

A baker's dozen of new wattles highlights significant *Acacia* (Fabaceae: Mimosoideae) diversity and endemism in the north-west Kimberley region of Western Australia

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Abstract

Maslin, B.R., Barrett, M.D. & Barrett, R.L. A baker's dozen of new wattles highlights significant *Acacia* (Fabaceae: Mimosoideae) diversity and endemism in the north-west Kimberley region of Western Australia. *Nuytsia* 23: 543–587 (2013). Thirteen new species of *Acacia* Mill. from the Kimberley region in northern Western Australia are described. These species are accommodated into three sections of the genus. *Acacia* sect. *Juliflorae* (Benth.) Maiden & Betche: *A. anastomosa* Maslin, M.D.Barrett & R.L.Barrett, *A. camptocarpa* Maslin, M.D.Barrett & R.L.Barrett, *A. cyclocarpa* Maslin, M.D.Barrett & R.L.Barrett, *A. diastemata* Maslin, M.D.Barrett & R.L.Barrett, *A. phacelia* Maslin, M.D.Barrett & R.L.Barrett and *A. synantha* Maslin, M.D.Barrett & R.L.Barrett. *Acacia* sect. *Plurinerves* (Benth.) Maiden & Betche: *A. anserina* Maslin, M.D.Barrett & R.L.Barrett, *A. obtriangularis* Maslin, M.D.Barrett & R.L.Barrett, *A. orthotropica* Maslin, M.D.Barrett & R.L.Barrett and *A. perpusilla* Maslin, M.D.Barrett & R.L.Barrett. *Acacia* sect. *Lycopodiifoliae* Pedley: *A. claviseta* Maslin, M.D.Barrett & R.L.Barrett, *A. dimorpha* Maslin, M.D.Barrett & R.L.Barrett and *A. prolata* Maslin, M.D.Barrett & R.L.Barrett. Notes are provided on *A. gracillima* Tindale (*Acacia* sect. *Juliflorae*) which provisionally includes a poorly known, distinctive entity in need of further taxonomic scrutiny. Except for *A. claviseta*, which extends to the Northern Territory, the new species are endemic to the Kimberley region. Eleven of the new species (all except *A. camptocarpa* and *A. claviseta*) are endemic to the high-rainfall area of the north-west Kimberley, highlighting significant levels of plant endemism in this region. A number of these species are geographically restricted (three are known only from the type) and all except *A. prolata* are treated as Priority taxa under the Department of Parks and Wildlife's Conservation Codes for Western Australian Flora. Most of the new species are killed by fire and their distributions are restricted to rocky, presumably naturally fire-limiting sites.

Introduction

The Kimberley region of Western Australia is recognised as a significant centre of plant diversity and endemism within Australia (Boden & Given 1995; McKenzie *et al.* 2009; Crisp *et al.* 2001; Ladiges *et al.* 2011; González-Orozco *et al.* 2011), echoing endemism in other groups such as fish (Morgen *et al.* 2011), frogs (Doughty 2011; Doughty *et al.* 2012) and snails (Gibson & Köhler 2012). The exact definition of the Kimberley as a biogeographic area varies between studies, from the north-

west Kimberley only (Doughty 2011), to the current definition of the region excluding the eastern part (Ladiges *et al.* 2011), to the political border (Wheeler 1992), or extending into the adjacent Northern Territory, following the extent of the geologically-defined Kimberley Block (Department of the Environment 2013). Under the *Interim Biogeographical Regionalisation for Australia* (IBRA) classification, the Kimberley region has been further divided into five sub-regions that correlate well with patterns of diversity and endemism within the region (Department of the Environment 2013; R.L. Barrett & M.D. Barrett unpubl. data). Where conducted at a sufficiently fine scale, several studies have identified the higher-rainfall (>1,000 mm) zone of the north-western Kimberley as an area of particularly high species diversity and endemism (e.g. Doughty 2011; González-Orozco *et al.* 2011; Gibson & Köhler 2012). Specific zones of highest richness and endemism are difficult to define in any group due to uneven survey effort and on-going taxonomic evaluation. A high proportion of the taxa known to be endemic to the Kimberley region in general, and the north-west Kimberley in particular, are associated with sandstone habitats. Sandstone ranges elsewhere in Australia often exhibit similar patterns of endemism (e.g. Western Arnhemland escarpment, Hawkesbury Sandstone in New South Wales; Benson & Howell 1994; Woinarski *et al.* 2006). Potter *et al.* (2012) provide an initial discussion of disjunctions in sandstone distribution in the context of rock wallaby diversification.

Current estimates of diversity and endemism within the Kimberley region are only preliminary as the area is remote and many parts are difficult to access and require the use of a helicopter. Two of the authors (MDB & RLB) have been collecting in remote parts of the Kimberley over the 21 years since publication of *Flora of the Kimberley region* (Wheeler *et al.* 1992). As a result of these and other surveys numerous undescribed plant species have been discovered in recent years, many of them relatively short-range or north Kimberley endemics. Examples include *Acacia barrettiorum* Lewington & Maslin, *A. spectra* Lewington & Maslin and *A. willingii* Lewington & Maslin (Lewington & Maslin 2009), and species from *Boronia* (Duretto 1997; 2006), *Backhousia* (Harrington *et al.* 2012), *Bossiaea* (Ross 2006), *Byblis* (Lowrie & Conran 1998; 2007), *Calytrix* (Barrett *et al.* 2009), *Corymbia* (Hill & Johnson 1995; Barrett 2007), *Drosera* (Lowrie 1996), *Euphorbia* (Halford & Harris 2012), *Goodenia* (Sage 2001), *Grevillea* (Kenneally 1988; Olde & Marriott 1993; Makinson 2000), *Ipomoea* (Johnson 2012), *Micraira* (Barrett & Barrett 2005), *Mitrasacme* (Dunlop 1996), *Planchonia* (Barrett 2006), *Polygala* (Kerrigan 2012), *Solanum* (Barrett 2013), *Stylidium* (Lowrie & Kenneally 1996, 1997; Kenneally *et al.* 2013), *Triodia* (Barrett *et al.* 2005; Barrett & Barrett 2011) and *Typhonium* (Hay *et al.* 1999), with many other novel taxa in preparation.

Biogeographic patterns involving Kimberley *Acacia* Mill. species are discussed by Hnatiuk *et al.* (1983), Hnatiuk and Pedley (1985), Hnatiuk and Maslin (1988), and most recently by González-Orozco *et al.* (2011). Although González-Orozco *et al.* (2011) identified several centres of endemism (in *Acacia*) within the Kimberley, including two within the north-west high-rainfall zone, it is clear that the true diversity and extent of these centres are at least partially distorted by differential collecting effort. Further survey effort in gaps between these centres would be valuable. Of the 146 taxa of *Acacia* now recognised for the Kimberley (including those described here), 56 species (58 taxa) are known to occur in the high-rainfall north-west region, and 25 species (27 taxa) are endemic in that area (or occasionally extend just outside the 1,000 mm isohyet), i.e. 44.6% (46.6%) endemism within this area, substantially higher than the 30% average for the whole Kimberley. Many of the non-endemic Kimberley acacias range eastwards to the Northern Territory and Queensland, with a lesser number extending south to the Great Sandy Desert and Pilbara regions.

Kimberley *Acacia* species display a mixture of resprouting and seeding strategies following fire. This region is subjected to intensive burning every year (Legge *et al.* 2011; Start 2013), from a variety of sources, and changes in fire regime are suspected since European colonisation (Craig 1999; Vigilante

2001). Given the high number of endemic *Acacia*, and their variable responses to fire, further studies on the long-term co-incident persistence of species with multiple regeneration strategies are recommended (e.g. Armstrong 2011 and Armstrong & Phillips 2012 for *Triodia*) in order to ensure we maintain endemic species within the landscape.

In this paper we describe thirteen new *Acacia* species that have emerged from recent Kimberley surveys. Four of these were provisionally identified as new taxa during a project at the Western Australian Herbarium sponsored by the Australian Heritage Commission in 2009, and were subsequently phrase-named by the authors. These four entities are described as new below, namely, *A. cyclocarpa* Maslin, M.D.Barrett & R.L.Barrett, *A. diastemata* Maslin, M.D.Barrett & R.L.Barrett, *A. perpusilla* Maslin, M.D.Barrett & R.L.Barrett and *A. prolata* Maslin, M.D.Barrett & R.L.Barrett. The remaining nine species were identified in field surveys subsequent to 2009, or from detailed study of herbarium collections. The thirteen new species described here bring the total number of formally recognised *Acacia* species for the Kimberley to 131 (representing 146 taxa), of which 40 species (30%) are endemic to the region. Additionally, there are four indigenous species of *Vachellia* Wight & Arn. (formerly *Acacia* subg. *Acacia*) in the region. The number of *Acacia* species now recognised for the Kimberley is 16 more than was recognised by Maslin (2001), an increase of 12% in the past 12 years. It is likely that future study of the Kimberley *Acacia* flora will further increase the number of taxa for the region.

Acacia sect. *Juliflorae* (Benth.) Maiden & Betche

Acacia anastomosa Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: north-east of Theda Station Homestead, north Kimberley region, Western Australia [precise locality withheld for conservation reasons], 12 April 2013, *R.L. Barrett, M.D. Barrett & B. Anderson* RLB 8003 (*holo*: PERTH 08440514; *iso*: BRI, CANB, DNA, K, MEL, NSW, PERTH 08440522).

Acacia sp. Carson River (M. McDonald MM1890), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Spindly, straggly, multi-stemmed *shrubs* 1–2 m tall. *Bark* smooth, brown. *Branchlets* angled at extremities but soon terete, marked with short, raised stem projections where phyllodes have fallen, finely ribbed (often appearing obscurely striate), the ribs dull or shiny (but lacking obvious resin) and of the same colour as the inter-rib spaces, dark red aging greyish, glabrous or with microscopic, red-brown glandular trichomes. *Stipules* mostly caducous, triangular, inconspicuous, *c.* 0.5 mm long. *New shoots* shiny, green except with minute, reddish brown glandular trichomes when very young. *Phyllodes* narrowly elliptic or sometimes obovate, mostly dimidiate with lower margin straight or shallowly convex and upper margin clearly convex, sometimes a few symmetric with both margins convex, (4–)5–9(–12) cm long, 15–25(–40) mm wide, sometimes interspersed with a few *c.* 10 mm wide, *l: w* = 2.5–4.5(–6), thinly to moderately coriaceous, straight or slightly recurved, green, glabrous; *main longitudinal nerves* 2–4 and normally with an additional 2 or 3 imperfect and/or less discrete nerves parallel to them, not especially prominent (but visible to the unaided eye), plane or slightly raised (when dry), yellow, not or scarcely resinous, some or all confluent with lower margin of phyllode for 2–12 mm above the pulvinus, minor nerves anastomosing to form an open, net-like reticulum, the nerve-islands ±irregularly square to oblong (longitudinally orientated), some or all nerves of the reticulum commonly lack capping cells and may therefore be somewhat obscure; *marginal nerve* discrete but not prominent, yellow to light brown, not or scarcely resinous; *apices* mucronate, the mucro triangular, 0.7–1.7 mm long, flattened (not noticeably thickened); *pulvinus* 2–3(–4) mm long.

Gland situated on upper margin of phyllode at distal end of pulvinus or to 2 mm above it, sometimes absent, sometimes phyllode lamina slightly swollen about the gland. *Inflorescences* simple, 1 or 2(–3) per axil; *peduncles* 8–17 mm long, 0.6–0.8 mm diam. when in flower, to 1.5 mm diam. when in fruit, glabrous except often with scattered hairlets as on receptacle, striate by very fine, longitudinal furrows when dry; *basal peduncular bract* single, early caducous, triangular, *c.* 1 mm long; *spikes* 10–20(–28) mm long, with flowers rather close together; *receptacles* *c.* 1 mm diam., with microscopic, red-brown glandular trichomes. *Bracteoles* spatulate, 0.5–1 mm long, claws linear and expanded into ovate, slightly thickened laminae, some persistent on receptacle after flowers have dropped. *Flowers* 5-merous; *calyx* *c.* 1/3 length of corolla, gamosepalous, shortly dissected into triangular to broadly triangular or oblong lobes, calyx tube sparsely hairy (some glandular) to sub-glabrous and nerveless; *corolla* 1.5 mm long, glabrous or sub-glabrous but the nerveless or finely 1-nerved petals with microscopic white villae along their margins towards apices. *Pods* (dehisced valves plus few aborted, unopened pods) narrowly oblong to narrowly oblong-oblancheolate, narrowed towards the base, not constricted between the seeds, 5–10 cm long, 7–10 mm wide, crustaceous to \pm sub-woody, straight, opening elastically from apex with the dehisced valves strongly recurved (often forming a \pm open coil), dark brown and sometimes faintly pruinose, glabrous, obliquely nerved with some nerves sparingly anastomosing, inner surface of valves dark red except for yellow or light brown marginal nerve; *marginal nerve* thick and evident but not raised. *Seeds* (immature, few seen) oblique in the pods, seated in shallow but distinct chambers each separated by a narrow septum, ellipsoid; *funicle-aril* fleshy, white and narrowly turbinate, the *funicle* straight or sometimes convoluted. (Figure 1)

Characteristic features. Spindly, predominantly glabrous *shrubs*. *Phyllodes* mostly dimidiate, moderately short and broad (mostly 5–9 cm long and 15–25 mm with l: w = 2.5–4.5), with 2–4 *main longitudinal nerves* (plus a few imperfect ones) of which some or all are confluent with lower margin of phyllode at base, minor nerves forming an open net-like reticulum comprising \pm irregularly square to oblong nerve-islands, apical *mucre* short and not noticeably thickened. *Inflorescences* simple; *peduncles* 8–17 mm long; *spikes* short (10–17 mm long) and rather densely flowered. *Flowers* 5-merous; *calyx* *c.* 1/3 length of corolla, shortly dissected into triangular to broadly triangular lobes. *Pods* narrowly oblong to narrowly oblong-oblancheolate, narrowed towards the base, 5–10 cm \times 7–10 mm, crustaceous to \pm sub-woody, straight, opening elastically from apex with the dehisced valves strongly recurved (often forming a \pm open coil); *marginal nerve* thick. *Seeds* oblique, seated in shallow but distinct chambers each separated by a narrow septum.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 12 Apr. 2013, R.L. Barrett, M.D. Barrett & B. Anderson RLB 8010 (PERTH); 29 May 1971, J.R. Maconochie 1245 (DNA, PERTH); 12 June 1987, M. McDonald MM 325 (PERTH); 12 Oct. 1993, M. McDonald MM 1890 (PERTH).

Distribution. Occurs in the Kimberley region of northern Western Australia where it is known only from south of Kalumburu (Figure 2A). It is abundant at the type location.

Habitat. Grows on red volcanic soil in open woodland with *Eucalyptus tectifica*, *Corymbia greeniana* and *Erythrophleum chlorostachys* over *Gossypium exiguum*, *Chrysopogon fallax* and *C. latifolius*.

Phenology. Because of the paucity of collections it is not possible to determine an accurate phenology for this species; however, three specimens with flowers at anthesis have been collected, one in April, one in late May and the other in mid-June. The one known fruiting collection, with aborted and seemingly recently-dehisced pods, was collected in mid-October. This species therefore probably

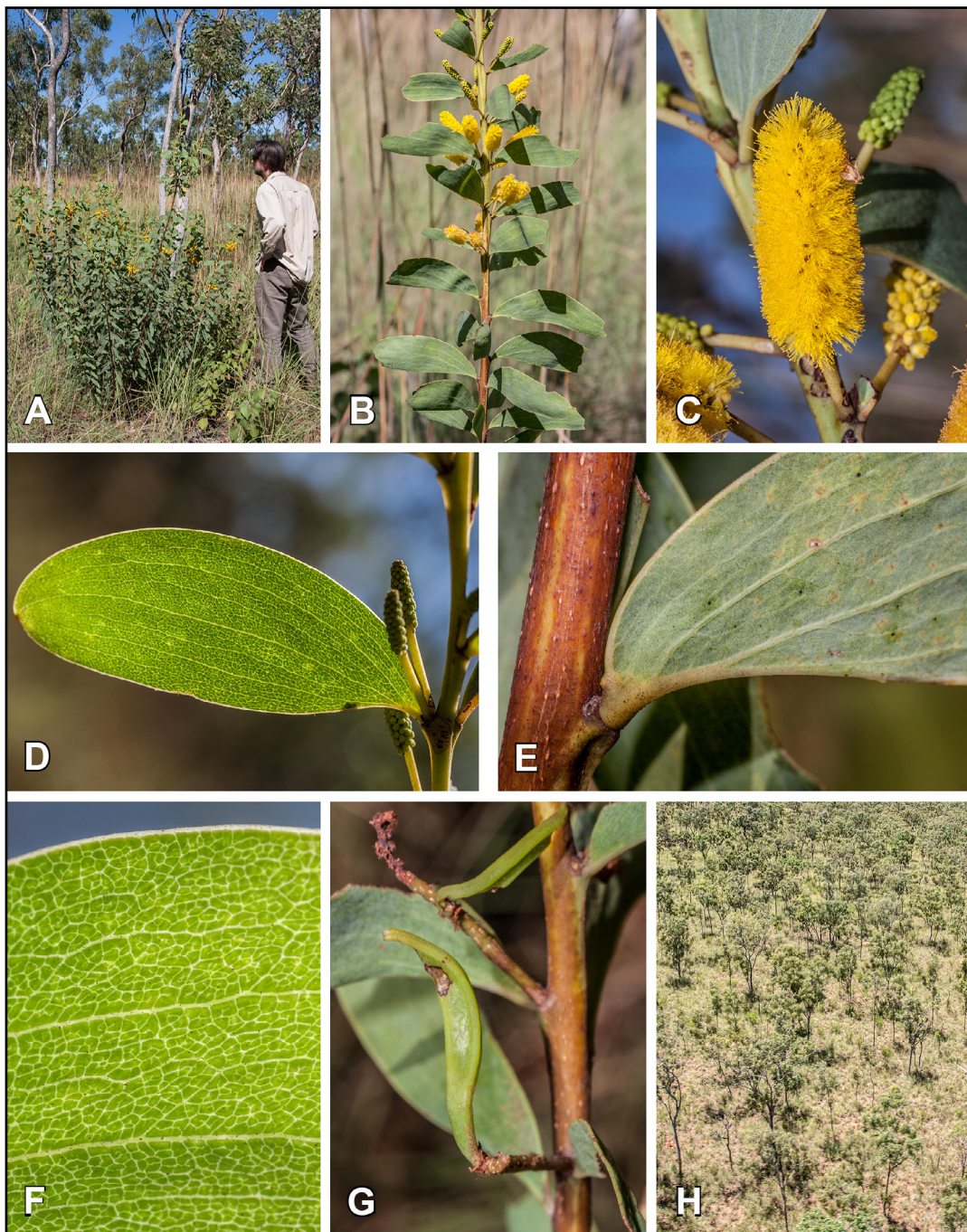


Figure 1. *Acacia anastomosa*. A – habit; B – flowering branchlet; C – inflorescence; D – phyllode; E – phyllode base showing gland and nerves fused to the lower margin; F – anastomosing veins on phyllode; G – immature pod; H – habitat. Images from *R.L. Barrett et al.* RLB 8003. Photographs by R. Barrett.

flowers at the end of the wet season and into the early dry season with fruit developing from the middle of the dry season.

