

# Studies in the genus *Acacia* (Mimosaceae)—5\* —Miscellaneous new phyllodinous species—

By B. R. Maslin

## Abstract

Four new, endemic, Western Australian *Acacia* species are described: *A. anfractuosa* sp. nov., *A. argutifolia* sp. nov., *A. jacksonioides* sp. nov. and *A. simulans* sp. nov. These species belong to Bentham's division Phyllodineae.

### 1. *Acacia anfractuosa* Maslin sp. nov.

*Frutex* vel *arbor* parva ad 4 m alta, diffusa, exilis; *rami* plerumque penduli, flexuosi, glabri vel strigosi. *Stipulae* caducae. *Phyllodia* linearia, ad 170(200) mm longa. 1–2 mm lata, inter venis minute strigosis, in sectione transversali rhombea (ubi angusta) ad  $\pm$  plana; costa nervisque marginalibus prominentibus; inter eos 1–3 nervi tenuiores. *Glands* obscura in margine supra phyllodii ad extremitatem distale pulvini. *Pedunculis* 5–7(10) mm longis; *capitula* globulosa ad leviter obloidea. *Florae* 5-merae. *Legumen* lineare, ad 120 mm longum, 1.5–2.5 mm latum. *Semina* in legumine longitudinalia, ellipsoidalia, 4.5–5 x 1.5 mm.

*Type*: 26 km E of Karalee on Great Eastern Highway, Western Australia, 15 December 1971, B. R. Maslin 2402 (holo: PERTH; iso: CANB, K, NY).

Diffuse, openly branched, rather spindly *shrub* or *small tree* to 4 m tall, either single-stemmed or dividing at ground level into ca. 3 main trunks; *bark* grey, smooth but sometimes slightly roughened at base of trunk; *branches* often pendulous, flexuous, terete, obscurely ribbed on branchlets, glabrous or strigose (hairs densest around base of phyllodes and between ribs on branchlets), light brown to red-brown, soon becoming grey. *Stipules* caducous. *Young shoots* resinous, densely strigose. *Mature phyllodes* linear, to 170(200) mm long, 1–2 mm wide, simply curved or sometimes  $\pm$  sigmoid, spreading, slightly resinous, minutely strigose between veins, olive-green to grey-green, rhombic in cross section (when narrow) to  $\pm$  flat; *midrib* and marginal nerves prominent broad and yellowish, 1–3 finer nerves occur between each midrib and marginal nerve; *apex* sometimes uncinat, not pungent, brown; *pulvinus* cylindrical, 0.5–1.5 mm long, obscurely transversely wrinkled, minutely strigose. *Gland* obscure, situated on upper margin of phyllode at distal end of pulvinus, lamina tissue insignificantly swollen around the gland. *Inflorescences* simple, often arising from base of a new shoot within axil of phyllode, 1–2(3) per node; *peduncles* 5–7(10) mm long, minutely strigose (hair density variable), basal bract caducous solitary ovate and minute (ca. 0.5 mm long); *receptacle* obloid, 1.5–3 mm long, densely puberulous to glabrescent; *flower heads* bright yellow, globular to obloid, 7–8 mm long at anthesis, with 22–32  $\pm$  loosely arranged flowers. *Bracteoles* 0.7–0.9 mm long, puberulous abaxially, claws linear, laminae ovate and inflexed. *Flowers* 5-merous; *calyx*  $\frac{1}{4}$  to ca.  $\frac{1}{2}$  length of corolla, divided for  $\frac{1}{4}$  its length into oblong obtuse ciliolate lobes, tube brown sparsely to densely puberulous and nerveless; *petals* ca. 2 mm long, connate for  $\frac{3}{4}$ – $\frac{1}{2}$  their length, glabrous, obscurely 1-nerved. *Legumes* linear, to 120 mm long, 1.5–2.5 mm wide, firmly chartaceous, slightly raised over seeds, obscurely longitudinally nerved, minutely silvery-strigose (hairs dense on young legumes), dark brown; *margins* somewhat contracted between seeds (indentations shallowly concave), marginal nerve scarcely thickened broad glabrous and yellowish. *Seeds* longitudinal in legume, ellipsoid, 4.5–5 mm long, 1.5 mm wide, brown with cream-coloured mottlings, a dark brown line extends around periphery of seed, somewhat shiny; *pleurogram* horseshoe-shaped, open towards the hilum, obscure; *areole* 0.5 mm long; *funicle* slender and convoluted, gradually thickened into a pileiform, whitish aril.

