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Acacia alaticaulis and *A. kulnurensis* (Fabaceae, Mimosoideae), rare new species from New South Wales, Australia

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Abstract

Two new species, ***Acacia alaticaulis*** Kodela & Tindale and ***A. kulnurensis*** Kodela & Tindale, belonging to *Acacia* section *Botrycephalae* and allied to *A. terminalis* (Salisb.) J.F.Macbr., are described and illustrated. Both species are rare with restricted distributions north of Sydney, from the Howes and Mangrove Mountain areas, into the Hunter Valley region of New South Wales, Australia.

Introduction

The bipinnate *Acacia* species of section *Botrycephalae* occur naturally in south-eastern Australia. This paper formalises the names of two new species belonging to this section that were previously referred to and described under various manuscript or phrase names in floras, reports and census lists (eg Maryott-Brown and Wilks 1993, Briggs and Leigh 1996, Kodela and Harden 2002, APC 2013, APNI 2013). Although superficially similar to *Acacia terminalis* (Salisb.) J.F.Macbr., *A. alaticaulis* and *A. kulnurensis* can most readily be distinguished from this allied species and each other based on vegetative characters (see key below). They are morphologically distinct from the remaining taxa in the *A. terminalis* complex, particularly in having sessile or near-sessile leaves and markedly recurved pinnules. A revision of the *A. terminalis* complex is ongoing, with several taxa currently treated as subspecies with manuscript and phrase names (see Kodela and Harden 2002, APNI 2013).

Methods

This study is largely based on detailed morphological observations of herbarium specimens held at NSW (including many duplicate specimens yet to be distributed), as well as field investigations. The morphological feature 'young foliage-tips' in the descriptions is often used in *Acacia* section *Botrycephalae* and refers to the apex of leaves that are at an early stage of development.

†Deceased 2011.

Taxonomy

Acacia alaticaulis Kodela & Tindale, ***sp. nov.***

Acacia terminalis subsp. E (Maslin et al. 1990: 290)

Acacia terminalis s. lat. (winged form) (Maryott-Brown and Wilks 1993: 16)

Acacia sp. 35 (Howes Mountain; *R.G.Coveny 4108 & R.Bisby*) (Briggs and Leigh 1996: 194)

Acacia sp. A (Kodela and Tindale 2001a: 221 & 222, fig. 6A–E)

Acacia sp. Howes Mountain (*R.G. Coveny 4108*) NSW Herbarium (APC 2013, APNI 2013)

[*Acacia terminalis auct. non* (Salisb.) J.F.Macbr.: Maslin et al. 1990: 290, *p.p.*, fide NSW48881]

Diagnosis: *Acacia alaticaulis* Kodela et Tindale, species nova, differt ab *A. terminali* (Salisb.) J.F.Macbr. ramulis, petiolis et rhachidibus alatis, foliis fere sessilibus, petiolis ad 0.5 cm longis, pinnulis valde recurvatis et petioli glandula parviore 1–2 mm longa.

Type: New South Wales: Central Coast: Howes Mountain, 80 miles (128 km) N of Windsor on the Windsor–Singleton road, alt. 300 m, *R.G. Coveny 4108 & R. Bisby*, 26 Mar 1972 (holo: NSW106991; iso: BRI, CANB, K, MEL, NSW826817, US).