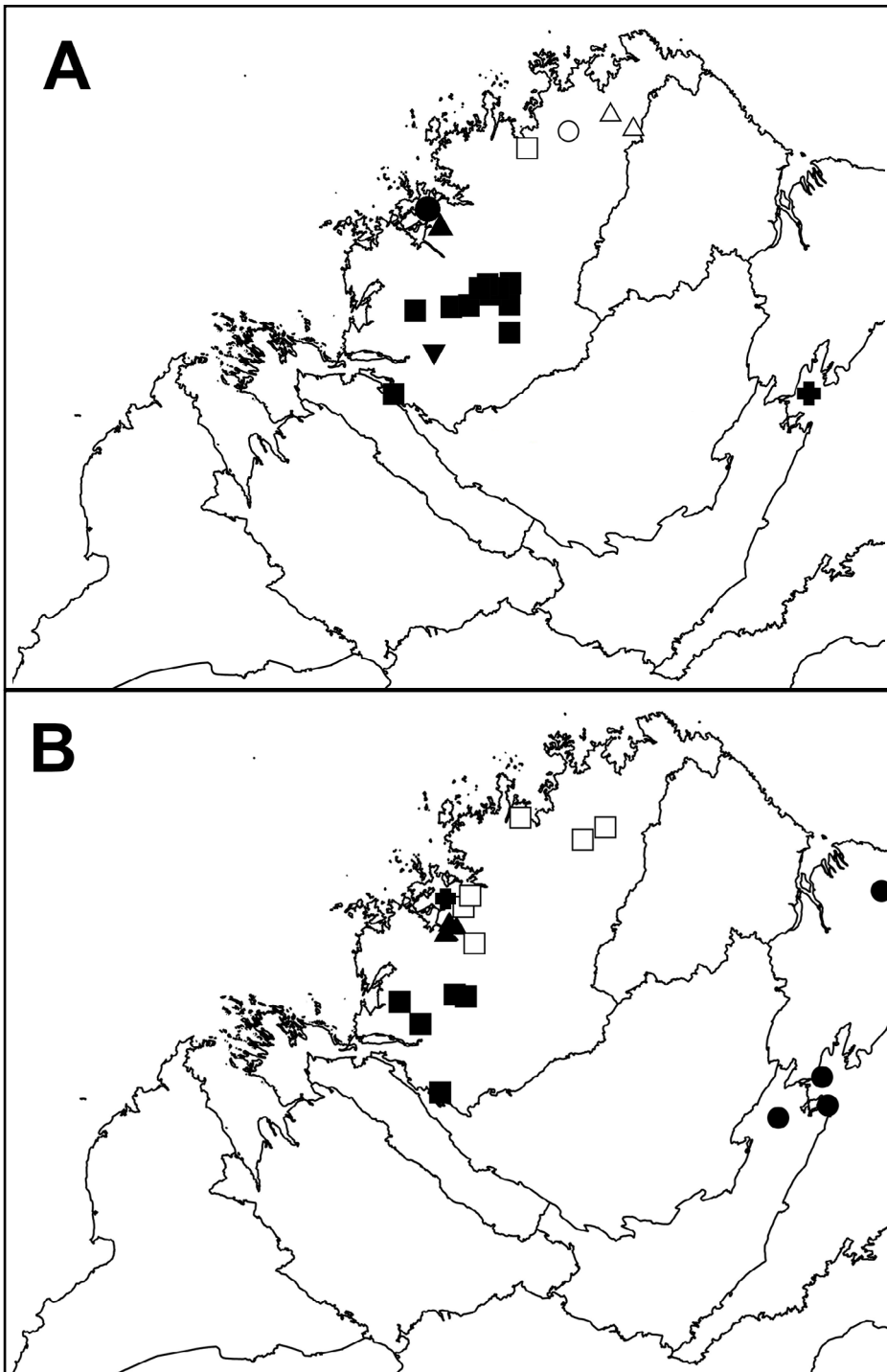


Figure 2. Species distributions in the Kimberley region of Western Australia and the adjacent Northern Territory with IBRA regions shown. A – *Acacia anastomosa* (Δ); *Acacia anserina* (\bullet); *Acacia camptocarpa* (\oplus); *Acacia dimorpha* (\blacktriangledown); *Acacia obtriangularis* (\square); *Acacia perpusilla* (\circ); *Acacia prolata* (\blacksquare); *Acacia synantha* (\blacktriangle). B – *Acacia clavisetata* (\bullet); *Acacia cyclocarpa* (\blacktriangle); *Acacia diastemata* (\square); *Acacia orthotropica* (\oplus); *Acacia phacelia* (\blacksquare).

Conservation status. *Acacia anastomosa* was originally listed by Smith (2012) as a Priority Three taxon, under the name *A. sp. Carson River* (M. McDonald MM1890); however, a disjunct collection tentatively included under this taxon at the time of its conservation assessment is here described as *A. synantha* Maslin, M.D.Barrett & R.L.Barrett, significantly reducing the known range of *A. anastomosa*. The conservation status of *A. anastomosa* (as *A. sp. Carson River*) has therefore been recently changed to Priority One under Department of Parks and Wildlife (DPaW; formerly Department of Environment and Conservation) Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–; Smith 2013).

Common name. Carson River Wattle.

Etymology. The botanical name is derived from the Greek *anastomosis* (formation of a network), in allusion to the reticulately nerved phyllodes.

Affinities. *Acacia anastomosa* appears to be most closely related to *A. limbata* F.Muell. which is a member of the '*A. stigmatophylla* group' (see Tindale 1980 and Tindale & Kodela 1992 for discussion of this group). These two species have similar pods in that they are hard-textured and open elastically from the apex with the dehisced valves recurved and the seeds seated in distinct, oblique depressions, each separated by a narrow septum. They have similar flowers and inflorescences and their phyllodes sometimes resemble one another in shape, size and basic nervature. *Acacia limbata* is distinguished from the new species by its normally longer peduncles (mostly 20–40 mm) and wider pods (mostly 10–15 mm), also, it has fewer anastomosing phyllode nerves which form clearly elongated nerve-islands about 5–12 mm long (nerve-islands about 1–3 mm long and forming a net-like reticulum in *A. anastomosa*). The branchlets of *A. limbata* are often pruinose (not pruinose in *A. anastomosa*) and its phyllodes are commonly (but not always) continuous with the branchlets along their lower margin (never continuous in *A. anastomosa*). The new species bears a superficial resemblance to *A. synantha* which is described as new below but the relationship is probably not especially close (see *A. synantha* for discussion).

Acacia camptocarpa Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: south-south-west of Kununurra, east Kimberley, Western Australia [precise locality withheld for conservation reasons], 15 May 2012, R.L. Barrett RLB 7512 (*holo:* PERTH 08455473; *iso:* CANB, DNA, K, MEL, NSW, PERTH 08455481).

Multi-stemmed, lignotuberous *sub-shrubs* 0.6–1 m tall. *Branchlets* terete except slightly angled at extremities, ribbed, yellowish when young, aging greenish then light brown, glabrous. *Stipules* early caducous, triangular, minute, *c.* 0.5 mm long, light brown. *New shoots* resinous, not viscid (at least when dry), green. *Phyllodes* narrowly elliptic to narrowly elliptic-oblongate, symmetric or sometimes slightly asymmetric with the upper (rarely the lower) margin \pm straight and the lower margin normally shallowly convex, 6.5–11 cm long, 10–22 mm wide, l: w = (4–)5–10, patent to ascending, coriaceous, straight but occasionally a few shallowly incurved near apex, glabrous, scurfy between the nerves, dark green with slight silvery sheen when fresh, milky dull green when dry; *longitudinal nerves* numerous, fine, shiny, slightly viscid and not touching (inter-nerve space wider than diameter of nerve), 4–6(–7) per mm, 3(–5) nerves more evident than the rest with the central one the most prominent, free to base (nerves neither confluent with one another or with the lower margin), anastomoses absent or very occasional; *marginal nerve* discrete, narrow, yellowish; *apices* acute to obtuse; *pulvinus* 1.5–3 mm long. *Gland* situated on upper margin of phyllode at distal end of pulvinus, somewhat evident, often

slightly raised. *Inflorescences* simple, 1 or 2 per axil; *peduncles* 1–4(–6) mm long, scurfy and resinous when in flower; *basal peduncular bract* single, persistent, navicular, c. 1 mm long; *spikes* 8–15 mm long when dry, densely flowered; *receptacle* densely puberulous with pale yellow, short, \pm spreading hairs. *Bracteoles* c. 0.5 mm long, light golden puberulous abaxially, claws narrowly oblong, expanded into a \pm thickened and inflexed, ovate lamina. *Flowers* 5-merous; *calyx* 2/3 or slightly less the length of the petals, gamosepalous, dissected for 1/4–1/3 its length into broadly triangular to almost oblong lobes, calyx tube light golden puberulous; *corolla* c. 1.5 mm long, glabrous, petals 1-nerved, the nerve slightly thickened; *ovary* glabrous. *Pods* oblong to narrowly oblong, 3–8 cm long, 4–6 mm wide, straight-edged or very shallowly constricted between seeds, flat, not raised over seeds, thinly coriaceous-chartaceous, mostly strongly curved (sometimes into an open circle), a few loosely coiled or sigmoid especially following dehiscence, grey-brown, scurfy, glabrous, nerveless but \pm obscurely longitudinally ridged, retained in clusters on the branches following dehiscence. *Seeds* longitudinal in the pods, obloid to slightly ellipsoid, 5–7 mm long, 2–3 mm wide, very dark brown; *pleurogram* fine; *areole* elongated ‘u’-shaped, open at the hilar end, 3.5–4 mm long, 1 mm wide; *funicle* minute, expanded into a once- or twice-folded, thickened, cream *aril* below the seed. (Figure 3)

Characteristic features. Multi-stemmed *sub-shrubs* 0.6–1 m tall. New shoots resinous, green. *Branchlets* glabrous. *Phyllodes* narrowly elliptic to narrowly elliptic-oblong, 6.5–11 cm long, 10–22 mm wide, mostly straight, glabrous, scurfy between the nerves; *longitudinal nerves* numerous, fine, shiny, slightly viscid and not touching, 4–6(–7) per mm, 3(–5) nerves more evident than the rest, free to base, anastomoses absent or very occasional. *Gland* at distal end of pulvinus somewhat evident. *Peduncles* 1–4(–6) mm long, scurfy and resinous when in flower; *spikes* 8–15 mm long (when dry).

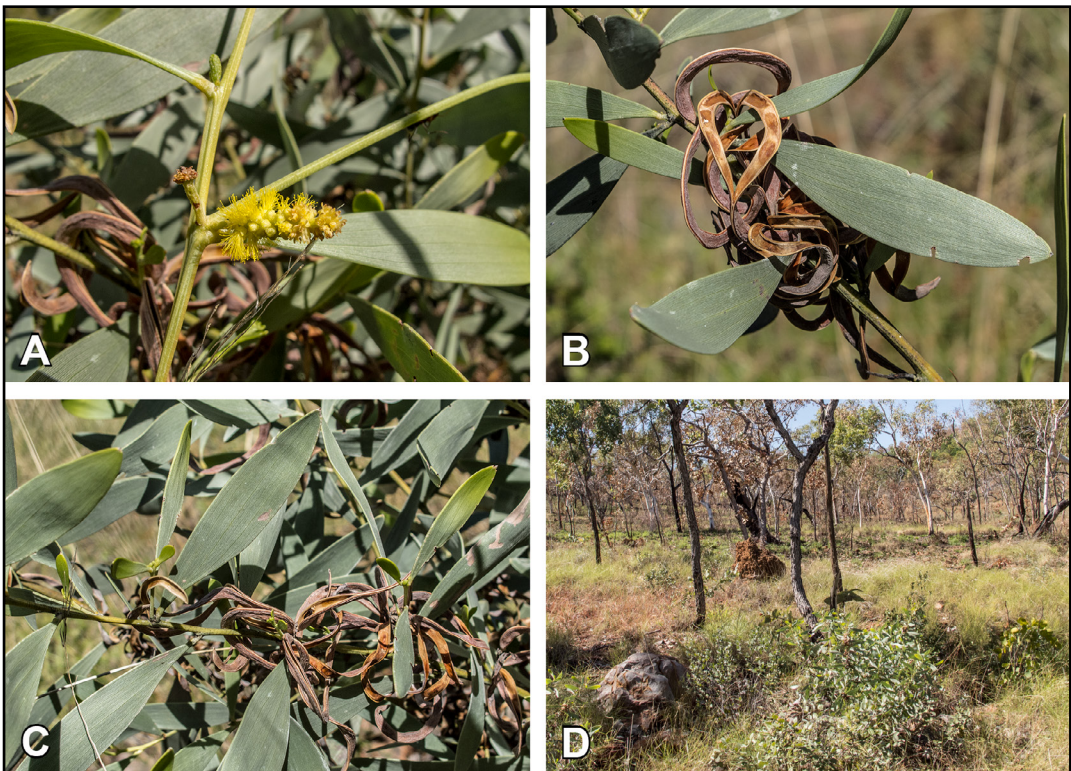


Figure 3. *Acacia camptocarpa*. A – flowering and fruiting branchlet; B – fruiting branchlet; C – fruiting branchlet; D – habit and habitat. Images from R.L. Barrett RLB 7512. Photographs by R. Barrett.

Flowers 5-merous; *calyx* c. 2/3 length of the petals, gamosepalous, dissected for 1/4–1/3 into broadly triangular to ±oblong lobes, calyx tube light golden puberulous; *corolla* glabrous, petals with midrib slightly thickened; *ovary* glabrous. *Pods* oblong to narrowly oblong, 3–8 cm long, 4–6 mm wide, straight-edged or very shallowly constricted between seeds, flat, thinly coriaceous-chartaceous, mostly strongly curved (sometimes into an open circle), grey-brown, scurfy, glabrous. *Seeds* longitudinal, 5–7 × 2–3 mm; *aril* cream-coloured.

Other specimen examined. WESTERN AUSTRALIA: [type locality] 5 Feb. 2010, R.L. Barrett RLB 6620 (BRI, NT).

Distribution. Occurs in the east Kimberley region of northern Western Australia where it is known from only a single population south-west of Lake Argyle (Figure 2A). Despite considerable survey effort in the area by RLB, including helicopter surveys, this species is currently known only from a small number of plants (less than 50) scattered over a distance of 2 km. This species co-occurs with the Priority One taxon *Corymbia cadophora* subsp. *polychroma* which has a well-defined distribution of about 15 km long and 1 km wide on the top of a sandstone range. *Acacia camptocarpa* appears to be even more restricted in distribution than this *Corymbia*. It occurs adjacent to the habitat for *Triodia barbata* and *T. cremnophila*, both Priority One species.

Habitat. Grows in sandy loam on gentle sandstone slopes in open woodland adjacent to massive banded ironstone outcrops. It grows in association with *Acacia oncinocarpa*, *A. thomsonii*, *Corymbia cadophora* subsp. *polychroma*, *Erythrophleum chlorostachys*, *Erythroxyllum ellipticum* and *Eucalyptus brevifolia* over *Dodonaea viscosa*, *Grevillea dryandri*, *Petalostigma quadriloculare*, *Cymbopogon ambiguus*, *Eriachne obtusa* and *Triodia* aff. *bitextura*.

Phenology. Flowering plants have been observed in January, February and May with fruit collected in February and May. The plants collected in February and May both possess scattered flowers (mostly at full anthesis, some in bud) and numerous pods (mostly recently dehisced, some with a few seeds remaining).

Conservation status. *Acacia camptocarpa* is to be listed as Priority One under DPaW Conservation Codes for Western Australian Flora (M. Smith pers. comm.). The known population could potentially be threatened by proposed expansion of an active mine site. Further surveys should be conducted to determine whether further populations exist in the area.

Common name. Ragged Range Wattle.

Etymology. The botanical name is derived from the Greek *kamptos* (bent, curved, flexible) and *karpos* (fruit) in allusion to the obviously curved pods.

Affinities. *Acacia camptocarpa* appears most closely related to *A. thomsonii* Maslin & M.W.McDonald which is widespread in the tropical dry zone of Australia (eastern Kimberley region of Western Australia east through the Northern Territory to north-western Queensland). The two species are similar in their phyllode shape (including them sometimes being slightly asymmetric with a ±straight upper margin), size and basic nervature, gland position and morphology, spicate inflorescences, relatively short peduncles, bracteole morphology and gamosepalous calyces with short, triangular lobes. The new species is sympatric with *A. thomsonii*, but the latter can be distinguished by its taller, non-lignotuberous habit (2–6 m tall and sparingly branched at the base), sericeous branchlets

and phyllodes (although the phyllode hairs are sometimes sparse), glabrous receptacles, glabrous or sparsely white-puberulous calyx tubes (hairs never golden), straight to shallowly curved, non-scurfy pods that are raised over and variably constricted between the seed and red-brown to rich dark brown in colour, and normally bright yellow seed arils. Also, in *A. thomsonii* the new shoots are bronze or brownish in colour and there are subtle differences in their phyllode nervature. In *A. thomsonii* the phyllodes always possess a few anastomosing minor veins and two of the main longitudinal nerves often (but not always) run together near the pulvinus; in *A. camptocarpa* anastomoses are very rare and the main longitudinal nerves remain free to the base. A detailed description of *A. thomsonii* is provided in Maslin and McDonald (1996).

Notes. This species is lignotuberous and has been observed to resprout following fire.

Acacia cyclocarpa Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: Prince Regent River Reserve [Kimberley region], Western Australia [precise locality withheld for conservation reasons], 20 August 1974, *A.S. George* 12477 (*holo:* PERTH 04343921; *iso:* CANB, K, NSW, PERTH 05981069).

Acacia sp. Pitta Creek (M.D. Barrett 1840), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Sprawling, decumbent to semi-erect, viscid *shrubs* to 0.6(–1.5) m tall and 1.5 m across. *Bark* exfoliating in a Minni Ritchi¹ fashion at extreme base of stems, otherwise comprising a thin, light grey external layer that is longitudinally fractured to reveal reddish new bark beneath, the irregularly shaped, exfoliating strips slightly recurved at either end. *Branchlets* terete, finely ribbed (the ribs plane and yellowish on young branchlets), light brown, reddish brown or pale green, glabrous or rarely appressed, ±silky hairy mainly on the ribs. *Stipules* persistent, triangular, *c.* 1 mm long, scarious, red-brown, glabrous. *Phyllodes* narrowly linear or sometimes linear-elliptic, narrowed at base, (4–)5–8.5 cm long, (1–)1.5–2.5 mm wide, often spreading at irregular angles (varying from ascending to erect, patent or deflexed), thin-textured and not rigid, straight to shallowly incurved or shallowly recurved, flat, glabrous or with sparse, appressed, ±silky hairs, green; *longitudinal nerves* numerous, 3–6 per mm, the central nerve yellow and more pronounced than the nerves on either side of it; *upper margin* wider than lower margin (view end-on); *apices* acuminate, gradually narrowed to a fine, normally shallowly to obviously curved (straight on a few phyllodes), innocuous, brown point; *pulvinus* 0.5–1 mm long, yellow, wrinkled when dry. *Gland* situated on upper margin of phyllode at distal end of pulvinus, not prominent. *Inflorescences* simple, single within axil of phyllodes; *peduncles* 12–25 mm long, noticeably longer than spikes, normally resinous, glabrous or with sparse, appressed, ±silky hairs, base ebracteate but a single, scarious, brown bract *c.* 1 mm long near or above middle of peduncle (often absent when in fruit); *spikes* obloid to short-cylindrical, (7–)9–12 mm long and (5–)6–7 mm wide at anthesis (when dry), flowers somewhat densely arranged, light golden. *Bracteoles* *c.* 1.5 mm long, claws narrowly oblong to linear, equalling or slightly longer than the narrowly ovate, acuminate laminae. *Flowers* 5-merous; *sepals* slightly exceeding 1/2 length of petals, free, linear but slightly expanded at apices, glabrous, 1-nerved; *petals* 1.7–2 mm long, glabrous, obscurely striate. *Pods* strongly curved into an open circle or coil, 5–7 mm wide, coriaceous, flat but slightly raised over seeds, not or scarcely constricted between seeds, brown, glabrous, aromatic by conspicuous, viscid resin (especially when young), finely reticulate with nerves longitudinal or obliquely longitudinal; *marginal nerve* thick. *Seeds* longitudinal in the pods, obloid to slightly ellipsoid, 4.5–5 mm long,

¹Minni Ritchi is a distinctive bark type found in about 20 species of *Acacia*; it is reddish in colour and exfoliates in narrow shavings that curl retrorsely from each end.

3–3.5 mm wide, compressed (1.5–2 mm thick), shiny, very dark brown to blackish except dull cream at centre; *pleurogram* obscure; *areole* oblong-elliptic, small (0.8–1 × 0.5–0.6 mm), not open at the hilar end; *funicle* filiform, expanded into a thick, folded, cream to dull yellow (when dry) *aril* below the seed. (Figure 4)

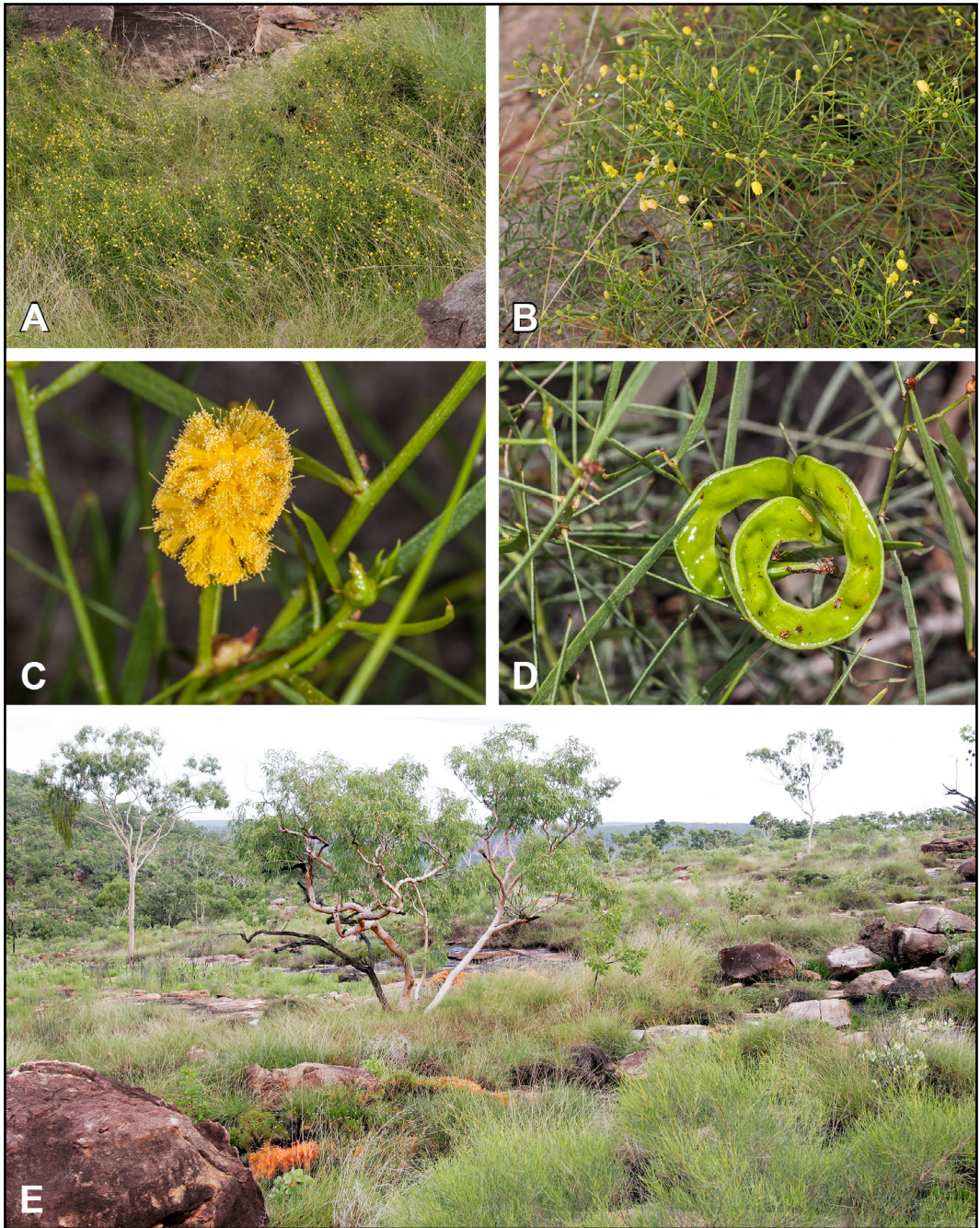


Figure 4. *Acacia cyclocarpa*. A – habit; B – flowering branches; C – flowering branchlet; D – pod; E – habitat. Images from R.L. & M.D. Barrett 2632. Photographs by R. & M. Barrett.

