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Seven new species in Acacia section Lycopodiifolia (Mimosaceae)

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Abstract

In preparation for a treatment of *Acacia* sect *Lycopodiifolia* for the 'Flora of Australia', seven new species are described and illustrated; *Acacia anasilla*, *A. capillaris*, *A. hypermeces*, *A. mitodes*, *A. repens*, *A. smeringa* and *A. zatrichota*. All occur in the Kimberley, Western Australia, with *A. repens* extending to the Northern Territory. A key to all species of *Acacia* with whorled phyllodes is provided.

Introduction

Acacia section *Lycopodiifolia* was described by Pedley (1978) to accommodate a group of tropical and subtropical Australian wattles with whorled phyllodes, prominent stipules and flowers in solitary heads. In an earlier paper (Pedley 1972), he recognised 12 species, but two of these, the non-tropical *A. baueri* Benth and *A. cedroides* Benth, are now considered better placed in section *Phyllodineae* (Maslin & Stirton, 1998; B R Maslin, Western Australian Herbarium, personal communication). Forster (1990) described the new species *A. porcata* from Queensland. In the course of preparing an account of section *Lycopodiifolia* for the 'Flora of Australia', seven new species were recognised and I describe them here. All occur in the Kimberley, Western Australia, and *A. repens* is also recorded for the Northern Territory. On the basis of collections made so far, all of these seven species are considered rare. The coding used here for conservation status of these seven species follows Briggs & Leigh (1996). Under the Conservation Codes for Western Australian Flora of the Department of Conservation and Land Management, all of these seven species are Priority Two. The sectional name is spelt *Lycopodiifolia* in accordance with Article 22.5 of the 'International Code of Botanical Nomenclature' (Greuter *et al*., 1994).

This study was based on a study of the morphology of habit, vegetative parts, flowers and fruits of all taxa in the section, from most Australian herbaria as well as the Royal Botanic Gardens, Kew. A key to all species of *Acacia* with whorled phyllodes is provided.

Systematics

Acacia sect Lycopodiifolia Pedley, *Austrobaileya* 1:82 (1978) (as *Lycopodiifoliae*)

Racosperma sect *Lycopodiifolia* (Pedley) Pedley, *Bot J Linn Soc* 92:240 (1986). Type: *A. lycopodiifolia* Cunn ex Hook.

Phyllodes in whorls of 6–27, less than 2 cm long, terete or slightly flattened, commonly abruptly mucronate but not pungent, without prominent nerves; stipules usually prominent, the base commonly persistent after phyllode falls. Flowers 5-merous, in solitary axillary heads; 6–50 flowers per head. Calyx shortly or moderately lobed. Pod flat with ± prominent margins. Seed arillate.

A section of 18 species, mainly of tropical and subtropical Australia including semi-arid and arid regions, readily recognised by the small, whorled phyllodes with prominent stipules. Seedlings have the characteristic alternate, bipinnate leaves which change abruptly to whorled phyllodes. In most species the mucro of the phyllode wears off after a year or so. Several taxa are highly variable and probably further taxa should be recognised. The section should be thoroughly revised, with extensive field work.

Descriptions of the species

Acacia anasilla A S George, sp nov (Fig 1 A–C)

Inter species alias sectionis *Lycopodiifoliae* habitu elatiore (frutex ad 2 m altus), indumento densissimo hispido, et capitulis grandibus (floribus 40–50), praecipue differt. Stipuli recti, 1.5–2 mm longi. Lobi calycis subulati, glabri. Lobi corollae striati, hispidi.

Typus: Winnama Spring, Mabel Downs Station, WA, 17° 11' S, 128° 15' E, 15 November 1989, *K A Menkhorst 835*; holo: PERTH 01187465; iso: CANB, DNA, MEL1582581.

Erect *shrub* to 2 m. *Stems* densely white-hispid; internodes 2–10 mm long, on main stems to 16 mm. *Phyllodes* 15–20 per whorl, spreading to gently recurved or the lower erect, somewhat flattened when dried with a midrib evident on abaxial surface, ± straight, slender, 5–10 mm long, hispid; mucro 2–4 mm long, ± incurved, commonly with viscid droplets; stipules erect, subulate, 1.5–2 mm long. *Peduncles* 1.5–3 cm long, hispid. *Heads* 40–50-flowered; bracteoles subulate, 2.5–3 mm long, glabrous. *Calyx* ca. 0.8 mm long, glabrous; lobes subulate, short. *Corolla* 2–2.3 mm long; lobes ± striate, hispid in upper half. *Pod* sessile or on stipe to 1.5 mm long, 2–3.5 cm long, 5–6 mm wide, glabrous. *Seeds* 3–10 per pod, longitudinal, ca. 4 mm long; aril large; pleurogram closed.

