

## Miscellaneous new species of *Acacia* (Fabaceae: Mimosoideae) from south-west Western Australia

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### Abstract

Maslin, B.R. Miscellaneous new species of *Acacia* (Fabaceae: Mimosoideae) from south-west Western Australia. *Nuytsia* 24: 139–159 (2014). Six new species endemic to south-west Western Australia are described. Three of the species belong to *Acacia* Mill. sect. *Acacia* (formerly sect. *Phyllodineae* DC.), namely, *A. adjutrices* Maslin (based on *A. insolita* subsp. *efoliolata* Maslin), *A. coatesii* Maslin and *A. thieleana* Maslin, one from *Acacia* sect. *Juliflorae* (Benth.) Maiden & Betche, namely, *A. collegialis* Maslin and two from *Acacia* sect. *Plurinerves* (Benth.) Maiden & Betche, namely, *A. besleyi* Maslin and *A. fraternalis* Maslin. Three of the species have conservation value under Department of Parks and Wildlife Conservation Codes for Western Australian Flora, namely, *A. adjutrices* (Priority Three), *A. besleyi* (Priority One) and *A. coatesii* (Priority One).

### Introduction

Six miscellaneous new species from the south-west of Western Australia are described. These species are referable to *Acacia* Mill. sect. *Acacia* (formerly sect. *Phyllodineae* DC.), sect. *Juliflorae* (Benth.) Maiden & Betche and sect. *Plurinerves* (Benth.) Maiden & Betche, and all are included in the online identification key to Australian acacias (Maslin 2014).

### *Acacia* Mill. sect. *Acacia*

*Acacia adjutrices* Maslin, *nom. et stat. nov.*

*Basionym:* *Acacia insolita* subsp. *efoliolata* Maslin, *Nuytsia* 12(3): 362 (1999). *Type:* near Pingelly [precise locality withheld for conservation reasons], Western Australia, 6 August 1981, B.R. Maslin 5044 (*holo:* PERTH 00168920; *iso:* CANB, K, NY, PERTH 00616249).

Multi-stemmed, normally erect *sub-shrub* 0.3–0.7 m tall, sometimes sprawling or prostrate. *Stems* slender, green, glabrous or sometimes with sparse, minute, appressed to patent hairs in axils of phyllodes or on the terminal, inflorescence-bearing region of stems. *New shoots* brownish red except tips of young phyllodes distinctively yellow. *Stipules* 0.5–1 mm long. *Bipinnate leaves* (on mature plants) absent or rarely a few at base of stems; *pinnae* 1 pair, 5–12(–15) mm long; *petiole* 15–40 mm long, eglandulose; *leaflets* 2–3(–4) pairs, ± lanceolate, sometimes narrowly elliptic or oblong-elliptic, 5–12(–20) mm long, 2–4(–7) mm wide, flat, sub-glaucous, glabrous or with minute, appressed hairs on margins. *Phyllodes*

often superficially resembling the stems, usually linear, 50–150(–180) mm long except shorter (mostly 15–40 mm) at ends of stems where inflorescences occur, usually (0.5–)0.8–2 mm wide, ascending to erect, straight or shallowly curved or shallowly sigmoid, green, glabrous, flat except sometimes  $\pm$ quadrangular when very narrow; *midrib* prominent, raised when dry; *lateral nerves* usually not evident; *apices* acute with a straight to curved or occasionally uncinuate tip; *pulvinus* 0.5–1 mm long; *gland* absent. *Inflorescences* simple, initiated on new shoots within axils of juvenile phyllodes, 1 or 2 per axil, sometimes a few short axillary racemes (1.5–8 mm long) or false racemes at ends of branchlets where phyllodes fail to develop; *peduncles* 4–10(–12) mm long, sparsely to densely hirtellous, the hairs very short, fine and patent or sometimes sub-appressed; *heads* globular, 11–19-flowered, golden. *Bracteoles* oblong to spatulate, *c.* 1 mm long, sessile or with a short, oblong stipe, laminae acute. *Flowers* 5-merous; *calyx* gamosepalous, 1/2–2/5 length of corolla, dissected for 1/3–1/2 its length into triangular lobes; *calyx tube* glabrous to puberulous; *corolla* glabrous, petals prominently 1-nerved. *Pods* linear to narrowly oblong, 30–60 mm long, 4–4.5 mm wide, not constricted between the seeds and not or scarcely raised over them, flat, crustaceous, straight to slightly curved, greyish brown, often faintly pruinose, glabrous, nerveless or very obscurely reticulately nerved with small nerve-islands, margins thickened and yellow. *Seeds* longitudinal in pods, rarely a few transverse, normally obloid, sometimes ellipsoid, obliquely truncate on edge adjacent to aril, 3–4 mm long, 2–2.5(–3) mm wide, seated in distinct, oblong, longitudinally oriented depressions 4–5(–6) mm long and *c.* 3 mm wide, shiny, black or sometimes a few very dark brown; *pleurogram* continuous; *areole* elliptic, 1.3–2 mm long, 0.5–0.7 mm wide; *aril* clavate, not folded, cream-coloured. (Figure 1)

*Characteristic features.* Multi-stemmed *sub-shrub* normally 0.3–0.7 m tall. *Stems* slender, glabrous or sometimes sparsely hairy. *New shoots* brownish red with tips of young phyllodes yellow. *Bipinnate leaves* (mature plants) absent or rarely a few at base of stems; *pinnae* 1 pair, 5–12(–15) mm long; *petiole* 15–40 mm long, eglandulose; *leaflets* 2–3(–4) pairs, 5–12(–20) mm long, 2–4(–7) mm wide, flat. *Phyllodes* often resembling the stems, mostly linear, 50–150(–180) mm long except shorter (mostly 15–40 mm) where inflorescences occur, usually (0.5–)0.8–2 mm wide, ascending to erect, green, glabrous, flat except sometimes  $\pm$ quadrangular when very narrow; *midrib* prominent, raised when dry; *gland* absent. *Inflorescences* mostly simple; *heads* globular, 11–19-flowered, golden. *Flowers* 5-merous; *calyx* dissected for 1/3–1/2 its length into triangular lobes; *petals* prominently 1-nerved. *Pods* linear to narrowly oblong, 30–60 mm long, 4–4.5 mm wide, crustaceous,  $\pm$ straight, greyish brown, often faintly pruinose, glabrous, margins thickened and yellow. *Seeds* mostly longitudinal in pods, obliquely truncate on edge adjacent to aril, seated in distinct, oblong, longitudinally oriented, depressions; *areole* elliptic; *aril* clavate.

*Selected specimens examined.* WESTERNAUSTRALIA: [localities withheld for conservation reasons] 8 July 1977, *A.S. George* 14611 (AD, PERTH); 28 Sep. 2000, *G.J. Keighery & N. Gibson* 4020 (PERTH); 21 Jan. 1960, *J. Kelsall* 45 (PERTH); Aug. 1988, *D. Lamont s.n.* (PERTH 00921270); 12 Aug. 1996, *B.J. Lepschi* 2873 & *T.R. Lally* (AD, CANB, MEL, NSW, PERTH); 6 Aug. 1981, *B.R. Maslin* 5044 A (K, PERTH); 7 Aug. 1980, *K. Wallace s.n.* (BRI, MEL, NSW, PERTH 00168475).

*Distribution.* Occurs in south-west Western Australia in a few, disjunct populations from near Pingelly and Brookton in the south-central wheatbelt, extending north-west of Brookton to Wandoo Conservation Park.

*Habitat.* Grows in loam or clay on laterite hills, in sandplain scrub, normally in association with *Eucalyptus wandoo*.



Figure 1. *Acacia adjutrices*. A – habit; B – stem base showing multi-stemmed base and strong main root; C – flowering branch showing inflorescences simple (lowermost node) or arranged in axillary racemes or false terminal racemes; D – branchlets with linear phyllodes; E – pods. Photographs by Bruce Maslin.

*Phenology*. Flowers in July and August; pods with mature seed have been collected from late November to mid-December.

*Conservation status*. *Acacia adjutrices* is listed by Smith (2013) as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora, under the name *A. insolita* subsp. *efoliolata*.

*Etymology*. The species epithet is derived from the Latin *adjutrix* (a female helper), and is applied here as a plural noun in apposition. It is with great pleasure that I name this species for Susan (Sue)

Carroll, Meriel Falconer, Evelyn McGough and Kaye Veryard, past and present members of the Western Australian Herbarium ‘database team’. Their excellent work, so willingly and graciously undertaken, in maintaining accurate content for the two Herbarium databases, WAHERB and WACENSUS, has greatly facilitated my work on *Acacia* for the past two to three decades. Parenthetically it is noted that the word *adjutrix* was used by Lewis and Short (1879: 38) in an example from the Histories of Tacitus, *legiones adjutrices* for ‘legions raised by the proconsul in the provinces for the purpose of strengthening the veteran army’, could be loosely adapted here for staff appointed by a Curator in a State for supporting an aged botanist such as myself.

