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PLANT PORTRAITS

25. Acacia hexaneura P.Lang & R. Cowan, sp. nov. (Leguminosae)

Illustration: Based on herbarium specimens of the holotype and paratypes.

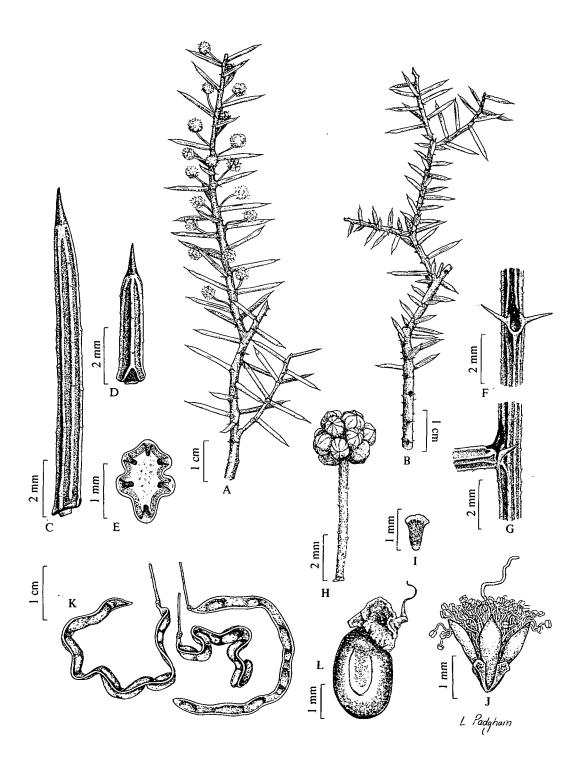
Acacia enterocarpae affinis a qua differt stipulis spinosis ad 1.5 mm longis, phyllodiis sessilibus compressis 5-17 (-23) mm longis 6-nerviis (nervis singulis in quoque margine et binis in quoque latere), pedunculis 1(2) per axillam, bractea basilari pedunculi inconspicua 0.2-0.6 mm longa, alabastris subglobulosis et leviter applanatis, medi-nervo petalis versus apicem dorsaliter vix incrassatis, leguminibus parce strigosis leniter ad valde undulatis et plerumque irregulariter flexis sed interdum tantum falcatis.

Type: G.C. Bishop s.n. (holo: AD 99019139; iso: CANB, PERTH), 45 km S Kimba on roadside adjacent Section 16, Hundred of James, Eyre Peninsula, South Australia, 28.vii.1984.