Key to taxa of Acacia with regularly whorled phyllodes

(includes four taxa not belonging to section Lycopodiifolia , marked *)

1 Phyllodes pungent (south-western WA)
- 2 Flowers 5-merous
  - 3 Stems ribbed; phyllodes 10–30 (–40) mm long; heads cream to pale yellow; pods striate, 2.5–3.5 mm wide ..... A. cedroides*
  - 3 Stems ribless; phyllodes normally 8–19 mm long, sometimes shorter; heads golden; pods not striate, 5–7 mm wide ..... A. sphacelata subsp verticillata *
- 2 Flowers 4-merous; stems ribless; phyllodes 8–12 (–15) mm long; heads pale yellow; pods not striate, 3–4 mm wide ..... A. simulans*

1 Phyllodes not pungent, though commonly abruptly mucronate (northern arid & tropical Australia, NSW)
- 4 Plant prostrate
  - 5 Flowers 6–8 per head; calyx 1.8–2 mm long ..... A. mitodes
  - 5 Flowers 16–25 per head; calyx 0.5–0.8 mm long
    - 6 Phyllodes 6–9 per whorl, prominently uncinate; stipules 1.5–2 mm long; calyx lobes triangular ... A. repens
    - 6 Phyllodes 9–12 per whorl with straight or slightly curved mucro; stipules ca. 1 mm long; calyx with irregular, rounded lobes ..... A. hypermeces
- 4 Plant erect or spreading, occasionally procumbent
  - 7 Petals not or obscurely striate
    - 8 Stipules typically absent, if present then minute; phyllodes commonly 5–7 per whorl ..... A. baueri*
    - 8 Stipules prominent, 0.5–4.5 mm long, setaceous; phyllodes commonly 8 or more per whorl
      - 9 Calyx glabrous
        - 10 Plant viscid; phyllodes 6–12 per whorl; stipules 0.8–1.5 mm long; flowers 25–40 per head ..... A. spondylophylla
        - 10 Plant not viscid; phyllodes 14–20 per whorl; stipules 3–4.5 mm long; flowers 20–25 per head ..... A. capillaris
      - 9 Calyx lobes hairy at least in part
        - 11 Calyx less than 1 mm long
          - 12 Phyllodes 12–15 per whorl; calyx 0.4–0.6 mm long; stem indumentum of yellow hairs; seeds transverse ..... A. hippuroides
          - 12 Phyllodes 16–20 per whorl; calyx 0.7–0.8 mm long; stem indumentum of white hairs; seeds longitudinal ..... A. zatrichota
        - 11 Calyx more than 1 mm long
          - 13 Calyx 1.2–1.5 mm long
            - 14 Phyllodes in whorls of 10–15, 2–7 mm long; mucro 2.5–3 mm long; calyx lobes obtuse ..... A. smeringa
            - 14 Phyllodes in whorls of 15–20, 8–15 mm long; mucro ca. 1–1.5 mm long; calyx lobes acute or acuminate ..... A. longipedunculata
          - 13 Calyx 1.7–2.2 mm long ..... A. porcata
  - 7 Petals striate
    - 15 Calyx lobes broadly triangular or rounded
      - 16 Flowers 10–25 per head; seeds longitudinal
        - 17 Phyllodes 14–18 per whorl; stipules 3–4.5 mm long; pod not viscid ..... A. capillaris
        - 17 Phyllodes 8–11 per whorl; stipules 0.4–3 mm long; pod viscid
          - 18 Flowers 20–25 per head; stems velvety-tomentose ..... A. chippendalei
          - 18 Flowers usually 10–20 per head; stems puberulous, pubescent or glabrous ..... A. galioides
      - 16 Flowers 25–35 per head; seeds transverse ..... A. orthotricha
    - 15 Calyx lobes linear
      - 19 Phyllode mucro 2–4 mm long; flowers 40–50 per head ..... A. anasilla
      - 19 Phyllode mucro less than 1.5 mm long; flowers usually fewer than 40 per head
        - 20 Phyllodes usually 2–5 mm long, occasionally to 9 mm; stems not viscid
          - 21 Phylodes 10–14 per whorl; mucro curved, commonly 1–1.5 mm long; seeds longitudinal ..... A. lycopodiifolia
          - 21 Phyllodes 6–10 per whorl; mucro oblique, to 0.2 mm long, or absent; seeds transverse or slightly oblique ..... A. adoxa
        - 20 Phyllodes usually 8–15 mm long, occasionally as short as 6 mm; stems, or at least stipules, viscid
          - 22 Stipules 2–3 mm long; phyllodes flattened, or channelled above; calyx 0.9–1.5 mm long ..... A. perryi
          - 22 Stipules <2 mm long; phyllodes terete; calyx 0.6–0.9 mm long ..... A. asperulacea