Spindly, straggly or slender shrub to small tree to 4 m high, with longer branches often weeping; *bark* smooth, grey. *Branchlets* angled, green, brown, reddish brown, purplish brown or bluish, glabrous or with very few scattered hairs to 0.2 mm long, conspicuously winged by c. 5 narrow, convoluted, pale brown to red or green (with reddish margin) ridges 1–3 mm high, with low (< 0.1 mm high) striations between. *Young foliage-tips* reddish brown, almost glabrous or slightly puberulous, resinous. *Leaves* bipinnate; *pulvinus* to 3.5 mm long, glabrous or with a few short, white hairs; *petiole* (above pulvinus) to 5 mm long but often less than 1 mm with leaves appearing almost sessile, ornamented by winged ridges, glabrous (or almost so), bearing a gland just below the basal pair of pinnae (or rarely just above the pulvinus), the gland oblong to broadly oblong or broadly elliptic, yellow-rimmed or red, glabrous, 1–2 mm long, 0.8–1.1 mm wide, with orifice depressed, 0.5–0.9 mm long and 0.2–0.3 mm wide; *rachis* (14–)25–85 mm long (sometimes absent), with winged ridges, almost glabrous with very sparse, short hairs, adaxial surface distinctly grooved, with a narrow longitudinal ridge often bearing a jugary gland just below terminal pair of pinnae (gland circular to broadly elliptic, very broadly obovate or sometimes ± rotund, glabrous, 0.7–1.8 mm long, 0.5–1.3 mm wide, with orifice 0.2–0.9 mm long and 0.1–0.4 mm wide), sometimes with similar jugary glands just below other pairs of pinnae towards apex of rachis, interjugary glands absent; *terminal seta* narrowly deltate, to 3 mm long, ± glabrous; *pinnae* (1–)3–10 pairs, (12–)25–45(–60) mm long, 7–15 mm wide, mostly ± perpendicular to rachis; *pinna-rachis* with very sparse short hairs, usually bearing a small, glabrous gland at base of terminal pair of pinnules (gland ± circular and 0.3–0.6 mm diam., with orifice to 0.2 mm diam.), rarely with similar small glands at base of other pairs of pinnules; *pinnules* 7–17 pairs, opposite or alternately arranged on pinna-rachis, well-spaced, not touching, oblong to narrowly oblong (sometimes almost cultrate), narrowly ovate to lanceolate, narrowly obovate or sometimes elliptic to narrowly elliptic, 2.6–9(–11) mm long, 0.9–3(–3.6) mm wide, glabrous or rarely with a few hairs, adaxial surface dark to mid-green, often slightly raised or keeled along midvein, abaxial surface paler, margin recurved, base asymmetric, apex acuminate or sometimes acute, 0.1–0.5 mm long. *Heads* globular, (6–)8–16-flowered, (5–)7–11 mm diam., pale yellow or pale cream-coloured, borne in axillary and terminal racemes or panicles to 33.5 cm long (arrangement often becoming panicle-like towards ends of the branches), the raceme axes winged, ± glabrous or sparsely puberulous/pubescent, with 8–41 heads; *peduncles* 5–17 mm long, sparsely to moderately puberulous; *bract* at base of peduncles broadly deltate, 1–1.5(–1.7) mm long, red-brown, becoming dark brown when dry, ciliolate, persistent; *bracteoles* dark brown, glossy, (0.7–)0.9–1.2 mm long, ± arrow-shaped or rhombic (similar to those in *A. kulnurensis*) (claw 0.1–0.5 mm long, usually broad and ciliolate; lamina 0.5–0.8 mm long, ciliate and with hairs similar to those on margin occurring at base of the outer surface). *Flowers* 5-merous; *calyx* 0.7–1.1 mm long, cupular, dissected for 1/8–1/3(–1/2) into very broad lobes, ciliolate with pale yellow or white hairs, with similar hairs at base and partly along midribs, with apex of lobes obtuse; *corolla* 2.1–2.5(–2.9) mm long, dissected for (1/2–)2/3 or to base, lobes narrowly ovate to lanceolate or sometimes ± narrowly elliptic, midrib prominent, apices of lobes acute, thickened, incurved, granulate or with a small tuft of minute white hairs on inside surface near tip; *ovary* glabrous. *Legumes* cultrate to linear, usually 60–120 mm long, 11–13(–15) mm wide, mostly straight-sided but sometimes irregularly constricted between seeds, usually curved, ± flat, slightly raised and sometimes rough over seeds, coriaceous, dull or slightly shiny, reddish brown or blackish brown, with fine, often obscure transverse veins (usually radiating from margin and incomplete), glabrous; margin pale, prominent. *Seeds* 6–11 arranged longitudinally or slightly oblique in the legume, 4.5–6 mm long, 3.3–3.9 mm wide, broad

to very broadly ellipsoid or oblongoid, black; *areole* closed, same colour as rest of the seed, 2.5–3.8 mm long, 1.5–1.7 mm wide; *funicle* cream-coloured to fawn-coloured, filiform, expanded into a cap-like aril, prolonged along one side of seed. Fig. 1.

Distinguishing features: branchlets conspicuously winged by convoluted, narrow ridges 1–3 mm high; petioles and rachises also winged; bipinnate leaves almost sessile; interjugary glands absent; pinnules with margin recurved and apex acuminate or acute; flower-heads pale yellow or pale cream-coloured.

Flowering: December to May, possibly also later since old flowers occur in late August on *Constable s.n. NSW48881*. **Legumes:** developing from April, with mature legumes occurring around November. Old legumes without seed have been retained on plants in December, March and April.

Distribution: occurs in the vicinity of Howes Mountain (6–7 km NE of Howes Valley, E of Putty Road) and along Old Convict Road to Mount Murwin (c. 10 km ESE of Howes Valley), Hunter Range, Yengo National Park. Also recorded further north around Mount Isobel (Maryott-Brown and Wilks 1993). Locally occasional to scattered.

Habitat: grows on ridges and hillslopes, in sandy and sandy clay soils, on sandstone or at the junction of shale and sandstone, in woodland to open forest, with *Corymbia eximia*, *Eucalyptus piperita*, *E. punctata* and *Angophora costata*, with shrub understorey.

Etymology: the specific epithet refers to the winged branchlets, derived from Latin *alatus* (meaning 'winged') and *caulis* (meaning 'stem').

Conservation status: although the known populations of *Acacia alaticaulis* are protected in the Yengo National Park, the restricted distribution of the species will have management implications (see Maryott-Brown and Wilks 1993). *Acacia alaticaulis* is not listed as threatened under state or federal legislation but it has been recognised as a ROTAP taxon with the code 2RC-t, indicating it is 'rare', has a geographic range of less than 100 km, and the total known population occurs in a proclaimed reserved (Briggs and Leigh 1996).