Dense, rigid, prickly shrub to 1-1.5 m tall, spreading to 2 m wide, often rounded in shape. Branchlets angular, striate, strongly ribbed when young; ribs yellowish with sparse, minute tubercules formed by the bases of inflexed, straight, whitish, small hairs; interstices mid-green with raised whitish stomata; older branchlets becoming red-brown, terete, weakly ribbed, tuberculate, glabrous and resinous. Stipules persistent, spinose, straight or slightly recurved. straw-coloured ageing dark brown, to 1.5 mm long, on a thickened flange surrounding base of phyllode. Phyllodes sessile, perpendicular or sometimes slightly inclined, rigid, mid-green. straight or slightly recurved, compressed, 5-17 (-23) mm long, 1.2-2.0 mm wide, 0.7-1.3 mm thick, scabridulous, with raised whitish stomata, distinctly 6-nerved (one on adaxial margin, one on abaxial margin and two on each face, very rarely with an extra but minor nerve below adaxial one), with nerves strongly raised in well-defined ridges and sparsely tuberculate by the bases of minute caducous whitish inflexed hairs, abruptly tapered into rigid brown mucro 1-2 mm long, base slightly expanded and articulate, readily detaching from stem; pith with red-brown resin globules; pulvinus extremely reduced and completely concealed by stipular flange; gland in a notch at extreme base of phyllode, nerve on adaxial margin bifurcating immediately above notch which is filled with small to large, dark brown resin mass remaining stiffly viscous. Inflorescences simple, axillary. Peduncles 1(2) per node, (3-) 5-7 (-9) mm long, appressed-puberulous; basal peduncular bract inconspicuous and often embedded in resin, redbrown, shallowly triangular or depressed ovate, 0.2-0.6 mm long. Flower-heads globular, (13-) 16-20 (-25)-flowered, golden-yellow, 4-6 mm diam. at anthesis (when dry); bracteoles minute, spathulate with viscid-puberulous blade. Flowers 5-merous; buds subglobular and slightly flattened; sepals free, narrowly oblong with slightly expanded apex, 1/3-1/2 as long as petals, viscid-puberulous; petals becoming free, obovate-elliptic, glabrous, with mid-nerve indistinct and very slightly thickened dorsally towards apex; ovary appressed-puberulous. Legumes dark blackish-green, drying to light brown, often persisting in a tangled mass after dehiscence, linear, weakly to strongly undulate and usually irregularly bent or folded in three dimensions but sometimes merely falcate, 35-90 mm long, 2-3.3 mm wide, crustaceous, sparingly strigose with antrorse white hairs much denser near base, slightly raised over seeds; margins thickened, pale, not constricted between seeds. Seeds longitudinal in legume, light red-brown to dark greenishgrey, with paler zone around pleurogram, (broadly) ellipsoid-oblong, 2.5-3.5 mm long, 1.5-2 mm wide, 1-1.5 mm thick, shiny, with slight peripheral ridge; pleurogram "U"-shaped, c. ²/₁ length of seed; aril apical, white suffused pale brown, translucent, crested, $\frac{1}{3} = \frac{2}{3}$ length of seed, vitreous, finely rugose, tapered abruptly into funicle; funicle small, filiform, sinuous, Fig. 1.

Selected specimens examined (from a total of 24 collections)

SOUTH AUSTRALIA: Eyre Peninsula Region: C.R. Alcock 697 (AD), junction of Kimba-Cowell road and scenic highway (old Pt Augusta road), 10.viii.1965; C.R. Alcock 1258 (AD, PERTH), old highway 15 km NW Cowell



adjacent to Section 80, Hundred of Miltalie, 16.i.1967; G.C. Bishop s.n. (AD), roadside adjacent to Section 34, Hundred of James, c. 50 km S Kimba on road to Cowell, 28.vii.1984; J.D. Briggs 1101 (CBG, AD, H), near Pine Hill HS, c. 25 km SSE Kimba, 33°19'S 136°33'30"E, 29.viii.1983; B. Copley 2996 (AD), 17 km NW Cowell, 3.i.1970; T. Croft 21 (AD), Section 29, Hundred of James, 24.xi.1989; P.J. Lang D8861 (AD), Section 17, Hundred of James, c. 4 km W Sheoak Hill, 17.vii.1985; P.J. Lang D8774 (AD), Section 32, Hundred of Yalanda, c. 3.5 km E Yalanda Hill, 26.xi.1985; P.J. Lang D8717 (AD), D8718 (PERTH), D8719 (AD), D8721 (AD), Section 106, Hundred of Miltalie, c. 5 km SE Carroo Curtie Reservoir, 33°28'40"S 136°42'30"E, 26.xi.1987; P.J. Lang 1809 (AD, PERTH), c. 3 km WSW Rarma Downs, on Cowell-Kimba road, 33°25'S 136°48', 26.xii.1989; D.J.E. Whibley 7305 (AD), on road to Yabmana, 33°37'S 136°46'E, 29.viii.1976.

Distribution: Endemic to northeastern Eyre Peninsula between Kimba and Cowell within a range of 45 km. Fig. 3.

Habitat

Occurs in well-drained gravelly loams and sands. Frequently found on small quartzite hills in skeletal soil often with associated limestone or ironstone deposits. Also favours disturbed sites along roadsides, in gravel pits or limestone rubble pits, and in regrowth after burning or clearance of vegetation. A population east of Yalanda Hill (PJL D8774) is exceptional in being associated with a granite outcrop.

Soil sampled from the site of PJL 1809 is a reddish-yellow (Munsell code: 5 YR 6/6) sandy loam of pH 8.5 with quartz and limestone gravel.