\* The previous four papers in this series were published in *Nuytsia* vol. 1, nos. 3, 4 and 5.

*Distribution:* (Figure 1) Western Australia: Bruce Rock to near Kellerberrin then east to Boorabbin (about halfway between Southern Cross and Coolgardie).

*Habitat:* Yellow sand in sandplain heath.

WESTERN AUSTRALIA: 283 mi peg on Great Eastern Highway (454 km E of Perth), *T. E. H. Aplin* 1953 (L, PERTH, RSA); Bruce Rock, *E. T. Bailey* s.n., Sept. 1933 (PERTH); 5 mi (8 km) north of Muntadgin, *E. T. Bailey* 284 (MEL, PERTH); Near Southern Cross, *W. E. Blackall* s.n., Sept. 1929 (CANB, PERTH); Near Kellerberrin, *G. E. Brockway* s.n., Dec. 1943 (PERTH); 1 mi (1.6 km) E of Boorabbin, *C. A. Gardner* 7998 (K, PERTH); About 5.5 mi (10.5 km) E of Muntadgin, *B. R. Maslin* 1822 (AD, B, BRI, MEL, NSW, PERTH).

*Flowering and fruiting period:* The flowering season begins in July-August and extends to at least December. Legumes are initiated from October to at least December; mature seed has been collected in December. The previous year's legumes are often present on the bushes during the next flowering season and these sometimes contain a few ripe seed.

Because the flower heads of *A. anfractuosa* vary from globular to obloid, it is difficult to fit this species into Bentham's classification (1864). The taxon is most closely allied to *A. heteroneura* Meisn. (Plurinerves-Nervosae, according

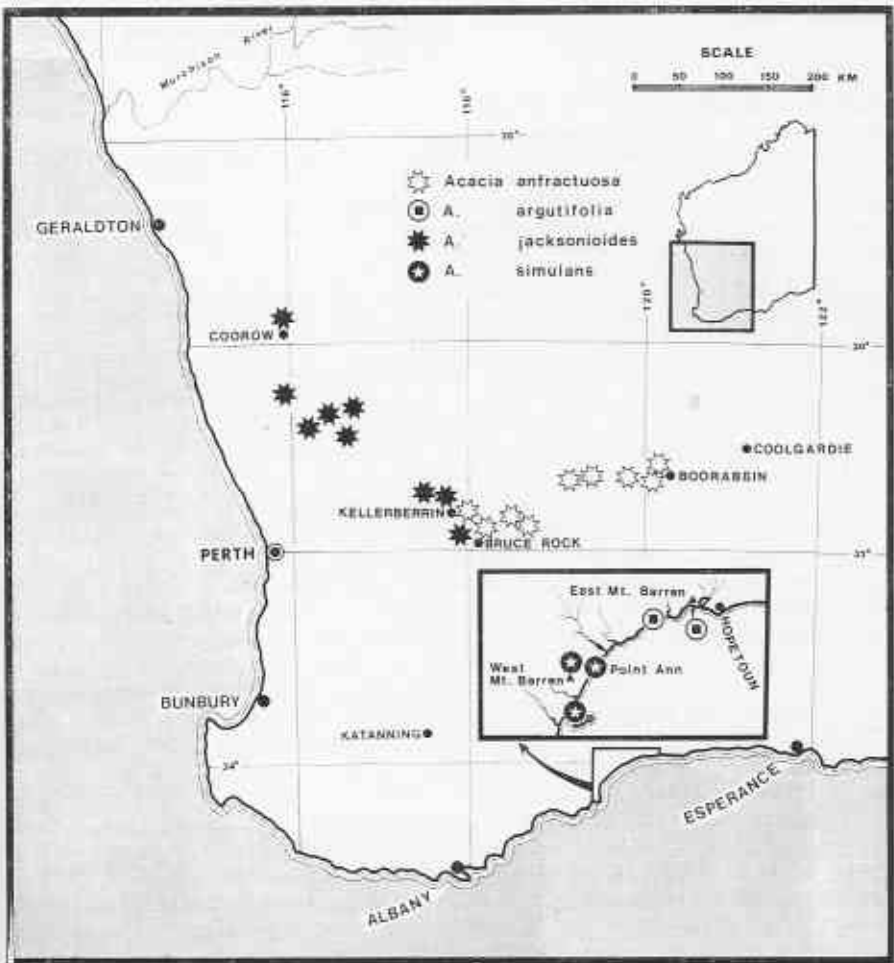


Figure 1. Distribution of *Acacia anfractuosa*, *A. argutifolia*, *A. jacksonioides* and *A. simulans*.

to Bentham, l.c.) and *A. jutsonii* Maiden (Juliflorae-Stenophyllae, according to Maiden, 1917) but it differs from both in its often pendulous, flexuose branches, and its curved phyllodes.