Selected specimens examined: (c. 18 collections examined)**: New South Wales: Central Coast**: Howes Mountain, c. 6 miles [9.6 km] NE of Howes Valley, *Constable s.n.*, 26 Aug 1959 (AD, CANB, MEL, NSW48881, PERTH); Howes Mountain, 17 miles [27.4 km] S of Bulga, *Coveny s.n.*, 11 Feb 1968 (B, CBG, MO, NSW98531, PERTH); Howes Mountain, *Coveny 10209 & Seur*, 9 Sep 1978 (A, AD, BRI, CANB, HO, L, NSW, PERTH, US, Z); Putty Road, 27.5 km N of turnoff to Putty, *D'Aubert 425, Hind & Jones*, 5 Dec 1988 (NSW); 20.5 km S of intersection with Milbrodale Road on the Putty Road, *Johnstone 2300 & Orme*, 7 Dec 2007 (K, NSW, PERTH); Putty Road, 17.3 km N of the Macdonald River crossing, c. 6.5 km due NE of Howes Valley, western side of Howes Mountain, *Kodela 268 & James*, 16 Apr 1993 (CANB, NSW, PERTH), *Kodela 270 & James*, 16 Apr 1993 (CANB, MEL, NSW); W side of Howes Mountain, *Tame 2852*, 24 Nov 1990 (NSW).

Notes: *Acacia alaticaulis* differs from *A. terminalis* by the markedly winged branchlets, petioles and rachises (less pronounced winged ridges may occur in *A. terminalis*), shorter petioles to 5 mm long, markedly recurved pinnules (pinnules may be slightly recurved in *A. terminalis*) and usually smaller petiolar gland 1–2 mm long (1.2–12 mm long in *A. terminalis*). The possibility of intergrades or hybrids between these species requires further investigation. *Acacia alaticaulis* can be distinguished from *A. kulnurensis* by the winged branchlets, petioles and rachises, and almost glabrous branchlets and foliage, as well as often having shorter bracts at the base of the peduncles and slightly narrower legumes.

Some specimens are annotated with the earlier manuscript names *Acacia terminalis* subsp. *howensis* Tindale & Kodela and *A. howensis* Tindale & Kodela (both *in sched.*), where 'howensis' referred to the type locality Howes Mountain. Before publication the specific epithet was changed to the more suitable epithet 'alaticaulis' (referring to the distinct morphological feature of the winged branchlets) to avoid possible confusion with similarly named localities such as Lord Howe Island. *Acacia alaticaulis* has previously been cited as a manuscript name (eg in Maslin 2001, Kodela and Harden 2002: 467, Kodela 2013a; as *A. alaticaulis* Kodela & Tindale *ms.* (*Coveny 4108*) in the latter two references). The name was included in Pellow et al. (2009: 259) but not validly published there.

The collections, *Coveny 4108 & Bisby* (type) and *Constable s.n.*, 26 Aug 1959, are vouchers for a cyanogenesis survey undertaken by Maslin et al. (1990).

Acacia kulnurensis Kodela & Tindale, ***sp. nov***.

Acacia terminalis subsp. C (Maslin et al. 1990: 290), *p.p.* (excluding *M. Fox 7907028* and NSW55281)

Acacia terminalis s. lat. (Kulnura form) (Maryott-Brown and Wilks 1993: 14)

Acacia sp. 34 (Kulnura; *R.G. Coveny 4142 & R. Bisby*) (Briggs and Leigh 1996: 194)

Acacia sp. B (Kodela and Tindale 2001b: 222 & 223, fig. 6F–I)