In undisturbed sites typical plant communities are: Eucalyptus dumosa — E. gracilis (— E. socialis — E. calycogona) open scrub of whipstick mallee over sparse sclerophyllous shrubs; and Melaleuca uncinata (broombush) open heath/tall shrubland. Characteristic associated plants include Boronia inornata, Lasiopetalum behrii, Westringia rigida, Olearia muelleri and Dodonaea bursariifolia.

Phenology: Flowers July-September, and in mature fruit November-December.

Affinities

Acacia hexaneura is a very distinctive species in subgenus Phyllodineae section Plurinerves on account of its spinose stipules (uncommon in the subgenus) and prominently six-nerved phyllodes (two nerves per face and two on each margin). It is clearly most closely related to A. enterocarpa (jumping-jack wattle) which shares the following important features: branchlets ribbed, tuberculate, with antrorse hairs; phyllodes spreading, rigid, pungent and multi-nerved; infloresence simple (not racemose); peduncles rather short and hairy with a solitary basal bract; heads globular, relatively small and few-flowered; flowers 5-merous with sepals free; legumes undulate; and seeds longitudinal with a terminal aril.

Despite its close affinity, A. enterocarpa differs significantly from the new species by its: inconspicuous, nonspinose stipules under 0.5 mm long; longer phyllodes (20-45 mm) with 10-12 nerves and an obvious short pulvinus; peduncles up to 3-6 per node with the basal peduncular bract conspicuous (0.5-1 mm long); mature flower buds more or less obconical with mid-nerve of petals prominently thickened dorsally towards their apex; legumes tightly folded in a single plane and sparsely to densely hirsute with longer more divergent hairs. It also differs by the hairs of young branchlets tending to be denser, longer, often curled and inclinate

Fig. 1. Acacia hexaneura P. Lang & R. Cowan. A, flowering branchlet; B, branchlet with shorter phyllodes marking end of previous season's growth; C, detached phyllode in side view with pulvinus exposed; D, shorter phyllode viewed from above, showing gland in notch at base of bifurcating adaxial nerve; E, transverse section of phyllode; F, node in front view with phyllode detached, showing stipules and stipular flange encircling phyllode scar; G, node in side view, showing base of phyllode and axillary resin mass above stipule; H, peduncle and flower head in mature bud; I, bracteole; J, recently opened flower; K, legumes from single population varying in shape and degree of undulation; L, seed. (A, C, E, H, I, J, G.C. Bishop s.n. (holotype); B, D, G, L, P.J. Lang 1809; F, R. Bates 3276; K, P.J. Lang D8774).

rather than inflexed. Acacia enterocarpa is mainly found farther south on Eyre Peninsula and prefers better agricultural soils with calcareous loams and clays. Although there is a northern outlier in the vicinity of Cowell, no sympatric occurrences with A. hexaneura have been observed. The two species appear to be ecologically distinct and show no evidence of morphological intergradation.

Three other species on Eyre Peninsula resemble Acacia hexaneura in having short, rigid, spreading, pungent, sessile, multinerved phyllodes and (sub-)globular flower-heads. Acacia rhigiophylla (dagger-leaved wattle) is the most likely to be confused with the new species, as it also has small spiny stipules, and is similar in habit, general appearance, and its distribution on Eyre Peninsula. Closer examination reveals that it is very dissimilar in a number of ways. For example, A. rhigiophylla has strongly flattened phyllodes with three or more nerves per face; heads cylindrical to oblong, loosely 3-10-flowered, and subsessile to shortly pedunculate; flowers 4-merous with calyx gamosepalous; legumes strongly curved and not undulate; and seed with a yellowish aril. Furthermore, A. rhigiophylla is almost exclusively associated with granite outcrops, whereas A. hexaneura has only once been found near granite. Acacia colletioides and A. nyssophylla can be readily distinguished from A. hexaneura by their: caducous stipules, phyllodes 8- and 16- (or more) nerved respectively, legumes strongly curved or coiled, and seeds partially enveloped by a prominent yellow or orange aril.