*Common name.* Convivial Wattle.

*Variation.* The specimen *J. Kelsall* 45 is atypical in the lowermost phyllodes on the stems being narrowly elliptic and wider than normal (3–9 mm), with the broadest ones finely penninerved.

*Affinities.* This species is most closely related to *A. insolita* E.Pritz. within which it was formerly treated as a subspecies (*vide* Maslin 1999: 362–363). *Acacia insolita* can be readily distinguished by the persistent and normally conspicuous bipinnate foliage that extends from the base of its stems to the upper fertile region where inflorescences and phyllodes are produced. Apart from being more numerous, these leaves have longer pinnae (mostly 18–50 mm) with more numerous leaflets (mostly 5–10 pairs) than those of *A. adjutrices*. The carpological features of the two species are very similar except that in *A. insolita* the pods are wider (normally 5.5–7 mm), the seeds are normally transverse to oblique and are seated in wider (mostly 4–5 mm) depressions that are  $\pm$ square, or if oblong, are transversely oriented (the depressions are *c.* 3 mm wide and longitudinally oriented in *A. adjutrices*). The inflorescences of the two species are essentially the same, but sometimes the heads of *A. insolita* are creamy yellow. The main area of occurrence for *A. insolita* is the forest region from Dwellingup and Marradong south to near Nannup and Manjimup, but it also occurs in the wheatbelt region in the Popanyining–Wickepin–Narrogin area, just south of where *A. adjutrices* is found. A revised description of *A. insolita*, with subsp. *efoliolata* excised, is provided in Maslin (2014).

*Acacia adjutrices* has a superficial resemblance to *A. flagelliformis* Court which has consistently racemose inflorescences (the racemes are enclosed when young by conspicuous brown bracts), 6–9-flowered heads, nerveless petals and no bracteoles. *Acacia flagelliformis* occurs in the vicinity of Busselton, well-removed from where *A. adjutrices* grows.

***Acacia coatesii* Maslin, *sp. nov.***

*Type:* south of Coolgardie, Western Australia [precise locality withheld for conservation reasons], 3 September 2012, *N. Gibson* 6433 (*holo:* PERTH 08396183; *iso:* CANB, K, MEL, NSW).

*Acacia* sp. Londonderry (N. Gibson 6433), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed June 2014].

Low-domed, intricately branched, compact, rigid *sub-shrub* 20–40 cm tall and 0.5–1.5 m across, plants forming hemispherical cushions. *Main branches* sub-crooked, dividing into many short, straight, rigid, ascending to erect, pungent *branchlets* that are terete, very obscurely nerved, glabrous, orange-red at tips when young (but aging green then light grey), often lightly pruinose and devoid of phyllodes when old. *Stipules* caducous or sub-persistent, narrowly triangular, 0.5–1 mm long, erect, brittle, neither rigid nor pungent, brown, glabrous. *Phyllodes* lanceolate to narrowly elliptic or oblong-elliptic, 6–15 mm

long, (1–)1.5–3 mm wide, l: w = 3–7, straight or sometimes slightly incurved, wide-spreading to erect, sub-glaucous to dull green, glabrous (or occasionally with a few appressed hairs on margins of young phyllodes); *midrib* prominent, central to sub-central, yellow; *lateral nerves* not visible; *marginal nerves* yellow or (on young phyllodes) reddish or light brown, the upper margin 2-nerved below the gland and 1-nerved above the gland; *apices* gradually narrowed to a straight, rigid, slender, subulate, dark brown, pungent to sub-pungent cusp 1–2 mm long; *pulvinus* distinct, 0.5–1 mm long, terete, yellow, very finely transversely wrinkled when dry. *Gland* situated on upper margin of phyllode 1–2 mm above the pulvinus, sometimes absent, rarely 2 close together,  $\pm$ circular, c. 0.2 mm diam., neither prominent nor raised. *Inflorescences* simple and 2 per node or vestigial, binate racemes with axes 0.1–0.2 mm long, a vegetative bud normally initiated in axil between the peduncles at anthesis; *peduncles* 3–4 mm long but may reach 6 mm when in pod, often shallowly recurved in pod, glabrous; basal peduncular bract single, caducous, cucullate, curved and concave, c. 1.5 mm long, brown, glabrous, sessile; *heads* globular, 8–9-flowered, 3–4 mm diam. at anthesis when dry, bright golden, showy. *Bracteoles* spatulate, c. 1 mm long, brown; *claws* narrowly oblong; *laminae* about as long as the claws, narrow, sparsely hairy abaxially, acute to short-acuminate. *Calyx* absent or reduced to a single, linear, short, membranous, glabrous, colourless sepal; *petals* 5, 1–1.2 mm long, glabrous, nerveless. *Pods* (immature) oblong, 10–15 mm long, 3–4 mm wide, straight to very slightly curved, flat, very slightly raised over seeds and not constricted between them, dark-coloured, glabrous, very obscurely reticulate or nerves not visible, obtuse; margins thickened, yellow; abruptly constricted at base to a short stipe c. 1 mm long. *Seeds* (immature) oblique in pods, funicle expanded into a clavate, white *aril*. (Figure 2)

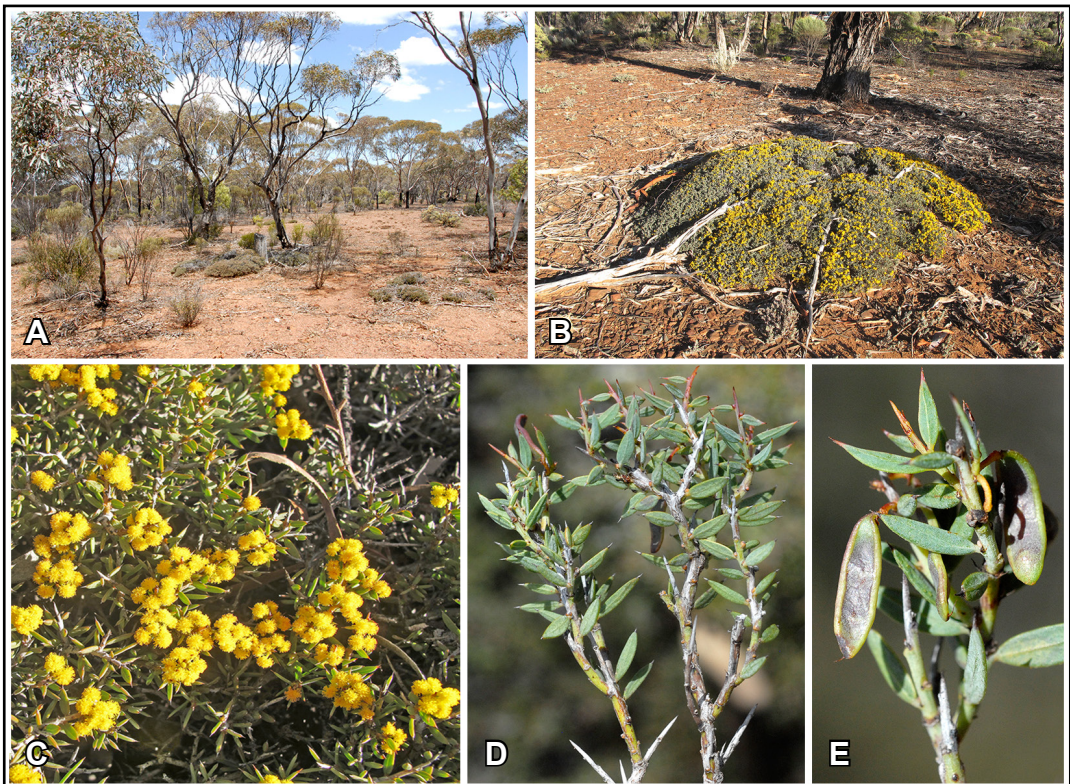


Figure 2. *Acacia coatesii*. A – habitat; B – habit showing low-domed, compact growth form; C – flowering branches; D – branches showing short, spinescent branchlets and small, pungent phyllodes; E – pods (small). Photographs by Neil Gibson (B, C) and Bruce Maslin (A, D, E).