Characteristic features. Sprawling, decumbent to semi-erect, viscid *shrubs* to 0.6(–1) m tall. *Bark* Minni Ritchi at extreme base of mature stems. *Stipules* persistent, triangular, c. 1 mm long, red-brown. *Phyllodes* normally narrowly linear, (4–)5–8.5 cm long, (1–)1.5–2.5 mm wide, often spreading at irregular angles, thin-textured and not rigid, flat, glabrous or sparsely appressed-hairy; *longitudinal nerves* numerous with the central one the most pronounced; upper margin broader than lower margin; *apices* acuminate by a fine, normally curved, innocuous point. *Gland* at distal end of pulvinus, not prominent. *Inflorescences* simple; *peduncles* 12–25 mm long, noticeably longer than spikes, glabrous or sparsely appressed-hairy, a single brown bract near or above middle; spikes obloid to short-cylindrical, 9–12 mm long (when dry). *Bracteoles* c. 1.5 mm long, laminae acuminate. *Flowers* 5-merous; *sepals* slightly exceeding 1/2 length of petals, free, linear but slightly expanded at apices, glabrous; *petals* glabrous, obscurely striate. *Pods* strongly curved into an open circle or coil, 5–7 mm wide, glabrous, very viscid (especially when young); *marginal nerve* thick. *Seeds* longitudinal, obloid, 4.5–5 mm long, 3–3.5 mm wide, very dark brown to blackish except dull cream at centre; *areole* small (0.8–1 × 0.5–0.6 mm), not open at the hilar end; *aril* thick, folded below the seed.

Selected specimens examined. WESTERNAUSTRALIA: [localities withheld for conservation reasons] 29 Jan. 2000, M.D. Barrett 952 (PERTH); 10 Jan. 2001, R.L. & M.D. Barrett 1721 (MEL, PERTH); 21 Jan. 2003, R.L. & M.D. Barrett 2632 (DNA, PERTH); 19 Aug. 1974, K.F. Kenneally 2078 (NSW, PERTH); 6 Aug. 2006, T. Willing s.n. (BRI, DNA, MEL, PERTH 07386567).

Distribution. Occurs in the north-west Kimberley region of northern Western Australia where it occurs along the Prince Regent River, with populations both inside and outside Prince Regent National Park (Figure 2B). Populations are usually large but composed of plants scattered over broken sandstone over several kilometres.

Habitat. Grows on broken sandstone plateaus, generally around ridge crests where the sandstone provides a degree of fire protection. Grows in association with *Acacia orthocarpa*, *A. prolata*, *Auranticarpa resinosa*, *Borya subulata*, *Eucalyptus miniata*, *E. phoenicea*, *E. rupestris*, *Livistona lorophylla*, *Owenia vernicosa* and *Triodia claytonii*.

Phenology. Flowers predominantly in the wet season from January to April. However, two flowering collections have been collected in August 1994 and 2006, both of which were atypical in having unusually long wet seasons. Pods with mature seeds collected in April and August.

Conservation status. *Acacia cyclocarpa* is listed by Smith (2013) as a Priority Three taxon under DPaW Conservation Codes for Western Australian Flora, under the name *Acacia* sp. Pitta Creek (M.D. Barrett 1840) (Western Australian Herbarium 1998–).

Common name. Ring-pod Minni Ritchi.

Etymology. The botanical name is derived from the Greek *kyklos* (Latin *cyclus*), a circle or ring, and *karpōs*, a fruit, in allusion to the pods which are prominently curved into an open circle or coil.

Variant. An extensive continuous population (>5 km) of plants in the south-west Edkins Range (R.L. Barrett, M.D. Barrett & B.M. Anderson RLB 7984) is clearly related to *A. trachycarpa* E.Pritzl and *A. cyclocarpa* (especially in phyllode nervature and widened upper phyllode margins), but has some differences from both. In particular, habit is consistently erect (sprawling to decumbent or rarely semi-erect in *A. cyclocarpa*, erect-spreading or rarely sprawling in *A. trachycarpa*), sepals united

(like *A. trachycarpa*, free in *A. cyclocarpa*), but not golden-hairy (golden-hairy in *A. trachycarpa*, glabrous in *A. cyclocarpa*), petals are striate (like *A. cyclocarpa*; 1-nerved in *A. trachycarpa*), pods curved like *A. trachycarpa* but slightly narrower (6 mm; in *A. trachycarpa* the pods are 7–12 mm wide; *A. cyclocarpa* has pods 5–7 mm wide but they are typically more strongly curved than in RLB 7984) and seeds longitudinal (like *A. cyclocarpa*; oblique in *A. trachycarpa*). This collection apparently represents a distinct entity, but we await further material in order to assess its taxonomic status.

Affinities. *Acacia cyclocarpa* is most closely related to *A. trachycarpa* which is common in the Pilbara region, c. 1,000 km south-west of where the new species occurs. Of the characters shared by these two species the following are perhaps the most important: bark Minni Ritchi; stipules persistent; phyllodes narrowly linear, thin-textured, plurinerved with the central nerve the most pronounced, upper margin wider than lower margin, apices terminated by a distinct, fine mucro; inflorescences simple and spicate; flowering peduncles with a single, small bract above the base; flowers 5-merous; pods coriaceous, flat with thickened margins, viscid, reticulately nerved; seeds dark-coloured except distinctively dull cream at centre. *Acacia trachycarpa* is distinguished from *A. cyclocarpa* in a number of ways. Unlike the new species which has a low, sprawling growth form, *A. trachycarpa* is normally an erect, obconic shrub or small tree normally 2–5 m tall. However, as noted by Maslin *et al.* (2010), an uncommon, dwarf variant (which grows to about 1 m tall) occurs in *A. trachycarpa*; this variant is most readily distinguished from both typical *A. trachycarpa* and from *A. cyclocarpa* by its short phyllodes (1.5–4 cm long). The two species also differ in the details of their flowers with those of *A. trachycarpa* having sepals that are less than half the length of the petals, united for 1/3–2/5 their length and golden-hairy, petals 1-nerved and bracteoles shorter (less than 1 mm long). Furthermore, *A. trachycarpa* has generally shorter peduncles (5–15 mm long), longer and narrower spikes (mostly 10–20 × 3–5 mm), hairy pods (at least when young) which are broader (7–12 mm wide) and moderately to strongly, often irregularly curved (only sometimes curved into an open circle as in *A. cyclocarpa*), and oblique seeds which are larger (5–8 × 4–7 mm). The new species is also related to the Kimberley endemic, Minni Ritchi species *A. gracillima* Tindale (see below) which is most readily distinguished by its taller stature (mostly 2.5–5 m), longer spikes (20–40 mm) and pilose pods.

Acacia diastemata Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: east of Mount Trafalgar [Kimberley region], Western Australia [precise locality withheld for conservation reasons], 25 January 2007, R.L. Barrett & M.D. Barrett RLB 3939 (*holo:* PERTH 07766866; *iso:* CANB, K, MEL, NSW, DNA).

Acacia sp. Prince Regent River (R.L. & M.D. Barrett 3939), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Erect *shrubs* or small *trees* 2–5 m tall, mature trunks to 12 cm dbh. *Bark* fibrous, grey. *Branchlets* terete, finely ribbed, brown aging grey, glabrous, with scattered lenticels. *Stipules* inconspicuous, c. 0.5 mm long, triangular, sometimes caducous. *New shoots* resinous but not viscid (at least when dry). *Phyllodes* narrowly linear, 9–16 cm long, 1–2 mm wide, thin and pliable, erect, straight to shallowly incurved, glabrous, green; *longitudinal nerves* 3, distant, the often yellowish central nerve more pronounced than the others; *apices* straight to sub-uncinate, terminated by a blunt, callous point; *pulvinus* 1.5–2 mm long, brown, finely transversely wrinkled when dry. *Gland* situated on upper margin of phyllode at distal end of pulvinus, very small. *Inflorescences* simple, 2 per axil; *peduncles* 1.5–3(–4) mm long, glabrous; *basal peduncular bract* single, c. 2 mm long, early caducous; *spikes* 25–35 mm long, interrupted with distinct spaces between flowers or groups of flowers, light golden; *receptacle* slender, glabrous. *Bracteoles* early caducous, less than 0.5 mm long, sub-sessile by a very

short, oblong claw, the lamina broadly ovate. *Flowers* 4-merous or sometimes 5-merous; *mature buds* small (1–1.2 × 0.6–0.7 mm); *calyx* 1/4–1/3 length of corolla, gamosepalous, shortly dissected into broadly triangular lobes that are glabrous or minutely and sparsely ciliate, calyx tube glabrous and nerveless; *petals* 1–1.2 mm long, glabrous, very obscurely 1-nerved; *ovary* glabrous or with a few appressed hairs at apex. *Pods* narrowly linear, very slightly constricted between seeds, obviously rounded over seeds with the oblong umbo extending to edge of pod, 4–7 cm long, 2–2.5 mm wide, thinly coriaceous-crustaceous, shallowly curved or sometimes straight, brown, glabrous, obscurely longitudinally reticulately nerved, narrowed at base to slender stipe 2–3 mm long. *Seeds* longitudinal in the pods, obloid, 2–2.5 mm long, 1.2–1.4 mm wide, compressed (c. 1 mm thick), brown, glossy; *areole* elongated ‘u’-shaped, with a narrow opening at the hilar end, 1–1.5 mm long, 0.4–0.5 mm wide; *funicle* gradually expanded into a folded, bright yellow or sometimes cream (at least when dry) *aril* below the seed. (Figure 5)

Characteristic features. Erect *shrubs* or small *trees* 2–5 m tall. *Branchlets* glabrous. *Phyllodes* narrowly linear, 9–16 cm long, 1–2 mm wide, thin and pliable, erect, straight to shallowly incurved, glabrous; *longitudinal nerves* 3, widely spaced; *apices* terminated by a blunt, callous point. *Gland* on upper margin of phyllode at distal end of pulvinus, very small. *Peduncles* 1.5–3(–4) mm long, glabrous; *spikes* 25–35 mm long, interrupted. *Flowers* 4-merous or sometimes 5-merous; *calyx* gamosepalous, shortly dissected into broadly triangular lobes, calyx tube glabrous. *Pods* narrowly linear, slightly

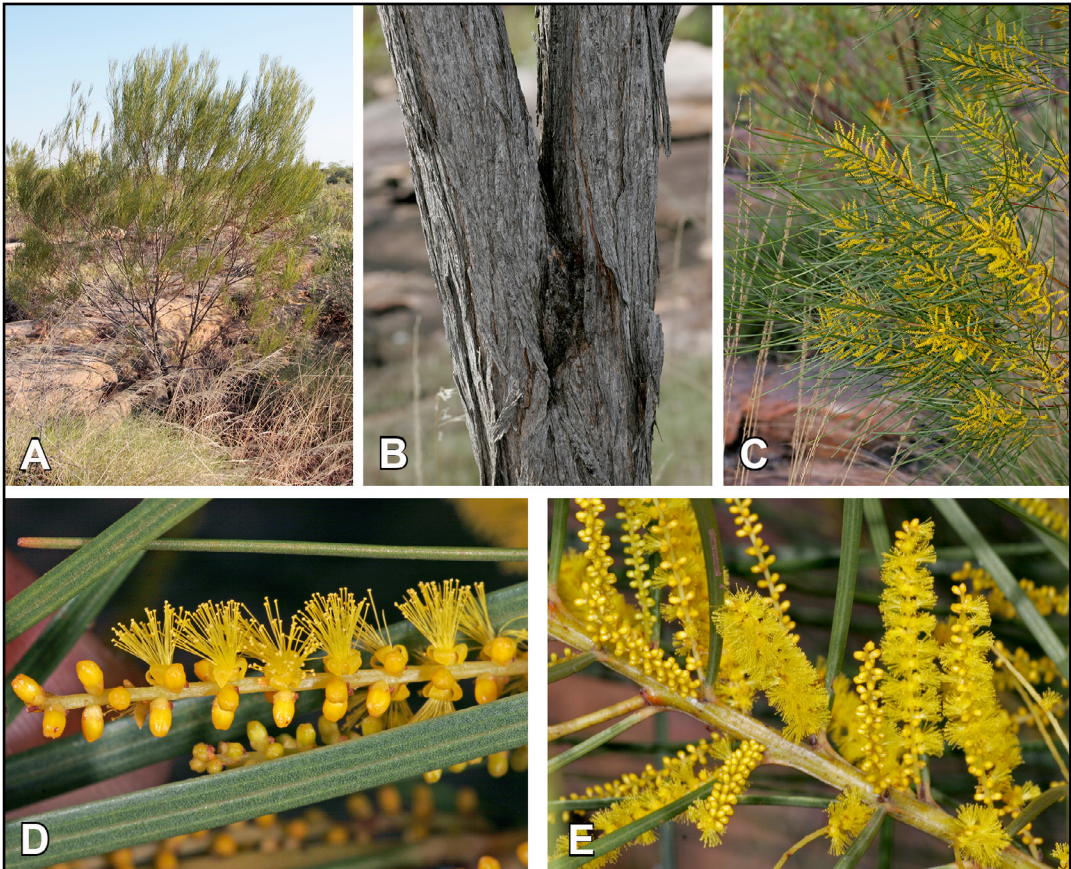


Figure 5. *Acacia diastemata*. A – habit and habitat; B – stem of old tree; C – flowering branches; D – inflorescence and phyllode nerves; E – flowering branchlet. Images from R.L. Barrett & M.D. Barrett RLB 3939. Photographs by R. Barrett.

constricted between and obviously rounded over seeds, 2–2.5 mm wide, thinly coriaceous-crustaceous. *Seeds* longitudinal, 2–2.5 × 1.2–1.4 mm; *areole* elongated 'u'-shaped; *aril* bright yellow or sometimes cream (at least when dry).

Selected specimens examined. WESTERNAUSTRALIA: [localities withheld for conservation reasons] 21 Jan. 2003, R.L. Barrett & M.D. Barrett MDB 1372 (BRI, MEL, NSW, PERTH); 28 Jan. 2007, M.D. Barrett & R.L. Barrett MDB 1843 (AD, BRI, CANB, DNA, G, MEL, NSW, NT, NY, PERTH); 23 Apr. 2008, R.L. Barrett & M.D. Barrett RLB 4584 (DNA, PERTH); 29 Apr. 2008, R.L. Barrett & M.D. Barrett RLB 4893 (MEL, NSW, PERTH).

Distribution. Occurs in the Kimberley region of northern Western Australia where it is known from widespread but very localised populations between the Prince Regent River, north to the Roe River, and east to Drysdale River National Park (Figure 2B). Its geographic range extends over about 200 km along a south-west/north-east axis.

Habitat. Exclusively restricted to small stands (of often <100 plants) on massive sheeting sandstone pavements, that are presumably more protected from fires than the surrounding landscape, and always away from pavement margins. It grows with a variety of species at each known locality including *Acacia kenneallyi*, *Goodenia* aff. *gloeophylla*, *Hibiscus superbis*, *Macarthuria vertex*, *Triodia* spp. and *Triumfetta* spp.

Phenology. Because of the paucity of collections it is not possible to determine with accuracy the phenology of this species. Specimens in flower have been collected in late January while pods with seeds have been collected in late March and May. It probably flowers in the wet season and fruits in the early dry season.

Conservation status. *Acacia diastemata* is listed by Smith (2013) as Priority Three under DPaW Conservation Codes for Western Australian Flora, under the name *Acacia* sp. Prince Regent River (R.L. & M.D. Barrett 3939) (Western Australian Herbarium 1998–). While known from a moderate number of populations scattered over a reasonably large area, none of the known populations is large. Studies on the sensitivity of this species to changes in fire regime are necessary to understand its risk status.

Common name. Sandstone Pavement Wattle.

Etymology. The specific epithet is the plural of the Greek *diastema* (an interval, space between), in allusion to the distinct spaces between the flowers and flower clusters, producing interrupted spikes. It is used here as a noun in apposition.

Morphology. Flower merosity is variable, which is unusual in *Acacia*. Within a single spike the flowers can be either all 4-merous or a mixture of 4-merous and 5-merous.

Affinities. *Acacia diastemata* is most closely related to *A. scopulorum* Pedley which occurs in Kakadu National Park, Northern Territory. These two species share very similar inflorescence and carpological features but *A. scopulorum* is readily recognised by its much wider (4–8 mm) phyllodes which have more numerous longitudinal nerves (8–14). The 4-merous flowers with gamosepalous calyces, which are arranged in long, interrupted spikes, suggest that both these species are related to the '*A. longifolia* group' from south-eastern Australia (see Brown *et al.* 2010 for discussion of this group). Indeed,

these morphological attributes, together with the narrowly linear, 3-nerved, glabrous phyllodes render *A. diastemata* remarkably superficially similar to narrow phyllode forms of one particular member of this group, *A. longissima* Hort. ex H.L.Wendl. This species has phyllodes 1–7(–10) mm wide with 3–5(–7) main longitudinal nerves; the narrowest phyllodes are 1–2 mm wide and 3-nerved with the central one the most pronounced, and as such resemble those of *A. diastemata*. *Acacia longissima* occurs in near-coastal areas between Bundaburg (south-east Queensland) and the Mullumbimby district (far-north coast of New South Wales) and is distinguished from *A. diastemata* by its eglandular phyllodes, narrowly elliptic, much larger seeds (5–6 × 2 mm), densely tomentulose ovaries and commonly longer peduncles (normally 4–10 mm) that are sometimes sparsely appressed-hairy.

Some specimens assigned to the polymorphic *A. gonocarpa* F.Muell. have atypically long, narrow phyllodes (c. 10 cm × 1–2 mm) which superficially resemble those of *A. diastemata* but the two species are not closely related. *Acacia gonocarpa* is readily recognised by its winged, quadrangular pods and free sepals.

Acacia gracillima Tindale, *Telopea* 1: 74 (1975). *Type*: Bold Bluff, W. Kimberley, Western Australia, 13 June 1905, *W.V. Fitzgerald* 1131 (*holo*: NSW; *iso*: K, PERTH).

Acacia sp. Trent River (K.F. Kenneally 11701), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Acacia gracillima belongs to a group of species that possess a distinctive bark type called Minni Ritchi (see footnote p. 552). This group comprises about 20 species nationwide, and additional to *A. cyclocarpa* and *A. gracillima*, is represented in the Kimberley region by *A. delibrata* A.Cunn. ex Benth., *A. lysiphloia* F.Muell. and *A. monticola* J.M.Black; *A. trachycarpa* from the Pilbara region is also a member of this group (this species is possibly a rare introduction to the Kimberley). Apart from its bark the distinctive features of *A. gracillima* are as follows: phyllodes very narrow, thin-textured, indistinctly plurinerved (midrib being the most pronounced nerve) and terminated by a sub-setose point, spikes long and narrow with small, sub-densely arranged flowers, calyx gamosepalous and very reduced in size (less than c. 1/4 length of the corolla), pods thin-textured, prominently rounded over the seeds (with umbo extending to edge of pods) and pilose, and dark-coloured seeds that possess a small areole surrounded by a wide band of dull cream tissue that is bordered by an obscure pleurogram. *Acacia gracillima* occurs in the west Kimberley region from the Buccaneer Archipelago, south-east through the King Leopold Range. Morphologically it is not an especially variable species (see below). Until now the informal entity, *Acacia* sp. Trent River (K.F. Kenneally 11701), was provisionally regarded as a distinct taxon, recognised by its relatively short, broad and crowded phyllodes and rather short seeds; however, examination of material at the Western Australian Herbarium shows that this variation falls within the range of that for *A. gracillima*. Specimens formerly ascribed to *Acacia* sp. Trent River predominate on the Yampi Peninsula and some adjacent off-shore islands; available collections show this area as disjunct from other populations of the species that occur about 70 km to the south-east and which predominate in the Bold Bluff and Bell Gorge areas of the King Leopold Range. A similar disjunction occurs in *Solanum leopoldense* (Barrett 2013).