Conservation status

Acacia hexaneura is considered to be a relatively secure species even though it tends to occur in small populations of usually less than 50 plants. This is because populations are well scattered throughout its range and have often escaped clearance on stony rises that are unsuitable for agriculture.

Two small populations of A. hexaneura in Section 17, Hundred of James are conserved in a 400 ha Heritage Agreement area. The species may also be represented in Sheoak Hill Conservation Park as it grows in disturbed soil along the road reserve adjoining the park. A conservation status code of 2RCi is suggested using the criteria of Briggs & Leigh (1989).

Etymology: the epithet refers to the prominently and consistently 6-nerved phyllodes, from the Greek hexa- (six) and neuron (nerve).

26. Acacia praemorsa P. Lang & Maslin, sp. nov. (Leguminosae)

Illustration: Based on herbarium specimens of isotype and paratype collections.

Frutex erectus ad 1-3 m altus, saepe surculosus. Ramuli acutangulati, glabri. Stipulae caducae, anguste triangulares, scariosae. Phyllodia erecta ad patentia, laxa, flexibilia, leniter ad valde incurvata, linearia vel anguste linearia, (5-) 20-90 mm longa, (1-) 1.2-2.4 (-2.8) mm lata, 0.2-0.6 mm crassa, laevia, glabra, uninervia; medi-nervus immersus, ad paginam invisibilis; apex praemorsus, a glande atrobrunnea resinacea oblique truncatus, a mucrone excentrico rubro-brunneo incurvo tumido brevi in latere abaxiali superatus, a unguibus duobus rubro-brunneis stipuliformibus incurvis parvulis in latere adaxiali appendiculatus; glans in margine adaxiali 6-18 mm supra pulvinum sita. Racemi 1(2) per nodum, capitulis floriferis 1(2); axis 1.5-3.5 (-6) mm longus, glaber, ebracteatus, saepe surculo apicali propullanti. Pedunculi (3) 6-12 mm longi, glabri; bractea solitaria, sero caduca, aurea-brunnea, cucullata, 1.3-2 mm longa, laevis, scariosa, plerumque versus apicem bifindens, secus marginem apicalem fimbriata. Capitula globosa, laete flava, 34-50 (-58)-floribus. Flores 5-meri; sepala libera, linearia, ad apicem trullata, paleacea; petala libera, oblanceolata, circa 2 mm longa, paene glabra. Legumina linearia, recta vel leniter curva, ad 135 mm longa, 5-8.5 mm lata, glabra, crustacea ad paene cartilaginea, supra semina modice elevata. Semina in legumine longitudinalia, fuliginea, elliptica-lenticularia, 4.5-6.8 mm longa, 3-4 mm lata, 1.5-2.3 mm crassa, punctulata; arillus sordide albidus, clavatus, carinatus.

Type: P.J. Lang 1824 (holo: AD; iso: CANB, CBG, K, MEL, NSW, PERTH), Section 362, Hundred of Mann, c. 3 km W of Glenville HS (Yabmana) NW corner of scrub block, 33°38′30″S 136°38′45″E, Eyre Peninsula, South Australia, 27.xii.1989.