*Characteristic features.* Low-domed, intricately branched, compact, generally glabrous *sub-shrub* 20–40 cm tall, forming hemispherical cushions. *Branches* dividing into many short, straight, rigid, ascending to erect, pungent *branchlets*. *Stipules* caducous or sub-persistent, not pungent. *Phyllodes* lanceolate to narrowly elliptic or oblong-elliptic, 6–15 mm long, (1–)1.5–3 mm wide, normally straight, wide-spreading to erect, sub-glaucous to dull green; *midrib* prominent; *lateral nerves* not visible; *apices* pungent to sub-pungent by slender, straight cusp 1–2 mm long; *pulvinus* 0.5–1 mm long. *Inflorescences* simple and 2 per node or vestigial, binate racemes; *peduncles* 3–4(–6) mm long; basal peduncular bract single, caducous, cucullate, *c.* 1.5 mm long; *heads* globular, 8–9-flowered, small (3–4 mm diam. at anthesis when dry), bright golden, showy. *Bracteoles* spatulate, *c.* 1 mm long, brown. *Calyx* absent or reduced to a single, linear, short, membranous sepal; *petals* 5, 1–1.2 mm long, 1-nerved but nerve not visible at the apex. *Pods* (immature) oblong, 10–15 mm long, 3–4 mm wide, ±straight, flat, not constricted between seeds; margins thickened, yellow. *Seeds* (immature) oblique in pods.

*Other specimens examined.* WESTERN AUSTRALIA: [localities withheld for conservation reasons] 27 Nov. 2012, *J. Jackson* 255 (PERTH); 8 Dec. 2013, *B.R. Maslin* 10285 (PERTH); 11 Oct. 2011, *R. Meissner & R. Coppen* 3720 (PERTH); 8 Sep. 1966, *K. Newbey* 2556 (PERTH).

*Distribution.* Occurs in the goldfields region of south-west Western Australia where it is presently known from only a single population (containing several hundred plants) south of Coolgardie. This population occurs on Bullabulling Pastoral Lease in an area covered by an existing mining tenement. The paucity of collections of this species is somewhat surprising because the area where it occurs is not especially remote, and has been subject to at least intermittent collecting activity for more than one hundred years (dating back to about the late 19<sup>th</sup> Century when L.C. Webster collected in the general region, *vide* Hall 1978).

*Habitat.* Open woodland dominated by *Eucalyptus clelandii* and *E. lesouefii* over open shrubland that includes *Acacia erinacea*, *A. hemiteles*, *Atriplex nummularia*, *Eremophila scoparia*, *Dodonaea stenozyga* and *Olearia muelleri*. Grows in shallow, red, sandy clay on flat or gently sloping ground towards the base of a low greenstone ridge (greenstones are variably metamorphosed mafic to ultramafic volcanic sequences with associated sedimentary rocks, *vide* Romano 2012).

*Phenology.* Plants at peak anthesis have been collected in early September and judging from these it is suspected that flowering would extend from about mid-August to early October. Pods with immature seed have been collected in late November and early December; mature seed is likely to be present on plants in mid- to late December.

*Conservation status.* *Acacia coatesii* is listed by Smith (2013) as Priority One under Department of Parks and Wildlife Conservation Codes for Western Australian Flora, as *Acacia* sp. Londonderry (N. Gibson 6433). Further survey of suitable habitats in the Coolgardie region is needed to determine with greater certainty the frequency of the species.

*Etymology.* It is with much pleasure that I have the opportunity to name this species for Dr David (Dave) Coates, Senior Principal Research Scientist with the Department of Parks and Wildlife, in recognition of his major contribution to science and the conservation of Western Australian flora. Furthermore, over the past 30 years or so Dave has given me significant assistance, both scientifically and managerially.

*Common name.* Coates' Cushion Wattle.

*Affinities.* The new species is most closely related to *A. intricata* S.Moore. Both are low-domed, compact sub-shrubs with spinescent, glabrous branchlets, small, glabrous, pungent, 1-nerved phyllodes, and small, few-flowered heads on short, glabrous peduncles; furthermore, they share the very unusual attribute of either having no calyx or if present then represented by a single, linear, membranous sepal (that is very difficult to see, even at magnification). *Acacia intricata* is most readily distinguished from the new species by its thicker, more rigid, sessile phyllodes and its curved to openly once-coiled pods that are narrower (2–2.5 mm wide) and variably but discernibly constricted between the seeds which are longitudinally oriented in the pods. Typical representatives of *A. intricata* have very short phyllodes (2–4 mm long); however, a variant from near Southern Cross in the western extremity of the goldfields region has phyllodes that are within the length range of the new species, namely, 4–10(–20) mm long. *Acacia intricata* has a more westerly distribution than that of *A. coatesii* and, apart from the aforementioned variant, it is largely confined to the wheatbelt region where it extends from Bencubbin and Jaurdi Station south to Lake Grace and Lake King.

*Note.* This species was first collected by Ken Newbey in September 1966.

***Acacia thieleana* Maslin, sp. nov.**

*Type:* Fox's Lair reserve on western outskirts of Narrogin, western boundary, c. 0.5 km south of Narrogin–Williams road, Western Australia, 3 December 2013, B.R. Maslin 10270 (*holo:* PERTH 08517371; *iso:* MEL).

*Acacia* sp. P174 (J.M. Brown 228), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed June 2014].

Grass-like, caespitose, multi-stemmed (from a woody rootstock) *sub-shrub*, either erect and 20–50 cm tall or sprawling/scrambling and ±prostrate. *Stems* gracile, little-divided, green, glabrous or occasionally with microscopic, patent or appressed hairs, rarely loosely pilose, mostly terete to sub-terete or quadrangular, infrequently a few flattened and with a vestigial wing 0.3–0.5(–1) mm wide, smooth or microscopically verrucose. *Stipules* narrowly triangular to ovate-triangular, 0.5–1 mm long, erect, ±scarious. *Phyllodes* continuous with the stems, normally extremely reduced to form erect, brown appendages 0.5–1.5 mm long that are terete or semi-terete, sometimes further reduced to horizontally flattened scales, sometimes phyllodes clearly-developed (they superficially resemble the stems) and 2–33 mm long, 0.3–1 mm wide, erect, straight or shallowly incurved, quadrangular to terete or ±compressed, subulate, 4-nerved with abaxial one the most pronounced, innocuous by a straight or curved, brown tip that is shallowly concave (when dry) on abaxial surface. *Gland* absent. *Inflorescences* simple (single or occasionally twinned at nodes) or short, 1- or 2-headed racemes; *raceme axes* 5–10 mm long, slender, base ebracteate; *peduncles* 5–15(–23) mm long, glabrous, smooth or sometimes microscopically verrucose; *basal peduncular bracts* absent; *heads* globular, 5–9 mm diam. at anthesis when dry, 15–19-flowered, golden or cream-coloured; buds obtuse. *Bracteoles* ovate or oblong-elliptic, 0.8–1(–1.5) mm long, 0.5–0.7 mm wide, shallowly concave, glabrous, sessile or sub-sessile. *Flowers* 5-merous; *calyx* gamosepalous, widely obconic, 2/5–1/2 length of corolla, 1.3–1.5 mm wide at apex, truncate, repand or very shortly dissected into obtuse or broadly triangular, non-thickened lobes; *calyx tube* glabrous, nerveless; *petals* 2.5–3 mm long, glabrous, smooth, nerveless. *Pods* narrowly oblong, prominently rounded over seeds with umbo not quite extending to margins of valves, not constricted between the seeds, 20–35 mm long, 4.5–6.5 mm wide, thinly coriaceous-crustaceous, shallowly curved or occasionally sub-straight, brown, glabrous or sparsely pilose, nerveless, margins thickened, gradually narrowed at base to stipe 2–3 mm long. *Seeds* transverse in pods, ellipsoid to ovoid-ellipsoid, 2–2.5 mm long, 1.7–2 mm wide, turgid, dull, black; *pleurogram* continuous; *areole*

circular to elliptic, 0.7–1.2 mm long, 0.5–0.6 mm wide; *funicle* folded beneath a fleshy, white *aril* that is narrowed and dark-coloured at attachment to seed. (Figure 3)

*Characteristic features.* Grass-like, caespitose, multi-stemmed *sub-shrub*, erect or  $\pm$ prostrate. *Stems* gracile, little-divided, green, mostly terete to sub-terete or quadrangular, infrequently a few flattened and with a vestigial wing 0.3–0.5(–1) mm wide. *Phyllodes* continuous with stems, normally extremely reduced, erect,  $\pm$ terete, brown appendages 0.5–1.5 mm long, sometimes phyllodes clearly-developed



Figure 3. *Acacia thieleana*. A – grass-like habit; B – multiple stems at ground level; C – flower heads; D – pods. Photographs by Bruce Maslin.