There is a distinctive entity known only from three locations in Prince Regent National Park (e.g. *R.L. Barrett & M.D. Barrett* RLB 3761) that is currently ascribed to *A. gracillima* but which requires further study in order to reassess its taxonomic status. This entity is characterised by having very fine phyllodes (0.5–1 mm wide) and pendulous branchlets (phyllodes mostly 1–2 mm wide and branchlets not known to be pendulous in *A. gracillima*); it occurs on the Prince Regent River, about 150 km north of the main occurrence of the species. Other variation within *A. gracillima* appears not to be

taxonomically significant. For example, many plants from the vicinity of Mt Bell often have a denser indumentum of often pale golden appressed hairs on their phyllodes and branchlets than elsewhere, and one from Cone Bay (*K.F. Kenneally* 11701), has atypically wide phyllodes (3–4 mm).

Acacia phacelia Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: north-west Kimberley, Western Australia [precise locality withheld for conservation reasons], 10 October 2007, *T. Willing s.n.* (*holo*: PERTH 07764022; *iso*: CANB, K, MEL).

Acacia sp. Wren Creek Crossing (*K.F. Kenneally* 11853), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Acacia sp. Edkins Range (R.L. Barrett & M.D. Barrett RLB 661), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Spreading, straggly, openly branched or sometimes compact *shrubs* 0.4–1(–1.5) m tall and to 3 m across. *Branchlets* slender, terete except slightly angled at apices, finely ribbed, the ribs sometimes with a relatively thin layer of clear, shiny resin for some distance below the phyllode cluster, light brown aging grey, ±densely pubescent to pilose, the hairs weak, patent, shallowly curved to straight or sub-cripsed and white. *Stipules* not prominent, triangular, 0.7–1 mm long, scarious, erect, light brown. *New shoots* densely pilose, not resinous. *Phyllodes* in clusters of (2–)3–5(–8) at mature nodes, 1 per node when first initiated on new shoots, most commonly narrowly oblong-oblancheolate but ranging to narrowly oblong, narrowly oblong-elliptic or sometimes ±linear, narrowed at base, (4–)6–10(–12) mm long, 0.7–1.3 mm wide, shallowly incurved to straight or shallowly sigmoid, flat, green, ±sparsely pubescent with short, fine, patent hairs; *nerves* normally not discernible but often slightly longitudinally wrinkled when dry, infrequently with some faint, sparingly anastomosing longitudinal nerves; *apices* excentrically mucronate, rostellate or uncinata; *pulvinus* c. 0.5 mm long. *Gland* situated on upper margin of phyllode 1–2 mm above the pulvinus, not prominent. *Inflorescences* simple, 1 or 2 per node; *peduncles* (3–)4–8 mm long, short-pilose with patent, white hairs; *spikes* obloid to short-cylindrical, 4–7 × 3–4 mm when dry, flowers densely arranged, yellow. *Bracteoles* c. 1 mm long, exerted beyond flowers in young buds, claws narrowly oblong to linear and glabrous, laminae triangular-lanceolate to ovate, acuminate, longer than claws and ±sparsely short pilose. *Flowers* 5-merous; *sepals* 1/2–3/4 length of petals, free, linear, sparsely short-pilose at apex; *petals* c. 1.3 mm long, glabrous, nerveless. *Pods* linear, neither raised over nor constricted between the seeds, 3–8 cm long, 2–4 mm wide, firmly crustaceous, straight to slightly curved, opening elastically from apex with dehisced valves shallowly to moderately recurved, red-brown, pubescent (hairs short and patent) to glabrous, longitudinally striate with some nerves anastomosing, flat but abruptly deflexed at rim to form a perpendicular, narrow, flattened outer edge, quadrangular in section when narrow. *Seeds* oblique in the pods, seated in distinct chambers each separated by a narrow septum, ellipsoid (but commonly slightly asymmetrically so), 4–4.5 mm long, 2.2–2.8 mm wide, slightly shiny, dark brown to greyish brown except *pleurogram* bordered by a band of dull cream tissue; *areole* elongated ‘u’-shaped, 3–3.5 mm long, 1 mm wide, open at the hilar end; *funicle* expanded into a dull cream (when dry), conical *aril* 1–2.5 mm long. (Figure 6)

Characteristic features. *Branchlets* terete, ±densely pubescent to pilose with weak, patent hairs. *Phyllodes* in clusters of (2–)3–5(–8) at mature nodes, mostly 6–10 mm long, 0.7–1.3 mm wide, shallowly incurved to straight or shallowly sigmoid, ±sparsely pubescent; *nerves* normally not discernible; *apices* excentrically mucronate, rostellate or uncinata. *Spikes* obloid to short-cylindrical, 4–7 mm long when dry; *peduncles* (3–)4–8 mm long, short-pilose with patent, white hairs. *Bracteoles*

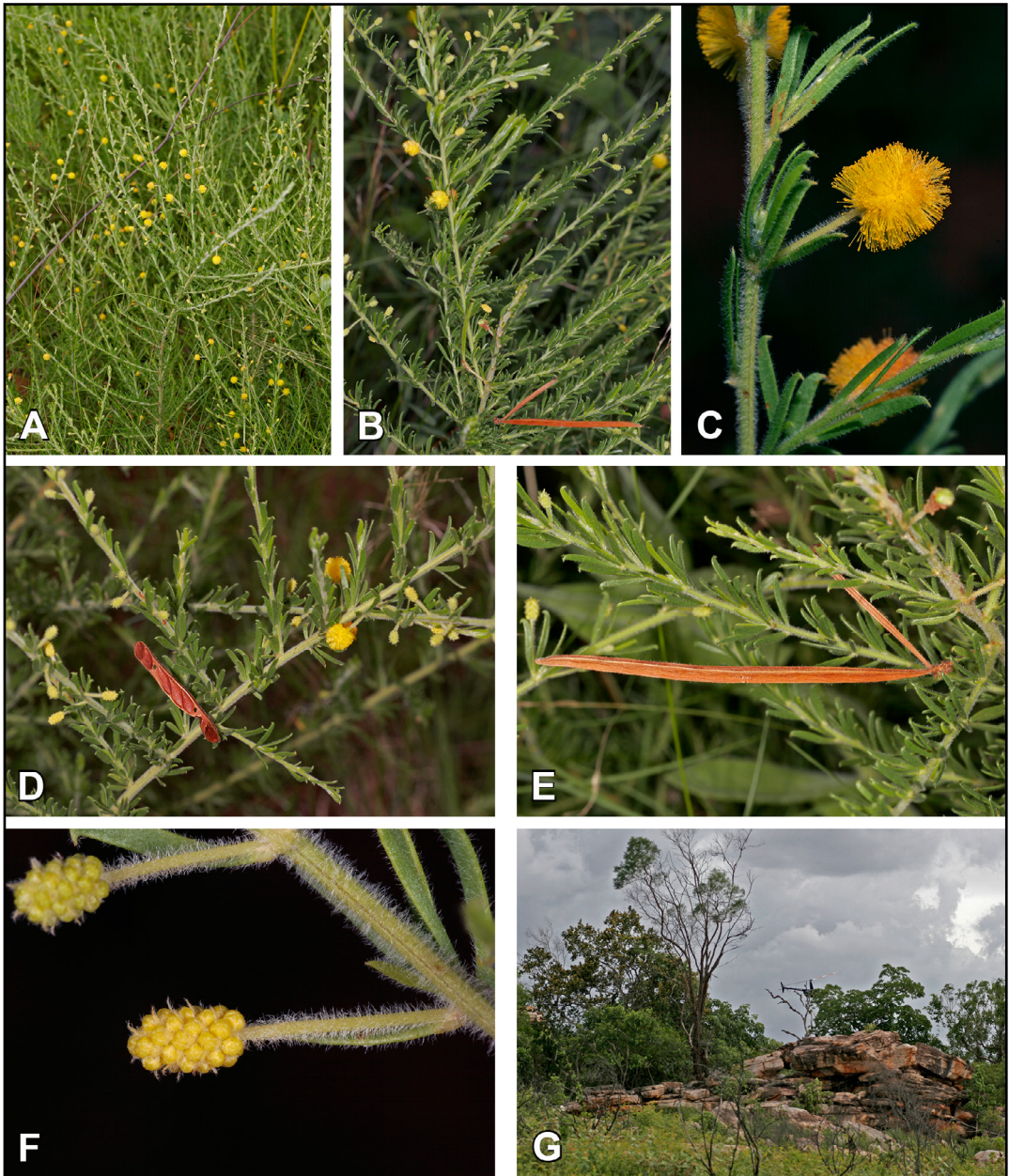


Figure 6. *Acacia phacelia*. A – habit; B – flowering branch; C – flowering branchlet showing clustered phyllodes and inflorescence; D – flowering and fruiting branch; E – pod; F – budding inflorescence; G – habitat. Images from R.L. & M.D. Barrett RLB 4000. Photographs by R. Barrett.

exserted beyond flowers in young buds, the laminae acuminate. *Flowers* 5-merous; *sepals* $1/2$ – $3/4$ length of petals, free, linear, sparsely short-pilose at apex. *Pods* linear, 3–8 cm long, 2–4 mm wide, firmly crustaceous, \pm straight, opening elastically from apex with dehiscent valves recurved, red-brown, longitudinally striate, flat but abruptly deflexed at rim to form a perpendicular, narrow, flattened outer edge, quadrangular in section when narrow. *Seeds* oblique in pods, seated in distinct chambers each

separated by a narrow septum, dark brown to greyish brown except pleurogram bordered by a band of dull cream tissue; *areole* elongated 'u'-shaped; aril conical, 1–2.5 mm long, dull cream (when dry).

Selected specimens examined. WESTERNAUSTRALIA: [localities withheld for conservation reasons] 27 Jan. 2007, *R.L. & M.D. Barrett* RLB 4000 (MEL, NSW, PERTH); 29 May 1995, *D.G. Edinger* 957 (AD, BRI, CANB, DNA, K, MEL, NSW, NY, PERTH); 1 Aug. 1996, *K.F. Kenneally* 11853 (BRI, DNA, PERTH).

Distribution. Occurs in the north-west Kimberley region of northern Western Australia where it is known from four populations 100 km apart, from the Sale River, Edkins Range, Mt Daglish and Mungboon Plateau (Synnott Range) (Figure 2B).

Habitat. Very open low woodland over shallow sand over and between sandstone ridges. Grows in association with *Acacia translucens*, *A. lycopodiifolia*, *Brachychiton viscidulus*, *Callitris intratropica*, *Erythrophleum chlorostachys*, *Eucalyptus miniata*, *E. rupestris*, *Owenia vernicosa* and *Triodia* spp.

Phenology. Flowering occurs from December–January and May–October; a few pods with mature seeds are normally present on flowering plants. This species probably flowers mainly in the wet season, with sporadic flowering during the dry if conditions are favorable.

Conservation status. *Acacia phacelia* is listed by Smith (2012) as Priority Three under DPaW Conservation Codes for Western Australian Flora, under the name *Acacia* sp. Wren Creek Crossing (K.F. Kenneally 11853) (Western Australian Herbarium 1998–).

Common name. Kimberley Cluster-Wattle.

Etymology. The specific epithet is derived from the Greek *phakelos* (a cluster, bundle) in allusion to the fasciculate phyllodes that are characteristic of this species.

Affinities. *Acacia phacelia* is related to *A. conjunctifolia* F.Muell. Typical representatives of *A. conjunctifolia* occur in the Northern Territory (Victoria River area and bordering the Gulf of Carpentaria) and the extreme north-west of Queensland (around Westmoreland Station) but a few specimens provisionally referred to this species are also found in Western Australia, often in association with *A. phacelia* (see below). The most important characters uniting these two species include their fasciculate phyllodes, free sepals and their very similar pods and seeds. *Acacia conjunctifolia* is most readily distinguished from *A. phacelia* in being a resinous, glabrous species with strongly ribbed branchlets and longer phyllodes (usually 12–22 mm) that have an evident midrib and non-uncinate apices; it also has generally wider phyllodes (1–2(–3) mm), longer spikes (5–20(–30) mm) and wider pods (3.5–7 mm).

Fasciculate phyllodes and free sepals are found also in *A. amentifera* F.Muell., a species that is known only from its type (a flowering specimen collected by Ferdinand von Mueller in 1856 from the upper Victoria River, Northern Territory, *fide* Maslin and Cowan (2001)). *Acacia amentifera* is also a glabrous plant that is further distinguished from *A. phacelia* by its rather prominently ribbed branchlets and ±sessile spikes.

Notes. The Western Australian occurrence of *A. conjunctifolia* is based on *K.F. Kenneally* 11860 (in flower) and *R.L. & M.D. Barrett* RLB 4002 (PERTH). These two collections are from a single location,

occurring in small numbers within a population that also contained *A. phacelia* (i.e. *R.L. & M.D. Barrett* RLB 4000) and *A. tenuispica* Maslin (i.e. *R.L. & M.D. Barrett* RLB 4001). While it is possible that these two collections may represent hybrids between these two species they show a remarkable morphological similarity to the non-Western Australian material of *A. conjunctifolia*, differing only in their sometimes slightly larger phyllodes (15–30 × 3–5 mm) which may have a less pronounced midnerve. Further study of these Western Australian occurrences of *A. conjunctifolia* is warranted in order to re-assess their taxonomic status.

Acacia synantha Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: east of Mount Trafalgar, Prince Regent River, north-west Kimberley, Western Australia [precise locality withheld for conservation reasons], 25 January 2007, *R.L. & M.D. Barrett* RLB 3947 (*holo*: PERTH 07924933; *iso*: K, CANB, MEL).

Erect *shrubs* 1.5–1.6 m tall. *Branchlets* angled to ±flattened at extremities but aging terete, brownish grey, glabrous, resin-ribbed with the resin forming a thin to moderately thick, but not especially prominent, layer that becomes may become transversely segmented with age, mature branchlet ribs without resin or indistinctly resinous. *Stipules* triangular, inconspicuous, *c.* 1 mm long. *Phyllodes* dimidiately elliptic or sometimes ovate-elliptic, lower margin straight or shallowly convex, upper margin clearly convex, (3–)3.5–7 cm long, 10–25 mm wide, l: w = 3–4.5, thinly coriaceous, straight or slightly recurved, glabrous, dull mid-green (fresh) but sometimes drying greyish, invested with a thin layer of often flaky, dry, light grey resin; *main longitudinal nerves* 4–7 with the lowermost 1–3 confluent with the lower margin of the phyllode for 3–8 mm above the pulvinus, the nerves neither raised nor especially prominent, yellow, indistinctly resinous (but not viscid), minor nerves longitudinally anastomosing to form an open, obscure reticulum comprising clearly elongated nerve-islands, the nerves of the reticulum yellow and similar to main longitudinal nerves or very fine, greenish brown (when dry) and lacking capping cells; *marginal nerve* discrete but not prominent, yellow and resinous; *apices* distinctly mucronate, the mucro short (0.5–0.8 mm long), knob-like to ±conical, straight, erect, thickened, blunt, brownish (when dry); *pulvinus* 2–3 mm long, not pronounced. *Gland* situated on upper margin of phyllode at distal end of pulvinus or to 1 mm above it, rather obscure. *Inflorescences* simple but interspersed with a few short racemes (3–6 mm long), initiated within axil of young phyllodes on developing new shoots, post-mature spikes (with most flowers dropped) often present with young buds at oldest nodes on the shoot; *peduncles* 3–6 mm long, slender (*c.* 0.4 mm diam.), glabrous; *basal peduncular bract* single, early caducous, cucullate, *c.* 1 mm long, light brown; *spikes* 30–40 mm long, 2–5 per axil, flowers widely spaced within spike (but very densely arranged in young buds); *receptacles* slender (*c.* 0.4 mm diam.), glabrous, slightly resinous. *Bracteoles* sub-peltate, *c.* 0.5 mm long, glabrous, claws narrowly linear, abruptly expanded into a slightly thickened sub-circular lamina 0.2–0.3 mm diam. *Flowers* 5-merous; *calyx* *c.* 1/2 length of corolla, gamosepalous, about as long as wide, shortly dissected into broadly triangular lobes, calyx tube glabrous and obscurely 5-nerved, broad-based; *corolla* 1.1–1.3 mm long, glabrous, the petals 1-nerved. *Pods* (see discussion below). *Seeds* unknown. (Figure 7)

Characteristic features. Glabrous *shrubs*. Branchlets resin-ribbed. *Phyllodes* dimidiate, moderately short and broad (mostly 3.5–7 cm long and 10–25 mm with l: w = 3–4.5), with 4–7 *main longitudinal nerves* of which 1–3 are confluent with lower margin of phyllode at base, minor nerves forming an open reticulum with longitudinal nerve-islands, the knob-like or ±conical, thickened *mucro* short (0.5–0.8 mm long), straight and erect. *Inflorescences* simple, initiated within axil of young phyllodes on developing new shoots; *peduncles* slender and seemingly 3–6 mm long, *receptacles* slender; *spikes* 30–40 mm long, 2–5 per axil, the flowers widely spaced. *Flowers* 5-merous; *calyx* *c.* 1/2 length of corolla, shortly dissected into broadly triangular lobes, calyx tube glabrous.

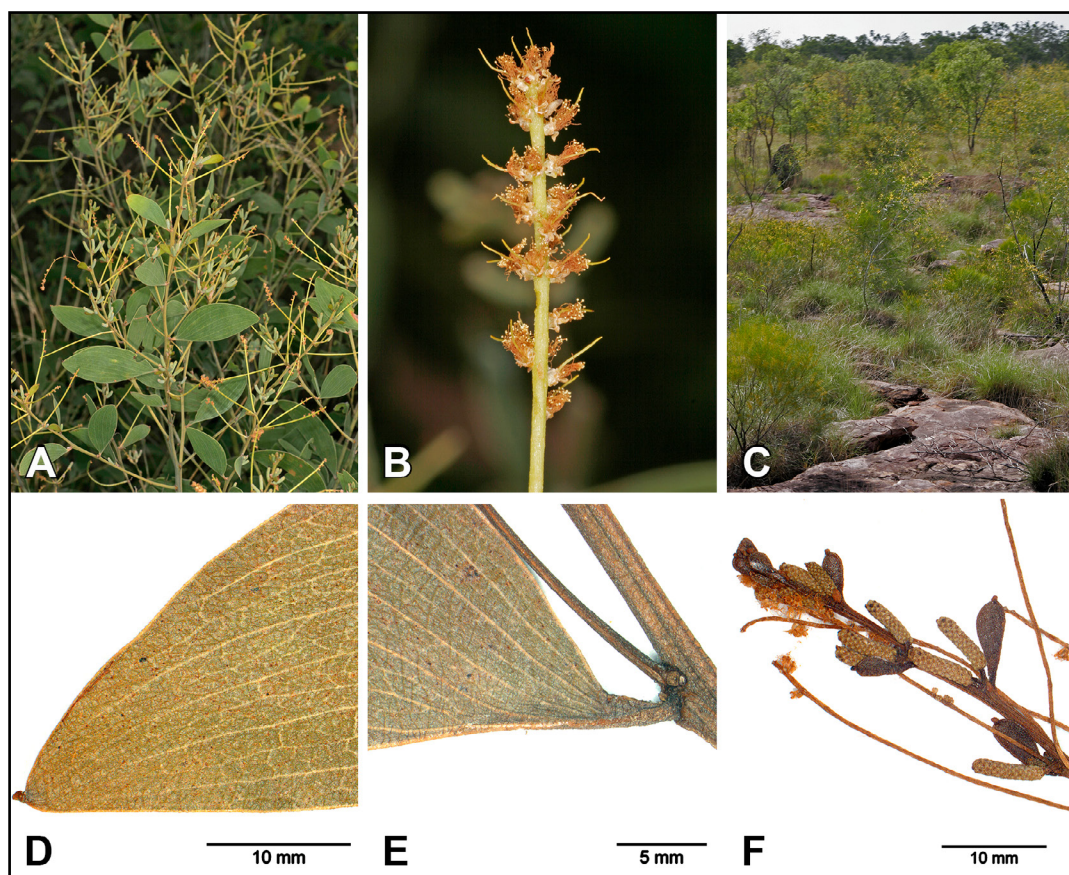


Figure 7. *Acacia synantha*. A – flowering branch; B – inflorescence; C – habitat; D – phyllode apex; E – phyllode base showing nerves fused to the lower margin; F – flowering branchlet. Images from *R.L. & M.D. Barrett* RLB 3947. Photographs: A–C by *R. Barrett*; D–F by *B. Maslin*.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 23 Jan. 2010, *M.D. Barrett & M. Maier* MDB 2723 (PERTH); 19 Jan. 2010, *R.L. Barrett, M. Maier & P. Kendrick* RLB 6249 (DNA, NSW, PERTH).

Distribution. Occurs in the west Kimberley region of northern Western Australia where it is known from only three populations over a distance of *c.* 20 km in the northern Prince Regent National Park (Figure 2A). The area in which it occurs is poorly collected and difficult to access; therefore, it is not known how widespread or otherwise this species might be. The area in which it grows is known to contain other geographically restricted endemics (e.g. *Calytrix gomphrenoides*). *Acacia synantha* is one of many plant taxa that have been discovered in Prince Regent National Park since its initial survey in 1974 (George & Kenneally 1974). The new species is reported as uncommon in the places where it grows.

Habitat. Occurs on sandstone pavement in vegetation comprising low shrubs over *Triodia* sp. Other *Acacia* species that occurred at the type locality included *A. kenneallyi*, *A. diastemata* (see above) and *A. retinervis*.

Phenology. Because of the paucity of collections it is difficult to accurately assess the phenology of this species. Available gatherings were collected in mid- to late-January and possessed semi-mature buds, often accompanied by spikes at an advanced stage of anthesis.