Erect, glabrous, often suckering shrub to 1-3 m tall. Bark red-brown ageing silverypurplish, smooth on stems, sometimes dark and fissured at base of old trunks. Branchlets green. acutely angled, smooth, glabrous. Stipules mostly caducous, weak, straw-coloured to redbrown, narrowly triangular, 0.8-1.4 mm long, scarious; often persistent, darker and larger on flowering axils. Phyllodes: erect to spreading, mobile about base, soft and flexible, mid-green to dark green, slightly to strongly incurved, linear or narrowly linear, (5-) 20-90 mm long, (1-) 1.2-2.4 (-2.8) mm wide, 0.2-0.6 mm thick, smooth (but with slight irregular, longitudinal wrinkling when dry), with a dull sheen, glabrous; 1-nerved, with single major nerve completely submerged and not visible superficially (except on very immature phyllodes or phyllodes of young suckers where it is evident by a weak medial indentation); apex premorse, obliquely terminated by a dark-brown, resinous gland which is flanked adaxially by a pair of red-brown. claw-shaped (incurved-conical), minute, stipule-like appendages and exceeded abaxially by an eccentric, red-brown, incurved, swollen, short mucro; basal gland on adaxial margin 6-18 mm above the pulvinus, inconspicuous, slightly recessed, elliptical; pulvinus often poorly developed, yellowish to light brown, (0.2-) 0.4-1.5 mm long. *Inflorescences* 1(2) very reduced racemes per node, or sometimes twin racemes with axes fused together; racemes 1-headed (twin racemes 2-headed), often with a vegetative shoot growing on from apex; raceme axis ebracteate at base, usually 1.5-3.5 mm long (to 6 mm long with early elongation of vegetative shoot), glabrous. Peduncles (3) 6-12 mm long, smooth, glabrous; basal peduncular bract solitary, late-caducous, light golden-brown, hood-shaped and completely enclosing young heads, 1.3-2 mm long, smooth, scarious, usually splitting distally into two lobes, fimbriate on apical margin and at the corners of its broad base. Flower-heads globose, 34-50 (-58)-flowered, bright yellow, 7.5-9.5 mm diam. at anthesis. Flowers 5-merous; bracteoles not seen; sepals free, linear with trullate apex, c. 4, length of petals and conspicuous on outside of heads in bud, paleaceous; petals free, oblanceolate, c. 2 mm long, glabrous except for a few minute scaly hairs, obscurely 1-nerved; ovary glabrous. Legumes initially coriaceous and dark green with brown margin, drying (pale) red-brown with straw-coloured margin, linear, straight to slightly curved, flat or slightly twisted, up to 11-seeded, to 135 mm long, 5-8.5 mm wide, glabrous, sometimes rugulose, crustaceous to almost cartilaginous, moderately raised over seeds, with a flattened margin c. 0.7 mm wide, slightly to moderately constricted (3-5 mm wide) between seeds. Seeds longitudinal in legume, dark brown to almost black, elliptic-lenticular, 4.5-6.8 mm long, 3-4 mm wide, 1.5-2.3 mm thick, moderately shiny, punctulate; peripheral ridge paler brown, thick, obtuse; pleurogram "U"-shaped, central, c. ½ length of seed; aril off-white tinged brown or green, stained dark brown at junction with hilum, more or less clavate, keeled, extending ²/₅-³/₅ down side of seed, sometimes with a few compressed shallow undulations distally; funicle brown, straight, flat, transversely oblong, short, 0.3-1 mm long. Fig. 2.

Specimens examined

SOUTH AUSTRALIA: Eyre Peninsula Region: M. Bennell D5483, D5484 (AD), Section 73, Hundred of Mann, 5.vi.1986; M. Bennell & G. Carpenter D8729, D8732 (AD), Section 3, Hundred of Mangalo, Lot 1B, N of Curtingee Creek 7.v.1987; T. Croft 24a (AD), 24b (AD, CANB), Section 362, Hundred of Mann, 30.x.1989; P.J. Lang D8723 (AD), D8724 (AD, PERTH), D8725 (AD), Section 73, Hundred of Mann, 5 km NE Yeldulknie HS on S side Yeldulknie EWS reserve, 33°40'S 136°35'E, 25.x.1987; P.J. Lang D8722 (AD, PERTH), Section 135, Hundred of Mann, 4 km NE Yeldulknie HS, 25.x.1987; P.J. Lang 1823, 1825 (AD), 1826 (PERTH), 1827 (AD), Section 362, Hundred of Mann, c. 3 km W Glenville HS (Yabmana), 33°38'30"S 136°38'45", 27.xii.1989.

Distribution

Endemic to northeastern Eyre Peninsula and extremely localized with four known populations occupying a range of less than 10 km. Fig. 3.

