaceous, straight to shallowly curved (valves curving more upon dehiscence), minutely appressed-puberulous on lateral faces, resinous especially when young, resembling the phyllodes when green, red-brown at maturity; margins broad but not thickened (in immature pods the margins appear to overgrow the lateral faces), commonly glabrous. *Seeds* longitudinal in pod, ellipsoid, 2–2.5 mm long, 1–1.3 mm wide, 1 mm thick, glossy, mottled dark brown on yellow-brown or brown-grey and with a dark brown peripheral nerve; *pleurogram* semicircular to U-shaped; *areole* small, pale; *aril* terminal, bluntly conic, as long or nearly as long as seed, white when fresh (drying a pale waxy yellow).

*Selected specimens examined.* WESTERN AUSTRALIA: 5.4 miles [8.6 km] E of East (Wheat) Bin, Hyden, *M. Barrow* M28 (PERTH); 40 miles [64 km] E of Hyden, *J.S. Beard* 3925 (PERTH); E of Gibb Rock, *J.S. Beard* 5926 (PERTH); Lake Hurlstone Nature Reserve, 9 km NW of Holt Rock on road to Hyden, *B.R. Maslin* 6373A (G, PERTH, Z); Lake Hurlstone Nature Reserve, 9 km NW of Holt Rock on road to Hyden, *B.R. Maslin* 6485 (CANB, K, PERTH); NW corner of Chiddarcooping Nature Reserve, *J.G. & M.H. Simmons* 2469 (PERTH).

*Distribution.* Occurs in south-west Western Australia in two discontinuous areas – the Chiddarcooping Nature Reserve north-east of Merredin; and from Gibb Rock to near Hyden and south-east to Lake Hurlstone.

*Habitat.* Grows in gravelly loam in association with granite outcrops or along watercourses, in *Melaleuca* scrub, low heath or *Eucalyptus stowardii* and *Allocasuarina campestris* shrubland.

*Phenology.* Flowering recorded from July to September; mature pods collected from November to January.

*Conservation status.* Although there are few collections, this species occurs in two nature reserves and is considered not under threat.

*Etymology.* The name is derived from *cracens*, Latin for slender, graceful, in allusion to the very slender phyllodes.

*Affinities.* Very closely related to *A. arcuatis* (see discussion under this species above). Forms of *A. tratmaniana* with short phyllodes could easily be confused with *A. cracensis*.

**Acacia filifolia** Benth., *London J. Bot.* 1: 369 (1842). *Type citation:* Swan River, Drummond. *Type:* Western Australia, *J. Drummond* 156 (*syn:* K); Swan River to King George Sound [Albany], Western Australia, *J. Drummond* 302 (*syn:* K, OXF, P).

[*A. ephedroides auct. non* Meisn.: G. Bentham, *Fl. Austral.* 2: 400 (1864), *pro parte*, as to *J. Drummond* 156.]

Open, wispy *shrub* 1.5–3 m tall, single-stemmed or sparingly branched at base. *Branchlets* straight or slightly flexuose, silvery sericeous between the red-brown or yellowish resin-ribs at the sometimes sub-pendulous tips. *Phyllodes* quadrangular to subquadrangular, occasionally terete, sessile, (10)12–20(25) cm long, 0.7–1 mm wide, rather slender, ascending, shallowly to strongly incurved, sometimes irregularly sigmoid, glabrous (except appressed hairs at base), sometimes sparsely appressed-hairy between nerves; *longitudinal nerves* 8, of uniform width and prominence (when phyllodes terete) or the nerve at each of the 4 angles more raised than the rest (when phyllodes quadrangular), broad, ± flat-topped and resinous, separated by narrow, shallow, dark longitudinal furrows. *Gland* on upper surface of phyllode 1–6 mm above base. *Inflorescence* single or paired (rarely 4) in axil of phyllode. *Heads* sessile or on densely hairy peduncle to 1 mm long, sub-globular to obloid, densely 30–40-flowered, 6–12 mm long and 5–8 mm diam. when dry, golden; *bracteoles* acute. *Flowers* 4-merous; *sepals* 1/2–3/4 length of petals, dissected for 1/2–3/4 their length; *petals* 1.5–2 mm long. *Ovary* tomentose. *Pods* linear, shallowly constricted between seeds and very slightly raised over them, 7–12 cm long, 2.5–3 mm wide, firmly chartaceous, straight to shallowly curved, densely appressed-hairy on faces; margins wide, glabrous, yellowish. *Seed* longitudinal, obloid-ellipsoid, 3 mm long, shiny, grey-brown with brown mottling and a dark peripheral nerve; *aril* as long as seed, drying yellowish.