Conservation status. *Acacia synantha* is to be listed as Priority Two under DPaW Conservation Codes for Western Australian Flora (M. Smith pers. comm.). Although it is known only from a limited area, this species is conserved in Prince Regent National Park.

Common name. Sandstone Synchronous Wattle.

Etymology. The botanical name is derived from the Greek, *syn-* (together) and *anthos* (flower) in allusion to the synchronous development of phyllodes and inflorescences on the expanding new shoots.

Morphology. The only fruiting material known that is likely to belong to this species are two, fragmentary, detached pod valves that are included on the *M.D. Barrett & M. Maier* MDB 2723 sheet. The salient features of this material are as follows: *c.* 30 mm long and recurved (one valve only, the other valve too depauperate to show length or curvature), 6–8 mm wide, crustaceous to sub-woody, flat, blackish, glabrous, obliquely nerved, margin thickened, seed depressions shallow and oblique. Better and more reliable material is needed before anything definitive can be said about the fruits of this new species.

Affinities. In the absence of reliable pod information it is difficult to be certain about the closest relatives of this new species. However, judging predominantly from inflorescence structure and development, and flower morphology, the new species appears to be closely related to *A. oligoneura* F.Muell. which is readily distinguished by its longer phyllodes (9–18 cm) with more clearly longitudinally trending minor nerves and the main nerves rarely confluent with the lower margin. *Acacia synantha* is also seemingly related to the polymorphic *A. oncinocarpa* Benth. which is mostly also distinguished by its longer phyllodes (normally 6–15 cm long) with main nerves not often confluent with the lower margin. In *A. oncinocarpa* the minor nerves of the phyllodes are often not anastomosing, but if anastomoses are present then they are few and more clearly longitudinally trending; furthermore, the gland is normally further removed from the pulvinus than in *A. synantha* (2–10 mm, but 1 mm in Western Australian plants). Although *A. oncinocarpa* is common in the northern regions of the Northern Territory it has a very scattered distribution in the Kimberley region of Western Australia.

Acacia synantha is superficially similar to *A. anastomosa* (which is described as new above) but the relationship is probably not especially close. Both these species have relatively short, dimidiate, reticulately nerved phyllodes with the main longitudinal nerves confluent with the lower margin at the base; they also share a gamosepalous calyx with short, triangular lobes. *Acacia anastomosa* differs most obviously from *A. synantha* in having much shorter and densely-flowered spikes on longer peduncles and the inflorescences are generally fewer within the phyllode axils. *Acacia anastomosa* also lacks the over-burden of resin that commonly occurs on the branchlet ribs and phyllode nerves of *A. synantha*, its phyllode reticulum has generally more elongated nerve-islands and the mucro at the apex of the phyllodes is not noticeably thickened.

***Acacia* sect. *Plurinerves* (Benth.) Maiden & Betche**

Acacia anserina Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: Prince Regent Nature Reserve [National Park], west Kimberley region, Western Australia [precise

locality withheld for conservation reasons], 23 January 2010, *M.D. Barrett & M. Maier* MDB 2744 (*holo*: PERTH 08440409; *iso*: BRI, CANB, DNA, K, MEL, NSW).

Erect, openly branched *shrubs* to 1 m tall. *Branchlets* terete, ribbed when young (ribs not resinous), densely pubescent with tolerably long, patent, white hairs that are straight to shallowly curved or slightly crisped. *Stipules* persistent, narrowly triangular, 1–1.5 mm long, erect, red-brown. *Phyllodes* dimidiately widely elliptic or sometimes widely obovate, with upper margin prominently rounded (sometimes the basal part parallel to and abutting the branchlet) and lower margin \pm straight, (3–)4–6 mm long, 2.5–4 mm wide, l: w = (1.2–)1.4–1.7, rather wide-spreading, puberulous with hairs similar to branchlets except shorter, green; *longitudinal nerves* numerous, rather indistinct, \pm distant, anastomoses few or absent; *apices* distinctly and excentrically mucronate, the mucro subulate, often basally adnate to or fused with phyllode margin, 0.5–1 mm long, not pungent and general outline sigmoid but the free portion shallowly to strongly recurved (sometimes into an open circle); *pulvinus* *c.* 0.5 mm long, cream-coloured. *Gland* situated on upper margin at distal end of pulvinus, very indistinct. *Inflorescences* simple, single within axil of phyllodes; *peduncles* 6–8 mm long, indumentum similar to branchlets; *basal peduncular bract* single, *c.* 1 mm long, persistent; *heads* globular, 17–25-flowered, light golden, the relatively large buds wide-spreading and narrowed towards their apices. *Bracteoles* clearly exerted in young buds, dimorphic with those at base of head sub-sessile and the remainder short-stipitate (stipe oblong, 0.3–0.4 mm long), the laminae triangular-trullate, *c.* 1 mm long, distinctly acuminate and red-brown. *Flowers* 5-merous; *calyx* 1/2 length of corolla, gamosepalous, shortly dissected into narrowly triangular, red-brown lobes each separated by a distinct, concave sinus, calyx tube with tolerably long, erect, white hairs at apex otherwise glabrous; *corolla* *c.* 2 mm long, the petals glabrous and 1-nerved. *Pods* (photographs seen) narrowly oblong, seemingly flat, neither raised over nor constricted between the seeds, 4–5 mm wide, red-brown, puberulous, longitudinally reticulately nerved; *marginal nerve* red-brown. *Seeds* not seen but judging from pod photograph they appear to have been seated in very shallow depressions each separated by an oblique septum. (Figure 8)

Characteristic features. Erect, openly branched shrubs to 1 m tall. *Branchlets* densely pubescent. *Stipules* persistent, 1–1.5 mm long. *Phyllodes* dimidiately widely elliptic or sometimes widely obovate, the upper margin prominently rounded, (3–)4–6 mm long, 2.5–4 mm wide, rather wide-spreading, puberulous; *longitudinal nerves* numerous, rather indistinct, anastomoses few or absent; *apices* distinctly and excentrically mucronate, the mucro subulate, 0.5–1 mm long and shallowly to strongly recurved (sometimes into an open circle). *Inflorescences* simple; *peduncles* 6–8 mm long, densely pubescent; *heads* globular, 17–25-flowered, the relatively large buds wide-spreading and narrowed towards their apices. *Bracteole laminae* triangular-trullate, red-brown and distinctly acuminate. *Flowers* 5-merous; *calyx* 1/2 length of corolla, shortly dissected into narrowly triangular, red-brown lobes, calyx tube with tolerably long, erect hairs at apex otherwise glabrous; *petals* glabrous and 1-nerved. *Pods* (photographs seen) narrowly oblong, seemingly flat, neither raised over nor constricted between the seeds, 4–5 mm wide, red-brown, puberulous, longitudinally reticulately nerved. *Seeds* not seen.

Distribution. Occurs in the west Kimberley region of northern Western Australia in the Princess May Range (Figure 2A). This poorly collected area is difficult to access and it is therefore not known how common or otherwise this species is, although it has not been found at any of six spot survey sites within 10 km of the only known locality. The type population contained about 200 plants restricted to small area 50 m across.

Habitat. The type was collected from a small, fire-protected pocket of dense vegetation that occurred on a gentle slope. The area comprised a seepage soak with water derived from the surrounding sandstone ridges. Associated species included *Boronia wilsonii*, *Triodia* aff. *burbidgeana* and *Drosera* aff. *paradoxa*.

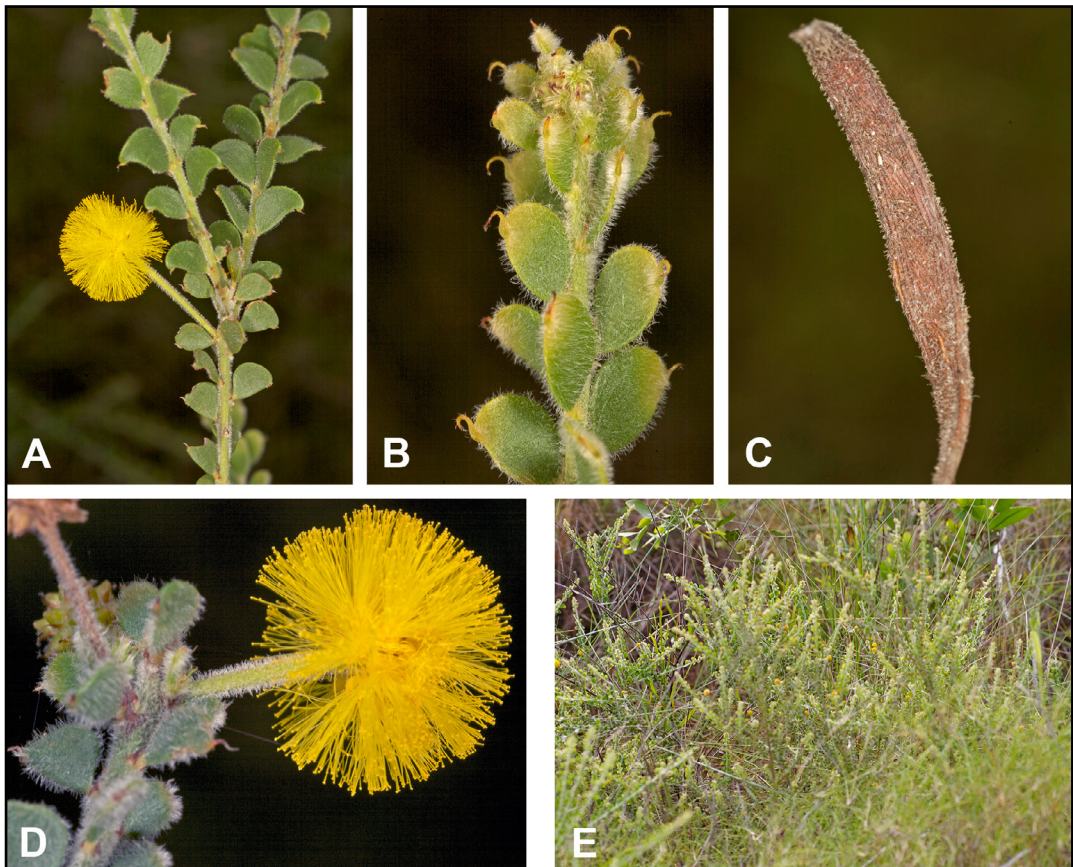


Figure 8. *Acacia anserina*. A – flowering branchlet; B – branchlet; C – pod; D – inflorescence; E – habit. Images from M.D. Barrett & M. Maier MDB 2744. Photographs by M. Barrett.

Phenology. The type was collected in late January and possessed mature inflorescence buds and a few heads at anthesis, along with rare pods.

Conservation status. *Acacia anserina* is to be listed as Priority Two under DPaW Conservation Codes for Western Australian Flora (M. Smith pers. comm.). It is known only from a single population, and surveys of similar sites in the vicinity have not located any other populations, but it is conserved in Prince Regent National Park.

Common name. Hairy Sandstone Wattle.

Etymology. The botanical name is derived from the Latin *anserinus* (pertaining to geese). It refers to the sigmoid, acuminate phyllode mucro which, when seen in plane view, is reminiscent of the shape of a goose's neck, head and beak.

Affinities. *Acacia anserina* appears to be most closely related to *A. perpusilla* which is described as new below. Significant characters shared by these two species include the following: stipules persistent; phyllodes small ($3\text{--}6 \times 2\text{--}4$ mm), dimidiate with a prominently rounded upper margin and \pm straight lower margin, plurinerved, and apices with a distinct, excentric mucro 0.5–1.5 mm

long; inflorescences simple; peduncles with a single, persistent basal bract; heads globular with relatively large, wide-spreading buds that are narrowed towards their apices; bracteoles short-stipitate with distinctly acuminate laminae; flowers 5-merous; calyx gamosepalous; petals 1-nerved. *Acacia perpusilla* is most readily distinguished from *A. anserina* by being glabrous in all parts but it is further recognised by its phyllode mucro which is straight to shallowly incurved (not recurved), its obscure gland is further removed (1–1.5 mm) from the base of the phyllode, its bracteole laminae and calyx lobes are paler coloured, and its pods are narrowly linear and narrower (2–3 mm wide). The phyllodes of *A. perpusilla* are slightly shorter and more erect than those of *A. anserina*, they also are broadest above the middle whereas in *A. anserina* they are normally broadest in the middle (infrequently above the middle). These two geographically restricted species are separated by a distance of about 200 km.

The wide-spreading, tapered flower buds that impart a star-like appearance to the unopened heads of *A. anserina* are similar to those of *A. stellaticeps* Kodela, Tindale & D.Keith (see *A. perpusilla* for discussion).

Acacia obtriangularis Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: Lawley River [Kimberley region], Western Australia [precise locality withheld for conservation reasons], 29 March 2010, *R.L. & M.D. Barrett* RLB 6800 (*holo:* PERTH 08440468; *iso:* CANB, BRI, DNA, K, MEL, NSW, NY, PERTH 08365237).

Acacia sp. Lawley River (R.L. Barrett & M.D. Barrett RLB 6800), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Erect *shrubs* 1.5–2 m tall, single-stemmed at the base with numerous ascending branches giving a quite dense appearance. *Branchlets* terete, obscurely ribbed, hirsutulous with fine, short, patent, straight, gland-tipped and eglandular hairs, the glands yellow to pale orange, the two hair types about equal in length or the eglandular ones slightly longer. *Stipules* persistent, linear-triangular, 2–3 mm long, slender, subulate, not pungent, curved upwardly from base, not or scarcely connate at their base, light brown, with both gland-tipped and eglandular hairs. *Phyllodes* inaequilaterally obtriangular, upper margin obviously rounded or more commonly with a \pm sharp angle above the middle at the gland, lower margin \pm straight, 3–5 mm long, 2–3 mm wide, l: w = 1.5–2, green, indumentum similar to branchlets; *longitudinal nerves* 6–8, sometimes rather indistinct, most intersecting the upper margin between the cusp and the gland, distant, anastomoses rare; *apices* pungent, the cusp slender, rigid, 0.5–0.7 mm long and yellow to light brown; *pulvinus* inconspicuous, *c.* 0.2 mm long. *Gland* situated on upper margin of phyllode (often at apex of angle) 3–4 mm above the pulvinus, tiny (*c.* 0.15 mm diam.) but evident at $\times 10$ magnification, raised, circular, yellow. *Inflorescences* simple, 1 per axil; *peduncles* 10–12 mm long, indumentum as on branchlets; *basal peduncular bract* absent but a persistent, single bract located just below the spike, this bract is very narrowly lanceolate, 1–1.3 mm long, curved upwards and light brown; *spikes* short-cylindrical, 7–10 \times 4–5 mm when dry, densely flowered, golden. *Bracteoles* 1.5–2 mm long, exerted in buds, indumentum sparse, the hairs short, spreading, mostly eglandular but sometimes also with scattered gland-tipped hairs, the claws linear to narrowly oblong and about as long as the laminae, the laminae inflexed relative to claws, narrowly lanceolate, acuminate, not thickened and light brown. *Flowers* 5-merous; *sepals* united at extreme base, 2/3–3/4 length of the petals, linear, ciliolate towards apex, the hairs white and eglandular; *petals* *c.* 1.5 mm long, puberulous, the hairs white and eglandular, nerveless. *Pods* narrowly oblong, 2–5 cm long, (4–)5 mm wide, curved, flat but low-rounded over seeds with umbo extending to margins of pods, brown but greyish prior to maturity, hirsutulous by fine, patent, very short, straight, eglandular hairs intermixed with scattered, larger, gland-tipped hairs (the glands pale orange aging red-brown)

with inflated, septate stalks, reticulately nerved. *Seeds* longitudinal in the pods, obloid, 5–5.5 mm long, 2.8–3 mm wide, compressed (*c.* 1.5 mm thick), very slightly shiny, microscopically pitted, very dark brown except dull yellow bordering the obscure pleurogram; *areole* narrowly oblong, 3–3.5 × 0.7–1 mm, not open at the hilar end; *funicle* very short, expanded into a thickened, folded *aril* that is cream-coloured except near attachment to seed where it is greyish (when dry). (Figure 9)

Characteristic features. *Branchlets* hirsutulous with fine, short, patent, straight, gland-tipped and eglandular hairs. *Stipules* persistent, 2–3 mm long, slender, subulate, curved upwardly from base, not or scarcely connate at their base. *Phyllodes* inaequilaterally obtriangular, upper margin obviously rounded or more commonly with a ±sharp angle above the middle at the gland, lower margin ±straight, 3–5 mm long, 2–3 mm wide, l: w = 1.5–2, green, indumentum similar to branchlets; *longitudinal nerves* 6–8, sometimes rather indistinct; *apices* pungent by a slender, rigid cusp 0.5–0.7 mm long. *Gland* 3–4 mm above the pulvinus (often at apex of marginal angle), tiny but evident at ×10 magnification. *Inflorescences* simple; *peduncles* 10–12 mm long, indumentum as on branchlets, with a persistent bract just below the spike; *spikes* short-cylindrical, 7–10 mm long (when dry). *Bracteoles* 1.5–2 mm long, exerted in buds. *Flowers* 5-merous; *sepals* united at extreme base, 2/3–3/4 length of the petals, linear. *Pods* narrowly oblong, (4–)5 mm wide, curved, low-rounded over seeds, hirsutulous by fine, patent, very short, eglandular hairs intermixed with larger, gland-tipped hairs with inflated, septate stalks. *Seeds* longitudinal, arillate.

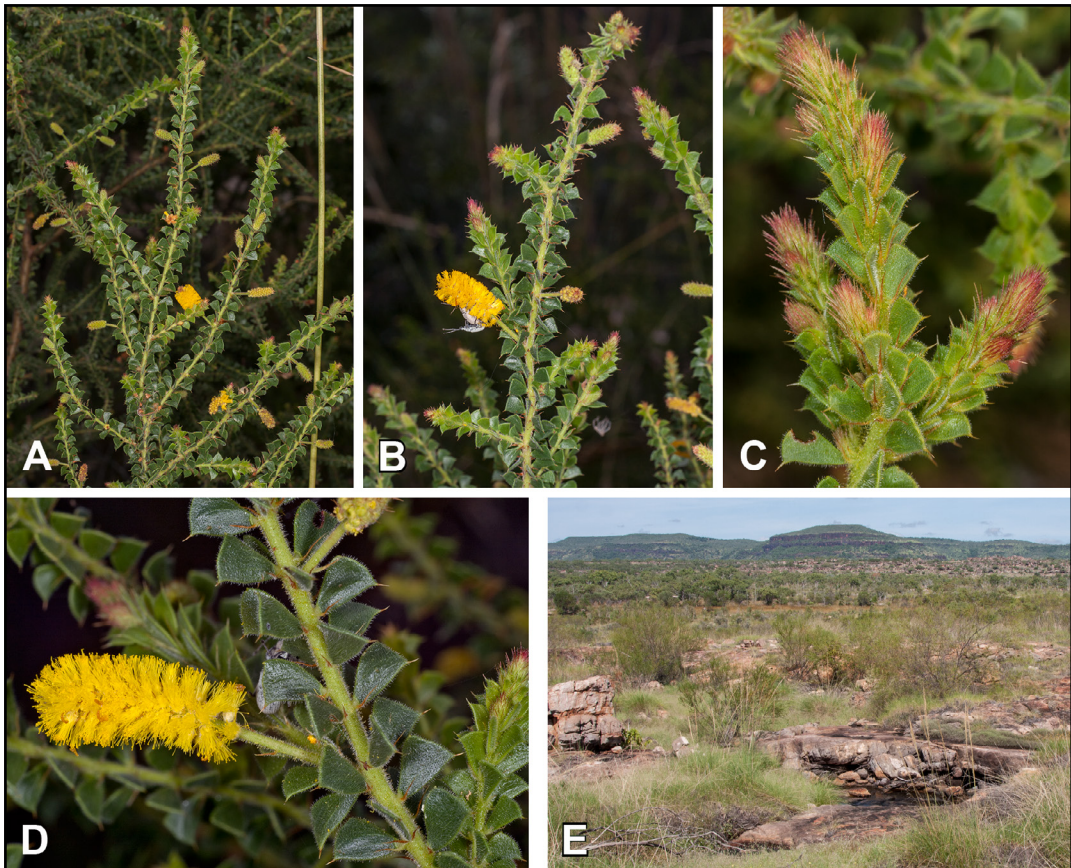


Figure 9. *Acacia obtriangularis*. A, B – flowering branch; C – branchlet with new growth; D – inflorescence; E – habitat. Images from R.L. & M.D. Barrett RLB 6800. Photographs by R. Barrett.

Other specimen examined. WESTERN AUSTRALIA: [locality withheld for conservation reasons] 25 Jan. 2010, R.L. Barrett & M.D. Barrett RLB 6464 (PERTH).

Distribution. Occurs near the mouth of the Lawley River in the Kimberley region of northern Western Australia where it is known from only a single large population of >1,000 plants, spread over several kilometres (Figure 2A).

Habitat. Grows on sand over sheet sandstone. Grows in associations with *Acacia* aff. *barrettiorum*, *Grevillea* spp. and *Monodia stipoides*.

Phenology. The single fertile specimen known was collected in late March and possessed young and near-mature inflorescence buds, a few spikes at anthesis and a few pods with seeds.

Conservation status. *Acacia obtriangularis* is listed by Smith (2013) as Priority One under DPAW Conservation Codes for Western Australian Flora, under the name *Acacia* sp. Lawley River (R.L. Barrett & M.D. Barrett RLB 6800) (Western Australian Herbarium 1998–).