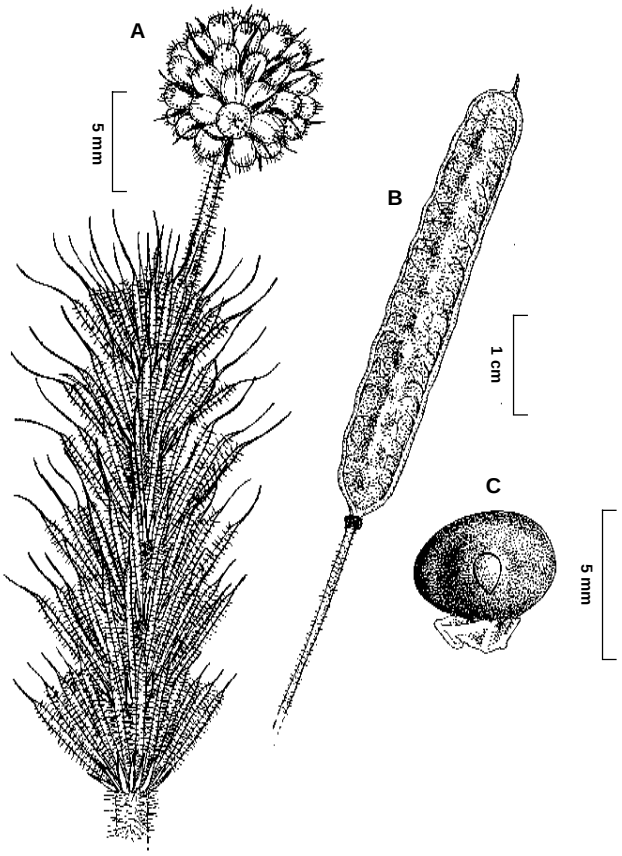

Figure 1. A–C, *Acacia anasilla.* A, portion of flowering branchlet; B, pod; C, seed.

Distribution and habitat Recorded from Mabel Downs and Springvale Stations and Dimond Gorge on the Fitzroy River, WA (Fig 2). Grows on sandstone hillsides in *Eucalyptus brevifolia* woodland. Flowers in Oct.–Nov.

Conservation status 2R-

Etymology Specific name from the Greek *anasillos* (a bristling hair), in reference to the overall appearance of the plant.

Other collections examined Dimond Gorge, ca. 70 km NE of Fitzroy Crossing, Fitzroy River, *A C Beauglehole 53813* (BRI, PERTH); NW of Springvale Station, *M Lazarides 5068* (CANB, MEL); Ord River, 1888, - *Nyntasy* (MEL); Halls Creek, 1895, *W D Mansbridge* (MEL).

Affinities This species has more flowers per head than others of the section. It resembles *A. lycopodiifolia* but is larger in all its vegetative parts. It is also similar to *A. smeringa*, differing especially in its striate corolla and narrow calyx lobes. The early collections from Ord River and Halls Creek possibly have general locality data.

Acacia capillaris A S George, sp nov (Fig 3 A-C)

Ad *Acaciam lycopodiifoliam* Cunn ex Hook affinis, a qua stipulis longioribus (3–4.5 mm longis) setaceis; phyllodiis in quoque verticillo 14–18; pedunculis longioribus (14–17 mm longis); calyce obscure striato lobis triangularibus; et legumine breviter stipitato, praecipue differt.

Typus: W of Mt Bell, [King] Leopold Range, WA, 17° 09' S, 125° 17' E, 5 May 1988, *R J Cranfield* 6719 (holo: PERTH 00909661; iso: CANB, K).