*Selected specimens examined.* WESTERN AUSTRALIA: 5 km N of Wongan Hills on the road to Ballidu, B.R. Maslin 4970 (BRI, CANB, K, MEL, MO, NY, PERTH); 6.9 km E of The Midlands Rd on South Waddy Rd, SE of Coorow, D. Papenfus DP454 (PERTH); 600 m S of Buntine–Marchagee Rd on Teasedale Rd, SE of Coorow, D. Papenfus DP459 (PERTH); Wongan [Hills] township road to

airstrip, B.H. Smith 667 (PERTH); Reynoldson's Reserve (N of Wongan Hills), A.S. Weston 7386 (PERTH).

*Distribution.* Scattered and discontinuous in south-west Western Australia from Coorow eastwards through Wongan Hills to near Burracoppin and Southern Cross.

*Habitat.* Grows in yellow or brown sand over laterite mostly in scrub or heath.

*Phenology.* Flowering recorded from May to September; mature pods collected in November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Three.

*Affinities.* Closely related to *A. aprica* and *A. tratmaniana* (see these species for discussion of differences). Also related to *A. merinthophora* E. Pritz. which is readily recognized by its prominently flexuose branchlets.

**Acacia isoneura** Maslin & A.R. Chapman, *sp. nov.*

Frutex ad 3 m altus. Ramuli versus apices sericei inter costas. Phyllodia teretia, grosse pungentia, 7–12(14) cm longa, 0.5–1.2 mm lata; nervi 8, lati, aequales, costis vadosis angustis separati. Inflorescentia simplex, 1 vel 2 per axillam; capitula  $\pm$  sessilia, obloidea ad breviter cylindrica. Flores 4-meri. Sepala 1/2 ad 3/4 unita. Legumen lineare ad submoniliforme, 3–6 cm longum, 2–2.5 mm latum. Semina longitudinalia, maculata.

*Typus:* near Mingenew [precise locality withheld for conservation reasons], Western Australia, 9 August 1970, B.R. Maslin 728 (*holo:* PERTH 00667919; *iso:* CANB, K, NY).

Rounded or obconic *shrub*, dense or openly branched, 0.5–3 m tall, few-branched or multistemmed at base. *Bark* smooth except fissured on main stems (sometimes only at base) of mature plants, dark grey except stems of young plants and upper branches of mature plants red-grey. *Branchlets* silvery sericeous between the rather fine yellow, light brown or red ribs towards apices, ageing glabrous. *Stipules* inconspicuous. *Phyllodes* terete, 7–12(14) cm long, 0.5–1.2 mm diam., soft, flexible or rigid, ascending to erect, straight to shallowly incurved, glabrous or sub-glabrous except appressed-puberulous when young and on upper surface at base of mature phyllodes, green to grey-green; *longitudinal nerves* 8, of uniform width and prominence, broad (0.2–0.3 mm wide), flat-topped or shallowly convex, not or scarcely raised, separated by shallow, narrow yet distinct, dark longitudinal furrows; *apex* acute with a coarsely pungent or innocuous dark brown, straight or slightly curved point; *pulvinus* indistinct, yellowish. *Gland* on upper surface of phyllode 0–3 mm above pulvinus, very indistinct, often obscured by hairs; phyllode sometimes slightly swollen about the gland. *Inflorescences* simple, single or paired in axil of phyllode. *Spikes* obloid to shortly cylindrical, 8–15 mm long, 4–5 mm wide when dry,  $\pm$  sessile (peduncle sometimes to 2 mm long, sericeous), 30–40-flowered, golden; *bracteoles* spatulate, mostly *c.* 0.5 mm long, dark brown,  $\pm$  puberulous abaxially, obtuse or acute. *Flowers* 4-merous; *sepals* 1/3–1/2 the length of the petals, dissected for 1/4–1/2 their length into triangular, normally ciliolate lobes; calyx tube glabrous or sparsely puberulous; *petals* glabrous, nerveless or almost so. *Ovary* tomentose. *Pods* linear to sub-moniliform, moderately constricted between seeds,  $\pm$  flat or shallowly raised over the seeds, straight to very shallowly curved, pendulous, 3–6 cm long, 2–2.5 mm wide, firmly chartaceous, reddish brown, minutely appressed-puberulous; margins somewhat broad (not thickened), glabrous. *Seeds* longitudinal in pod, ellipsoid to obloid-