(superficially resembling stems) and 2–33 mm long, 0.3–1 mm wide, erect, quadrangular to terete or ±compressed, subulate, 4-nerved with abaxial one the most pronounced, innocuous. *Gland* absent. *Inflorescences* simple or 1- or 2-headed racemes 5–10 mm long; *peduncles* 5–15(–23) mm long, glabrous; *heads* globular, 15–19-flowered, golden or cream-coloured. *Bracteoles* 0.8–1(–1.5) mm long, 0.5–0.7 mm wide. *Flowers* 5-merous; *calyx* gamosepalous, 2/5–1/2 length of corolla, 1.3–1.5 mm wide at apex, truncate, repand or very shortly dissected into obtuse or broadly triangular, non-thickened lobes; *calyx tube* and *petals* glabrous and nerveless. *Pods* narrowly oblong, prominently rounded over seeds, short (20–35 mm long), 4.5–6.5 mm wide, normally shallowly curved, margins thickened. *Seeds* transverse in pods, small (2–2.5 × 1.7–2 mm), black; *areole* circular to elliptic; *aril* white, narrowed and dark-coloured at attachment to seed.

*Selected specimens examined.* WESTERN AUSTRALIA: 3 mi (4.8 km) S of Narrogin on the road to Wagin, 7 Sep. 1970, T.E.H. Aplin, I. Lethbridge & R. Coveny 3189 (NSW n.v., PERTH); Dryandra State Forest, Lol Gray Block, E of the Wandering–Narrogin Road, 12 Sep. 1985, J.M. Brown 228 (PERTH); 15 km NE of Narrogin, Yillmilling Nature Reserve, 13 Sep. 1984, J.M. Brown 287 (PERTH); Reserve No. 19738, 1 km along O’Connor Road from Dardadine Road South, 22 Sep. 1996, V. Crowley s.n. (PERTH 04517490); property of N. Penny, Southern Needling Hills Q6, E of York, 3 June 2005, H. Green & A. Sole NP15 (PERTH); site 226, property of C. Kirby, S of Goomalling–Toodyay Road, c. 1 km W of Forrest Road, E of Toodyay, 18 Sep. 2008, M. Hislop & P. Lewis WW 226-15 (PERTH); Wongamine Nature Reserve, 18 km E of Toodyay to Goomalling, 5 July 1984, G.J. Keighery 7277 (PERTH); 4.5 km S of Narrogin on the road to Wagin, 7 Oct. 1990, B.R. Maslin 6758 (CANB, K, PERTH); 13 km NE of Toodyay on road to Goomalling, on private property c. 200 m E of Toodyay–Goomalling road, 1 Dec. 2013, B.R. Maslin 10266 (NSW, PERTH).

*Distribution.* Occurs in south-west Western Australia along the south-west margin of the wheatbelt where it has a discontinuous distribution from near Toodyay south to Dardadine (c. 40 km due SW of Narrogin). Within this range it has been recorded from Needling Hills (c. 15 km due E of York) and from the general vicinity of Narrogin. This entire region has been extensively cleared for agriculture with much of the remaining vegetation occurring in relatively small nature reserves and sometimes along road verges. *Acacia thieleana* has been recorded from both private property and in nature reserves (e.g. Wongamine Nature Reserve near Toodyay, and Dryandra Woodland and Yillmilling Nature Reserve near Narrogin) and its frequency, judging from herbarium labels, is both occasional and common.

*Habitat.* Grows in the lower shrub stratum of woodland often dominated by *Eucalyptus accedens*, *E. drummondii*, *E. wandoo* and/or *Allocasuarina huegeliana*. Occurs in laterite or sandy loam or sandy clay over laterite. Some of the low shrubs that co-occur with *A. thieleana* bear a superficial resemblance to the new species in their growth form and/or aphyllous branchlets, e.g. *Dampiera sacculata* (Goodeniaceae) and *Tricoryne elatior* (Hemerocallidaceae).

*Phenology.* Flowers from August to October; pods with mature seeds have been collected in early December.

*Conservation status.* Not considered rare or endangered.

*Etymology.* This species is named for Dr Kevin Thiele, Curator of the Western Australian Herbarium, in recognition of his significant contribution to Australian botany. One of Kevin’s outstanding achievements was the creation of the Lucid software package (see <http://www.lucidcentral.org/>) which has been of major assistance to many biologists by enabling the production of electronic identification keys, in

my case the *WATTLE* key (Maslin 2014) being the most important.

*Common name.* Thiele's Wattle.

*Affinities.* This new species is closely related to *A. applanata* Maslin. Indeed, superficially *A. thieleana* appears to be a gracile form of *A. applanata*, especially with respect to its stem morphology, but there is a cluster of vegetative, floral, carpological and geographic characters that enable the taxa to be reliably distinguished. As discussed below some of these characters are rather cryptic, but they are judged sufficiently significant to justify the recognition of two species, rather than subspecies of a single variable species.

*Acacia applanata* is distinguished from *A. thieleana* by its wider pods (7–10 mm) that are normally densely villous, larger seeds (3.5–4 × 2.2–3.5 mm) that are brown and which possess an aril that is not noticeably constricted at the attachment to the seed, smaller bracteoles (c. 0.5 × 0.2–0.4 mm) and smaller calyces (1/4–1/3 the length of the petals, 0.8–1.1 mm wide at apex) which are more deeply dissected into distinct, triangular lobes. The two species are also normally easily distinguished by their vegetative characters. As noted in Maslin (1995: 160) *A. applanata* is normally single-stemmed or few-branched at ground level (*A. thieleana* seemingly always has numerous stems arising from a woody rootstock). Individual stems of *A. applanata* normally have the appearance of being clearly flattened on account of a discrete wing that extends along the opposite sides of the central core. These wings are normally 1–3(–7) mm wide and are formed by the continuous, decurrent bases of the phyllodes; the free portion of the phyllode (i.e. the prolongation of the wing) often appears spur-like, it is triangular or narrowly triangular, 1.5–5(–10) mm long, erect and flattened (although the apical point is ±terete). The stems of *A. thieleana* on the other hand are normally terete to quadrangular and lack a marginal wing, and as such are narrower and have a more gracile appearance than those of *A. applanata*. The phyllodes in *A. thieleana* are commonly vestigial, being reduced to tooth-like, brown appendages that are terete or semi-terete and 0.5–1.5 mm long; these appendages are interpreted as representing the apical points of normal phyllodes. The production of normal phyllodes in *A. thieleana* is seemingly infrequent, but when they occur they reach to 33 mm long and unlike those of *A. applanata*, are ±terete to quadrangular with a distinct brown mucro.

Notwithstanding the above, there is some variation for vegetative attributes that can potentially confound the distinction between the two species, and careful examination (normally at ×10 magnification) is needed in order to apply names correctly. In *A. thieleana* a few stems are sometimes flattened and possess a vestigial wing 0.3–0.5(–1) mm wide. In *A. applanata* the stem wing in the region where inflorescences are produced can sometimes be similarly very narrow (c. 0.5 mm wide) and as such the stems may assume a terete/quadrangular appearance similar to that of *A. thieleana*. Furthermore, in a few extreme cases the phyllodes of *A. applanata* are so reduced that only the ±terete apical point remains at the nodes and these specimens again may resemble those of *A. thieleana*; this occurs especially in some specimens from the southern extremity of the species' geographic range. In all these cases the already-mentioned floral and carpological characters can be employed to reliably distinguish the species.

*Acacia thieleana* is parapatric with *A. applanata* and is distributed on the north-eastern margin of the geographic range of that species. *Acacia applanata* has a wide distribution that extends from the Jurien Bay district (c. 200 km N of Perth) to Albany on the south coast. A few specimens extend to the south-west margin of the wheatbelt with two records occurring within the range of *A. thieleana*, but the two species are not recorded as being sympatric. These two records are: (1) Dardadine townsite, Dardadine Road South, 13 Aug. 1992, *V. Crowley* 22 (PERTH) and (2) track off Lefroy Street, Narrogin,

N of cemetery, 3 Oct. 2002, G. Warren & P. Rose 669 (PERTH). Although *A. applanata* is commonly found on sandy soils it does sometimes show the same edaphic preferences as the new species.

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

***Acacia collegialis* Maslin, *sp. nov.***

*Type:* Cherry Tree Island on west side of Lake Cowan, c. 5 km west of Norseman on road to Hyden, Western Australia, 7 December 2013, B.R. Maslin 10281 (*holo:* PERTH 08520437 and 08520445; *iso:* K, MEL).

*Acacia* sp. Norseman (B. Archer 1554). Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed June 2014].