Mainly because of its flexuose, often pendulous branches and its long, narrow phyllodes and legumes, *A. anfractuosa* has in the past often been referred to as *A. hynesiana* W. V. Fitzg. This latter name is probably a synonym of *A. merinthophora* E. Pritzel but further work is needed to confirm this. *Acacia anfractuosa* differs significantly from the types of both *A. hynesiana* (W. V. Fitzgerald s.n.—MEL, NSW, PERTH) and *A. merinthophora* (L. Diels 2858—PERTH; E. Pritzel 316—NSW) in the following characters: phyllodes differently veined, flower heads pedunculate, and flowers 5-merous.

Between Mukinbudin and Welbungin (about 80 km north of Merredin) there occurs a variant of *A. anfractuosa* which differs from the typical form in that its phyllodes are terete and have four, equally spaced, very prominent, longitudinal grooves running the entire length of the phyllode. This variant is known from only two collections, viz. *W. E. Blackall* 848 and *C. A. Gardner* 2754, both of which are in flower. Judging from the herbarium label information, this variant has the same distinctive habit as the typical form. Further information is needed concerning this variant before its taxonomic status can be determined.

The specific epithet refers to the characteristic prominently flexuose branches.

## 2. *Acacia argutifolia* Maslin sp. nov.

*Fruites* ad 0.5 m altus; ramuli inconspicue nervati, modice puberuli (rami parce puberuli). *Stipulae* ± persistentes. *Phyllodia* aggregata, non verticillata, lineari-trigona, 6–13 x 1 mm, glabra, pungentia. *Glans* inconspicua, interdum nulla. *Capitula* globulosa. *Florae* 4-merae (petalae raro 5); *calycis* tubus glabratus; *petala* glabra, enervia.

*Type*: Northern slopes of Whoogarup Range, about 29 km due W of Hopetoun, Western Australia, 8 Oct. 1975, *B. R. Maslin* 3886 (holo: PERTH; iso: CANB. K, MEL, NY).

Low, spreading, intricate *shrub* 0.2–0.5 m tall and 1.2–1.7 m diam., dividing near ground level into 3–4 main branches; *bark* light grey on branches, red towards ends of branchlets; *lenticels* fairly conspicuous; *branchlets* terete, very obscurely nerved, moderately puberulous (hairs sparser on branches). *Stipules* very narrowly triangular, 1.5–2 mm long, somewhat persistent. *Phyllodes* scattered (not verticillate) and crowded, linear-trigonus (midrib prominent below but normally absent above, lateral angles conspicuous), 6–13 mm long, ca. 1 mm wide, ascending to almost patent, slightly curved, quite rigid, glabrous, bright to medium green, stomata numerous (quite apparent at x 10 mag.), pungent (mucrone 1 mm long, straight, brown or yellow); *pulvinus* ca. 0.5 mm long, somewhat dilated towards the base. *Gland* inconspicuous, sometimes absent, situated on upper surface of phyllode at, or near, distal end of pulvinus. *Inflorescences* simple, 1 per node; *peduncles* 5 mm long, glabrous, basal bract solitary and triangular; *receptacle* obloid, glabrous; *flower heads* globular, pale yellow, with 23–25 flowers. *Bracteoles* almost 1 mm long, — glabrous, claws oblong, laminae ovate and acute. *Flowers* 4-merous (in some heads a few flowers with 5 petals occur); *calyx* ca.  $\frac{1}{2}$  length of petals, divided for  $\frac{1}{2}$ – $\frac{3}{4}$  its length into oblong minutely ciliolate lobes, tube glabrescent; *petals* ca. 1.2 mm long, connate for  $\frac{1}{2}$  their length, glabrous, nerveless; *ovary* sessile, sparsely hairy. *Legumes* narrowly oblong, to 40 mm long, 2–4 mm wide, somewhat chartaceous, slightly raised over seeds, slightly curved, glabrous to glabrescent, tan to grey-brown, narrowed at both ends, stipe 3 mm long; *margins* slightly contracted between seeds, barely thickened, yellow. *Seeds* longitudinal in legume, obloid to ellipsoid, ca. 3 mm long and 1.8 mm wide, brown, with a darker brown line extending around periphery of seed, dull; *pleurogram* quite obvious, open towards the hilum; *areole* ca. 2.5 x 0.7 mm; funicle filiform, abruptly expanded into a conical (although often compressed at apex), white aril.