Erect *shrub* 40 cm tall. *Stems* pilose with spreading white hairs to 1 mm long; internodes 8–12 mm long, shorter on some branchlets. *Phyllodes* 14–18 per whorl, erect, somewhat flattened adaxially, 5–6 mm long, with an oblique to almost uncinate mucro 0.3–0.5 mm long, pilose with ascending to spreading white hairs; stipules setaceous, 3–4.5 mm long, spreading, yellowish. *Peduncles* 14–17 mm long, pilose with spreading white hairs that are more flexuose than on vegetative parts. *Heads* 15–20-flowered; bracteoles subulate, 2–2.5 mm long, glabrous. *Calyx* 0.8-1 mm long, divided for ca. half length into

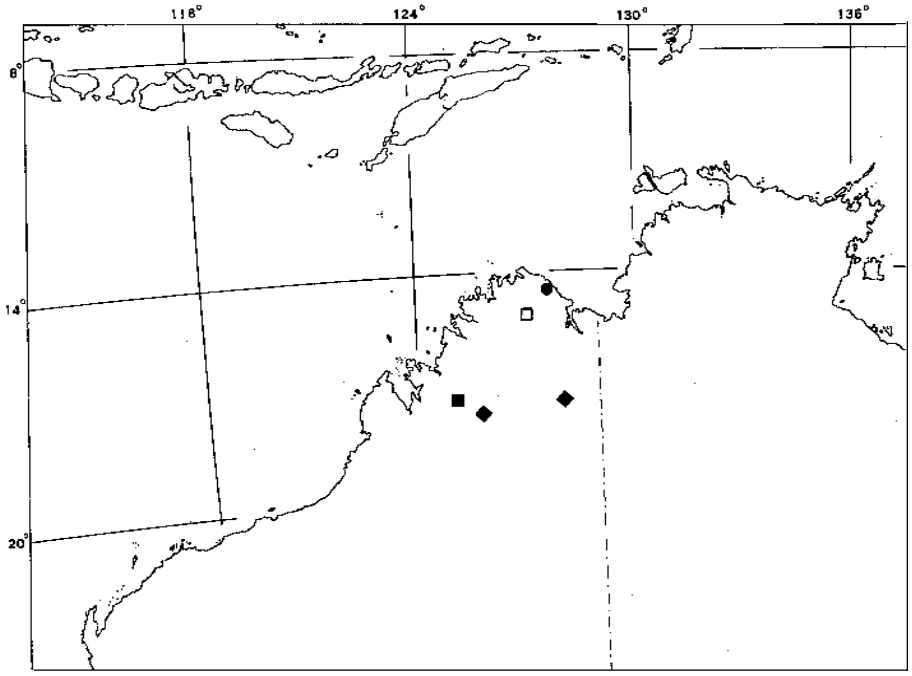

Figure 2. Distribution of *Acacia anasilla* (u), *A. capillaris* (n), *A. hypermeces* (l) and *A. mitodes* ( ).

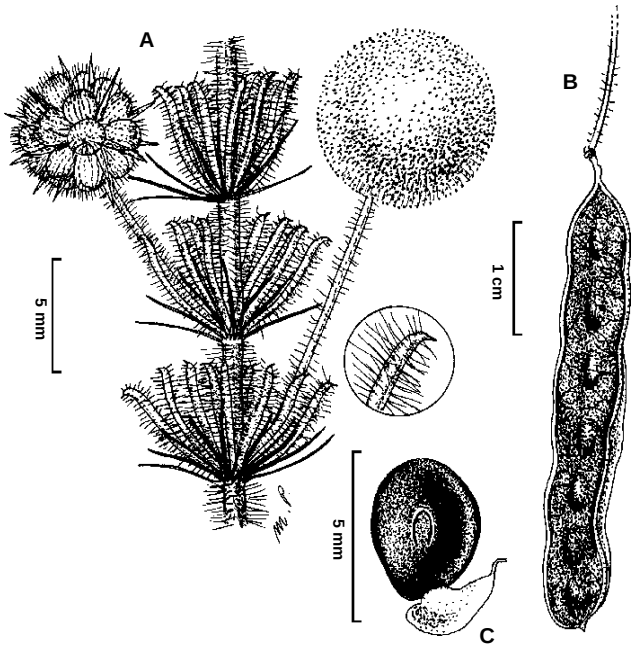

Figure 3. A–C, *Acacia capillaris.* A, portion of flowering branchlet with apex of phyllode (insert); B, pod; C, seed.

triangular obtuse lobes, not or obscurely striate, glabrous. *Corolla* 2–2.4 mm long, the lobes striate, pilose. *Pod* on stipe 2–3 mm long, linear, flat but raised over seeds, not viscid, 1.5–4 cm long, 4–4.5 mm wide, glabrous, brown; margin slightly thickened. *Seeds* 2–8 per pod, longitudinal, obliquely elliptic, 3.5 mm long, black; pleurogram distinct, open, ca. 1 mm long; aril nearly 2 mm long, cupular, offset to one side; funicle very small.