ellipsoid, 2–3 mm long, 1.5 mm wide, shiny, grey-brown with few dark brown speckles or light brown mottled yellow; pleurogram U- or V-shaped, open towards hilum, sometimes bordered by a narrow band of dark tissue; areole very small, 0.3–0.5 × 0.2 mm; funicle filiform, short, expanded into a ± conical, folded, white (drying pale yellow) aril which is 1/2 or fully the seed length.

*Distribution.* Occurs in the south-west of Western Australia in the Mingenew and Three Springs areas (subsp. *isoneura*) and from near Wubin to Perenjori (subsp. *nimia*), about 60 km to the south-east.

*Affinities.* Closely allied to *A. hopperiana* Maslin which is most readily distinguished by its 10-nerved phyllodes and discoid seeds.

*Subspecies.* Two allopatric subspecies are recognized, distinguished primarily by phyllode characters (see key above). The typical subspecies occurs further to the north-west than subsp. *nimia*.

#### ***Acacia isoneura* Maslin & A.R. Chapman subsp. *isoneura***

*Shrub* 0.5–2 m tall. *Phyllodes* soft and flexible, slender and filiform (0.5–0.6 mm diam.); nerves 0.2 mm wide; apex innocuous to coarsely pungent. *Spikes* paired in axil of phyllode, rarely single. *Seeds* (few seen) light brown mottled yellow; *pleurogram* not bordered by dark tissue.

*Selected specimens examined.* WESTERN AUSTRALIA [precise localities withheld for conservation reasons]: near Mingenew, A.M. Ashby 4880 (AD, PERTH); near Three Springs, 28 Aug. 1972, C. Chapman s.n. (PERTH); near Mingenew, R. Coveny 3079 (NSW, PERTH); B.R. Maslin 6417 (CANB, PERTH).

*Distribution.* Restricted to the Mingenew and Three Springs areas.

*Habitat.* Yellow, white or brown sand on slopes and tops of low rises, in shrubland or roadside remnant.

*Phenology.* Flowering recorded from August to September; mature pods collected in December.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Three.

*Affinities.* As discussed above, *A. isoneura* is closely related to *A. hopperiana* Maslin. In its slender, terete, multinerved phyllodes and sessile spikes, the new subspecies bears a superficial resemblance to *A. coolgardiensis* Maiden subsp. *coolgardiensis* which is most readily distinguished by its shorter spikes, 5-merous flowers and terete pods.

#### ***Acacia isoneura* subsp. *nimia* Maslin & A.R. Chapman, subsp. nov.**

*Phyllodia* rigida, crassa (0.8–1.2 mm diam.); nervi 0.3 mm lati. Inflorescentia spiciformis, solitaria, axillaris.

*Typus:* 3 miles [4.8 km] south of Bunjil on the road to Latham, Western Australia, 9 August 1970, B.R. Maslin 740 (*holo*: PERTH 00657867; *iso*: CANB, K).

*Shrub* 1.5–3 m tall. *Phyllodes* rigid, thick (0.8–1.2 mm diam.), coarsely pungent; nerves 0.3 mm wide. *Spikes* single in axil of phyllodes. *Seeds* (one collection seen) grey-brown bespeckled dark brown; *pleurogram* bordered by a narrow band of dark-coloured tissue.

*Selected specimens examined.* WESTERN AUSTRALIA: 6.5 miles [10.5 km] from Perenjori on Three Springs road, I.B. Armitage 372 (PERTH); 1.6 km S of Caron towards Wubin, B.R. Maslin 3177 (BM, BRI, MO, P, PERTH); 9 km S of Latham on road to Wubin, B.R. Maslin 6434 (CANB, K, MEL, PERTH); E of Caron, F.W. Went 157 (PERTH).