Spreading *shrub* or *tree* 2.5–6 m tall, crown 2–4 m wide, single-stemmed or with a few main stems arising from ground level. *Bark* dark grey, fibrous, longitudinally fissured, sometimes exfoliating in long, thin strips. *Branchlets* terete except slightly angled at extremities, obscurely ribbed, at extremities of some branchlets the ribs are coated with a thick or moderately thick layer of resin, glabrous or (at the reddish brown extremities) sparsely to densely appressed-hairy, aging glabrous and grey. *New shoots* resinous (but not viscid) and dark reddish brown or rarely green when dry, expanding phyllodes with sparse, silvery, appressed hairs and/or reddish, appressed, linear, glandular trichomes. *Stipules* triangular, microscopic, early caducous. *Phyllodes* narrowly elliptic, 5–8.5 cm long (occasionally interspersed with a few c. 4 cm long), 4–7 mm wide, l: w = 8–21, rather wide-spreading, shallowly to moderately falcately recurved, glabrous, green, shiny (when fresh); *longitudinal nerves* numerous (5–10 per mm), fine and close together, the central nerve slightly more pronounced than the rest; *marginal nerve* brown to red-brown, with a ±thin to thick layer of opaque, light grey resin, sometimes yellow and not resinous on oldest phyllodes; *apices* acute to acuminate, straight to uncinately; *pulvinus* 1–3 mm long. *Gland* situated on upper margin of phyllode 0–1 mm above the pulvinus, not prominent. *Inflorescences* simple or rudimentary 1- or 2-branched racemes to c. 1 mm long which grow out while heads are in bud; *peduncles* (1–)2–6 mm long, densely appressed to sub-appressed puberulous when in flower, sometimes glabrous or hairs confined to base when in pod; *basal peduncular bract* single, caducous, c. 1 mm long, light brown; *spikes* obloid to short-cylindrical, 5–9(–12) mm long, golden, buds slightly resinous. *Bracteoles* c. 1 mm long, *claws* narrowly oblong to linear, abruptly expanded into thickened, ±ovate, brown, laminae <0.5 mm wide. *Flowers* 5-merous; *sepals* free or united at base, c. 1/2 length of petals, narrowly oblong, glabrous or sparsely puberulous, scarcely expanded at the non-thickened or slightly thickened apices; *petals* c. 1.5–2 mm long, glabrous, nerveless or very obscurely 1-nerved. *Pods* linear to narrowly oblong, 40–80 mm long, 4–6 mm wide, ±thinly coriaceous-crustaceous, not or scarcely constricted between seeds, slightly rounded over seed with umbo extending to margin of valves, straight to shallowly curved, dark brown to dark red-brown (due to dense layer of glandular trichomes within a resin matrix); *margins* yellow to light brown, not or scarcely thickened and not or scarcely raised above face of valve, the outer edge deflexed to form a flat, outer edge to the valve 0.5–1 mm wide. *Seeds* longitudinal in pods, obloid to slightly obloid-ellipsoid, (3–)4–6 mm long, 2–3 mm wide, dull or slightly shiny, dark brown to blackish but normally pale brown at base of seed near aril or between the aril and areole, with heart-shaped differentiated tissue at centre of seed surrounding the areole (1.5–2 × 0.8–1 mm, yellowish or light brown, sometimes sub-shiny); *pleurogram* continuous or with a narrow opening at end facing the aril; *areole* 1.2–1.3 × 0.7–1 mm; *funicle* expanded into a once- or twice-folded, creamy white *aril* beneath the seed. (Figure 4)



Figure 4. *Acacia collegialis*. A – habit and habitat; B – stem showing longitudinally fissured, fibrous bark; C – fruiting branchlet showing characteristically recurved phyllodes; D – pods red-brown with non-flanged margins; E – seeds showing heart-shaped differentiated tissue surrounding areole. Photographs by Bruce Maslin.

**Characteristic features.** Spreading *shrub* or *tree*. *Phyllodes* narrowly elliptic, mostly 5–8.5 cm long, 4–7 mm wide,  $l:w = 8-21$ , falcately recurved, wide-spreading, acute to acuminate, glabrous, finely multi-striate; *marginal nerve* brown to red-brown, overlain by a  $\pm$ thin to thick layer of light grey, opaque resin, sometimes yellow and not resinous on oldest phyllodes. *Inflorescences* simple or rudimentary racemes to *c.* 1 mm long; *peduncles* (1–)2–6 mm long. *Spikes* obloid to short-cylindrical, 5–9(–12) mm long. *Sepals* free or united at base. *Pods* linear to narrowly oblong, 4–6 mm wide,  $\pm$ thinly coriaceous-crustaceous,  $\pm$ straight-edged, dark brown to dark red-brown (due to dense layer of glandular trichomes within a resin matrix), marginal nerve not or scarcely raised above face of valve. *Seeds* longitudinal in pods, with heart-shaped differentiated tissue at centre.

**Selected specimens examined.** WESTERN AUSTRALIA: Cherry Island, 4.7 km W of Norseman Post office along the new Hyden Track, 19 Apr. 2000, *B. Archer* 1554 (K, PERTH), same locality, 18 Nov. 2000, *B. Archer* 1766 (MEL *n.v.*, PERTH) and 1767 (CANB *n.v.*, PERTH); Toorak Hill, Coolgardie, 19 May 1979, *R.J. Cumming* 677 (PERTH); site WMC 40, Madoonia Station, Benneringie Road, 55.1 km from East Kambalda on a bearing of 141 degrees, 12 Dec. 1997, *A.A. Mitchell* 5121 (PERTH);

20 km NE of Sinclair Soak, c. 75 km NE of Norseman, 10 Aug. 1980, *K. Newbey* 7009 (PERTH); 8km E of Karonie which is c. 105 km E of Kalgoorlie, 2 Sep. 1968, *P.G. Wilson* 7600 (AD, PERTH).

*Distribution.* Occurs in the Coolgardie IBRA (Interim Biogeographic Regionalisation for Australia) region where it extends from Coolgardie east to Karonie (c. 100 km E of Kalgoorlie) and south to the vicinity of Norseman. Herbarium labels record the species as being both common and uncommon in the places where it is found.

*Habitat.* Grows in shallow, sandy clay-loam on rocky hills. The underlying lithology is recorded on herbarium labels as comprising granite, greenstone (*vide* Romano 2012), dolerite or basalt; *R.J. Cumming* 677 was collected from a lateritic breakaway. Commonly occurs in open tall shrubland or open low woodland comprising scattered eucalypts, e.g. *Eucalyptus griffithsii*, *E. longicornis*, over shrubland comprising *Dodonaea lobulata*, *Ptilotus obovatus*, and other species; *K. Newbey* 7009 occurred in heath dominated by *Leptospermum* sp.

*Phenology.* Flowers from about mid-April to early August; pods with mature seeds have been collected from early November to mid-December.

*Conservation status.* Not considered rare or endangered.

*Etymology.* The species name is from the Latin *collegialis* (collegial). It acknowledges the substantial assistance and/or advice that I have received from the following colleagues at various points in my career: Department of Parks and Wildlife staff Beng Siew Mahon (Librarian), Ben Richardson (Senior Technical Officer) and Peter White (Nature Conservation Officer); also David Coultas (Senior Botanist, Woodman Environmental Consulting) and Roger Underwood (former Manager and more recently author of the history of the Western Australian Herbarium, see Underwood 2011).

*Common name.* Southern Rock Wattle.

*Variants.* It is likely that *Acacia* sp. Mt Jackson (B. Ryan 176), which is common on Banded Iron Formation (BIF) ranges about 150–200 km to the north-east of Coolgardie, is conspecific with *A. collegialis*. It differs most obviously from the new species in the following ways: peduncles normally less densely hairy, phyllodes sometimes straight and having margins that are not often thick-resinous, and pods that are slightly more thick-textured and which have marginal nerves that are sometimes slightly elevated above the face of the valves (but not forming a discrete flange as in *A. quadrimarginea* F.Muell.). *Acacia* sp. Mt Jackson is represented at the Western Australian Herbarium by vouchered collections from the Koolyanobbing Range, Windarling Peak, Mt Jackson Range, the Helena and Aurora Range; there are also unvouchered records from Mt Elvire Station, Perrinvale Station, Diemals Station, Mt Manning, Mt Finnerty, the Hunt Range and Die Hardy Range (Geoff Cockerton pers. comm. 2007). Although the morphological differences separating *A. collegialis* and *Acacia* sp. Mt Jackson are not great, the taxa are geographically separated and have habitat differences in that *A. collegialis* is not recorded as occurring on BIF. It therefore seems prudent to keep these taxa separate until further field and laboratory studies can be undertaken to reassess the significance of their differences.