Distribution and habitat Known from Mt Bell and Scott Gorge in the Kimberley, W.A. (Figure 2). Grows in red-brown clay over granite, under *Livistona* palms near creek, and on rocky slopes among *Triodia.* Flowers in May.

Conservation status 2K-

Etymology Specific epithet taken from the Latin *capillaris* (hair- or thread-like), in reference to the fine stipules.

Other collection examined Scott Gorge, 17° 05' S, 125° 16' E, *M J Sands 4768* (K, PERTH).

Affinities This species is closely related to *A. lycopodiifolia* Cunn ex Hook in its long mucro of the phyllode, striate hairy corolla and pod with longitudinal seeds, but may be distinguished especially by the long, setaceous stipules. It may be distinguished further by the more numerous phyllodes in the whorl, obscurely striate calyx with triangular lobes, and shortly stipitate pod.

Acacia hypermecesA S George, sp nov (Fig 4 A,B)

Ad *Acaciam repentem* A S George affinis, a qua indumento densiore in apice corollae includente; phyllodiis per verticillo pluribus; calyce longiore breviter et irregulariter lobato; et stipite leguminis longiore (ad 4 cm longo), differt.

Typus: mouth of Berkeley River, WA, 14° 21' S, 127° 46' E, 9 Sept 1992, *K F Kenneally 11313* (holo: PERTH 02250594; iso: CANB, K).

Prostrate *shrub* to ca. 1 m wide, the branches, phyllodes and corolla apex openly hispid; internodes 3–10 mm long on upper stems, up to 26 mm on main stems. *Phyllodes* 9–12 per whorl, spreading to ascending, with straight or slightly curved mucro 0.2–0.3 mm long, flat with 1 adaxial and 2 abaxial grooves, commonly 8–15 mm long; stipules subulate, ca. 1 mm long, spreading. *Peduncles* 10–26 mm long, openly hispid. *Heads* commonly 16–21-flowered; bracteoles ovate to lanceolate, acute, 1 mm long, glabrous. *Calyx* 0.8 mm long; lobes very short, rounded-irregular, with midrib. *Corolla* 2 mm long, striate throughout, hispid at apex. *Pod* stipitate, 3–4 cm long, 5–6 mm wide, glabrous; margin slightly thickened. *Seeds* ca. 6 per pod, longitudinal, 3–4 mm long; pleurogram elliptic, closed; aril boat-shaped; funicle small?.

Distribution and habitat Known only from the type and a nearby locality in the Kimberley, WA. (Fig 2), growing in alluvial sand over sandstone rocks. Flowers in June.

Conservation status 2K-

Etymology Specific epithet from the Greek *hypermekes* (very long), in reference to the stipe of the legume.