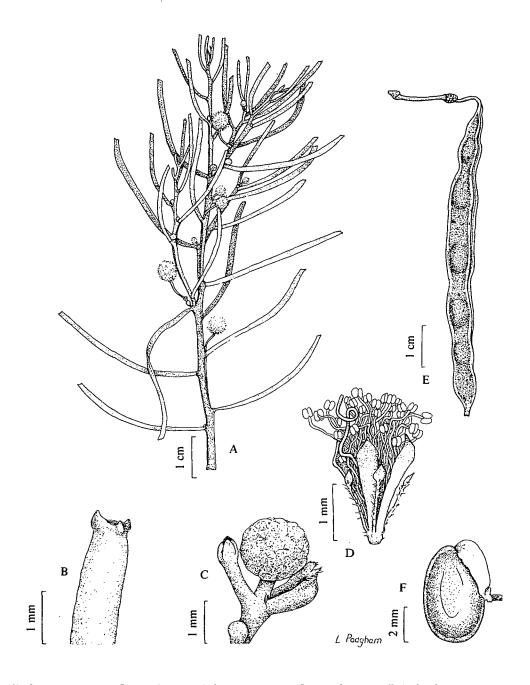


Fig. 2. Acacia praemorsa P. Lang & Maslin. A, flowering branchlet; B, apex of young phyllode; C; inflorescence, showing raceme with basal peduncular bract, developing flower head and vegetative shoot, with second raceme in bud at base; D, flower; E, legume; F, seed. (A, T. Croft 24a; B, P.J. Lang D8724; C, P.J. Lang D8725; D, E, F, P.J. Lang 1824 (isotype).

Hahitat

It is remarkable that the first collection of A. praemorsa was made as recently as 1986. This reflects the inaccessible nature of its habitat in valleys surrounded by steep rocky terrain and covered in thick low scrub. None of the known populations can be reached by road.

Acacia praemorsa grows in loamy soils derived from schistose metamorphic rocks often amongst outcrops on the lower slopes of small gullies. It is found where the widespread and dense open-heath communities dominated by Melaleuca uncinata (broombush) and/or Acacia calamifolia (wallowa) give way to a more open vegetation type. Acacia praemorsa typically occurs in Eucalyptus odorata (peppermint box) tall shrubland or sometimes in E. dumosa — E. anceps — E. socialis mallee open scrub to tall shrubland. Characteristic associated plants include Gonocarpus elatus, G. mezianus, Dodonaea hexandra, Halgania cyanea, and native grasses.

Acacia praemorsa seems to grow equally well in open areas on slopes and in shady sites at the base of steep gullies. Specimens from shady sites (such as the holotype) are characterized by much longer phyllodes.

Soil sampled at the type locality is a brown (Munsell code: 7.5 YR 5/4) coarse loam pH 5.5-6.0 with fine mica flakes.

Phenology

Sporadic flowers and fruits have been observed in late October and the type population also had an abundance of flowers and ripe fruit in late December. Collections made in May and June were without fruit or flower. It appears that flowering may occur, perhaps sporadically, over a relatively long period from spring to early summer.

Affinities

Acacia praemorsa is quite different from related species in gross morphology and its nearest relative is uncertain. Consequently, a Latin description has been provided instead of a diagnosis.

On close examination A. praemorsa is rather unusual with its angled stems and seemingly nerveless, truncate phyllodes. Almost invariably its phyllodes, stems and legumes are irregularly marked with numerous small, brown, resinous, often pustulate scars which presumably result from insect attack. In the field its habit and soft foliage bear a striking resemblence to Senna artemisioides (desert cassia/punty bush), and particularly the phyllodinaceous ssp. petiolaris. From a distance it may also be mistaken for A. calamifolia which often forms extensive colonies nearby. Vegetatively, A. praemorsa more closely resembles A. nematophylla, a species of coastal dunes on Eyre Peninsula recently distinguished from A. calamifolia by Maslin and Whibley (1987). However, A. nematophylla differs markedly from A. praemorsa in its non-racemose inflorescences, gamosepalous calyx, long funicle which ½-¾ encircles the seed, and phyllodes with four fine nerves and eglandular apices.