*Distribution.* Occurs between Wubin and Perenjori.

*Habitat.* Yellow sand in heath, scrub or tall shrubland.

*Phenology.* Flowering recorded from August to October; mature pods collected in December.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Three.

*Etymology.* The subspecific epithet is derived from the Latin *nimius* (excessive or over-abundant), alluding to the broader phyllodes with wider nerves that help distinguish this subspecies from subsp. *isonaura*.

*Affinities.* As discussed above, *A. isoneura* is closely related to *A. hopperiana*. In its rigid, terete, multinerved phyllodes and sessile spikes the new subspecies bears a superficial resemblance to *A. cylindrica* R.S. Cowan & Maslin which is most readily distinguished by its 16-nerved phyllodes (the nerves narrower, often of unequal width).

***Acacia lirellata*** Maslin & A.R. Chapman, *sp. nov.*

Frutex ad 1.5 m altus. Ramuli ± recti vel flexuosi, glabri vel minute adpresso-puberuli. Phyllodia teretia vel anguste linearia, 3–13 cm longa, 0.8–2.5 mm lata, curvata ad circinata vel serpentina, glabra; nervi 8 (3 in quoque pagina phyllodiorum appanatorum), sulcis profundis longitudinalibus separati; pulvinus c. 1 mm longus, vel absens et itaque phyllodium decurrens. Inflorescentia simplex; capitula sessilia, subglobularia ad obloidea, raro cylindrica. Flores 4-meri. Calyx vadoso lobatus. Legumen moniliformis vel submoniliformis, ad 7 cm longum, 2–3 mm latum. Semina longitudinalia; arillus flavidus.

*Typus:* 2 km east of Quairading towards Bruce Rock, Western Australia, 12 June 1976, B.R. Maslin 4163 (*holo:* PERTH 00156140; *iso:* CANB, K, NY).

Dense, low, spreading, intricate, sometimes procumbent *shrub*, 0.3–1(1.5) m high, 1–3(4) m wide. *Bark* smooth, fissured at base, reddish-grey; *branchlets* sub-straight to flexuose, spreading to erect, ribbed, yellow-brown, glabrous or minutely appressed-puberulous. *Stipules* triangular, c. 1 mm long, red-brown, persistent. *Phyllodes* sometimes continuous with the branchlets but not forming cauline wings (subsp. *lirellata*), terete to quadrangular (subsp. *lirellata*) or flat (subsp. *compressa*), 3–13 cm long, 0.8–2(3) mm wide, thick, erect, curved to circinate or serpentinous, green or glaucous between nerves, glabrous; *longitudinal nerves* 8, prominent, 3-nerved per face when phyllodes are flat, resinous and commonly of unequal width; on terete phyllodes the nerves separated by a deep longitudinal furrow (at least when dry); on flat phyllodes the midrib broader and more prominently raised than each

of the flanking nerves; *apex* innocuous to coarsely pungent, mucronate with a short dark brown point; *pulvinus* c. 1 mm long, yellow, wrinkled, or absent. *Gland* on upper margin of phyllode c. 1 mm above *pulvinus*, obscure. *Inflorescences* simple, 2(3) in axil of phyllode. *Heads* sessile, sub-globular to shortly obloid, rarely cylindrical, 5–7(15) mm long, 4–6 mm diam. when dry, sub-dense, golden. *Bracteoles* persistent, acute to acuminate or obtuse, very dark brown. *Flowers* 4-merous. *Sepals* 0.6–0.8 mm long, c. 1/2 length of petals, shallowly lobed, sparsely strigulose. *Petals* 1.5–2 mm long; nerves not evident. *Ovary* sessile, puberulous or hispidulous; *style* ± sub-lateral. *Pods* moniliform or sub-moniliform, 4–8 cm long, 2–3 mm wide, straight or loosely coiled, flat, firmly crustaceous or thinly coriaceous, brown, glabrous or densely antrorsely strigulose; margins broad, yellow, glabrous. *Seeds* longitudinal, obloid-ellipsoid, 2.5–3 mm long, 1.5–2 mm wide, c. 1 mm thick, dark brown; *pleurogram* fine, open towards hilum; *areole* oblong, c. 0.5 mm long, 0.2 mm wide; *funicle* short, filiform, straight, expanded into a terminal, yellowish (dry) aril.