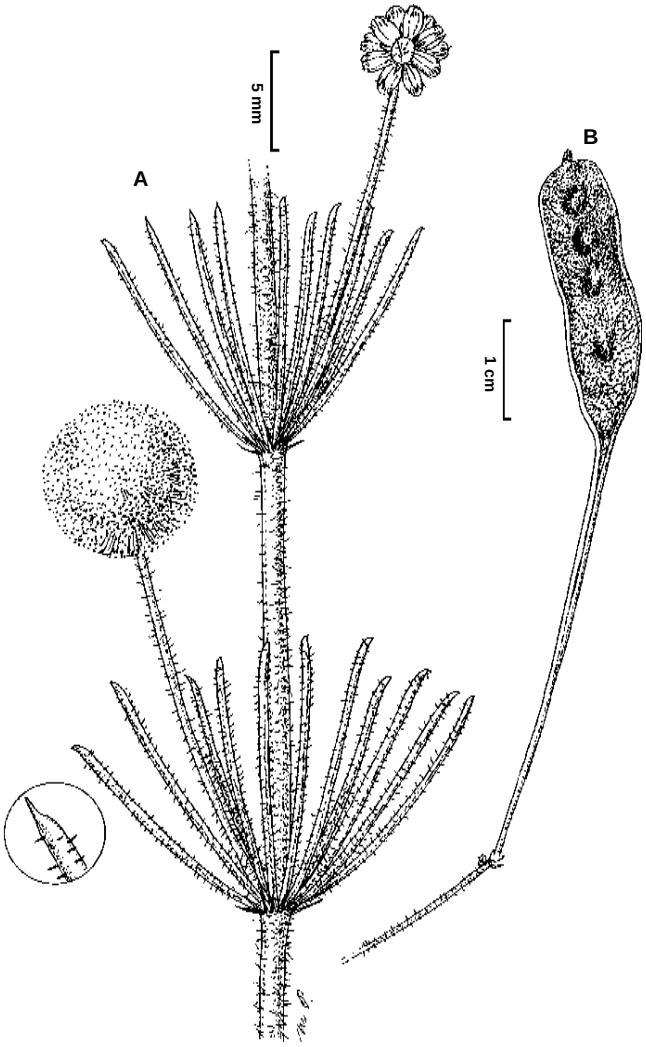

Figure 4. A,B, *Acacia hypermeces.* A, portion of flowering branchlet with apex of phyllode (insert); B, pod.

Affinities This is related to *A. repens* with which it shares the prostrate habit but from which it is distinguished by the more extensive indumentum including that on the corolla apex, by the greater number of phyllodes per whorl, by the longer, irregularly lobed calyx and by the very long stipe of the legume.

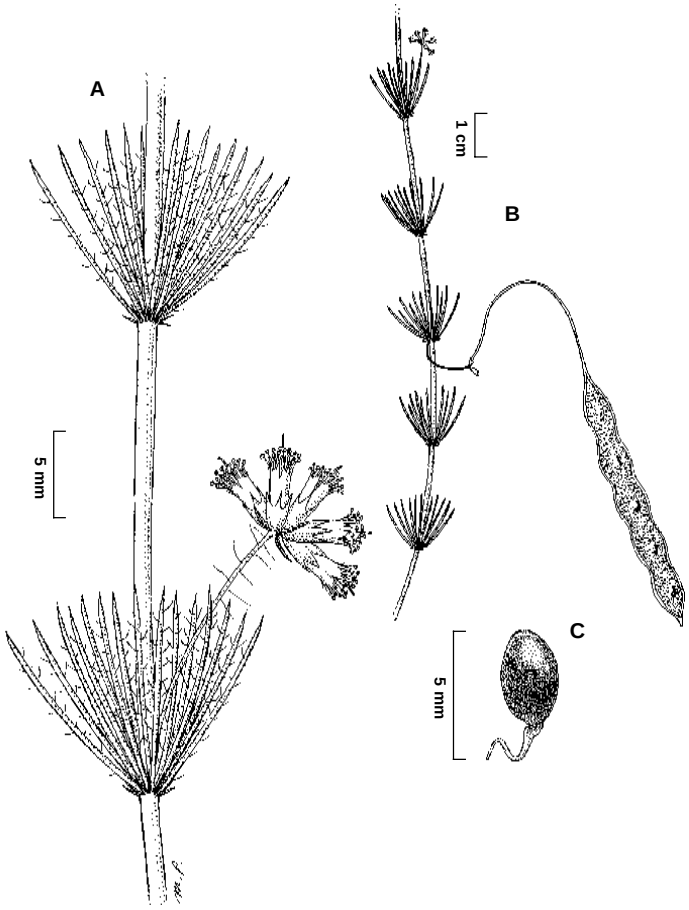

Figure 5. A-C, *A. mitodes.* A, portion of flowering branchlet; B, pod.; C, seed.

Acacia mitodes A S George, sp nov (Fig 5 A-C)

Inter species sectionis *Lycopodiifoliae* habitu prostrato, capitulis paucifloris (floribus 6–8 per capitulum) distinguitur; ad *A. hypermeces* A S George arcte affinis, sed calyce longiore (1.8–2 mm longo) lobis triangularibus, phyllodiis per verticillum numerosioribus (12–17), caulibus glabris, et stipulis longioribus (1.5–1.8 mm longis), praecipue differt.

Typus: Carson Escarpment, Drysdale River National Park, WA, 14º 49' S, 126º 49' E, 2 June 1996, *A A Mitchell 4404* (holo: PERTH 05199956; iso: CANB, K).

Prostrate *shrub. Stems* glabrous; internodes 19–30 mm long. *Phyllodes* 12–17 per whorl, erect to gently incurved, terete, acute with mucro ca. 0.2 mm long, 12–19 mm long, sparsely setose; stipules subulate, 1.5–1.8 mm long, erect to somewhat spreading, light brown. *Peduncles* 15–19 mm long, sparsely pilose. *Heads* 6–8-flowered; bracteoles navicular, ca. 1 mm long, glabrous. *Calyx* 1.8–2 mm long, smooth, glabrous; lobes triangular. *Corolla* 2.3–2.5 mm long, smooth, glabrous except setose lobes. *Pod* on stipe 45–55 mm long, 3–5 cm long, 7–8 mm wide, glabrous; margins slightly thickened. *Seed* (immature) longitudinal.