*Distribution:* (Figure 1) South-west Western Australia: known only from near East Mount Barren and Quoin Head (K. Newbey, pers. comm.), about 10–30 km west of Hopetoun.

*Habitat:* Grows in shallow sand over quartzite in low open heath.

WESTERN AUSTRALIA: East Mount Barren, south of Ravensthorpe, C. A. Gardner and W. E. Blackall 1428 (PERTH); East Mount Barren, K. Newbey 1618 (G, NSW, PERTH).

*Flowering and fruiting period:* Flowers intermittently from late July to January (K. Newbey, pers. comm.). Legumes containing mature seeds have been collected in early October. These were present on bushes that were just beginning their flowering period.

Using Bentham's classification (1864) *A. argutifolia* occurs in the Pungentes-Uninerves but it is not closely related to the other members of this group. This species is most closely allied to *A. simulans* Maslin from which it is readily distinguished by its scattered (not verticillate) phyllodes—see p. 101 below for a full discussion on these two species.

The specific epithet refers to the characteristic sharp-pointed phyllodes.

### 3. *Acacia jacksonioides* Maslin sp. nov.

*Frutex* 0.3–0.6 m altus, densus, intricatus, divaricate-ramosus, ramulis brevibus spinescentibus; rami nervati, glabri. *Stipulae* caducae. *Phyllodia* leviter et oblique ovata ad oblonga vel elliptica, 3.5–8(10) × 2.5–4(5) mm, glabra, marginibus ± undulatis, costis prominentibus. *Pedunculi* 3–6 mm longi, glabri; *capitula* globosa. *Bracteolae* nullae. *Florae* 5-merae *Legumen* anguste oblongum, plerumque 25–30 mm longum, 3 mm latum. *Semina* in legumine longitudinalia, obloidea, 2.2–2.5 × 1.2–1.7 mm.

*Type:* Nalyaring Well, 20 km N of Kellerberrin towards Yelbeni, Western Australia, 16 July 1970, B. R. Maslin 592 (holo: PERTH; iso: CANB, K, NY).

Dense, intricate, divaricately branched, rounded *shrub* 0.3–0.6 m tall, with short, spinescent branchlets; *branches* slightly flexuose, terete, quite prominently ribbed (ribs yellow), glabrous, glaucous (when fresh). *Stipules* caducous. *Phyllodes* slightly obliquely ovate to oblong or elliptic, 3.5–8(10) mm long, 2.5–4(5) mm wide, patent or somewhat reflexed, glabrous, margins slightly thickened and normally ± undulate, midrib prominent, lateral veins very obscure, apiculum short somewhat sharp and dark brown; *pulvinus* ca. 0.5 mm long, obscurely wrinkled. *Gland* not prominent, situated on upper margin of phyllode 1–2 mm above the pulvinus. *Inflorescence* an extremely reduced raceme consisting of a single flower head, 1(2) per node; *raceme axis* minute (0.1 mm long); *peduncles* 3–6 mm long, glabrous, subtended by 2 basal bracts; *flower heads* globular, yellow, with 10–14 flowers. *Bracteoles* absent. *Flowers* 5-merous; *calyx*  $\frac{1}{3}$  to slightly less than  $\frac{1}{2}$  length of corolla, divided for  $\frac{1}{4}$  it; length into obtuse glabrous or ciliolate lobes, tube nerveless and glabrous or glabrescent; *petals* 1.5–2 mm long, connate for ca.  $\frac{1}{3}$  their length but readily separating, very obscurely 1-nerved, glabrous; *ovary* glabrous. *Legumes* narrowly oblong, mostly 25–30 mm long, 3 mm wide, firmly chartaceous, curved, slightly undulate, quite prominently raised over seeds (but bulged on one surface of legume only—opposite surfaces for adjacent seeds), glabrous, brown; *marginal rib* narrow, slightly contracted between seeds, pale coloured. *Seeds* longitudinal in legume, obloid, 2–2.5 mm long, 1.2–1.7 mm wide, brown, shiny; *pleurogram* horseshoe-shaped, open towards the hilum; *areole* 0.7 mm long; *funicle* filiform, abruptly expanded into a thickened, curved, pale yellow aril.