*Affinities.* *Acacia collegialis* is closely related to *A. quadrimarginea* and indeed, in the absence of pods care is needed not to confuse them. The most obvious characters shared by these species are their wide-spreading, falcately recurved, finely multi-striate phyllodes with red margins, obloid to cylindrical spikes and free sepals. *Acacia quadrimarginea* is most readily distinguished from *A. collegialis* by

its ±woody pods that are wider (6–13 mm) and which possess an obvious, perpendicular marginal flange (1–)2–4 mm wide, larger seeds (mostly 6–9 × 4.5–6.5 mm) and commonly longer spikes (8–20 mm). Also, the phyllodes of *A. quadrimarginea* are often longer with a higher l: w ratio than those of *A. collegialis* (mostly 6–12 cm long with l: w = 15–40) and the reddish marginal nerve is not overlain by a layer of opaque, light grey resin. The two species are parapatric with *A. quadrimarginea* distributed slightly to the north of where *A. collegialis* occurs.

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

***Acacia besleyi* Maslin, *sp. nov.***

*Type:* south of Ravensthorpe, Western Australia [precise locality withheld for conservation reasons], 6 December 2013, *B.R. Maslin* 10280 (*holo:* PERTH 08518831; *iso:* CANB, K, MEL, NSW).

Rounded or obconic, erect, often bushy, resinous *shrub* 1–3 m tall and to *c.* 2 m across, dividing near ground level into few to many ascending, ±straight main stems to *c.* 3 cm diam. *Bark* stringy and fibrous, longitudinally fissured, grey on exterior but the underlying new bark light brown to reddish brown. *Branchlets* terete except apices flattened and angled, finely ribbed, smooth or tuberculate, the resin forming a veneer over entire surface (best developed at extremities), glabrous or with ±sparse, short, antrorsely appressed, shallowly incurved, white or sometimes very pale yellow hairs. *Stipules* triangular, minute (to 0.5 mm long), erect. *Phyllodes* linear but gradually and discernibly narrowed towards their base, 40–85 mm long, 2–3(–3.5) mm wide, thinly coriaceous, mostly shallowly incurved, some straight or moderately incurved, erect, slightly viscid or not viscid, green or sub-glaucous, glabrous; *longitudinal nerves* 3–5, not or scarcely raised, widely spaced with the central nerve normally yellow and more evident than the one or two, often impressed, brownish flanking nerves; *lateral nerves* absent or few and indistinct, longitudinally trending, sometimes a few anastomosing; *marginal nerve* not thickened; *apices* normally ±abruptly contracted to a distinct, acute point that is 0.5–1 mm long, straight to shallowly curved, innocuous or coarsely pungent and yellowish orange but aging brown, occasionally sub-uncinate; *pulvinus* 1–1.5 mm long, yellow, transversely wrinkled when dry. *Gland* situated on upper margin of phyllode (0.5–)1–3 mm above the pulvinus, not prominent, phyllode lamina often slightly swollen about the gland when dry. *Inflorescences* binate racemes, the 2 peduncles inserted opposite one another at distal end of raceme axis, often a vegetative bud initiated within axil of peduncles at anthesis; *raceme axes* (1–)2–4(–6) mm long, glabrous or occasionally sparsely appressed-hairy as on branchlets; *peduncles* 5–8 mm long, glabrous or occasionally sparsely appressed-hairy as on branchlets; *basal peduncular bract* single, triangular, *c.* 1 mm long; *heads* globular, 15–22-flowered, *c.* 5 mm diam. at anthesis when dry, yellow. *Bracteoles* 0.8–1 mm long, ±glabrous, claws linear, abruptly expanded into laminae that are ovate, *c.* 0.5 × 0.4 mm, concave, curved and acute to short-acuminate. *Flowers* 5-merous; *sepals* narrowly oblong to linear, free or united near their base, *c.* 2/3 length of petals, ±glabrous, abruptly expanded at apex into a small, ovate lamina; *petals* 1.2–1.4 mm long, glabrous or with very sparse, minute, appressed, straight hairs, nerveless or very obscurely 1-nerved. *Pods* narrowly oblong, 10–30 mm long, 3.5–5 mm wide, thinly coriaceous-crustaceous, straight to variously curved or sigmoid, often ±undulate, not or scarcely constricted between seeds and gently rounded over them with umbo extending to margins of valves, brown, sparsely to densely short-pilose by white hairs, obscurely openly reticulate, margins thickened. *Seeds* longitudinal in pods, normally obloid, a few ovoid, 2.8–3.5 mm long, 1.5–2 mm wide, compressed (*c.* 0.5 mm thick), shiny, dark brown to almost black; *areole* elongated ‘u’-shaped, open at end facing the aril, 1.5–2 mm long, (0.4–)0.5–0.7 mm wide; *funicle* filiform, reflexed below and expanded into a fleshy, clavate, sub-straight to slightly curved, white (aging dull yellow when dry) *aril* beneath the seed that extends along one edge of the seed for 1/4–1/3 the seed length. (Figure 5)



Figure 5. *Acacia besleyi*. A – habit (adolescent plant) and habitat; B – stem base showing multiple stems and stringy bark; C – outer grey bark exfoliating to reveal light brown new bark; D – branch showing long, narrow phyllodes and sparsely hairy pods; E – branch showing short phyllodes and densely hairy pods. Photographs by Bruce Maslin.

**Characteristic features.** Resinous shrub. Bark stringy and fibrous, grey externally, the underlying new bark light brown to reddish brown. Branchlets smooth or tuberculate, glabrous or with  $\pm$ sparse, short, antrorsely appressed hairs. Phyllodes linear but gradually and discernibly narrowed towards their base, 40–85 mm long, 2–3(–3.5) mm wide, mostly shallowly incurved, erect, glabrous; longitudinal nerves 3–5, not or scarcely raised, widely spaced with the central one normally yellow and more evident than the often impressed, brownish flanking nerves; lateral nerves absent or few, longitudinally trending with sometimes a few anastomosing; apices normally  $\pm$ abruptly contracted to a distinct, acute point. Inflorescences short racemes (1–)2–4(–6) mm long, with 2, opposite peduncles at distal end of raceme axis; peduncles 5–8 mm long, normally glabrous; heads globular, 15–22-flowered. Bracteoles 0.8–1 mm long, claws linear, abruptly expanded into ovate, concave, curved, acute to short-acuminate laminae  $0.5 \times 0.4$  mm. Flowers 5-merous; sepals narrowly oblong to linear, free or united near their base,  $\pm$ glabrous; petals  $\pm$ glabrous. Pods narrowly oblong, 10–30 mm long, 3.5–5 mm wide, thinly coriaceous-crustaceous, straight to variously curved or sigmoid, often  $\pm$ undulate, sparsely to densely

short-pilose. *Seeds* longitudinal in pods, normally obloid,  $2.8\text{--}3.5 \times 1.5\text{--}2$  mm; *areole* elongated 'u'-shaped,  $1.5\text{--}2 \times (0.4\text{--})0.5\text{--}0.7$  mm; *aril* clavate, white.

*Selected specimens examined.* WESTERNAUSTRALIA: [localities withheld for conservation reasons] 24 Oct. 1987, *K. Bradby* KLB 71 (PERTH); 28 Sep. 2002, *G.F. Craig* 5719 (CANB, K, PERTH); 17 Feb. 2005, *G.F. Craig* 6361 (PERTH); 4 Oct. 1901, *L. Diels* 4890 (PERTH); 6 Dec. 2013, *B.R. Maslin* 10279 (BRI, CANB, K, MEL, PERTH).

*Distribution.* Occurs in the southern coastal region of south-west Western Australia where it is seemingly confined to the Ravensthorpe Range. Presently known from just three localised populations (c. 20 km apart), one containing several hundreds of plants and the other two each containing less than 100 plants. None of the three populations is contained within a conservation reserve, and one is covered by an existing mining tenement. Improved field knowledge of this species is required by survey to determine its precise geographic range and abundance.

*Habitat.* Grows in undulating country along drainage lines within rocky terrain. The soils comprise brown, loamy clay or red clay over granite or quartz diorite. It occurs in mallee scrub dominated by various species of *Eucalyptus* (e.g. *E. dissimulata*, *E. flocktoniae*, *E. phaenophylla*, *E. phenax*, *E. proxima*, *E. sporadica*) with a rather dense understory shrub stratum that includes *Melaleuca acuminata*, *M. hamata*, *M. uncinata* and *M. undulata*.

*Phenology.* Inflorescences are initiated on new shoots during the fruiting period in December with the main flowering flush occurring mainly in October (with a few heads sometimes persisting to the next fruiting period). Pods with mature seed have been collected in December.

*Conservation status.* To be listed as Priority One under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (A. Jones pers. comm.).

*Etymology.* This species is named for the late Dr Laurie Besley (Bes), distinguished scientist with CSIRO in Sydney and subsequently Director of the Australian National Measurement Institute, Sydney. Bes was a man of significant intellect with a humble and dignified nature. He was a valued friend who had a very positive influence on my life. Fisk and Heng (2013) provide a most fitting obituary of Bes.