*Distribution.* Of scattered occurrence in the wheatbelt region of south-west Western Australia from between Coorow and Ballidu, south to Bruce Rock and Waterbiddan Rock.

*Etymology.* The species name is derived from the Latin diminutive of *lira* (a furrow), in allusion to the prominent longitudinal grooves that occur between the nerves on the phyllodes of this species.

*Affinities.* Seemingly most closely related to *A. cochlocarpa* and *A. tetraeneura* (see *A. cochlocarpa* for discussion).

*Subspecies.* Two subspecies, subsp. *lirellata* and subsp. *compressa*, are recognized within *A. lirellata* and these can normally be readily distinguished by their phyllode and bracteole characters (see subspecies descriptions below and key above). Two specimens from the York–Quairading area, (*I.B. Armitage* 451 and *J. Seabrook s.n.*, both PERTH), are atypical and appear to combine characters of both subspecies. Although subsp. *lirellata* is recorded for this area, subsp. *compressa* is currently not recorded there.

#### ***Acacia lirellata* Maslin & A.R. Chapman subsp. *lirellata***

*Phyllodes* decurrent along branchlets but not forming cauline wings, epulvinate, not easily detached and commonly persisting on lower branchlets after phyllodes have died, terete to quadrangular, or occasionally sub-flat (but then with a prominently raised central nerve which renders the phyllodes flattened-quadrangular in t.s.), often filiform, (5)6–13 cm long, 0.8–1.5 mm wide, strongly curved to circinate or serpentine. *Bracteoles* obtuse. *Pods* sub-moniliform.

*Selected specimens examined.* WESTERN AUSTRALIA: 5 km W of Quairading, *P. Armstrong* 84/90 (MO, PERTH); c. 152 mile peg Geraldton Highway [c. 19 km S of Coorow on The Midlands Rd], *C. Chapman* 3 (BRI, CANB, MEL, NSW, PERTH); Tammin, 1 Sep. 1936, *C.A. Gardner s.n.* (PERTH); 2 miles [3.2 km] W of Quairading on road to York, *B.R. Maslin* 489 (CANB, K, MEL, PERTH); 8 miles [13 km] E of Northam, *K. Newbey* 1937 (PERTH); private property, Edenvale, *D. Papenfus* DP447 (PERTH); 5.2 km S along Old Telegraph Rd from Winchester East Rd, NE of Coorow, *D. Papenfus* DP458 (PERTH); 5 miles [8 km] S on Meckering–York road, *R.D. Royce* 8514 (PERTH).

*Distribution.* Occurs in the south-west of Western Australia, in two discontinuous regions in the wheatbelt, the Coorow–Watheroo area and c. 180 km to the south-east between Northam and Beverley and east to Tammin and Quairading.

*Habitat.* Red or brown sandy loam, clayey sand and gravel in heath or woodland.

*Phenology.* Flowering recorded from June to September; mature pods collected in December.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Three.

*Affinities.* Closely related to *A. tetraneura* whose terete phyllode forms could be confused with subsp. *lirellata*. *Acacia tetraneura* is most readily distinguished, however, by its 4-nerved, non-decurrent phyllodes and its conspicuous bracteoles. Subsp. *lirellata* is also related to *A. aprica* and *A. arcuatilis* but is easily distinguished from both by its decurrent, deeply furrowed phyllodes.

*Variation.* The specimen *Newbey* 1937 is atypical in having flowers arranged in distinctly cylindrical spikes (all other specimens examined have sub-globular to obloid heads).

***Acacia lirellata* subsp. *compressa*** Maslin & A.R.Chapman, *subsp. nov.*

Phyllodia non decurrentia, breviter pulvinata, anguste linearia, plana, raro compressa, 3–7 cm longa, 1.5–2(3) mm lata, nervis 3 in quoque pagina.

*Typus:* about 3 miles [5 km] north of Bruce Rock towards Merredin, Western Australia, 4 August 1971, *B.R. Maslin* 1773 (*holo:* PERTH 00156604; *iso:* CANB, G, K, NY).