*Distribution:* (Figure 1) Western Australia: wheatbelt region from near Coorow south-east to near Bruce Rock.

*Habitat:* Gravelly sand or loam commonly on hilltops.

WESTERN AUSTRALIA: About 8 mi (12.9 km) N of Coorow, *C. Chapman* s.n., 1 July 1973 (PERTH); Yorkrakine, *C. A. Gardner* 8044 (BRI, MEL, PERTH, RSA); Ballidu, *R. T. Lange* 56 (PERTH); About 29 km due NW of Bruce Rock, *B. R. Maslin* 2364 (PERTH); About 37 km S of Moora towards Perth, *B. R. Maslin* 3275 (NSW, PERTH).

*Flowering and fruiting period:* Flowers in July and August; a few undehisced legumes remain on the bushes to mid-December.

According to Bentham's classification (1864) *A. jacksonioides* occurs in the Uninerves-Spinescentes. At PERTH this species has previously been known as *A. intricata* S. Moore. However, it is not closely related to this species. *Acacia jacksonioides* is distinguished from *A. intricata* by its short, divaricate, spinescent branchlets, its larger, undulate, less rigid phyllodes, and its longer peduncles.

The short, divaricate, spinescent branchlets, and relatively small phyllodes and flower heads render this new species similar to *A. erinacea* Benth. However, *A. jacksonioides* is readily recognized by its differently shaped, normally somewhat undulate, more prominently nerved phyllodes, its much narrower legumes, and its longitudinally arranged seeds. In its phyllode morphology, *A. jacksonioides* is similar to *A. semicircularis* Maiden and Blakely (Uninerves-Brevifoliae) but differs from this species in its divaricate, spinescent branchlets, and its smaller flower heads.

The specific epithet alludes to the general similarity in branching pattern between the new species and some members of the genus *Jacksonia* e.g. *J. hakeoides* Meisn. and *J. spinosa* (Labill.) R.Br.

#### 4. *Acacia simulans* Maslin sp. nov.

*Frutex* diffusus ad 1 m altus; *ramuli* teretes, glabri vel sparsim antrorse strigosi. *Stipulae* ca. 1 mm longae. *Phyllodia* verticillata 6-9-na, lineari-tetragona, 8-12 mm longa, patentia ad leviter reflexa, pungentia. *Glans* inconspicua. *Capitula* globulosa ad leviter obloidea. *Florae* 4-merae. *Legumen*  $\pm$  moniliforme, ad 70 mm longum, ad 4 mm latum. *Semina* in legumine longitudinalia, obloidea, ca. 4 mm longa, 2.5-3 mm lata, brunnea.

*Type:* About 1.6 km due NW of Mount Bland, Fitzgerald River National Park, Western Australia, 30 August 1973, *B. R. Maslin* 3483 (holo: PERTH; iso: BRI, CANB, K, MEL, NY, PERTH).

Diffuse, openly branched *shrub* to 1 m tall, dividing at ground level into a number of slender spreading branches; *bark* smooth, grey on branches, brown on branchlets; *lenticels* often quite prominent; *branchlets* terete, very obscurely nerved, glabrous or sparsely antrorsely strigose. *Stipules* narrowly triangular, ca. 1 mm long. *Phyllodes* regularly verticillate, 6-9 per whorl, linear-tetragonous (sometimes appearing trigonous due to reduction of midrib on upper surface of phyllode), 8-12 mm long, patent to slightly reflexed, straight or slightly curved, quite rigid, glabrous or sometimes glabrescent, stomata numerous (quite apparent at x 10 mag.), pungent (mucrone 1 mm long, straight, brown); *pulvinus* ca. 0.5 mm long, slightly dilated towards the base. *Gland* inconspicuous, situated on rib on upper surface of phyllode 2-4 mm above the pulvinus, orifice circular to oblong and 0.1-0.2 mm diam. *Inflorescences* simple, 1-2(3) per node; *peduncles* 2-4(5) mm long, glabrous, basal bract solitary; *receptacle* obloid, glabrous; *flower heads* light yellow, globular to slightly obloid, with 16-20 flowers. *Bracteoles* ca. 1 mm long, puberulous abaxially, laminae ovate. *Flowers* 4-merous; *calyx*  $\frac{1}{4}$ - $\frac{1}{3}$  length of petals, divided for  $\frac{1}{4}$ - $\frac{1}{3}$  its length into broadly triangular slightly keeled and inflexed lobes, tube puberulous; *petals* ca. 1.5 mm long, free to base, glabrous, nerveless; *ovary* minutely stipitate, glabrous or papillose. *Legumes*  $\pm$  moniliform, to 70 mm long, to 4 mm wide, firmly chartaceous, slightly curved, glabrous, brown, stipe ca. 6 mm long; *marginal nerve* narrow and yellow. *Seeds* longitudinal in legume, obloid to elliptic, ca. 4 mm long, 2.5-3 mm wide, dark