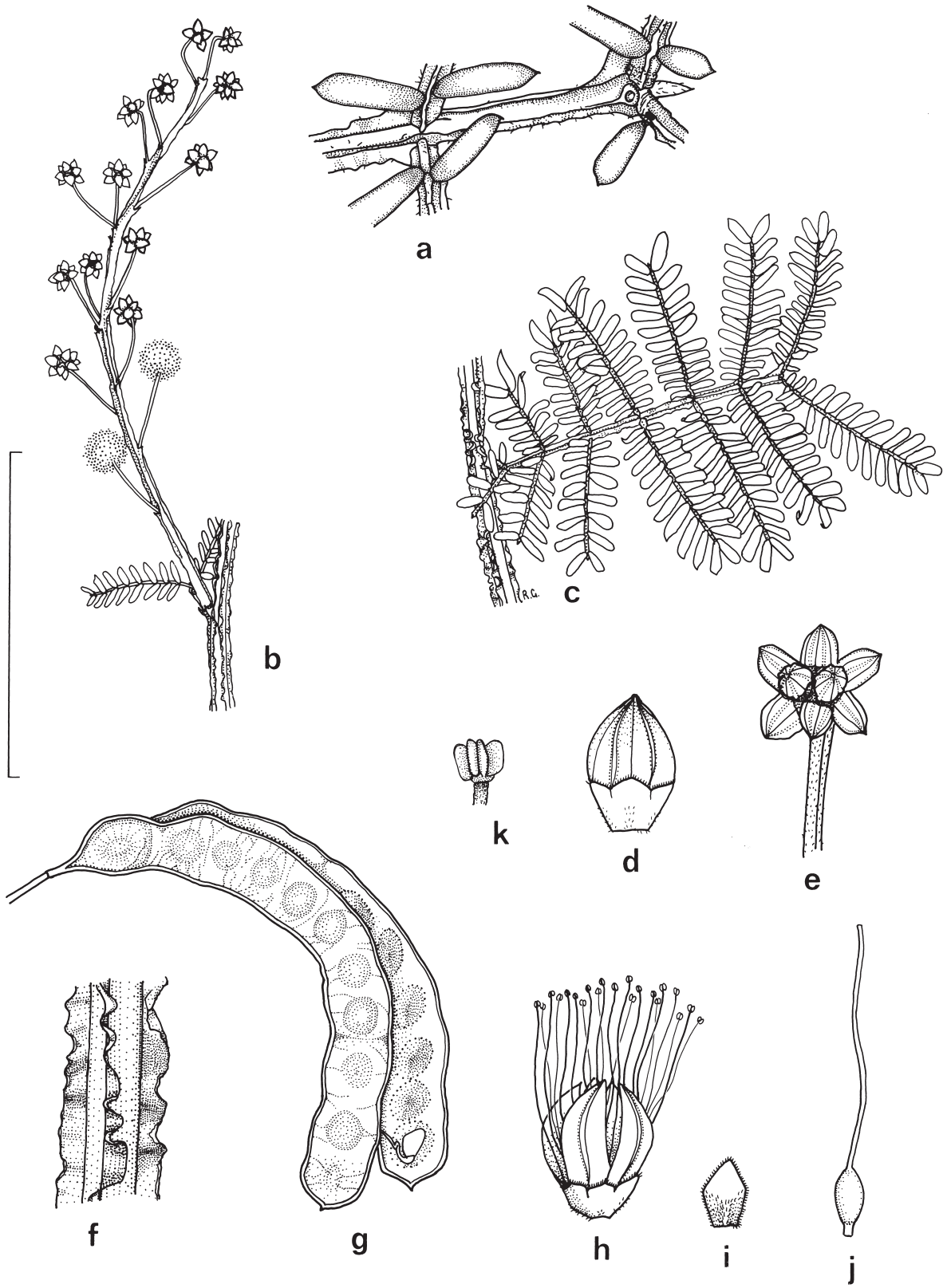

Fig. 1. *Acacia alaticaulis*: **a**, distal part of rachis; **b**, pseudo-raceme; **c**, leaf; **d**, bud; **e**, capitulum in bud; **f**, part of stem; **g**, legume; **h**, flower; **i**, bracteole; **j**, gynoecium; **k**, anther. Vouchers: a, c, f, g, *Constable s.n., NSW48881*; b, d, e, h–k, *Coveny s.n., NSW98531*. Scale bar: a, e = 12 mm; b, c, g = 60 mm; d, h–j = 6 mm; f = 20 mm; k = 1 mm.

Acacia sp. Kulnura (R.G. Coveny 4142) NSW Herbarium (APC 2013, APNI 2013)

Diagnosis: *Acacia kulnurensis* Kodela et Tindale, species nova, differt ab *A. terminali* (Salisb.) J.F.Macbr. foliis fere sessilibus, petiolis ad 0.5 cm longis, pinnulis valde recurvatis et petioli glandula parviore 0.7–1.6(–1.8) mm longa sed ab *A. alaticauli* ramulis, petiolis et rhachidibus non alatis et foliorum apicis juvenilibus dense pubescentibus pilis albis vel flavis statim diagnoscenda.

Type: New South Wales: Central Coast: 32.9 miles (53 km) c. S of Broke on the road to Kulnura, 1 mile (1.6 km) c. N of Bucketty, *R.G. Coveny 4142 & R. Bisby*, 27 Mar 1972 (holo: NSW106994; iso: A, AD, B, BRI, CANB, DNA, HO, K, L, MEL, MO, NSW826814, NSW826816, NSW977897, PERTH, RSA, U, UC, US).