Common name. Lawley River Wattle.

Etymology. The botanical name is derived from the Latin *triangularis* (triangular), modified by the prefix *ob-* (reversed-), in allusion to the shape of the phyllodes.

Morphology. The single bract that occurs on the upper half of the peduncles in *A. obtriangularis* and some other species of the *A. deltoidea* group are most likely homologous to bracteoles. These bracts are not especially common in *Acacia* but they do occur on some species in unrelated groups, e.g. *A. victoriae* Benth. and its allies (*vide* Maslin 1992); similar bracts are also found in some American species of *Vachellia* e.g. members of the *V. rigidula* (Benth.) Seigler & Ebinger group (*vide* Maslin & Stirton 1997 and Lee *et al.* 1989, as *A. rigidula* Benth.). The inflated, septate, gland-tipped hairs that occur on the pods are very distinctive; these hairs occur on some other members of the *A. deltoidea* group, e.g. *A. vincentii* Cowan & Maslin.

Affinities. *Acacia obtriangularis* belongs to the *A. deltoidea* group (Cowan & Maslin 1990) as evidenced by hairs of the indumentum often gland-tipped, stipules persistent and phyllodes obtriangular, plurinerved and sharply pungent. According to the classification of Pedley (1978) this new species is referable to *Acacia* sect. *Juliflorae* because of its spicate inflorescences. However, all other members of the *A. deltoidea* group have globular (rarely obloid) heads and therefore, according to Pedley's (1978) scheme, are classified as *Acacia* sect. *Plurinerves*. The '*A. stigmatophylla* group' (Tindale 1980) is another tropical assemblage that includes species referable to these two sections as currently defined.

Acacia obtriangularis is most readily distinguished from all other members of the *A. deltoidea* group by its spicate inflorescences. It appears most closely related to *A. froggattii* Maiden and *A. vincentii*, both of which have similarly small phyllodes which are broadest above the middle. Both these relatives are distinguished from the new species by their fewer-nerved phyllodes (2–5-nerved) that are more uniformly rounded along their upper margins (not angled at the gland which is normally more obscure or sometimes absent). *Acacia froggattii* (which has globular heads) is further distinguished by its phyllodes more elongate (l: w = (2–)3–4), peduncle bract absent or early caducous and the inflated, septate hairs on the pods thinner and less conspicuous; also, the eglandulose hairs on the branchlets are sometimes antrorsely recurved. *Acacia vincentii* (which has obloid heads) is further distinguished by

its generally wider pods (5–10 mm) with one or both margins crenate, oblique seeds, slightly shorter peduncles (5–10 mm) and stipules that are connate for a short distance above the base.

Acacia orthotropica Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: north-east of Mount Trafalgar, Prince Regent Nature Reserve [National Park; Kimberley region], Western Australia [precise locality withheld for conservation reasons], 27 January 2010, R.L. Barrett RLB 6527 (*holo:* PERTH 08440425; *iso:* CANB, DNA, K, MEL, NSW, PERTH 08455430).

Erect, single-stemmed *trees* to 4 m tall, branching *c.* halfway up trunk giving plants an obconic shape. *Branchlets* terete, finely ribbed appearing striate, reddish brown, glabrous. *Stipules* early caducous, triangular, *c.* 1 mm long, scarious, brown, ciliolate. *Phyllodes* narrowly oblong-oblanceolate, gradually narrowed towards base, 3–6 cm long, (2.5–)3–5 mm wide, erect, crowded, somewhat imbricate when dry, thinly coriaceous, straight, glabrous; *longitudinal nerves* 2, the central nerve the most pronounced, extending to the apex and confluent with lower margin for 2–7 mm above the pulvinus, second nerve (situated on adaxial side of the central nerve) extending for 2/3–3/4 length of phyllode, lateral nerves openly anastomosing; *marginal nerve* narrow and yellow or light brown; *apices* obtuse, mucronate; *pulvinus* 1.5–2 mm long, dark brown, finely wrinkled when dry. *Gland* situated on upper margin of phyllode 1–3 mm above the pulvinus, not prominent, oblong-elliptic, with a shallow but distinct central pore. *Inflorescences* simple, 1 or 2 per axil, initiated within axil of immature phyllodes on new shoots to produce terminal, false racemes, subtending phyllodes often mature by the time heads reach anthesis; *peduncles* 20–30 mm long, slender, irregularly curved or sigmoid when dry, glabrous; *basal peduncular bract* absent; *heads* globular, 30–35-flowered, 5–7 mm diam. when dry, reported to be pale yellow when fresh, light golden when dry. *Bracteoles c.* 1 mm long, claws narrowly linear and glabrous or white-hairy abaxially, abruptly expanded into a small, elliptic to circular lamina that is puberulous abaxially with light golden and white hairs. *Flowers* 5-merous; *calyx* slightly exceeding 1/2 length of corolla, normally dissected to about the middle (sometimes to the base) into oblong lobes that are apically puberulous-hirsutulous by short, straight, erect, light golden and white hairs; *corolla* 1.8 mm long, petals apically puberulous-hirsutulous with hairs as on calyx and nerveless; *ovary* glabrous. *Pods* (dehisced valves) oblong to narrowly oblong, 3–8 cm long, 14–16 mm wide, straight-edged or with occasional shallow constriction between seeds, flat but slightly raised over seeds, firmly chartaceous to very thinly crustaceous, straight to very slightly curved, red-brown, glabrous, reticulately nerved, abruptly narrowed at base to stipe 4–5 mm long. *Seeds* not seen but were seated in shallow, transverse depressions, each separated by a narrow septum. (Figure 10)

Characteristic features. Obconic, single-stemmed trees to 4 m tall. *Branchlets* glabrous. *Phyllodes* narrowly oblong-oblanceolate, 3–6 cm long, (2.5–)3–5 mm wide, erect, crowded, somewhat imbricate when dry, straight, glabrous; *longitudinal nerves* 2 with central one the most pronounced and confluent with lower margin at base, second nerve extending for 2/3–3/4 length of phyllode, lateral nerves openly anastomosing; *apices* obtuse-mucronate. *Inflorescences* simple, initiated within axil of immature phyllodes on new shoots; *peduncles* 20–30 mm long, slender, irregularly curved or sigmoid when dry, glabrous; *heads* globular, 30–35-flowered. *Bracteoles c.* 1 mm long, laminae puberulous with light golden and white hairs. *Flowers* 5-merous; *calyx* slightly exceeding 1/2 length of corolla, normally dissected to about the middle (sometimes to the base) into oblong, apically puberulous-hirsutulous lobes, hairs light golden and white; *petals* with hairs at apex as on calyx. *Pods* (dehisced valves) oblong to narrowly oblong, 14–16 mm wide, mostly straight-edged, firmly chartaceous to very thinly crustaceous, glabrous, reticulately nerved. *Seeds* not seen but were seated in shallow, transverse depressions, each separated by a narrow septum.

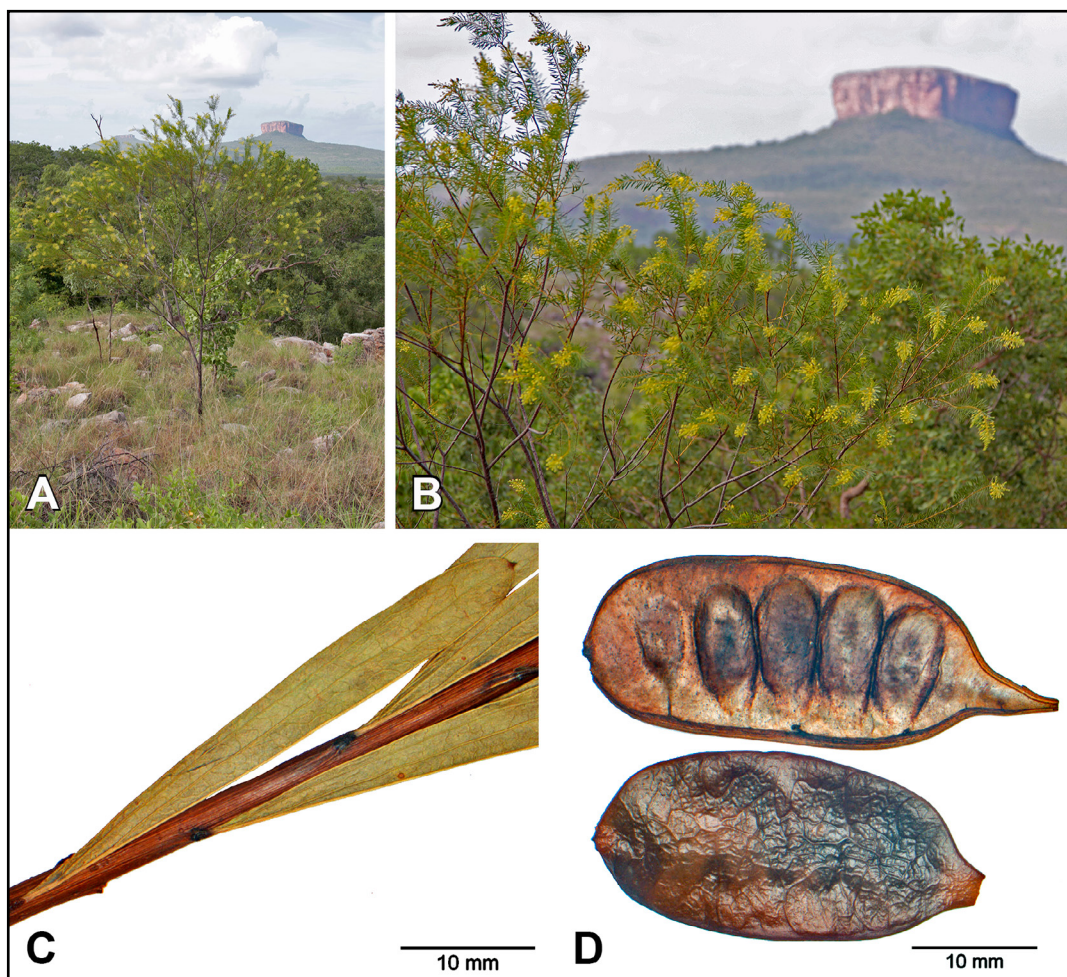


Figure 10. *Acacia orthotropica*. A, B – habit and habitat with Mt Trafalgar in background; C – phyllode; D – pod. Images from R.L. Barrett RLB 6527. Photographs: A, B by R. Barrett; C, D by B. Maslin.

Distribution. Occurs in the Kimberley region of northern Western Australia where it is known from only a single population in Prince Regent National Park (Figure 2B). The plants were scattered over a distance of 1.5 km and were locally common with several hundred plants seen.

Habitat. Grows on a broken sandstone slope adjacent to a low basaltic hill, in open shrubland over dense *Triodia* spp. ground cover. Grows in association with *Acacia plectocarpa*, *Eucalyptus brachyandra* and *E. miniata*, over *Petalostigma quadriloculare*, *Solanum cataphractum* and *Triodia* spp.

Phenology. The single known collection was at full anthesis in late January. Dehisced pods were collected at the same time.

Conservation status. *Acacia orthotropica* is to be listed as Priority Two under DPaW Conservation Codes for Western Australian Flora (M. Smith pers. comm.). Although this species is known from only a single population it occurs within Prince Regent National Park.

Common name. Mt Trafalgar Wattle.

Etymology. The botanical name is derived from the Greek words *ortho-* (straight or erect) and *tropikos* (of turning) in allusion to the phyllodes which are characteristically straight and aligned erect relative to the branchlets.

Affinities. *Acacia orthotropica* is most closely related to *A. kenneallyi* Cowan & Maslin despite its superficially dissimilar appearance. Among the more important or obvious characters shared by these two species are their glabrous branchlets, phyllodes, peduncles and pods, their 2-nerved phyllodes (although in *A. kenneallyi* the second, poorly developed nerve is not always present) with the lateral nerves forming an open reticulum, sepals and petals with often pale golden hairs at apices, and broad, flat, reticulately veined pods. *Acacia kenneallyi* is very easily distinguished by its pruinose branchlets, much larger phyllodes (15–25 cm × 6–14 mm) which are narrowly elliptic, tapered at both ends and commonly shallowly curved, often racemose or paniculate inflorescences with more numerous-flowered heads (46–56-flowered) and longer pods (9.5–11 cm) with obliquely arranged seeds. The two species have a somewhat similar (spindly) growth form and although they are not known to be sympatric they do occur within the same general area (they grow about 15 km apart).

The phyllode shape, size and nervature, globular heads and wide pods render *A. orthotropica* superficially similar to the arid zone species *A. jensenii* Maiden and some forms of *A. melleodora* Pedley; however, the relationship may not be especially close. The latter two species are resinous shrubs that are further distinguished from *A. orthotropica* by their phyllodes which have a small gland at the apex adjacent to the mucro, sepals that are united for about 3/4 their length and, together with the petals, are glabrous.

Acacia perpusilla Maslin, M.D. Barrett & R.L. Barrett, *sp. nov.*

Type: King Edward River, Theda Station, North Kimberley, Western Australia [precise locality withheld for conservation reasons], 1 May 2008, *M.D. Barrett* MDB 2224 (*holo:* PERTH 08103046; *iso:* CANB, BRI, DNA, K, MEL, NSW, PERTH 08455449).

Acacia sp. King Edward River (M.D. Barrett MDB 2224), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Spindly, erect, glabrous *shrubs* to 2 m tall (but see comment under *Notes* below). *Branchlets* resin-ribbed, the resin translucent and (at least with age) somewhat crenulate. *Stipules* persistent, triangular, 1–2 mm long, erect, light brown aging dark brown. *Phyllodes* widely obovate, dimidiate, the upper margin first parallel to and abutting the branchlet then prominently rounded, the lower margin ±straight, 3–4 mm long (excluding mucro), 2–3.5(–4) mm wide, l: w = 1.1–1.4, ascending to erect except few oldest phyllodes patent, flat or slightly undulate, green; *longitudinal nerves* numerous, sub-distant, none anastomosing, often indistinct especially on oldest phyllodes; *apices* distinctly and excentrically mucronate, the mucro often bristle-like, subulate, basally adnate to or fused with phyllode margin, 0.5–1.5 mm long, firm but brittle, not pungent, straight to shallowly incurved and brown; *pulvinus* vestigial. *Gland* situated on upper margin of phyllode 1–1.5 mm above the base, very indistinct. *Inflorescences* simple, single within axil of phyllodes; *peduncles* 4–12 mm long, resinous; *basal peduncular bract* single, c. 1 mm long, often persistent; *heads* globular, c. 15-flowered, light golden, the relatively large buds wide-spreading and narrowed towards their apices. *Bracteoles* dimorphic with those at base of head ±sessile and the remainder short-stipitate (stipe c. 0.3 mm long), the laminae triangular-trullate, distinctly acuminate and light brown. *Flowers* 5-merous; *calyx* 1/4–1/3 length of

corolla, gamosepalous, very shortly dissected into triangular, brown lobes each separated by a broad, shallowly concave sinus, calyx tube membranous and resinous; *corolla* c. 2 mm long, petals 1-nerved. *Pods* narrowly linear, neither raised over nor constricted between the seeds, depressed-quadrangular in section when young, 3–7.5 cm long, 2–3 mm wide, ±thinly crustaceous to slightly coriaceous, straight to shallowly sigmoid or shallowly curved, opening elastically from apex, the dehiscent valves recurved (sometimes into an open circle), dark red-brown to dark grey, obscurely longitudinally striate; *marginal nerve* discrete, yellowish. *Seeds* longitudinal in the pods, seated in distinct chambers each separated by a narrow septum, obloid, c. 4 mm long and 2 mm wide, very dark brown; *pleurogram* bordered by a narrow band of dull yellow tissue; *areole* elongated 'u'-shaped, open at the hilar end; *funicle-aril* conical, c. 2 mm long, straight, cream-coloured. (Figure 11)

Characteristic features. Spindly, erect, glabrous *shrubs* to 2 m tall. *Branchlets* resin-ribbed. *Stipules* persistent, 1–2 mm long. *Phyllodes* dimidiately obovate, the upper margin prominently rounded, 3–4 mm long (excluding mucro), 2–4 mm wide, mostly ascending to erect; *longitudinal nerves* numerous, none anastomosing, often indistinct; *apices* distinctly and excentrically mucronate, the mucro often bristle-like, subulate, 0.5–1.5 mm long and straight to shallowly incurved. *Inflorescences* simple; *heads* globular, c. 15-flowered, the relatively large buds wide-spreading and narrowed towards their apices. *Bracteole laminae* triangular-trullate, light brown and distinctly acuminate. *Flowers* 5-merous; *calyx* 1/4–1/3 length of corolla, very shortly dissected into triangular lobes; *petals* 1-nerved. *Pods* narrowly linear, depressed-quadrangular in section when young, neither raised over nor constricted between the seeds, 2–3 mm wide, ±thinly crustaceous to slightly coriaceous, opening elastically from apex, the dehiscent valves recurved. *Seeds* longitudinal, seated in distinct chambers each separated by a narrow septum; *funicle-aril* conical, c. 2 mm long, straight, cream-coloured.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 1 July 2005, *M. Cusack* 7 (PERTH); 8 Apr. 2007, *R. Maher s.n.* (G, MEL, NSW, NY, PERTH 08427771 & 08428867).

Distribution. Occurs in the northern Kimberley region of Western Australia where it is known only from along the King Edward River on Theda Station, about 30 km south-west of Kalumburu (Figure 2A). One collection was from a group of <10 plants, another populations contained c. 120 plants; at the *Maher s.n.* site it was reported to be 'common'.

Habitat. Grows in shallow soil among sandstone outcrops along watercourse in association with *Sorghum* sp. and *Heteropogon contortus*.

Phenology. The paucity of collections makes it difficult to determine an accurate phenology for this species. Plants with flowers at anthesis have been collected from between early May and early July; the May collection also possessed pods with mature seeds.

Conservation status. *Acacia perpusilla* is listed by Smith (2013) as Priority One under DPaw Conservation Codes for Western Australian Flora, under the name, *Acacia* sp. King Edward River (M.D. Barrett MDB 2224) (Western Australian Herbarium 1998–).

Common name. King Edward River Wattle.

Etymology. The botanical name is derived from the Latin *pusillus* (very small) modified by the suffix *per-* (very) in allusion to the small phyllodes.

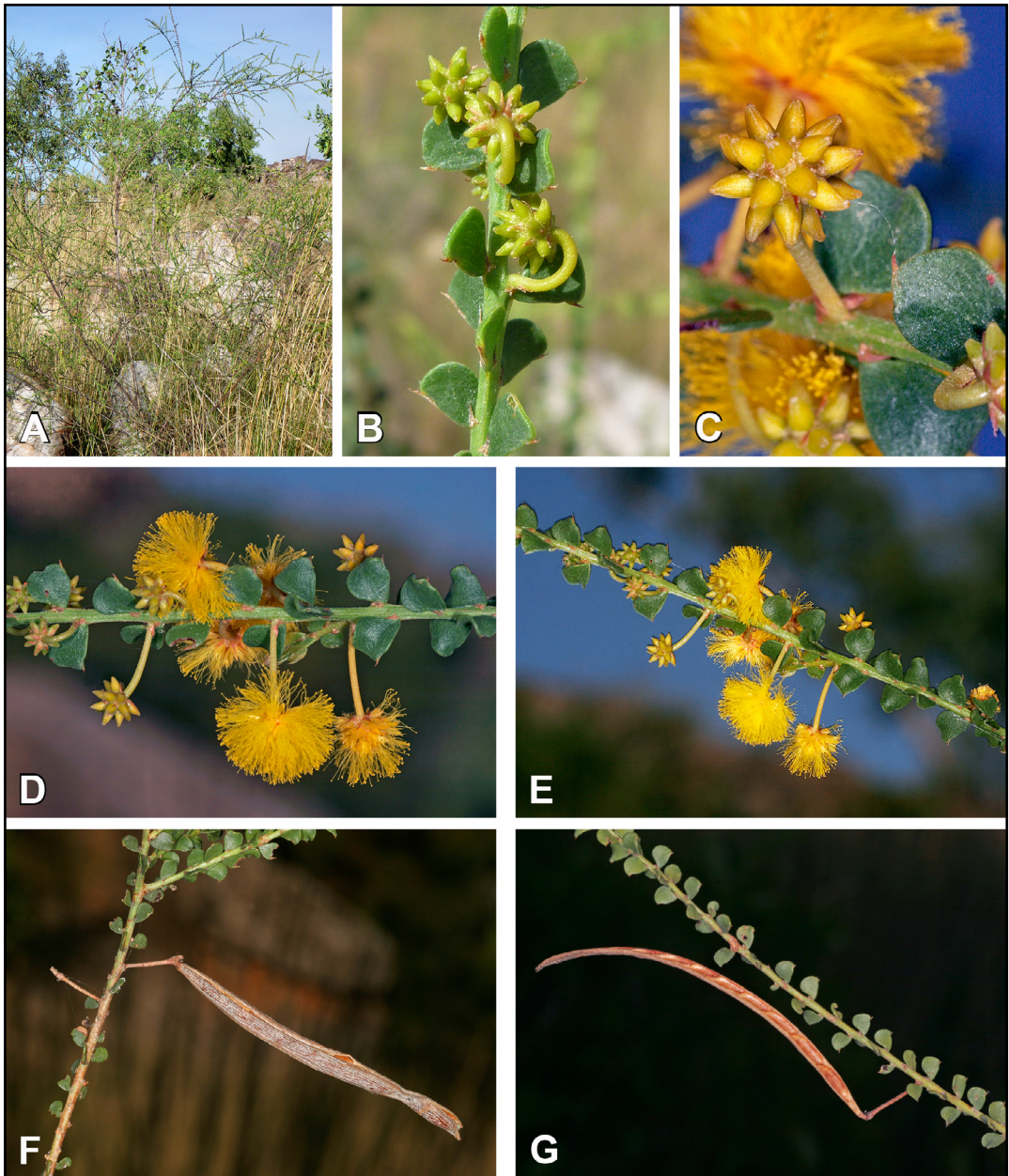


Figure 11. *Acacia perpusilla*. A – habit; B–E – flowering branchlets; F, G – fruiting branchlets. Images from M.D. Barrett MDB 2224. Photographs by M. Barrett.