*Common name.* Bes' Wattle.

*Affinities.* The precise closest relative of this new species is unknown, but in having short, binate racemose inflorescences, short, often undulate pods and plurinerved phyllodes it seems to have affinities to some members of the *A. flavipila* A.S. George group (see Cowan & Maslin 1990, 2001a). However, most species of that group have very short phyllodes (to about 30 mm long) that possess numerous anastomosing lateral nerves. There are, however, two species within the *A. flavipila* group that possess longer phyllodes with few or no anastomosing lateral nerves, namely, *A. lanei* R.S. Cowan & Maslin and *A. vittata* R.S. Cowan & Maslin. Neither of these species possess the distinctive stringy and fibrous bark of *A. besleyi* nor do they occur within its geographic range. *Acacia lanei* is further distinguished by its densely sericeous peduncles, more numerous-flowered heads (34–38) and its linear, arcuate pods that reach 12 cm in length. This species only rarely has linear phyllodes and it occurs in the Hyden–Lake Grace–Holt Rock area, about 100 km north-west of where *A. besleyi* grows. Although *A. vittata* has impressed phyllode nerves and similar pods and seeds to those of *A. besleyi* its phyllodes are narrowly elliptic and the nerves are more numerous with the central one not more



pronounced than the rest; it is further recognised by mostly simple (not racemose) inflorescences, basal gland that is located at the distal end of the pulvinus and its 1/2–2/3-united sepals. *Acacia vittata* is an uncommon species with most collections from the vicinity of Lake Logue (c. 130 km S of Geraldton) in the northern wheatbelt region.

Until now most specimens of *A. besleyi* had erroneously been labelled with the Western Australian Herbarium phrase name *Acacia* sp. Cape Arid (A.S. Weston 8164). The two species are superficially similar in possessing long, linear phyllodes, very short, binate racemose inflorescences and linear sepals that are basally united. However, *A. sp. Cape Arid* is most readily distinguished from the new species by its phyllodes that are narrower (1–1.5 mm wide) and 1-nerved and by its pods that are linear, arcuately curved and much longer (to about 7 cm). Furthermore, *A. sp. Cape Arid* is not obviously resinous as is *A. besleyi* and it is known only from Mt Ragged which is located 150 km due east-north-east of Esperance (i.e. c. 350 km ENE of where the new species grows).

The first collection of *A. besleyi* was that of L. Diels (*L. Diels* 4890) on October 4<sup>th</sup> 1901 who provisionally named the specimen as *A. heteroneura* Benth. under which name it was published in Diels and Pritzel (1904–05: 304). *Acacia heteroneura* has no particular close affinities to *A. besleyi* and it is quite possible that Diels used this name in error for *A. heteroclita* Meisn., a member of sect. *Plurinerves* that has a scattered distribution in south-west Western Australia, including south coastal areas (where it is recorded for Fitzgerald River National Park, not far south of where *A. besleyi* grows). *Acacia heteroclita* is readily distinguished from the new species by its consistently 3-nerved phyllodes, simple (non-racemose) inflorescences and linear pods that reach 8 cm in length.

#### ***Acacia fraternalis* Maslin, *sp. nov.***

*Type:* Jimberlana Hill, 5.3 km east of Coolgardie–Esperance Highway (from intersection on northern outskirts of Norseman) on Eyre Highway, Western Australia, 7 December 2013, B.R. Maslin 10283 (*holo:* PERTH 08517487; *iso:* AD, BRI, CANB, K, MEL, NSW, PERTH 08552274).

*Acacia* sp. Jimberlana Hill (K.R. Newbey 6751), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au> [accessed June 2014].

Erect, obconic *shrub* 1–3(–5) m tall, dividing at or near ground level into few to many, straight, relatively undivided main stems 7–12 cm dbh; crown dense, rounded and (1–)1.5–3(–5) m wide. *Bark* thin, smooth, grey externally, the underlying new bark pale orange. *New shoots* glabrous or sub-glabrous, resinous, not viscid (at least when dry). *Branchlets* slender, terete except flattened and angled at apices (especially on new growth), finely ribbed, brown to reddish brown when dry, sometimes yellow tinged orange when fresh, glabrous except often sparsely and minutely appressed-hairy at apices, the hairs white and straight. *Stipules* triangular, inconspicuous and minute (0.3–0.5 mm long), early caducous, erect. *Phyllodes* narrowly linear, terete to sub-terete or sometimes flat, 60–100(–120) mm long, 0.5–1.5(–2) mm diam./wide, mostly ascending to erect, sometimes ±patent, slender and not rigid, straight or more commonly shallowly incurved, occasionally shallowly wavy, green, glabrous; *longitudinal nerves* numerous (more than 8), often rather indistinct (especially on terete phyllodes), slightly raised, shallowly and often slightly irregularly furrowed between the nerves, 0.1–0.2 mm apart, of uniform prominence, normally the inter-nerve space the same colour as the nerves; *apices* narrowed to a short-acuminate, delicate, curved, innocuous, brown point, sometimes ±uncinate; *pulvinus* 1–1.5(–2) mm long. *Gland* situated on upper margin/edge of phyllode 0–0.5 mm above the pulvinus, microscopic and extremely obscure (easily overlooked), sometimes seemingly absent, circular, not raised. *Inflorescences*

1–2(–3)-headed racemes, initiated on new shoots during the fruiting phase, the peduncles opposite or more commonly alternate and situated on upper half of raceme; *raceme axis* 1–10(–20) mm long, flat to compressed and sparsely to densely appressed white-hairy or glabrous, often with a vegetative bud or growing out at apex when heads in bud, base ebracteate; *peduncles* 4–9 mm long, sparsely to moderately appressed-hairy, occasionally glabrous; *basal peduncular bract* single, caducous, triangular, c. 0.5 mm long, concave, light brown; *heads* globular, densely 20–30-flowered, 3.5–5 mm diam. at anthesis when dry, light golden, often resinous when in bud. *Bracteoles* 0.8–0.9 mm long, the *claws* linear, glabrous or sparsely puberulous abaxially and abruptly expanded into ovate, small *laminae* (c. 0.2 mm wide) that are ±inflexed, brown, obtuse or apiculate and sparsely puberulous abaxially and/or fimbriolate. *Flowers* 5-merous; *sepals* similar to bracteoles, linear to narrowly oblong, scarcely expanded at apices, free, 1/2–2/3 length of petals, membranous; *petals* 1.3–1.5 mm long, glabrous, nerveless or obscurely 1-nerved. *Pods* narrowly oblong to broadly linear, 30–60 mm long, 7–10 mm wide, firmly chartaceous, mostly shallowly curved and often slightly undulate, some ±straight, flat but obviously raised over seeds alternately on either side, not or scarcely constricted between the seeds, mid-brown to dark brown or red-brown, sub-shiny, glabrous or sparsely and minutely appressed white-hairy, nerveless or obscurely transversely nerved with some nerves sparingly anastomosing (but not forming a reticulum); *marginal nerve* often pale-coloured, not obviously thickened; *stipe* slender, to c. 4 mm long. *Seeds* transverse to oblique in pods, obloid to ellipsoid or ovoid, 3–3.5 mm long, 2–2.8 mm wide, compressed (1–1.5 mm thick), shiny, dark brown to dark greyish brown; *pleurogram* very obscure; *areole* ‘u’-shaped or sometimes almost ‘v’-shaped, open at end facing the aril, 0.5–1 mm long, 0.3–0.5 mm wide; *funicle* gradually expanded into and reflexed below a thickened, clavate to oblong, sub-straight to shallowly curved, white (aging dull yellow when dry) *aril* that extends along one edge of the seed for 1/4–1/3(–1/2) the seed length. (Figure 6)

*Characteristic features.* Obconic *shrub* 1–3(–5) m tall. *New shoots* glabrous or sub-glabrous, resinous. *Branchlets* glabrous except often sparsely and minutely appressed-hairy at apices. *Phyllodes* narrowly linear, terete to flat, 60–100(–120) mm long, 0.5–1.5(–2) mm diam./wide, not rigid, normally shallowly incurved, glabrous; *longitudinal nerves* numerous, often rather indistinct; *apices* short-acuminate, the tip delicate, curved and innocuous. *Inflorescences* 1–2(–3)-headed racemes 1–10(–20) mm long; *peduncles* 4–9 mm long, normally appressed-hairy; *heads* globular, densely 20–30-flowered, small (3.5–5 mm diam. at anthesis when dry). *Flowers* 5-merous; *sepals* linear to narrowly oblong, free. *Pods* narrowly oblong to broadly linear, 30–60 mm long, 7–10 mm wide, firmly chartaceous, mostly shallowly curved, often slightly undulate, obviously raised over seeds alternately on either side, ±glabrous, nerveless or obscurely transversely nerved with some nerves sparingly anastomosing. *Seeds* transverse to oblique in pods, 3–3.5 × 2–2.8 mm; *aril* clavate to oblong.