Slender, spindly, bushy or spreading shrub or occasionally small tree to 4 m high, with branches often numerous and pendulous; *bark* smooth, grey or light brown. *Branchlets* angled, brown, grey-brown, reddish brown, reddish, pale green or blackish, sparsely to densely clothed with ± erect to spreading, white, fawn or yellowish hairs (often appearing in tufts) to 0.4(–0.6) mm long, with longitudinal ridges to 0.3(–0.4) mm high that are often red, red-brown or paler brown than rest of branchlet, not winged. *Young foliage-tips* densely pubescent with hairs yellow or sometimes white. *Leaves* bipinnate; *pulvinus* inconspicuous, to 2.5 mm long, pubescent; *petiole* (above pulvinus) to 5 mm long, often inconspicuous with the leaves appearing sessile or almost so, pubescent, bearing a gland just below the basal pair of pinnae or just above the pulvinus, the gland broadly oblong to circular, yellow, tan, orange-brown or red, glabrous, 0.7–1.6(–1.8) mm long, 0.5–1(–1.2) mm wide, with orifice depressed, 0.2–0.6 mm long and 0.15–0.4 mm wide; *rachis* (6–)25–85 mm long, pubescent with hairs similar to those on branchlets, adaxial surface grooved and with a longitudinal ridge often bearing a jugary gland at or near base of terminal pair of pinnae (gland to 1 mm below terminal pinnae, similar to petiolar gland but usually smaller, broadly elliptic, broadly oblong or circular, glabrous, 0.7–1(–1.2) mm long, 0.5–0.8 mm wide, with orifice 0.15–0.5 mm long and to 0.2 mm wide), rarely with a similar jugary gland at base of second pair of pinnae from apex, interjugary glands absent; *terminal seta* often recurved, narrowly deltate, to 3.2 mm long, glabrous or with sparse hairs; *pinnae* 3–13 pairs, 5–45 mm long, 6–14 mm wide (basal pair of pinnae sometimes much smaller than others), mostly ± perpendicular to rachis; *pinna-rachis* pubescent, often with a minute, circular to elliptic gland (to 0.4 mm long) at the base of the terminal pair of pinnules and rarely a similar gland at base of second pair of pinnules below the apex; *pinnules* (4–)6–15 pairs (opposite or sometimes alternately arranged on pinna-rachis), well-spaced, mostly not overlapping or touching, oblong to narrowly oblong, broadly elliptic to narrowly elliptic, lanceolate or ± narrowly obovate to oblanceolate, 2.5–8.5 mm long, 0.8–4 mm wide, midvein often faint or inconspicuous, adaxial surface dark to mid-green, often slightly raised or keeled along midvein (particularly towards base), abaxial surface paler, margin recurved, ciliate, base asymmetric to slightly asymmetrically cordate, apex conspicuously acuminate. *Heads* globular, 5–11-flowered, (5–)6–12 mm diam., cream-coloured to pale yellow, borne in axillary and terminal racemes (1–)2–6 times the length of the leaves or in panicle-like arrangements (usually at ends of branches), the raceme axes to 29 cm long, pubescent, with 3–45 heads (axes generally shorter and with fewer heads towards apex of branchlet); *peduncles* 4–15 mm long, pubescent; *bract* at base of peduncles broadly deltate, 0.8–2.3 mm long, ciliate or rarely glabrous (eg *NSW107951*), with a distinct midrib, persistent; *bracteoles* ± conspicuous, dark brown, glossy, 0.9–1.5 mm long, arrow-shaped (claw 0.1–0.5 mm long, 0.15–0.55 mm wide, ciliate; lamina usually narrowly to broadly ovate, (0.5–)0.7–1.35 mm long, densely ciliate with yellow hairs to 0.3 mm long and with similar hairs at base of the outer surface) (bracteoles variable, generally having a very short, wide claw expanding into a broadly ovate lamina or having a longer and narrower claw expanding into a narrowly ovate to ovate lamina). *Flowers* 5-merous; *calyx* 0.7–1.1(–1.4) mm long, cupular, dissected for $^1/_7$–$^1/_2$, ciliate with pale yellow or white hairs to 0.2 mm long, with similar hairs at base and often along midribs, with apex of lobes acute to obtuse; *corolla* 1.9–2.8 mm long, dissected for c. $^1/_2$ length or to base, lobes narrowly ovate to ± lanceolate, midrib prominent, apices of lobes acute, thickened, incurved and granulate or with a tuft of minute, white hairs on inside surface near tip; *ovary* glabrous. *Legumes* long-stipitate, narrowly oblong to linear, (30–)50–130 mm long, 11–17 mm wide, mostly straight-sided but sometimes irregularly constricted between seeds, straight or curved, ± flat, slightly raised and sometimes corrugated over seeds, coriaceous, dull, brown, brownish black, purplish brown or purplish black, with fine, often obscure transverse veins (usually radiating from margin and incomplete), glabrous; margin pale, prominent. *Seeds* (3–)5–12 arranged longitudinally or slightly oblique within legume, 4.5–6.5 mm long, 3–4.2 mm wide, oblongoid to broadly oblongoid or ellipsoid (sometimes broadly ellipsoid to almost rotund), black, dull to slightly shiny; *areole* closed, same colour as rest of the seed, flat or slightly depressed, 2.4–3.8 mm long, 1.1–1.7 mm wide; *funicle* cream-coloured to fawn-coloured, filiform, expanded into a cap-like aril, prolonged along one side of seed. Fig. 2.

