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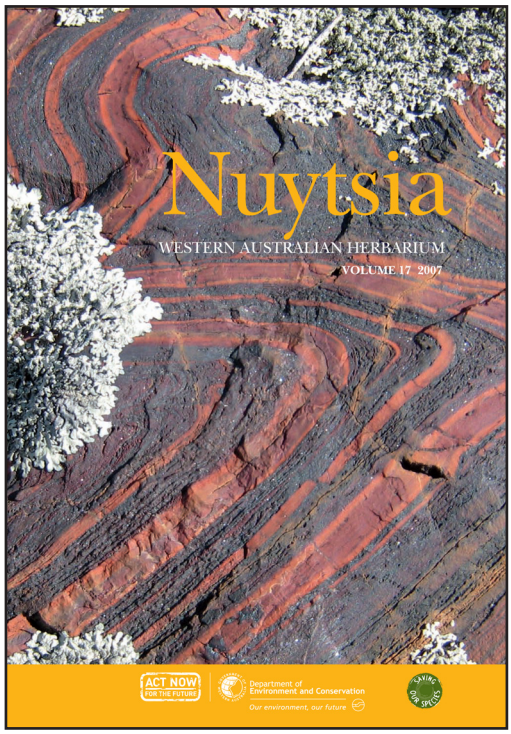

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Acacia cockertoniana (Leguminosae: Mimosoideae), a new species from banded ironstone ranges of the south-west arid zone, Western Australia

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Abstract

Maslin, B.R. *Acacia cockertoniana* (Leguminosae: Mimosoideae), a new species from banded ironstone ranges of the south-west arid zone, Western Australia. *Nuytsia* 17: 247–252 (2007). *Acacia cockertoniana* Maslin, a new species with a restricted distribution in the south-west arid zone of Western Australia is described. The species is restricted to banded ironstone ranges which accounts for its discontinuous distribution between Mt Jackson (130 km north of Southern Cross) and near Mt Magnet (*c*. 270 km north-west of Mt Jackson). Sterile specimens from north of Mt Magnet require confirmation as being this species. *Acacia cockertoniana* is often abundant in the places where it occurs and current evidence suggests that it is most common in the vicinity of the Windarling Range. *Acacia cockertoniana* appears to be most closely related to *A. balsamea* Cowan & Maslin.

Introduction

This new species was first drawn to my attention by Geoff Cockerton, after whom it is named. Botanical surveys in 2003 and 2004 in the Windarling Range (160 km north of Southern Cross) by Cockerton *et al.* (see Western Botanical 2004) had shown that the species was a conspicuous element of the vegetation in an area covered by a mining lease (an iron ore mine is now operational in this area). Following an inspection of these populations in 2004, I was able to locate additional specimens of the species at the Western Australian (WA) Herbarium (PERTH), mostly filed under *Acacia aff. coolgardiensis* Maiden. These specimens had mostly been gathered by Hugh Pringle (WA Department of Agriculture) in 1993 from the vicinity of Lake Barlee, about 100 km to the north of the Windarling Range.

The species is now known to occur on the Die Hardy Range and Mt Jackson, which are located immediately to the south of the Windarling Range; it also occurs in the Mt Magnet region about 200 km to the north-west. The first collection of the species appears to have been by Alan Payne (WA Department of Agriculture) from Meka Station (about 120 km north-west of Mt Magnet), however, this specimen is sterile and flowering or fruiting material is needed to confirm its identity. The new species is habitat specific, being restricted to areas of Banded Iron Formation (BIF).

Species description

Acacia cockertoniana Maslin, *sp. nov*.

Frutices vel *arbores*, 3–6(–7) m altae. *Phyllodia* anguste linearia vel lineari-elliptica vel lineare-oblanceolata, ad basim angustata, 5–15(–17) cm longa, (1–)2.5–5(–6) mm lata, plana, non rigida, resinosa; *nervi longitudinali* paralleli numerosi, relative lati (0.1–0.2 mm lati); *apices* curvati vel uncinati, acuti. *Capitula* globularia vel obloidea, *c.* 4–5 mm longa (in sicco); gemmae resinosae; *pedunculi* 4–6 mm longi in statu florenti, usque ad 12 mm in statu fructifero, glabri vel sub-glabri. *Flores* 5-meri; *sepala* libra vel ad basim breviter connata, oblonga vel anguste oblonga. *Legumina* linearia, (4–)6–12 cm longa, 3–5 mm lata, ± plana, plerumque inter semina non constricta, tenuiter crustacea, nervis longitudinalibus paucis, parce anastomosis, inter nervos sericea. *Semina* in legumine longitudinaliter disposita, 4–4.5 mm longa, 1.5–2 mm lata.

Typus: Windarling Range (160 km north of Southern Cross) south of the west end of Portman Iron Ore deposit W3, Western Australia, 14 December 2003, *S.A. McNee, G.O'Keefe & J. Lester* LCS 8815 (*holo*: PERTH 07125690; *iso*: K, MEL).

Acacia sp. Diemals (H.J.R. Pringle 3924A), Western Australian Herbarium, in FloraBase, http://florabase.dec.wa.gov.au [accessed 16 August 2007].