*Phyllodes* not decurrent, shortly pulvinate, flat, occasionally compressed, narrowly linear, 3–5(7) cm long, 1.5–2(3) mm wide, shallowly to strongly incurved, 3-nerved per face with the midrib broader and more prominently raised than the flanking nerves. *Bracteoles* acute to acuminate. *Pods* moniliform.

*Selected specimens examined.* WESTERN AUSTRALIA: Holleton Nature Reserve, c. 50 km ENE of Narembeen, *K. Atkins* 860901 (PERTH); Muntadgin, *E.T. Bailey* 54 (PERTH); 43.5 km from Wubin towards Wongan Hills, *E.M. Canning* WA/68 2902 (PERTH); c. 3 miles [5 km] N of Bruce Rock towards Merredin, *B.R. Maslin* 1776 (CANB, K, MEL, NSW, PERTH); 1 km due S of Ballidu, *P. Roberts* 323 (PERTH); Hindmarsh rifle range, *B.H. Smith* 365 (AD, BRI, CBG, MEL, PERTH).

*Distribution.* Occurs in two discontinuous areas in the wheatbelt area of the south-west of Western Australia, near Ballidu and c. 180 km to the south-east between Wyalkatchem and Cunderdin and east to Bruce Rock and Waterbitten Rock.

*Habitat.* In yellow, brown or white sand, loam or clay in open low scrub and heath.

*Phenology.* Flowering recorded in May, June, August and September; mature pods collected in September.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Two.

*Etymology.* The subspecific name is taken from the Latin *compressus* (flattened) and refers to the flattened phyllodes, a character which distinguishes this taxon from the typical subspecies.

*Affinities.* Superficially resembles *A. cochlocarpa* subsp. *velutinosa* (as discussed under *A. cochlocarpa*).

***Acacia tetraneura*** Maslin & A.R. Chapman, *sp. nov.*

Frutex 0.3–0.4 m altus. Ramuli glabri vel versus apices parce adpresso-puberuli. Phyllodia teretia vel plana, (2)3–7 cm longa, 1.5–3 m lata, rigida, recta, plerumque leviter incurva; nervi 4, prominentes, applanati, lati, resinosi. Inflorescentia simplex; capitula ± sessilia, globosa ad breviter oblongoidea; bracteolae acuminatae. Flores 4-meri. Sepala 1/2–2/3 unita. Legumen lineare. Semina non visa.

*Typus:* south-east of Hyden [precise locality withheld for conservation reasons], Western Australia, 22 July 1989, *B.R. Maslin* 6372 (*holo:* PERTH01001442; *iso:* AD, BRI, CANB, G, K, MEL, NSW, NY, Z).

Low, spreading, *shrub* 0.3–0.4 m tall, to 1 m across, ± flat-topped, circular in plane view, dividing at ground level into a number of main stems. *Bark* dark grey, finely longitudinally fissured at base of main stems, otherwise smooth. *Branchlets* glabrous or very sparsely spreading- or appressed-puberulous at the light brown, resin-ribbed (viscid when fresh) tips, glabrous and ribs absent or scarcely evident on mature branchlets. *Stipules* inconspicuous, triangular to deltate, *c.* 1 mm long, erect, dark brown to black, glabrous. *Phyllodes* narrowly linear (when terete) or linear to narrowly oblong (when flat), (2)3–7 cm long, 1.5–3 mm wide, rigid, erect, mostly shallowly incurved although some straight, smooth, glabrous except for pulvinar region, ± glaucous (commonly drying green) between the greenish (drying yellow-green) nerves; *longitudinal nerves* 4, prominent, the nerves flat-topped, broad (0.5–1 mm wide) and resinous (viscid when fresh), on terete phyllodes the nerves alternating with 4 equally prominent (but commonly narrower) longitudinal furrows, on flat phyllodes the nerves forming a prominent raised midrib on each face and prominent upper and lower margins; *lateral nerves* absent or obscure; *apical mucro* central or excentric, acute, hard, dark brown (colouring sometimes extending to lamina); *pulvinus* indistinct, 0.5–1 mm long, sub-smooth or obscurely transversely wrinkled, normally appressed-puberulous at least adaxially. *Gland* on upper margin of phyllode at or near distal end of pulvinus, very obscure. *Inflorescence* simple. *Heads* (1)2 per axil, sessile or on sparsely to densely puberulous peduncle to 1 mm long, globular to shortly obloid, 9 mm diam. when fresh, *c.* 5 mm diam. when dry, 13–20-flowered, light golden; *bracteoles* exerted in buds, 2 mm long; *claw* very short; *lamina* ± narrowly trullate, acuminate, shallowly concave towards base, sparsely ciliolate, sometimes puberulous abaxially at base, dark brown to blackish. *Flowers* 4-merous; *sepals* *c.* 2/3 length of petals, dissected for 1/3–1/2 their length into triangular, sparsely ciliolate lobes which are commonly brown at their tips; *calyx tube* broadly obconic, truncate at base, yellow, glabrous to sub-glabrous; *petals* *c.* 2 mm long, glabrous, obscurely 1-nerved. *Pods* (immature and dehiscent valves) linear, 2–5 cm long, 3 mm wide, coriaceous–crustaceous, curved and slightly twisted, raised over seeds and shallowly constricted between them, glabrous, dark brown, sub-winged due to prominent, broad (1 mm wide), yellow to light brown margins. *Seeds* (immature) longitudinal in pod.