Distinguishing features: almost sessile bipinnate leaves with small glands; indumentum of erect, white or pale yellow hairs similar on branchlets and foliage; branches and foliage have a yellowish, dull appearance, sometimes ± powdery (old herbarium specimens); pinnules with margin recurved and apex acuminate; flower-heads pale yellow.

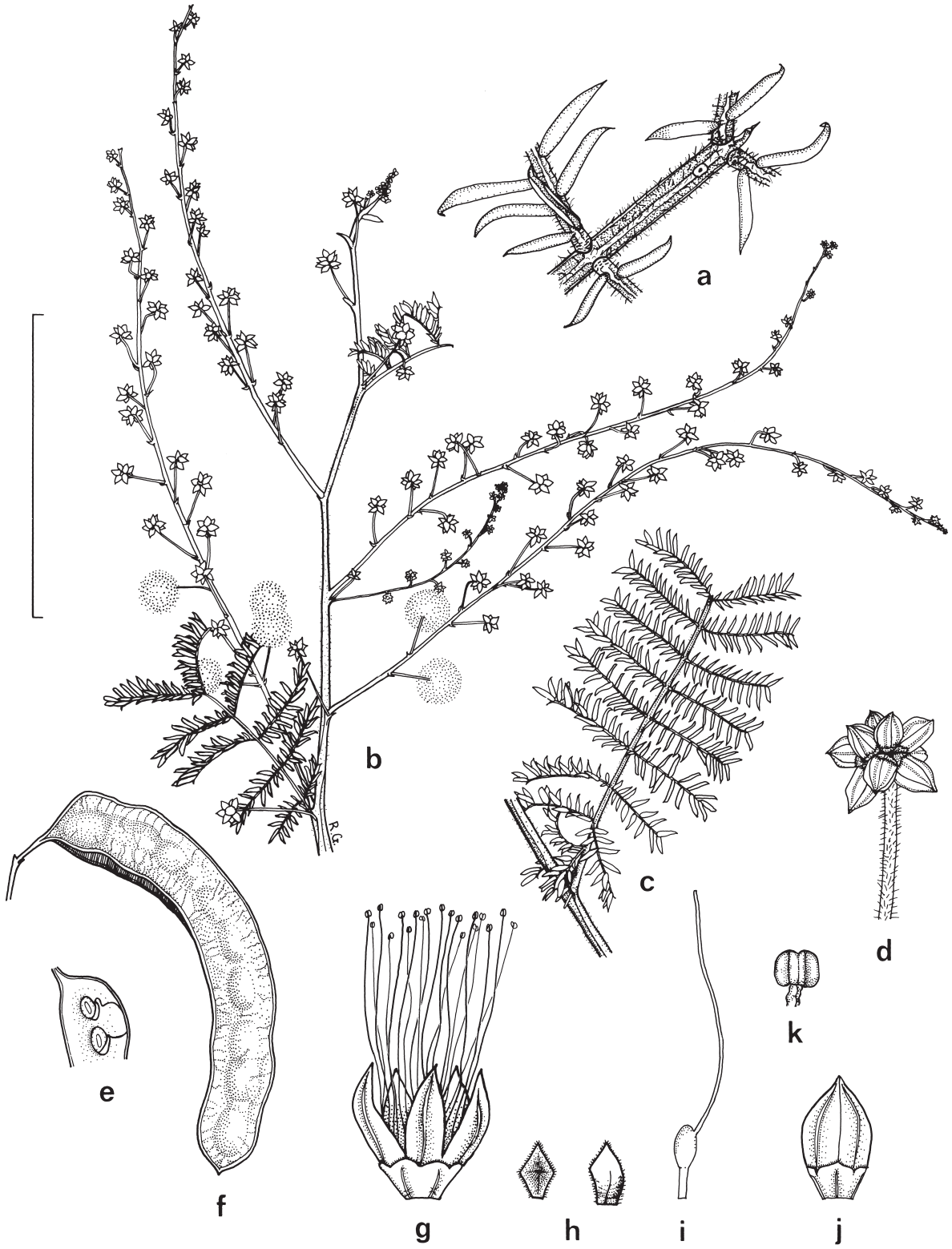

Fig. 2. *Acacia kulnurensis*: **a**, distal part of rachis; **b**, terminal part of branchlet with inflorescences; **c**, leaf ; **d**, capitulum in bud; **e**, seeds; **f**, legume; **g**, flower; **h**, bracteoles; **i**, gynoecium; **j**, bud; **k**, anther. Vouchers: a–d, g–k, *Coveny 4142 & Bisby*; e, f, *Ollerenshaw 143 & Muffett*. Scale bar: a, d = 12 mm; b, c, e, f = 60 mm; g–j = 6 mm; k = 1 mm.

Flowering: flowers from March to September with buds occurring from February. **Legumes:** starting to develop from April while plants still flowering; with mature seed occurring from September, but predominantly November to December.