Acacia praemorsa is most closely related to A. microcarpa (manna wattle) and its allies, namely, A. acinacea, A. imbricata and A. triquetra. These species of subgenus Phyllodineae, section Phyllodineae, together with A. praemorsa, share the following important characters: phyllodes with apical gland on adaxial margin adjacent to an eccentric and innoccuous mucro, racemes extremely reduced, basal peduncular bract solitary, seeds longitudinal with poorly developed peripheral ridge, and aril clavate and extending down one side of seed (Maslin, 1987). Apart from A. acinacea, all the members of this "A. microcarpa group" occur on Eyre Peninsula.

Acacia praemorsa differs from all other members of the "A. microcarpa group" by the following characters: phyllodes linear to narrow-linear, 20-90 mm long and 1.2-2.4 mm wide (length/width ratio 10-65), nerves submerged and thus seemingly absent, raceme axes 1.5-3.5 mm long, heads 34-58 flowered, and seeds punctulate. The other members of the "A. microcarpa group" have phyllodes that are shorter and/or broader, rarely narrow-linear, and have obvious (although often not prominent) midribs. They also have shorter raceme axes (0.5-1.5 mm long), smaller heads (8-22-flowered), and non-punctulate seeds.

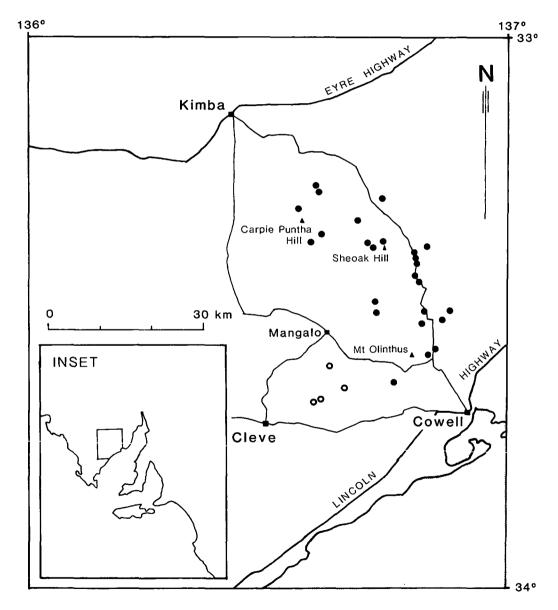


Fig. 3. Distribution of A. hexaneura (closed dots) and A. praemorsa (open dots) based on herbarium records and field observations.

A distinctive feature of A. praemorsa is the presence of a minute, almost microscopic, pair of claw-like appendages flanking the terminal gland of the phyllode. Although not previously reported, similar stipule-like structures were observed on A. microcarpa. In both species they are evident on the apices of very immature phyllodes appearing as lobes similar in structure to the developing mucro. In A. microcarpa the stipule-like appendages are often lost as the phyllode expands and the apex becomes eroded, but they persist on mature phyllodes of some individuals (e.g. C.R Alcock 707, D.J.E. Whibley 1907) as obvious projections immediately on the adaxial side at the end of the midrib. As these structures appear to be lacking in the other members of the group, A. microcarpa is possibly the closest relative of A. praemorsa.

Gland-bearing apices are uncommon in section *Phyllodineae* but do also occur in the "Acacia victoriae group" (Maslin, in press), some members of the "A. wilhelmiana group" (Maslin, 1990), A. johnsonii and related species, A. dictyophleba and related species, and a few other species. Acacia praemorsa shows no obvious close affinities to any of these taxa and is readily distinguished by the various attributes discussed above.

Conservation status

The four known populations of A. praemorsa were discovered by officers of the Native Vegetation Management Branch, Department of Environment & Planning, in assessing applications for vegetation clearance. In all cases, consent for clearance was refused. The population in Section 3, Hundred of Mann is now protected under a Heritage Agreement and another Agreement currently being prepared will cover the population at the type locality.

The population in Section 73, Hundred of Mann extends within 50 m of the southern boundary of the recently dedicated Yeldulknie Conservation Park. This park contains large areas of broadly similar habitat and it seems most likely that A. praemorsa will be found there.

The four populations each have about 500-1000 plants and the status code 2RCa is suggested using the criteria of Briggs and Leigh (1989).

Etymology: The epithet refers to the premorse phyllode apex and is derived from the Latin praemorsus meaning "as if bitten off".

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