Distribution and habitat Known only from the type locality in the Kimberley, WA (Fig 2). Grows in woodland at top of a sandstone cliff. Flowers in May–June.

Conservation status 1KC-

Etymology The specific name is from the Greek *mitodes* (thread-like), in reference to the long, filiform stipe of the pod.

Affinities Distinguished especially by the few-flowered heads. Closely related to *A. hypermeces*, differing also in the longer calyx, more phyllodes per whorl and longer stipules.

Acacia repens A S George, sp nov (Fig 6 A, B)

Ab speciebus aliis *Acaciae* sectionis *Lycopodiifoliae* habitu prostrato glabro praeter ramos et pedunculos parce hispidos, et corolla prominenter striata, praecipue differt.

Typus: Carr Boyd Range, ENE of Dunham River Station homestead, WA, 16° 14' S, 128° 29' E, 12 March 1978, *M Lazarides 8519* (holo: CANB, iso: BRI, DNA).

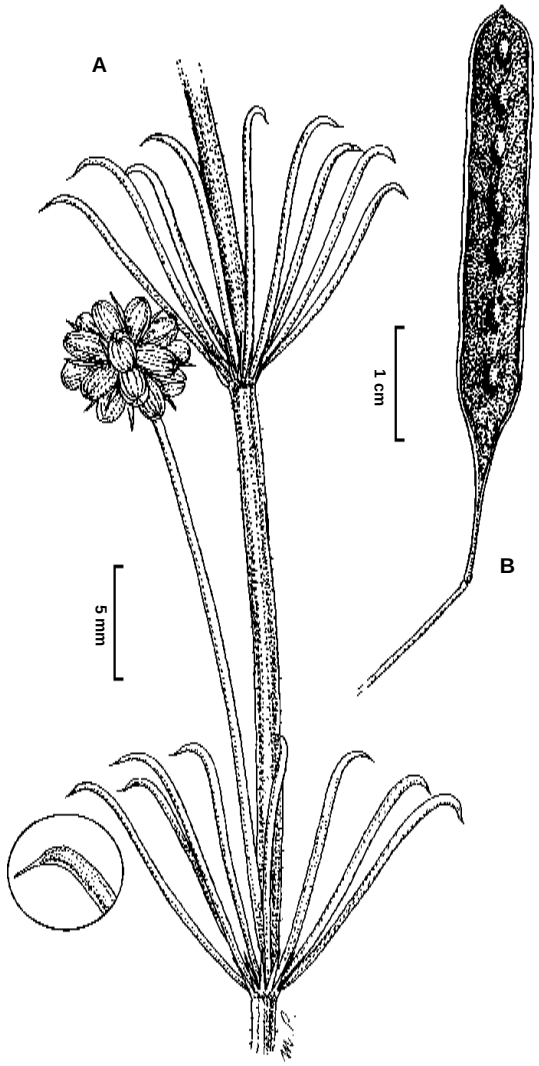

Figure 6. A,B, *Acacia repens.* A, portion of flowering branchlet with apex of phyllode (insert); B, pod.

Conservation status: 1K-

Etymology: The specific epithet is from the Latin repens (creeping), in reference to the unusual habit.

Other collection examined: Jasper Gorge, W of Jasper Creek on road to Timber Creek, NT, B R Maslin 7485, M McDonald & G Leach (DNA, PERTH).

Affinities: Foliage bright green; branches purplish. Distinguished by the prostrate habit which it shares with A. hypermeces but from which it differs in the sparse indumentum on branches and peduncles only, the fewer phyllodes per whorl, a shorter uncinate mucro on the phyllodes, the prominently striate corolla and a much shorter stipe to the pod. The Jasper Gorge collection is more hairy than the type but otherwise is a reasonable match.

Acacia smeringa A S George, sp nov (Fig 8 A-C)

Ad Acaciam lycopodiifoliam Cunn ex Hook affinis, a qua phyllodiis in quoque verticillo 15–20; phyllodiis recurvis ad uncinatis mucrone longissimo (2.5–3 mm longo); pedunculis longioribus (14–22 mm longis); calyce longiori (1.5 mm) lobis brevibus latis; et corolla glabra vix striata, differt.

Typus: Packhorse Range, WA, ca. 16°3', 125°6', May 1905, W V Fitzgerald 1009 (holo: PERTH 00187143).