Distribution: mainly in the Bucketty–Kulnura–Mangrove Mountain area in hilly country; common along the Wollombi and Settlers Roads between Mogo Creek and Bucketty (occurring c. 3 km N of Mogo Creek), and along roads (including George Downes Drive) between Bucketty, Kulnura and Mangrove Mountain (Central Mangrove area); occurring north to the Cessnock–Kurri Kurri area in the Hunter Valley. Locally occasional to frequent.

Habitat: grows in sandy soil on sandstone and sometimes in more loamy or clayey soil on softer rock lenses; often growing between sandstone boulders or on sandstone outcrops; prefers drier habitats on upper hillslopes and ridges above c. 200 m altitude; usually in dry sclerophyll forest or woodland, sometimes open woodland, with *Corymbia eximia*, *C. gummifera*, *C. maculata*, *Eucalyptus agglomerata*, *E. haemastoma*, *E. punctata*, *E. sieberi*, *E. squamosa*, *Angophora bakeri*, *A. euryphylla* and *A. costata*. Appears to colonise disturbed roadside areas in the Bucketty–Kulnura–Mangrove Mountain region. Grows in grey clay in *Eucalyptus crebra* forest near Kurri Kurri.

Etymology: the specific epithet refers to the occurrence of this species in the Kulnura area which includes the type locality.

Conservation status: *Acacia kulnurensis* has a restricted distribution (range < 100 km) and occurs in the Yengo National Park; most of the known distribution appears to be on the boundaries or outside the Park. Although not listed as threatened under state or federal legislation it has been recognised as a ROTAP taxon with the code 2RC, indicating it is 'rare' and has a geographic range of less than 100 km with at least one population occurring in a proclaimed reserved (Briggs and Leigh 1996).

Selected specimens (c. 28 collections examined)**: New South Wales: North Coast:** c. 1 km NE of Abernethy Pinnacle, Aberdare State Forest, *Bell s.n.*, 20 Feb 2001 (NSW472007); Elrington near Cessnock, *Harman s.n.*, 17 Nov 2009 (NSW797979); Ellalong (Maitland Pastoral Protection District), *Riley s.n.*, Sep 2012 (NSW974083); 3 km SE of Kurri Kurri, *Tame 78*, May 1978 (NSW); 2 miles [3.2 km] E of Kurri Kurri, *Tindale s.n.*, 30 Jun 1964 (CANB, NSW64670). **Central Coast:** near Old Northern Road turnoff on road to St Albans from Wollombi, *Bishop, Goodwin & James 678*, 15 Nov 1984 (NSW); Olney State Forest, 25 miles [40.3 km] SW of Newcastle, *Constable s.n.*, 26 May 1960 (AD, BRI, CANB, HO, NE, NSW56753, PERTH, UNSW, Z); Kulnura, 21 km WNW of Wyong, *Coveny 5846, Hind & Hancock*, 23 Nov 1974 (BRI, CANB, K, NSW, US), *Coveny 5852, Hind & Hancock*, 23 Nov 1974 (BRI, MEL, P, PERTH, Z); Kulnura, *Coveny 10200 & Seur*, 9 Sep 1978 (AD, BM, BRI, CANB, K, MEL, NSW, PERTH, Z); 3.1 km N of Greta Road intersection at Kulnura on George Downes Drive, *Johnstone 2264 & Orme*, 27 Nov 2007 (K, NSW); ridge N of Mogo Hill, c. 7.5 km due NE of Fernances, Yengo National Park, *Kodela 264 & James*, 16 Apr 1993 (CANB, MO, NSW, PERTH); Fernances–Mogo Creek–Bucketty road, c. 3 km N of Mogo Creek, Yengo National Park, *Kodela 265 & James*, 16 Apr 1993 (CANB, MEL, NSW); Mangrove Mountain, c. 3 km W of Central Mangrove, *Kodela 266 & James*, 16 Apr 1993 (CANB, NSW, UNSW); Walkers Ridge Forest Drive, Olney State Forest, *Kodela 267 & James*, 16 Apr 1993 (CANB, MEL, NSW, PERTH, Z); 2.5 miles [4 km] N of Fernances, toward Bucketty, *Ollerenshaw 143 & Muffett*, 5 Dec 1972 (CBG046029, NSW).

Notes: specimens of *Acacia kulnurensis* have sometimes been confused with *A. jonesii* F.Muell. & Maiden, which occurs further south in the vicinity of Bargo, Nowra and Goulburn. *Acacia jonseii* differs from *A. kulnurensis* by having small jugary glands at the base of all pairs of pinnae, pinnules ± concolorous with apex less acuminate, racemes flexuose to 6 cm long, flower-heads yellow to golden-yellow, ovary densely hairy and legumes smaller.