Affinities. *Acacia perpusilla* belongs to the ‘*A. stigmatophylla* group’ (see Tindale 1980 and Tindale & Kodela 1992 for discussion) where *A. setulifera* Benth. appears to be its closest relative. These two species resemble one another particularly on account of their very small, distinctly mucronate phyllodes, but they also share a number of other characters, namely, branchlets resin-ribbed; stipules persistent; inflorescences simple; flowers in heads with the buds relatively large, spreading and pointed; bracteoles distinctly acuminate; pods opening elastically from the apex; and seeds with a straight, conical funicle-aril. *Acacia setulifera* is most readily distinguished from the new species by its

phyllodes which are patent, ovate to elliptic, not markedly asymmetric and very indistinctly nerved; it also has broader pods (mostly 4–6 mm wide) and normally more numerous-flowered heads (mostly 15–26). *Acacia setulifera* occurs in the Victoria River district, Northern Territory, and also the Carr Boyd Range south of Kununurra in the far eastern Kimberley region (*vide* Maslin & Weston 1993), about 300 km south-east of where *A. perpusilla* grows. *Acacia perpusilla* also seems closely related to *A. anserina* (see that species above for discussion).

Acacia barrettiorum is another endemic Kimberley species with globular heads and very small, plurinerved phyllodes terminated by a bristle-like mucro. These attributes render *A. barrettiorum* superficially similar to *A. perpusilla*, but it is most readily distinguished by its broad-based, sessile, symmetrically oblong phyllodes, its more thinly textured pods that are shallowly constricted between and obviously rounded over the seeds, and the funicle-aril that is folded beneath the seed. These pod and seed characters show that *A. barrettiorum* is not a member of the '*A. stigmatophylla* group'.

The wide-spreading, tapered flower buds that impart a star-like appearance to the unopened heads of *A. perpusilla* and *A. anserina*, are similar to those of *A. stellaticeps*. *Acacia stellaticeps* also has asymmetric phyllodes with a markedly rounded upper margin, is a member of the '*A. stigmatophylla* group' and occurs in the Kimberley region, but extends to adjacent areas in both Western Australia and the Northern Territory (Kodela *et al.* 2001). *Acacia stellaticeps* is most readily distinguished from both *A. perpusilla* and *A. anserina* by its larger phyllodes (mostly 8–20 × 4–12 mm) with a small, thickened, erect, knob-like mucro, larger flower buds and heads, and often broader pods (4–10 mm wide).

Notes. *Acacia perpusilla* was first collected in 2005 by M. Cusack from north of the King Edward River Falls (Cusack 7). The label accompanying this specimen describes the plant as a 'Subshrub to 0.5 m, rounded, often procumbent'. This habit description is most curious and does not describe typical plants of the species which have a spindly, distinctly erect growth form. Assuming that the Cusack description is not an error it is possible that the plant sampled by this collector was flood-damaged or a result of fire regeneration. The Cusack collection site was inspected by Robyn Maher (see *Acknowledgements*) who was unable to find any plants matching Cusack's description, but an entity with a spindly, erect habit was collected from the area (Maher *s.n.*). Specimens of this spindly entity were later confirmed by one of us (MDB) as matching the original Cusack gathering except for its habit. Further sampling of an area a few kilometres downstream from the Cusack site revealed two populations of the spindly entity (i.e. *A. perpusilla*), one population containing about 20 plants (the type specimen was collected from this population) and the other containing about 100 plants. An alternative explanation for the Cusack label is that the description was applied in error to a plant of *A. sp.* Kununurra (Lullfitz 6195) (= a broad phyllode form of *A. translucens* Cunn. ex Hook.) which is known to occur about 4 km downstream from where the Cusack collection of *A. perpusilla* was found.

Acacia sect. *Lycopodiifoliae* Pedley

Acacia claviseta Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: east of Pompeys Pillar, Warmun [Kimberley region], Western Australia [precise locality withheld for conservation reasons.], 6 February 2010, R.L. Barrett RLB 6652 (*holo:* PERTH 08440395; *iso:* CANB, K, MEL, NSW).

Erect, much-branched, slightly viscid *shrubs* commonly 0.6–0.8 m tall, apparently sometimes reaching 2.5 m. *Branchlets* terete, ribs not evident, densely pilose to pubescent, the fine hairs patent

to slightly or moderately antrorse or retrorse and very pale yellow at branchlet extremities (but aging white). *Stipules* setose, (1–)1.5–2.5 mm long, erect. *Phyllodes* in regular whorls, 9–16 per whorl, crowded with the phyllodes commonly \pm equalling the internode length of 2–8(–10) mm, linear, (3–)4–7(–8) mm long (excluding mucro), 0.3–0.4 mm wide, erect to ascending, straight to shallowly curved or occasionally shallowly sigmoid, sometimes discernibly recurved to sub-uncinate at apex, terete to sub-terete or horizontally \pm flattened, very obscurely wrinkled when dry, puberulous, the hairs fine, short (to *c.* 0.5 mm long), wide-spreading, straight to shallowly incurved and pale yellow (youngest phyllodes) aging white; *longitudinal nerves* not visible or obscurely 1-nerved abaxially; *apices* terminated by a distinct, narrowly clavate, yellow to light brown mucro (0.5–)1–1.5 mm long, or by a fine, setose (non-clavate) mucro (0.2–)0.3–0.5 mm long. *Gland* not visible. *Inflorescences* simple, one per whorl; *peduncles* 15–30 mm long, \pm densely pilose, the hairs patent, straight and pale golden or sometimes (especially in pod) white; *basal peduncular bract* absent; *heads* globular, 8–9 mm diam. (when dry), 30–42-flowered, bright golden. *Bracteoles c.* 3 mm long, exerted in young buds, claws short (*c.* 0.5 mm long), the narrow lamina caudate to long-acuminate and ciliate at base. *Sepals c.* 1/2 length of petals (varies from slightly less than 1/2 to slightly more than 1/2), variably dissected for 1/4–3/4 their length into 5–7, oblong to narrowly oblong or slightly spatulate, 1-nerved lobes which are ciliate with golden or pale golden, short, straight hairs at their apices, calyx tube and base of lobes glabrous; *petals* 5, 2.5–3 mm long, with short, straight, pale yellow hairs at apices, \pm obscurely striate. *Pods* oblong to narrowly oblong, 10–35 mm long, 6–8 mm wide, flat but \pm slightly raised over seeds along midline, not or scarcely constricted between the seeds, dehiscing unilaterally, thinly coriaceous-crustaceous, straight to shallowly curved, mid-brown to dark brown, glabrous, reticulately nerved, often apiculate, sessile; *marginal nerve* light brown to yellowish. *Seeds* longitudinal in the pods, irregularly obloid to ellipsoid (commonly obliquely truncate along part of edge), 4–5.5 mm long, 3–4 mm wide, flattened to somewhat turgid, very dark brown to black, dull to slightly shiny; *pleurogram* obscure, sometimes dull cream; *areole* normally ‘u’-shaped, open at the hilar end, 0.5–1 mm long, 0.4–0.7 mm wide; *funicle* very short and filiform, expanded into a normally clavate cream (?white when fresh) *aril* 2–4 mm long. (Figure 12)

Characteristic features. *Branchlets* densely pilose to pubescent. *Stipules* setose, (1–)1.5–2.5 mm long, erect. *Phyllodes* whorled, 9–16 per whorl, crowded, (3–)4–7(–8) mm long (excluding mucro), 0.3–0.4 mm wide, erect to ascending, terete to horizontally \pm flattened, puberulous; *longitudinal nerves* not visible or obscurely 1-nerved abaxially; *apices* terminated by a distinct, narrowly clavate, yellow to light brown mucro (0.5–)1–1.5 mm long, or by a fine, setose (non-clavate) mucro (0.2–)0.3–0.5 mm long. *Peduncles* 15–30 mm long, \pm densely pilose with pale golden or sometimes white hairs; *heads* 30–42-flowered. *Bracteoles c.* 3 mm long, the lamina caudate to long-acuminate. *Sepals c.* 1/2 length of petals, variably dissected for 1/4–3/4 their length into 5–7 lobes that are oblong to narrowly oblong or slightly spatulate and golden or pale golden ciliate at their apices; *petals* 5, with short, straight, pale yellow hairs at their apices, \pm obscurely striate. *Pods* oblong to narrowly oblong, 10–35 mm long, 6–8 mm wide, flat but \pm slightly raised over seeds along midline, glabrous, reticulately nerved, sessile. *Seeds* longitudinal, irregularly obloid to ellipsoid, 4–5.5 mm long, 3–4 mm wide; *areole* normally ‘u’-shaped, small (0.5–1 \times 0.4–0.7 mm), aril clavate and 2–4 mm long.

Other specimens examined. WESTERNAUSTRALIA: [localities withheld for conservation reasons] 13 May 2012, R.L. Barrett RLB 7491 (PERTH); 23 June 1976, A.C. Beauglehole 53684 (BRI *n.v.*, PERTH); 9 May 1988, K.F. Kenneally & B.P.M. Hyland KFK 10731 (DNA, PERTH). NORTHERN TERRITORY: 10 May 2008, I.D. Cowie 12097 (B *n.v.*, BRI *n.v.*, DNA *n.v.*, MEL *n.v.*, MO *n.v.*, PERTH).

Distribution. Occurs in the eastern Kimberley region of northern Western Australia to the south of Kununurra where is known from a few scattered localities on Bedford Downs Station, the Osmond

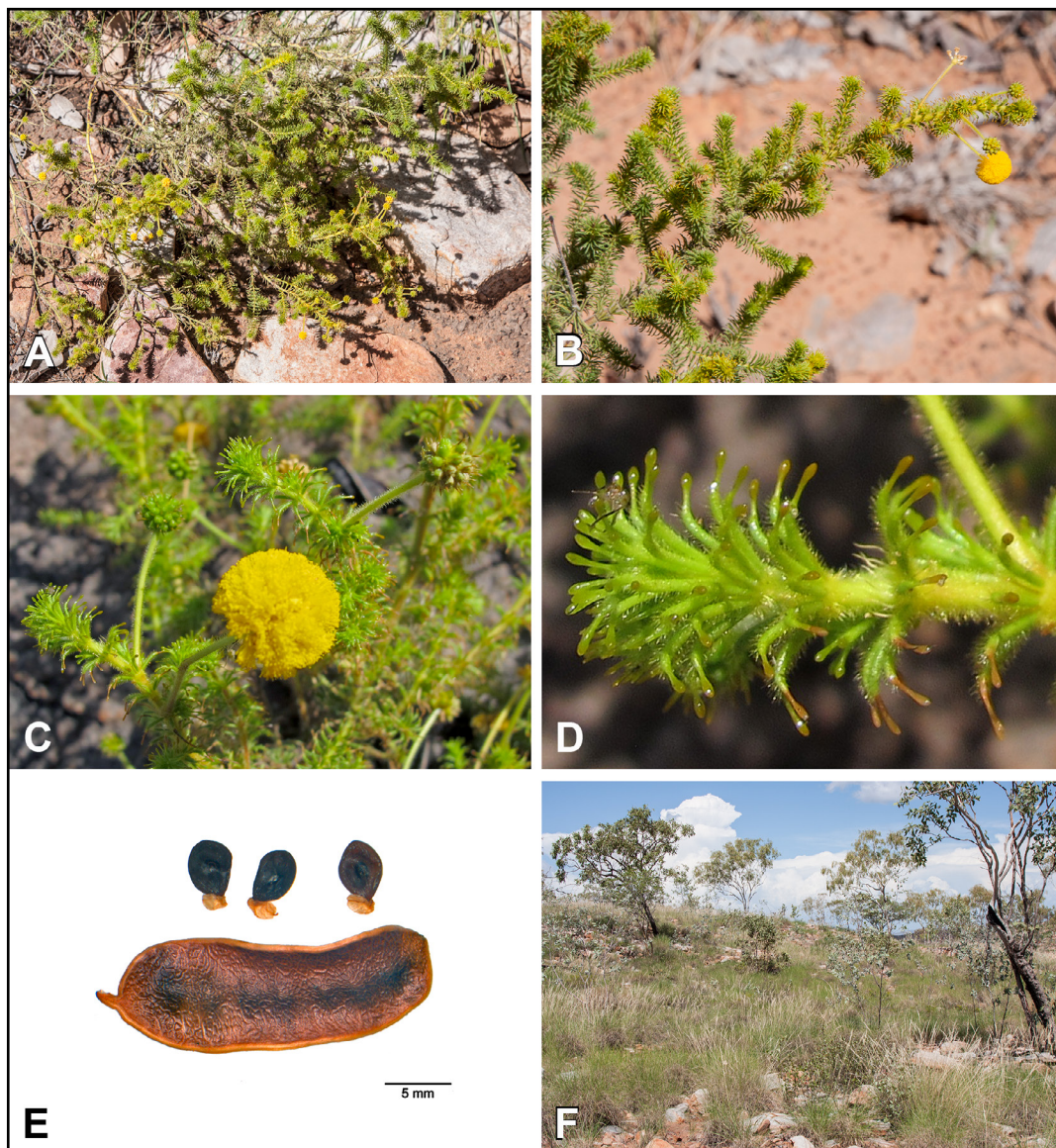


Figure 12. *Acacia claviseta*. A – habit; B – flowering branch; C – inflorescence; D – whorled phyllodes with clavate mucros; E – pod and seeds; F – habitat. Images from R.L. Barrett RLB 6652. Photographs: A–D, F by R. Barrett; E by B. Maslin.

Range and near Pompeys Pillar, north of Warmun. It also occurs in Keep River National Park, Northern Territory, about 100 km due north-east of Kununurra. (Figure 2B)

Habitat. Grows on top of sandstone ridges, on sand flats and shallow sand lenses among sandstone boulders and on scree slopes. Grows with *Acacia arida*, *A. thomsonii*, *Calytrix exstipulata*, *Comesperma secundum*, *Corymbia collina*, *C. dichromophloia*, *Cymbopogon bombycinus*, *Dodonaea hispidula* var. *arida*, *Erythrophleum chlorostachys*, *Gardenia resinosa* subsp. *resinosa*, *Gompholobium subulatum*, *Grevillea miniata*, *G. mimosoides*, *G. velutinella*, *Mirbelia viminalis*, *Petalostigma quadriloculare*, *Solanum cunninghamii* and *Triodia fitzgeraldii*.

Phenology. Judging from the relatively few available collections it is probable that this species flowers between February/March and July/August. Pods with mature seeds commonly co-occur with flowers during this period.

Conservation status. *Acacia claviseta* is to be listed as Priority Three under DPaW Conservation Codes for Western Australian Flora (M. Smith pers. comm.). Although it has a relatively wide overall geographic range it has a restricted, localised occurrence in the few places where it is known to occur.

Common name. Club-tipped Whorled Wattle.

Etymology. The specific epithet is taken from the Latin *clavi-* (club-) and *seta* (bristle) in allusion to the diagnostic mucro of the phyllodes (see *Morphology* below).

Morphology. The narrowly clavate setae that are mostly 1–1.5 mm long and which commonly occur on the youngest phyllodes are very distinctive. With age the terminal swollen portion of the trichome is lost and the phyllodes are then terminated by a fine setose point mostly 0.3–0.5 mm long. On many specimens some branchlets are dimorphic for this character, some bearing clavate setae and some with a fine setose (non-clavate) mucro. *Acacia claviseta* is the only species of sect. *Lycopodiifolia* where the setae are distinctly and consistently swollen in this fashion. However, slightly clavate setae occasionally occur on some phyllodes of *A. prolata*, and in a few other species, e.g. *A. lycopodiifolia* Cunn. ex Hook.. Also, in some species the setae may superficially appear to be clavate due to a surface exudate of resin, however in these cases the tissue of the setae is not swollen as in *A. claviseta*.

The yellow hairs that are normally found on the branchlets, phyllodes and peduncles of this species often impart a faint but discernible yellowish tinge to the plants.

Most labels describe this species as a shrub less than 1 m tall. However, the specimen *Kenneally & Hyland* KFK 10731 describes the plant as attaining 2.5 m in height. Assuming this to be correct then it is very unusual for a species from sect. *Lycopodiifoliae* to be so tall.

Affinities. *Acacia claviseta* appears most closely related to *A. anasilla* A.S. George and *A. lycopodiifolia* which also possess phyllodes with well-developed setose points, striate petals and pods with longitudinal seeds. These two relatives are most readily distinguished from the new species by their indumentum comprising white (not yellow) hairs, non-clavate (or occasionally slightly clavate) phyllode setae and shorter calyces (clearly less than 1/2 the length of the corolla) with short, linear to narrowly triangular lobes. Specimens of *A. claviseta* that possess phyllodes with short, non-clavate setae may superficially resemble *A. capillaris* A.S. George but this species is recognised by its longer stipules (3–4.5 mm), short, glabrous calyx and its indumentum of white hairs. *Acacia claviseta* appears to have some affinities with *A. prolata* (see that species below for discussion).

Notes. It is suspected that *A. claviseta* is fire sensitive.

Acacia dimorpha Maslin, M.D. Barrett & R.L. Barrett, *sp. nov.*

Type: Edkins Range, west Kimberley region, Western Australia [precise locality withheld for conservation reasons], 11 April 2013, *R.L. Barrett, M.D. Barrett & B. Anderson* RLB 7981 (*holo:* PERTH 08440492; *iso:* CANB, DNA, G, K, MEL, NT, NSW, PERTH 08440506).

Erect *shrubs* 0.4–1 m tall. *Branchlets* terete, very obscurely ribbed or ribs not evident, pubescent to short-pilose with straight, patent, white hairs. *Stipules* narrowly triangular to linear-triangular, 1–1.5(–2) mm long, wide-spreading, often shallowly incurved, scarious, brown. *Phyllodes* in regular whorls 5–10(–15) mm apart, 11–18 per whorl, linear, dimorphic, upper phyllodes subtending inflorescences, 2–5 mm long with *mucre* 2–3 mm long, lower phyllodes without inflorescences, 6–20 mm long with slender, brittle *mucre* 0.5–1.5 mm long, 0.3–0.5 mm wide, slender, patent to ascending or erect, straight to shallowly incurved, commonly shallowly recurved at apex, sub-terete to horizontally flattened, longitudinally wrinkled when dry, moderately hirsutulous, the hairs 0.1–0.2 mm long, straight to shallowly incurved and wide-spreading; *longitudinal nerves* not visible; *apices* terminated by an excentric, distinct, setose *mucre* 0.5–3 mm long (see above). *Gland* not visible. *Inflorescences* simple; *peduncles* 15–25 mm long, indumentum as on branchlets, base ebracteate; *heads* globular, *c.* 7 mm diam. (when dry), yellow, 25–40-flowered. *Bracteoles* lanceolate to narrowly lanceolate, *c.* 1.5 mm long, the claws shorter than laminae which are *c.* 0.3 mm wide and acuminate (gradually and uniformly narrowed). *Flowers* 5-merous; *calyx* 1/3–2/5 length of corolla, gamosepalous, dissected for 1/4–1/2 its length into oblong or triangular to broad-triangular lobes, calyx tube glabrous and seemingly nerveless or obscurely 5-nerved; *petals* 2–2.3 mm long, glabrous, striate but often obscurely so. *Pods* narrowly oblong, 2.5–9 cm long, 5–7 mm wide, flat, straight-sided or slightly constricted between seeds, raised over seeds along midline, thinly coriaceous, straight or sometimes shallowly curved, dark brown to blackish, glabrous, reticulately nerved; gradually or abruptly narrowed at base with a poorly defined stipe *c.* 1 mm long; *marginal nerve* thickened. *Seeds* longitudinal in the pods, irregularly obloid-ellipsoid, 4.5–5.5 mm long, 3–3.5 mm wide, black, dull and smooth except slightly shiny and often wrinkled at centre (especially bordering the pleurogram); *areole* *c.* 1.5 × 0.7–0.8 mm, with a narrow opening at the hilar end; *funicle* expanded into a clavate, white *aril*. (Figure 13)

Characteristic features. *Branchlets* pubescent to short-pilose with straight, patent, white hairs. *Stipules* 1–1.5(–2) mm long, wide-spreading. *Phyllodes* whorled, dimorphic, upper phyllodes subtending inflorescences, 2–5 mm long with *mucre* 2–3 mm long, lower phyllodes without inflorescences, 6–20 mm long with slender, brittle *mucre* 0.5–1.5 mm long, straight to shallowly incurved but commonly shallowly recurved at apex, sub-terete to flat, hirsutulous; *longitudinal nerves* not visible. *Peduncles* 15–25 mm long; *heads* 25–40-flowered. *Bracteoles* lanceolate to narrowly lanceolate, *c.* 1.5 mm long and 0.3 mm wide. *Flowers* 5-merous; *calyx* 1/3–2/5 length of corolla, dissected for 1/4–1/2 its length into oblong or triangular to broad-triangular lobes, calyx tube glabrous; *petals* glabrous, striate but often obscurely so. *Pods* narrowly oblong, 2.5–9 cm long, 5–7 mm wide, flat but raised over seeds along midline, reticulately nerved, ±sessile. *Seeds* longitudinal, irregularly obloid-ellipsoid, black, dull and smooth except slightly shiny and often wrinkled at centre.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons.] 20 Mar. 1998, *M.D. Barrett* MDB 446 (PERTH); 11 Apr. 2013, *R.L. Barrett, M.D. Barrett & B. Anderson* RLB 7948 (PERTH); 22 June 2012, *H. Dauncey* H 611 (PERTH); 10 Aug. 1943, *C. Davis s.n.* (PERTH 07883218); 1 Oct. 1923, *W.R. Easton* 747 (PERTH).