*Selected specimens examined.* WESTERN AUSTRALIA: Dundas Hills, Norseman, 7 Nov. 1962, *J.S. Beard* 2387 (PERTH); W of Cundelee Mission, N of Zanthus, 9 Nov. 1963, *A.S. George* 5986 (PERTH); upper slopes of Jimberlana Hill, 5.9 km NE of Norseman, 16 Apr. 1995, *B.J. Lepschi & T.R. Lally* 1810 (BRI *n.v.*, CANB *n.v.*, PERTH); 5 km S of Higginsville on Coolgardie–Esperance Highway to Norseman (c. 63 km N of Norseman), 26 June 2000, *B.R. Maslin* 7972 (AD, CANB, K, MEL, NSW, PERTH); 51.3 km from Kambalda on a bearing of 196 degrees, 6 Dec. 1997, *A.A. Mitchell* 4983 (PERTH); Binaronca Rock, c. 55 km N of Norseman, *s. dat.*, *K.R. Newbey* 8572 (PERTH).

*Distribution.* Occurs in the southern goldfields region of south-west Western Australia where most collections are from Jimberlana Hill (where it is quite abundant) and the nearby Dundas Hills, and from about 50 km to the north from the general vicinity of the now-abandoned township of Higginsville (about halfway between Widgiemooltha and Norseman). There is also a single record from west of Cundelee Mission (*A.S. George* 5986) which is about 120 km due north-east of Higginsville; this

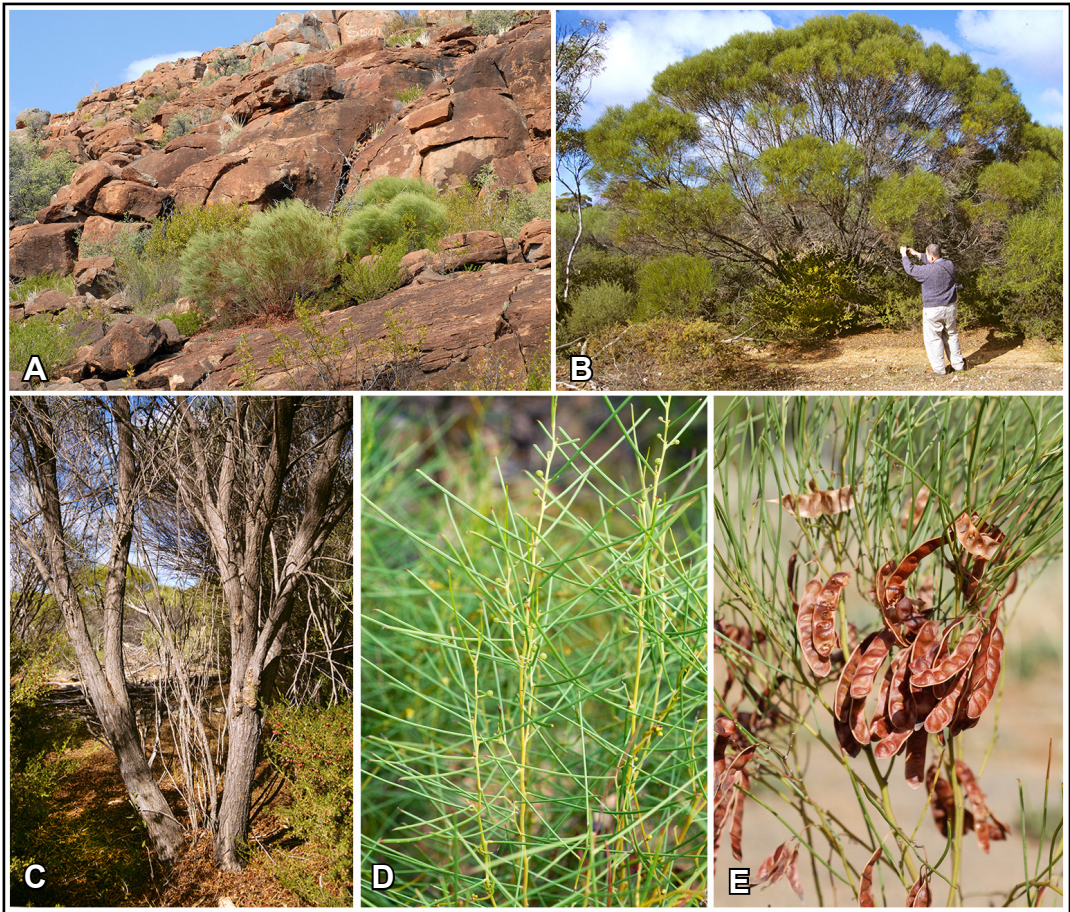


Figure 6. *Acacia fraternalis*. A – habitat (Jimberlana Hill); B – habit (with David Seigler, U.S.A.); C – stem base; D – phyllodes; E – pods. Photographs by Bruce Maslin.

collection apparently represents a disjunct occurrence of the species. Herbarium labels suggest that *A. fraternalis* is at least sometimes common in the places where it occurs.

*Habitat.* Appears to most commonly occur in brown or red-brown clay, sandy clay or sandy loam on the slopes of granite and/or basalt hills. The Cundeelee plant referred to above was recorded as growing in red sand. At Jimberlana Hill *A. fraternalis* occurs in very open low woodland and mallee heath with *Triodia* ground cover whereas elsewhere it is recorded as occurring in open *Eucalyptus* woodland (that includes *E. lesouefii*) and tall shrubland dominated by *A. acuminata*.

*Phenology.* This species appears to have a long flowering period that extends from about November to June. Pods often co-occur with the inflorescences; immature pods have been collected in April and June, and pods with mature seeds collected in November and December. The plants at Jimberlana Hill have been observed to set large pod crops and these can occur on individuals which are apparently of a young age (i.e. on plants that are about 1 m tall).

*Conservation status.* Not considered rare or endangered.

*Etymology.* The species epithet is adapted from the Latin *fraternus* (brotherly) and is named for my brother, John Allan Maslin, who throughout much of my working career generously prepared distribution maps for many of the Western Australian *Acacia* taxa that I described. A particularly fine example of his cartographic skills is seen in the book by Curry *et al.* (2002) that he co-authored.

*Common name.* Maz's Myall.

*Variation.* The phyllodes on specimens from the vicinity of Higginsville are consistently flat whereas elsewhere they are terete to sub-terete.

*Affinities.* The new species is most closely related to *A. warramaba* Maslin but it also has affinities with *A. papyrocarpa* Benth. The more important characters shared by these species include their multi-riate phyllodes with distinctive, delicate, curved, innocuous points, short-racemose inflorescences with globular heads, 5-merous flowers with  $\pm$ free sepals and narrowly oblong, firmly chartaceous pods.

*Acacia warramaba* is most readily distinguished from *A. fraternalis* by its consistently flat phyllodes that are broader (3–7 mm) and commonly shorter (often 40–60 mm long, but ranging to 100 mm) and its heads that have more numerous flowers (*c.* 45). *Acacia warramaba* has a relatively wide geographic range that extends from the general vicinity of Southern Cross to Kambalda, Peak Charles and east of the Fraser Range. This distribution encompasses that of *A. fraternalis* and although there are records of both species occurring in the area between Norseman and Higginsville, they are not known to be sympatric. It is possible that future studies may consider that these two taxa would be better treated as subspecies of the one species.

*Acacia papyrocarpa* is distinguished from *A. fraternalis* by its new shoots which are clearly appressed-puberulous by tolerably long, straight hairs that commonly persist on mature phyllodes and terminal, mature branchlets (hairs absent or microscopic in *A. fraternalis*), flat pods that are not or scarcely rounded over the seeds and which are openly reticulately nerved, longitudinal seeds that are larger (4.5–5 mm long) and have an aril that is folded below the seed (not extending along one edge of seed as in *A. fraternalis*). Also, the phyllodes of *A. papyrocarpa* are often wider and/or shorter than those of *A. fraternalis*. The growth form of *A. papyrocarpa* differs from that of the new species in that the plants are commonly arborescent (3–8 m tall) and possess a dense, neat, spreading, umbrageous canopy which often appears silvery green (due to light reflecting from the above-mentioned hairs). *Acacia papyrocarpa* has a wide geographic range that extends from Kalgoorlie in Western Australia across the Nullarbor Plain to Mt Irwin Station and the southern Flinders Range in South Australia; it is commonly found on calcareous soils (*vide* Cowan & Maslin 2001b).

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