*Selected specimens examined.* WESTERN AUSTRALIA [precise localities withheld for conservation reasons]: E of Pingaring, A.S. *George* 9338 (CBG, MO, PERTH); Bruce Rock area, *B.R. Maslin* 1801 (CANB, K, MEL, PERTH); Ironcaps area, *R.M. Buehrig* 93.11.4.15 (PERTH).

*Distribution.* Occurs in south-west Western Australia from the three disjunct areas cited above which occur in the central and south-eastern wheatbelt region over a distance of about 150 km.

*Habitat.* Grows in brown sandy loam, grey loam or yellowish-brown clay over or with laterite on the slopes of low rises in heath.

*Flowering period.* Flowering recorded in late May, July and August.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority One.

*Etymology.* The species name is derived from the Greek *tetra* (four) and *neuron* (nerve) and refers to the characteristic 4-nerved phyllodes.

*Affinities.* *Acacia tetra-neura* is a very distinctive species on account of its low-spreading,  $\pm$  flat-topped growth habit,  $\pm$  sessile heads with 4-merous flowers, dark brown, acuminate bracteoles that are exerted in the buds, and linear pods with broad margins. Furthermore, the new species has a very distinctive phyllode nervation which alone distinguishes it from relatives such as *A. cochlocarpa* and *A. lirellata*. The phyllode nerves (but not the phyllode form) are remarkably similar to those of *A. sciophanes* Maslin, a species readily distinguished by its taller, wispy habit, pendulous, flexuose branchlets, pedunculate heads of 5-merous flowers and longer, terete pods (Maslin 1977: 153).

*Variation.* There is variation both within and between populations in the phyllode length and cross sectional shape; however, current evidence suggests that the recognition of infraspecific taxa is not warranted. For example, plants from south-east of Hyden (the type population) have terete to slightly compressed phyllodes about 1.5 mm wide and mostly 4–5 cm long, although a few phyllodes may reach 7 cm. Plants from the Bruce Rock population, on the other hand, have clearly flattened phyllodes 2–3 mm wide and 2–4 cm long. This degree of variation can occur in a single population; for example, *Buehrig* 93.11.4.10 has specimens with both terete and sub-flattened phyllodes.

*Acacia tratmaniana* W. Fitzg., *J. West Australian Nat. Hist. Soc.* 1: 8 (1904). *Type:* Cunderdin, Western Australia, August 1903, *W. V. Fitzgerald s.n. (holo: PERTH 00774200; iso: K, PERTH 00774197):* see Maslin & Cowan (1994a) for discussion of types.