Erect shrub to ca. 1 m tall. Stems loosely tomentose with white hairs to ca. 0.5 mm long; internodes 5–15 mm long. Phyllodes 15–20 per whorl, erect to spreading with recurved to uncinate tip, linear, thick, 2–7 mm long, setose; mucro 2.5–3 mm long, excentric, spreading to recurved, glabrous; stipules linear-subulate, 1.5–2 mm long, incurved, yellowish. Peduncles 14–22 mm long, pilose with spreading white hairs. Heads ca. 30-flowered; bracteoles lanceolate, subulate, concave, 2–2.5 mm long, glabrous, the margins slightly irregular. Calyx 1.5 mm long, shortly broadly and obtusely lobed, ribbed, glabrous. Corolla 2.5 mm long, scarcely ribbed, glabrous. Pod sessile or almost so, linear, gently curved, flat but raised over seeds, 3–7.5 cm long, 5–6.5 mm wide, glabrous, brown; margin thickened. Seeds 5–9 per pod, longitudinal, ovoid-obovoid with oblique apex, 5–6 mm long, 3.5 mm wide, black, shining; pleurogram elliptic-obovate, closed, 1 mm long; aril boat-shaped along seed, 3–4 mm long; funicle small.

Distribution and habitat: Known from the type, a collection from near Mt Jameson, and one from near the Manning River, WA (Fig 7). Grows in shallow rocky soil, in woodland dominated by Eucalyptus argillacea with Plectrachne common in the understorey. Flowers in May–June.

Conservation status: 2K-

Etymology: The specific epithet is taken from the Greek merinx/smerinx (a bristle), in reference to the bristly aspect of the plant due to the long mucro of the phyllode.

Other collections examined: near Manning River, I Cowie 329 (PERTH); Mt Jameson area, E R Tudor B14 (MEL).

Affinities: Related to A. lycopodiifolia Cunn ex Hook but distinguished especially by the recurved to uncinate phyllode tip with very long mucro, the more numerous phyllodes per whorl, longer calyx with short, broad lobes, and glabrous, scarcely striate corolla. The phyllode shape, shortly lobed calyx, larger scarcely striate glabrous corolla and closed pleurogram distinguish it from A. capillaris. The collection from the Mt Jameson area is very close to the type morphologically but has a mucro on the phyllode only 1.5–1.7 mm long. A recent collection from the Caroline Range, R L Barrett 619 (PERTH), closely resembles A. smeringa but has hispid flowers.

Acacia zatrichota A S George, sp nov (Fig 9)

Inter species alias sect Lycopodiifoliae indumento densissimo, phyllodiis grandibus (8–18 mm longis), capitulis grandibus, bracteolis et calyce glabro, praecipue differt.

Typus: above Picaninny Gorge, Bungle Bungle National Park, WA, 17° 26' S, 128° 24' E, 4 July 1989, A Menkhorst 475 (holo: PERTH 1582586; iso: DNA, MEL).

Erect shrub to 1.5 m. Stems densely pilose with white hairs; internodes 2–9 mm long. Phyllodes 16–20 per whorl, erect, straight to incurved, terete, obscurely 1-grooved adaxially, 8–18 mm long, with an oblique mucro 0.2–0.4 mm long, pilose with spreading yellowish hairs; stipules subulate, 0.5–2.8 mm long, spreading, brown. Peduncles solitary, 23–30 mm long, sparsely pilose with white hairs. Heads ca. 30-flowered; bracteoles lanceolate, acuminate, 2.5–3 mm long, glabrous. Calyx 0.7–0.8 mm long, with short narrow lobes, smooth, glabrous. Corolla 2.5–2.8 mm long, glabrous except hirsute, smooth to faintly striate lobes. Pod sessile, linear, not viscid, not seen mature. Seeds 3–6 per pod, ?longitudinal, not seen mature.

Distribution and habitat: Occurs in the Bungle Bungle National Park, south-eastern Kimberley, WA (Fig 7). Grows in dissected sandstone, with open woodland or shrubland usually with Triodia. Flowers in June–July.

Conservation status: 2KC-

Etymology: The specific name is from the Greek trichotos (hairy) with the intensive participle za- used as a prefix, in reference to the prominent indumentum.

Other collections examined: Bull Ck, Bungle Bungle National Park, G N Cowie 924 (DNA); Swamp Creek, Winnama Gorge, S J Forbes 252 (BRI, MEL).

Affinities: A distinctive species with large hairy phyllodes and large heads. The glabrous bracts and calyx are characteristic.

Acknowledgments:

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