Acacia kulnurensis differs from *A. terminalis* by having almost sessile leaves with petioles up to 5 mm long, pinnules markedly recurved, and petiolar gland usually smaller, being 0.7–1.6(–1.8) mm long. Occasionally there are intermediate forms (eg in the areas of Boree, Fernances and Howes Range), which possibly represent intergrades or hybrids between these species. For example in the Yengo National Park: small tributary of Wellums Creek, between the Great North Road and Mogo Creek Road, *Bell & Vollmer s.n.*, 14 Apr 1993 (NSW270203); Devils Rock, Boree Track, Bala Range, *Wilks & Maryott-Brown s.n.*, 6 Mar 1993 (NSW270698). *Acacia kulnurensis* is most readily distinguished from *A. alaticaulis* by the unwinged branchlets, petioles and rachises, and the apex of the developing leaves being densely pubescent with white or yellow hairs.

The collections *Constable s.n.*, 26 May 1960, *Tindale s.n.*, 30 Jun 1964, and *Ollerenshaw 143 & Muffett* are vouchers for a cyanogenesis survey by Maslin et al. (1990).

Some specimens are annotated with the earlier name '*Acacia terminalis* subsp. *kulnurensis* Tindale & Kodela', *in sched.*, while '*A. kulnurensis*' has previously been cited as a manuscript name (eg in Maslin 2001, Kodela and Harden 2002: 467, Kodela 2013b; as *A. kulnurensis* Tindale & Kodela *ms.* (*Coveny 4142*) in the latter two references). The name was included in Pellow et al. (2009: 259) but not validly published there.

Key to distinguish *Acacia alaticaulis*, *A. kulnurensis* and *A. terminalis*

1a. Leaves with petiole mostly 5–43 mm long; pinnae (1 or)2–6(–8) pairs; pinnules ± flat or with margin slightly recurved; petiolar gland 1.2–12 mm long ..... ***A. terminalis***

1b. Leaves almost sessile with petioles to 5 mm long; pinnae (1–)3–13 pairs; pinnules with margin markedly recurved; petiolar gland 0.7–1.6(–1.8) mm long 2

2a. Branchlets glabrous or very sparsely puberulous, conspicuously winged by convoluted, narrow ridges to 3 mm high; young tips of foliage reddish brown, almost glabrous or slightly puberulous, resinous; pinnules mostly glabrous; petioles and rachises winged; raceme axes ± glabrous or sparsely puberulous, winged ..... ***A. alaticaulis***

2b. Branchlets sparsely to densely pubescent, with indistinct longitudinal ridges to 0.4 mm high (not winged); young tips of foliage densely pubescent with yellow or white hairs; pinnules ciliate; petioles and rachises not winged; raceme axes pubescent, not winged ..... ***A. kulnurensis***

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References

APC (2013) *Australian Plant Census*. Council of Heads of Australasian Herbaria. Centre for Australian National Biodiversity Research. http://www.chah.gov.au/apc/index.html (Accessed Sep 2013)

APNI (2013) *Australian Plant Name Index.* Council of Heads of Australasian Herbaria. Centre for Australian National Biodiversity Research. http://www.cpbr.gov.au/cgi-bin/apni (Accessed Sep 2013)

Briggs JD, Leigh JH (1996) *Rare or threatened Australian plants*, 1995 revised edition. (CSIRO: Collingwood)

Kodela PG (2013a) *Acacia alaticaulis* Kodela & Tindale ms. (Coveny 4108). *PlantNET* http://plantnet.rbgsyd.nsw.gov.au/ (Accessed Sep 2013)

Kodela PG (2013b) *Acacia kulnurensis* Tindale & Kodela ms. (Coveny 4142). *PlantNET* http://plantnet.rbgsyd.nsw.gov.au/ (Accessed Sep 2013)

Kodela PG, Harden GJ, (2002) *Acacia*, pp. 381–476, in Harden GJ (ed.), *Flora of New South Wales* Vol. 2. Revised edition. (UNSW Press: Sydney)

Kodela PG, Tindale MD (2001a) *Acacia* sp. A, pp. 221 & 222, in Orchard AE, Wilson AJG (eds), *Flora of Australia* Vol. 11A, *Mimosaceae*, Acacia *part 1*. (ABRS/CSIRO Publishing: Melbourne)

Kodela PG, Tindale MD (2001b) *Acacia* sp. B, pp. 222 & 223, in Orchard AE, Wilson AJG (eds), *Flora of Australia* Vol. 11A, *Mimosaceae*, Acacia *part 1*. (ABRS/CSIRO Publishing: Melbourne)

Maryott-Brown K, Wilks D (1993) *Rare and endangered plants of Yengo National Park and adjacent areas.* New South Wales National Parks and Wildlife Service (unpublished report)

Maslin BR (2001) *WATTLE – Acacias of Australia*. CD ROM (CSIRO Publishing: Collingwood)

Maslin BR, Conn EE, Hall N (1990) Cyanogenesis in Australian Leguminosae: herbarium survey of some *Acacia* and Papilionoideae species. *Kingia* 1(3): 283–294.

Pellow BJ, Henwood MJ, Carolin RC (2009) *Flora of the Sydney Region*, 5th edition (Sydney University Press: Sydney)

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