brown, slightly shiny; *pleurogram* quite prominent, open towards the hilum; *areole* 3 mm long, 1.5 mm wide; *funicle* slender, reflexed below a thickened, conical, white aril.

*Distribution*: (Figure 1) South-west Western Australia: known only from a restricted area along the south coast in the vicinity of West Mount Barren (about 70 km due WSW of Hopetoun).

*Habitat*: Sand among the low shrub stratum of *Eucalyptus tetragona* (R.Br.) F. Muell. tall open shrubland.

WESTERN AUSTRALIA: Below Mount Bland, near West Mount Barren, ESE of Ongerup, T. E. H. Aplin, I. Lethbridge and R. Coveny 3317 (PERTH); Near Point Ann, A. S. George 10044 (AD, PERTH); About 1.6 km due NW of Mount Bland, Fitzgerald River National Park, B. R. Maslin 3482 (B, BRI, K, L, MEL, NSW, PERTH, RSA); 1 mi (1.6 km) NW of Mount Maxwell, K. Newbey 827.

*Flowering and fruiting period*: Flowers from July to September; seeds mature in the first two weeks of December.

Using Bentham's classification (1864) *A. simulans* occurs in the series *Brunioideae*, however, it is not closely related to the other members of this group. *Acacia simulans* has its closest affinities with *A. argutifolia* Maslin (see p. 98 above) which occurs in the *Pungentes-Uninerves*. These two species have the same basic phyllode and legume structure and very similar inflorescences. *Acacia simulans* is distinguished from *A. argutifolia* by its verticillate phyllodes and its less hairy branchlets. Neither species shows a close relationship with previously described Western Australian acacias.

In his discussion under *A. cedroides* Benth., Pedley (1972, p. 12) referred to a possible new species collected from near Mount Maxwell (K. Newbey 827); this species is *A. simulans*. As both *A. cedroides* and *A. simulans* have pungent and verticillate phyllodes they superficially resemble one another, but they are not particularly closely related. In addition to the characters mentioned by Pedley, *A. simulans* differs from *A. cedroides* in its habit (more diffuse), its normally shorter and more spreading phyllodes, its 4-merous flowers, its  $\perp$  moniliform, firmly chartaceous, non-striate legumes, and its darker coloured seeds.

Pedley (l.c.) noted that *A. cedroides* was not closely related to the other regularly verticillate members of the *Brunioideae*. From my own observations it appears as though this species has its closest affinities with *A. larinina* Meisn., a member of the *Pungentes-Uninerves*. Both taxa share similar phyllode, inflorescence and legume characters. The main difference between them is their phyllode arrangement (verticillate in the former taxon, scattered and crowded in the latter). An interesting comparison can be made between this pair of species and the *A. simulans*-*A. argutifolia* pair. Both *A. cedroides* and *A. simulans* have regularly verticillate phyllodes and therefore, according to Bentham's classification, occur in the *Brunioideae*, but they are anomalous members of this group. Likewise, *A. larinina* and *A. argutifolia* (the respective closest relative of the above two species) are atypical members of Bentham's *Pungentes-Uninerves*; both these taxa have scattered (not verticillate) and crowded phyllodes. These two species-pairs undoubtedly constitute natural taxonomic groups. From the above it is seen that parallel evolution has occurred in these two unrelated groups of species. Thus while Bentham's classification of *Acacia* is undoubtedly useful for grouping species of this vast genus, it does not necessarily reflect the true relationships of the taxa contained therein.

The specific epithet refers to the superficial resemblance of the new species to *A. cedroides*.

### Acknowledgments

The author wishes to express his appreciation of the assistance given by Mr. Ken Newbey for his valuable comments on *A. argutifolia* and *A. simulans*. Mr. Alex George is also gratefully acknowledged for checking the latin descriptions.

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