Dense *shrub*, rounded or obconic, multi-stemmed, 0.6–3(4) m tall. *Bark* smooth except fissured at base of main stems (rarely the branches) on oldest plants, commonly grey on main stems and red-brown on upper branches. *New shoots* resinous. *Branchlets* erect, straight, silvery sericeous between the red-brown or yellow resin-ribs. *Stipules* not seen. *Phyllodes* quadrangular, (2.5)4–8(11) cm long, 0.5–0.7 mm wide, slender, ascending to erect, shallowly to moderately incurved,  $\pm$  sparsely appressed-puberulous (especially when young) becoming glabrous, often resinous (but not viscid), green to grey-green; with a  $\pm$  flat-topped, equally broad, raised *longitudinal nerve* along each angle; nerve on each intervening four faces often not evident (represented by a broad, shallow longitudinal furrow) but when evident these are less raised and commonly narrower than those on angles (all 8 nerves then separated by narrow, shallow, dark longitudinal furrows); *apex* acute to shortly acuminate, innocuous to coarsely pungent, dark, incurved, shortly pungent; *pulvinus* indistinct, c. 1 mm long, yellow-brown. *Gland* on upper surface of phyllode 1(–2) mm above base, obscure. *Inflorescences* simple, single or paired in axil of phyllode. *Heads* sessile, globular to sub-globular or sometimes obloid, 13–24(28)-flowered, 4–7 mm long, 4–7 mm wide, sub-dense, bright golden; buds resinous; *bracteoles* c. 1 mm long, dark brown, obtuse to acute. *Flowers* 4-merous; *sepals* 1/3–1/2 length of petals, dissected for c. 1/2 their length into triangular lobes; *petals* 1.2–1.8 mm long. *Ovary* tomentose; style sub-lateral. *Pods* linear, 4–8 cm long, 2–3 mm wide, moderately constricted between seeds, flat but very slightly raised over seeds, thinly coriaceous–crustaceous, straight to shallowly curved, glabrous or minutely antrorsely strigulose, brown; margins yellowish; often rather broad (but not thickened). *Seeds* longitudinal in pod, obloid-ellipsoid, 2.5–3 mm long, 1.5–2 mm wide, 1–1.5 mm thick, shiny, light brown or greyish with dark brown mottlings; *pleurogram* fine, open at hilar end; *areole* very small, 0.3 mm long,

0.2–0.3 mm wide; *funicle* filiform, expanded into a folded, terminal, white (drying dull yellowish) aril which is almost as long as the seed.

*Selected specimens examined.* WESTERN AUSTRALIA: E of Ogilvie which is 15 miles [24 km] N of Northampton, A.C. Burns 21 (NSW, PERTH); Great Eastern Highway, 5 miles [8 km] W of Hines Hill, A.S. George 2662 (PERTH); 28 miles [45 km] SE of Quairading on the road to Corrigin, B.R. Maslin 499 (CANB, PERTH); 0.8 km E of Kununoppin towards Nungarin, B.R. Maslin 3409 (DNA, NSW, PERTH); about 1 km S of Hotham River crossing towards Katanning, B.R. Maslin 3760 (BRI, CANB, K, MEL, NSW, PERTH); 2.1 km E of Kununoppin on the road to Nungarin, B.R. Maslin 5318 (PERTH).

*Distribution.* Occurs in the south-west of Western Australia in an area from near Wongan Hills south to Pingelly and east to Mukinbudin and Hyden with disjunct populations in the Geraldton area in the north and Boyup Brook in the south.

*Habitat.* Grows on yellow or brown sand, lateritic gravel, clay or brown loam on flats, sides of hills or granite outcrops in scrub, shrubland or roadside regrowth.

*Phenology.* Flowering recorded from July to October; mature pods collected in December.

*Conservation status.* Not under threat.

*Affinities.* Until recently, *A. tratmaniana* was placed under *A. filifolia* (see above) which is readily distinguished by its larger heads with more numerous flowers and longer, stouter phyllodes that are more widely spaced along the branchlets. The short-phyllode variant of *A. tratmaniana* can easily be confused with *A. cracentis*.

*Variation.* A few flowering specimens with unusually short phyllodes (2.5–4 cm long) have been collected from near Hines Hill, Muntadgin, Hyden and Corrigin (e.g. B.R. Maslin 499, M.H. Simmons 1318, both PERTH). These closely resemble *A. cracentis* but are distinguished most readily by their quadrangular phyllodes with a broad nerve along each angle. Further studies are needed to determine the status of this short phyllode variant of *A. tratmaniana* and to re-examine its relationship with *A. cracentis*.

### Acknowledgements

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