Distribution. Occurs in a relatively restricted area of the west Kimberley region of northern Western Australia where it is known from the Edkins and Artesian ranges near the Charney River (Figure 2A).

Habitat. Red-grey sand over quartzite or sandstone on slopes and rocky ridges. Grows in sand seeps and along seasonal creeks. A short-lived species that regenerates prolifically following fire. Occurs with *Acacia vincentii*, *Corymbia* sp. Prince Regent River (*R.L. Barrett & M.D. Barrett* RLB 3750), *Eucalyptus rupestris*, *Hibiscus kenneallyi*, *Macarthuria vertex*, *Planchonia rupestris*, *Ricinocarpos rosmarinifolius*, *Solanum* sp. Prince Regent River (*T. Handasyde* CH 1925), *Triodia* sp., *Triumfetta coronata*, *Triumfetta* spp. and other shrubs.

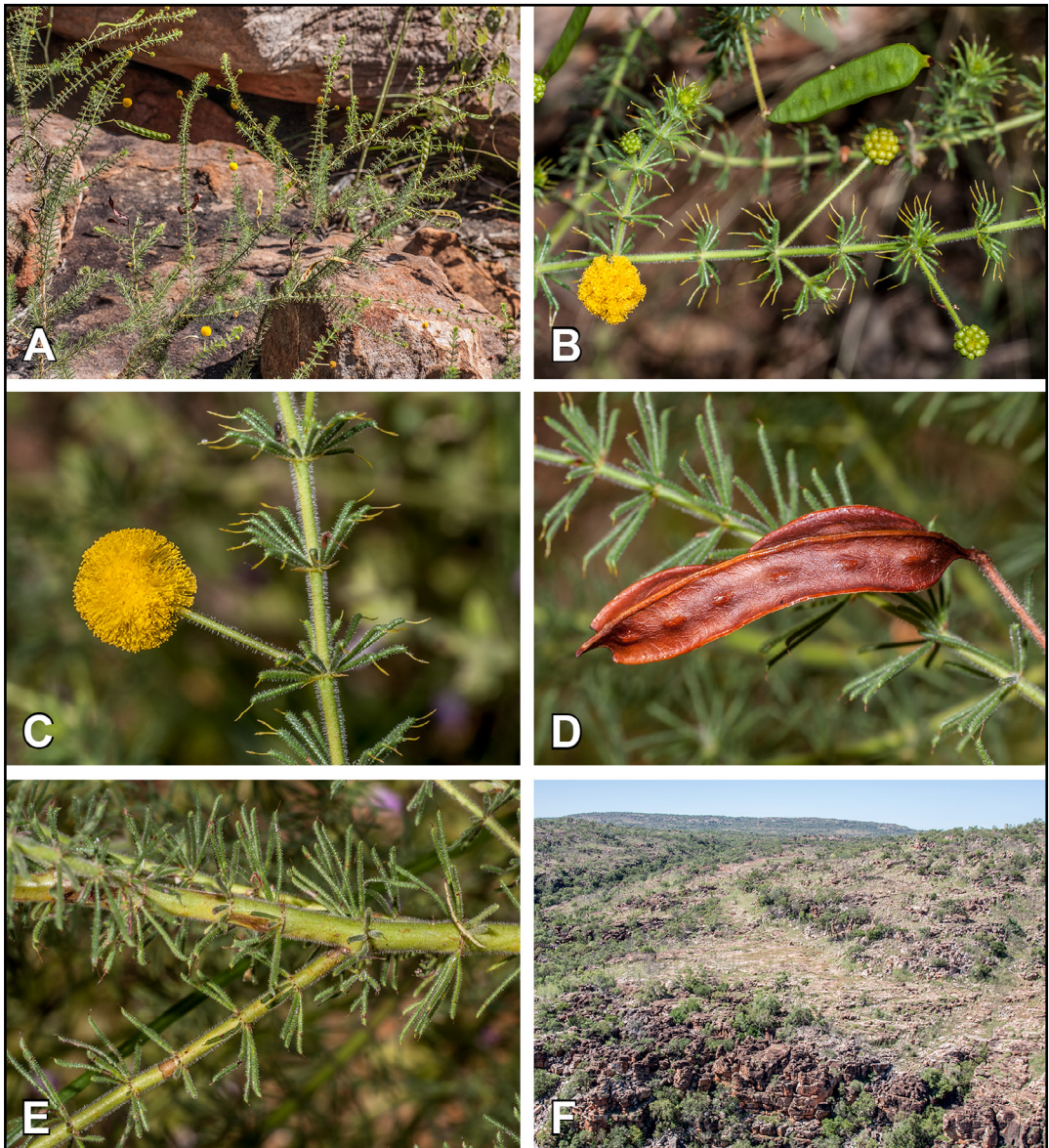


Figure 13. *Acacia dimorpha*. A – habit; B – flowering and fruiting branchlet with upper phyllodes with long mucros; C – inflorescence and upper phyllodes; D – pod and lower phyllodes; E – lower phyllodes with short mucros; F – habitat. Images from R.L.Barrett *et al.* RLB 7981. Photographs by R. Barrett.

Phenology. Available collections were gathered in March, April, June, August and October. In each of these months plants were in mature bud and/or with flowers at anthesis, and most also possessed immature pods. Pods with a few mature seed have been collected in April (at which time most pods were immature).

Conservation status. *Acacia dimorpha* is to be listed as Priority One under DPaW Conservation Codes for Western Australian Flora (M. Smith pers. comm.).

Common name. Artesian Range Whorled Wattle.

Etymology. The botanical name is derived from the Latin *dimorphus* (having two forms) in allusion to the clear difference in size of phyllodes that occur towards the ends of the branchlets (which commonly subtend inflorescences) and those towards the base of the branchlets (which do not subtend inflorescences).

Affinities. *Acacia dimorpha* is very closely related to *A. smeringa* A.S.George. Among the more important characters shared by these two species are their patent branchlet indumentum, dimorphous phyllodes (with those towards the ends of the branchlets that often subtend inflorescences clearly shorter than those towards the base of the branchlets where no inflorescences occur) with prominent, setose points, gamosepalous calyx, striate petals and longitudinal seeds. *Acacia smeringa* is a poorly known species that occurs in the northern Packhorse Range (80 km south-east of where *A. dimorpha* occurs) where it appears to be localised around Manning Gorge. The main differences between *A. smeringa* and *A. dimorpha* are found in their phyllodes and inflorescences. In *A. smeringa* the phyllodes at the base of the branchlets which do not subtend inflorescences are shorter than those of *A. dimorpha* (5–7 mm long, compared with 6–20 mm); also, the setose points on both the upper and lower phyllodes in *A. smeringa* are of essentially of the same length (1.5–3 mm long) and morphology whereas in *A. dimorpha* the points on the longer phyllodes are shorter (0.5–1.5 mm) and more slender than those on the shorter, terminal phyllodes. In *A. smeringa* the bracteoles are slightly larger ($c. 2.5 \times 0.4$ – 0.6 mm compared with $c. 1.5 \times 0.3$) and more importantly, the calyx is $1/2$ – $2/3$ the length of the petals (less than $1/2$ in *A. dimorpha*) and is less obviously dissected. Although the differences between the two entities are not great, they are subjectively judged to be significant enough to warrant the recognition of *A. dimorpha* as a distinct species, but it is recognised that future studies may consider that it is better treated as subspecies of *A. smeringa*.

Acacia dimorpha is also related to *A. prolata* which is described as new below (see that species for discussion of differences).

Variants. While less than 100 km across, the geographical area in which *A. dimorpha*, *A. prolata* and *A. smeringa* occur is geologically complex and contains many localised plant species. These three species occur in disjunct locations, *A. dimorpha* in the west, *A. prolata* in the northern centre and *A. smeringa* in the east. The following two collections from intermediate locations between the distribution of *A. prolata* and *A. smeringa* cannot be readily placed in either species and have characteristics which ally them to *A. dimorpha*. *R.L. Barrett* 619 from the Caroline Ranges (located north-west of Manning Gorge) is vegetatively very similar to *A. dimorpha* but it has the calyx of *A. smeringa* (i.e. exceeding $1/2$ the length of the corolla and deeply dissected into oblong lobes); furthermore, it differs from both these species, and from the following variant, in having obviously hairy petals and sepals. *R.L. & M.D. Barrett* RLB 6766 is a superficially similar collection with clearly dimorphic phyllodes and is known from Mt Russ which is located north-west of the Caroline Ranges. This collection probably represents yet a different entity; its calyx appears to combine characters of both *A. smeringa* and *A. dimorpha* in being $1/2$ – $2/5$ the length of the petals and rather deeply dissected into oblong lobes, and its branchlet indumentum approaches that of *A. prolata* in having fine hairs, some of which are retrorsely curved.

Acacia prolata Maslin, M.D.Barrett & R.L.Barrett, *sp. nov.*

Type: ‘Thedachloa Flat’ (informal name), east of Bachsten Camp, south edge of Prince Regent Nature Reserve [National Park; Kimberley region], Western Australia, 26 March 2010, *M.D. & R.L. Barrett* RLB 6699 (*holo:* PERTH 08427879; *iso:* BRI, CANB, DNA, K, MEL, NSW).

Acacia sp. Mt Agnes (R.L. Barrett & M.D. Barrett RLB 4053), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

Erect, spreading, slightly viscid *shrubs* 0.5–1 m tall. *Branchlets* terete, very obscurely ribbed or ribs not evident, pubescent with the weak, short or long hairs shallowly to markedly recurved and slightly to prominently retrorse (but not closely appressed to branchlet). *Stipules* narrowly triangular to linear-triangular, 1–1.5(–2) mm long, wide-spreading to erect. *Phyllodes* in regular whorls 3–12 mm apart, 10–20 per whorl, linear, (3–)4–8(–10) mm long (excluding mucro), to 12 mm on juvenile plants, very infrequently dimorphic with those subtending inflorescences (near ends of branchlets) *c.* 1/2 length of those lower down the branch, 0.3–0.5 mm wide, ascending to patent (erect on juvenile plants), straight to shallowly incurved or shallowly recurved over most of the length but always recurved at apex, sub-terete to horizontally flattened, obscurely longitudinally wrinkled when dry, glabrous to sparsely or moderately hirsutulous, the hairs minute (*c.* 0.1 mm long), straight to slightly curved and ascending to patent; *longitudinal nerves* not visible or obscurely 1-nerved abaxially; *apices* terminated by an excentric, distinct, \pm setose mucro 0.5–1.5(–2) mm long, the point occasionally slightly swollen to appear very narrowly clavate. *Gland* not visible. *Inflorescences* simple; *peduncles* 10–20 mm long, pubescent, the weak hairs patent to retrorse and sparse to moderately dense, base ebracteate; *heads* globular, 6–8 mm diam. (when dry), yellow, 25–35-flowered. *Bracteoles* lanceolate to narrowly lanceolate, 1.5–2 mm long, the claws shorter than laminae which are 0.15–0.3 mm wide and acuminate (gradually and uniformly narrowed). *Flowers* 5-merous; *sepals* 1/2 or slightly more than 1/2 length of petals, mostly free or united at extreme base but sometimes variably united for up to 1/2 their length in a few flowers in some heads, oblong to narrowly oblong or \pm linear, glabrous; *petals* 2–2.2 mm long, glabrous or sub-glabrous (hairs very few and spreading), striate but often obscurely so with only the midnerve evident. *Pods* narrowly oblong, 4.5–8 cm long, 5–7 mm wide, flat, straight-sided or slightly constricted between seeds, raised over seeds along midline, thinly coriaceous, straight or shallowly curved, dark brown to blackish, glabrous, reticulately nerved gradually or abruptly narrowed at base with a poorly defined stipe 1–3 mm long; *marginal nerve* thickened. *Seeds* longitudinal to longitudinally oblique in the pods, obloid to ellipsoid, 4–5 mm long, 2.5–3 mm wide, flattened (*c.* 2 mm thick), black, dull except slightly shiny at centre; *pleurogram* obscure; *areole* small (*c.* 1 \times 0.5 mm), ‘u’-shaped, open at the hilar end; *funicle* expanded into a clavate, white *aril*. (Figure 14)

Characteristic features. *Branchlets* pubescent with weak, slightly to prominently retrorse hairs. *Stipules* 1–1.5(–2) mm long. *Phyllodes* whorled, (3–)4–8(–10) mm long, very infrequently dimorphic with those subtending inflorescences (near ends of branchlets) *c.* 1/2 length of those lower down the branch, sub-terete to flat; *longitudinal nerves* \pm not visible; *apices* terminated by a distinct, \pm setose mucro 0.5–1.5(–2) mm long. *Peduncles* 10–20 mm long; heads 25–35-flowered. *Bracteoles* lanceolate to narrowly lanceolate, 1.5–2 mm long, 0.15–0.3 mm wide, acuminate. *Flowers* 5-merous; *sepals* 1/2 or slightly more than 1/2 length of petals, mostly free, oblong to narrowly oblong or \pm linear, glabrous; *petals* glabrous or sub-glabrous, striate but often obscurely so. *Pods* narrowly oblong, 4.5–8 cm long, 5–7 mm wide, flat but raised over seeds along midline, reticulately nerved, \pm sessile. *Seeds* longitudinal to longitudinally oblique, black, dull except slightly shiny at centre.

Selected specimens examined. WESTERN AUSTRALIA: 7.5 km E of Walunge Chasm, 12 Jan. 2001, R.L. & M.D. Barrett MDB 1213 (MEL, PERTH); sandstone pavement N of ‘Leptospermum Falls’ (informal name), 5 km E of junction of Pitta Creek and Prince Regent River, 10 Jan. 2001, R.L. & M.D. Barrett RLB 1673 (NSW, PERTH); 6.9 km WNW of Mt Hann, 27 Mar. 2010, M.D. & R.L. Barrett MDB 2867 B (BRI, NSW, MEL, PERTH); Humbert Yard creek, 22 km NW of Mt Hart Station [HS], 29 June 1987, D.J. Edinger 516 (CANB, DNA, PERTH, dups distributed as *A. lycopodiifolia*).

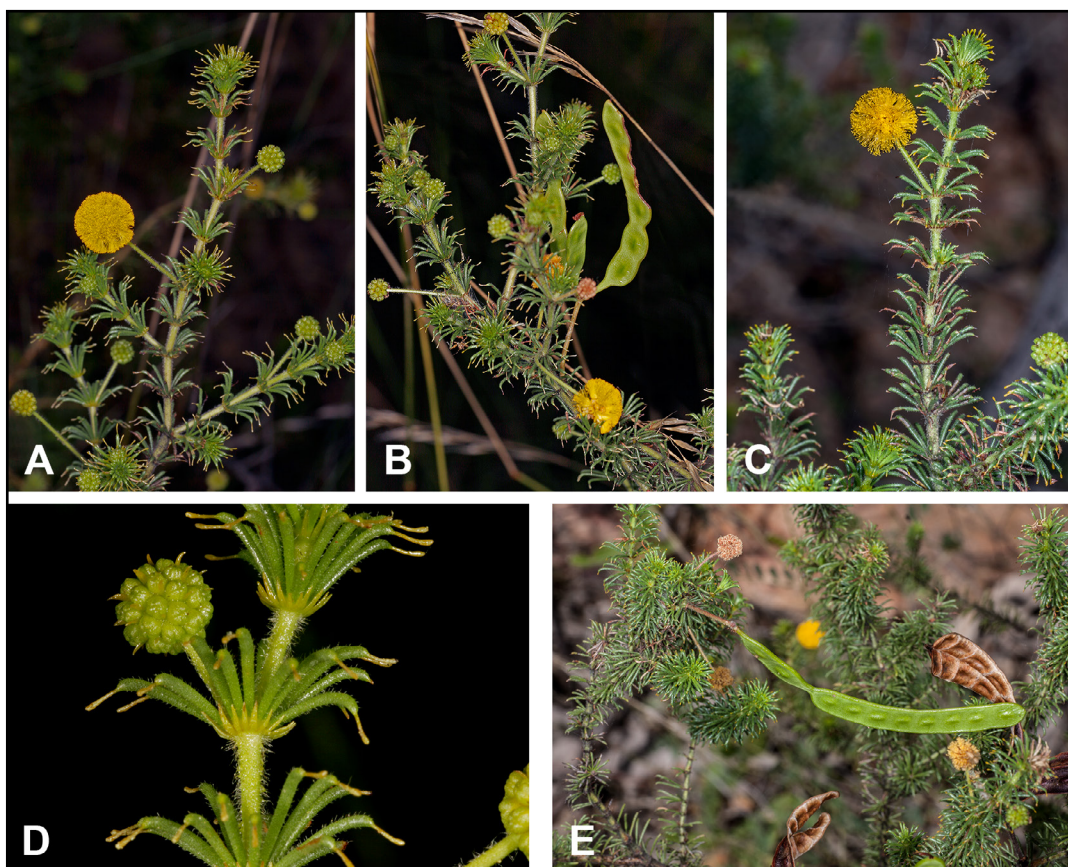


Figure 14. *Acacia prolata*. A – flowering branchlet; B – flowering and fruiting branchlet; C – flowering branchlet; D – budding inflorescence and phyllodes with slightly clavate mucros; E – flowering and fruiting branches. Images from R.L. & M.D. Barrett MDB 1213. Photographs by R. & M. Barrett.

Distribution. Occurs in the Kimberley region of northern Western Australia where it is relatively common and known from many scattered localities through the northern Edkins Range and southern Prince Regent National Park, over a distance of *c.* 50 km, with an apparently disjunct occurrence at Humbert Yard on Mt Hart Station, some 100 km to the south-east of the core distribution (Figure 2A).

Habitat. Grows on sandstone slopes and ridges, often with *Triodia* ground cover. Associated species include *Acacia adenogonia*, *A. latifolia*, *A. retinervis*, *Boronia wilsonii*, *Bossiaea barrettiorum*, *Corymbia* sp. Prince Regent River (R.L. Barrett & M.D. Barrett RLB 3750), *Eucalyptus brachyandra*, *E. herbertiana*, *E. rupestris*, *Gompholobium subulatum*, *Grevillea adenotricha*, *G. latifolia*, *Jacksonia rupestris* and *Triodia* aff. *bynoei*.

Phenology. Available collections were gathered in January, February and June. In each of these months plants were in flower and some also possessed mature pods.

Conservation status. Not considered rare or endangered.

Common name. Gardner Plateau Whorled Wattle.

Etymology. The botanical name is derived from the Latin *prolatus* (extended, elongated) in allusion to the long, ±setose mucro of the phyllodes.

Morphology. As with many taxa of sect. *Lycopodiifoliae* the general facies of juvenile plants of *A. prolata* differs from that of mature plants. In this species the phyllodes of the juveniles are characteristically erect (not ascending to patent) and some are slightly longer than those of mature individuals.

Affinities. *Acacia prolata* appears most closely related to *A. dimorpha* (see above) and *A. smeringa* on account of the relatively long, ±setose mucro on its phyllodes, its striate petals and its longitudinal seeds. The latter two species are most readily distinguished from *A. prolata* by their patent (not retrorsely curved) branchlet hairs and clearly united sepals. Also, in *A. prolata* the uppermost phyllodes in the fertile region of the branchlets and the lowermost phyllodes in the non-fertile region of the branches are normally of more or less uniform length (not significantly different in length as occurs in the other two species). There are, however, a few specimens of *A. prolata* where the upper phyllodes (subtending the inflorescences) are about half as long as the lowermost ones (which do not subtend inflorescences) but these specimens do not display the very marked phyllode dimorphism that occurs in *A. dimorpha* and *A. smeringa*. *Acacia prolata* is further distinguished from *A. smeringa* by having phyllodes with slightly shorter apical mucro (normally 0.5–1.5 mm long compared with 2–3 mm) and from *A. dimorpha* by its longer sepals (which are less than 1/2 the length of the petals in *A. dimorpha*) and generally shorter phyllodes (phyllodes in the non-fertile region of branchlets 6–20 mm in *A. dimorpha*).

Acacia claviseta (see above) is perhaps not far removed from *A. prolata* but is distinguished most readily by the yellow indumentum that occurs on its upper branchlets, young phyllodes, peduncles and petals, and also by the phyllode mucro which is often clearly swollen and clavate (slightly clavate setae occur in *A. prolata* but they are rare). *Acacia anasilla* and *A. lycopodiifolia* are perhaps not far removed from the new species but are distinguished by their united sepals that are clearly less than half the length of the petals.

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