Photographs. WorldWideWattle [online at www.worldwidewattle.com].

Obconic, multi-stemmed or infrequently single-stemmed *shrubs* or *trees* 3–6(–7) m tall, main stems 8–10 cm dbh and together with the upper branches typically slightly crooked, young plants rounded and to 4 m across; *crowns* sub-dense, greyish green (new growth light green) with a silvery sheen. *Bark* grey, rough, rather deeply longitudinally fissured on main stems, smoother on upper branches. *Branchlets* terete, reddish brown (often partially covered with a light grey, ± flaking epidermis), angled at extremities due to yellow resin ribs, sericeous between ribs (the hairs short, straight, appressed, silvery and difficult to see without magnification), indumentum sparse to moderate, the ribs not prominent with age. *New shoots* bright light green (tinged yellowish), resinous, slightly viscid. *Phyllodes* narrowly linear to linear-elliptic or linear-oblanceolate, narrowed at the base, 5–15(–17) cm long, (1–)2.5–5(–6) mm wide, flat, not rigid, mostly erect but some spreading at wide angles, straight to shallowly incurved, shallow recurved or sometimes shallowly sigmoid, resinous (resin often confined to nerves), with a slight unpleasant musky odour, mid-green to dark greyish green (often drying darkish green tinged yellowish brown), minutely sericeous producing a silvery sheen in sunlight, the hairs mostly confined to between nerves; *longitudinal nerves* numerous, parallel, of uniform prominence or more commonly 3–5 more pronounced (visible to unaided eye) than the rest, relatively broad (0.1–0.2 mm wide), covered with a discernible layer of translucent shiny resin (observe at ×10 mag. or higher); *apices* curved to uncinate, acute; *pulvinus* 0.5–1.5 mm long, not prominent. *Gland* situated on upper margin on phyllode 0–2 mm above the pulvinus, not prominent, submerged within lamina which is slightly swollen about the gland. *Inflorescences* simple, 1 or 2 per axil; *heads* globular (especially in bud) or more commonly obloid, about 4–5 mm long (when dry), light golden, buds resinous; *peduncles* 4–6 mm long when in flower, up to 12 mm long when in fruit, glabrous to sub-glabrous (hairs minute, straight, appressed and silvery white); single *basal peduncular bract* persistent to anthesis, *c.* 1 mm long, brown, resinous. *Bracteoles* spathulate, 0.6–0.8 mm long, glabrous or sub-glabrous, claws linear, the laminae ovate-elliptic, *c.* 0.3 mm wide, ± inflexed and brown. *Flowers* 5-merous, small (1.3–1.5 mm long); *sepals* free or very shortly united at base, ⅓–½ length of petals, oblong to narrowly oblong but often

slightly expanded at apex; *petals* 1.6–1.8 mm long, glabrous, nerveless or very obscurely 1-nerved. *Pods* linear, (4–)6–12 cm long, 3–5 mm wide, ± flat (not obviously raised over the seeds), straight-edged or sometimes very slightly constricted between the seeds, pendulous, straight to shallowly curved, thinly crustaceous, light red-brown, marked with few, ± prominent, sparingly anastomosing longitudinal nerves, sericeous between the nerves, marginal nerve scarcely evident. *Seeds* longitudinal in pods, obloid to narrowly obloid, 4–4.5 mm long, 1.5–2 mm wide, compressed (1 mm thick), mid-brown, shiny; *pleurogram* 'u'-shaped, not prominent, open towards the hilum, bordered by a diffuse band of dull yellow tissue; *areole* 0.4–0.5 mm long, 0.3–0.4 mm wide; *funicle* filiform, folded below a fleshy, terminal, pale coloured (cream) *aril*. (Figure 1)

Characteristic features. *Shrubs* or *trees* 3–6(–7) m tall, main stems and upper branches typically slightly crooked, crowns greyish green (light green when making new growth) with a silvery sheen. *Phyllodes* narrowly linear to linear-elliptic or linear-oblanceolate, narrowed at the base, 5–15(–17) cm long, (1–)2.5–5(–6) mm wide, flat, not rigid, resinous, mid-green to dark greyish green (often drying darkish green tinged yellowish brown), minutely sericeous (hairs mostly confined to between nerves); parallel *longitudinal nerves* numerous, relatively broad (0.1–0.2 mm wide), covered with a discernible layer of translucent shiny resin; *apices* curved to uncinate, acute. *Heads* globular or obloid, about 4–5 mm long (when dry), buds resinous; *peduncles* 4–6 mm long when in flower, up to 12 mm long when in fruit, glabrous to sub-glabrous. *Flowers* 5-merous; *sepals* free or very shortly united at base, oblong to narrowly oblong. *Pods* linear, (4–)6–12 cm long, 3–5 mm wide, ± flat, mostly not constricted between seeds, straight to shallowly curved, thinly crustaceous, marked with few, ± prominent, sparingly anastomosing longitudinal nerves, sericeous between the nerves. *Seeds* longitudinal in pods.

Selected specimens examined. WESTERN AUSTRALIA: Mt Magnet, Harmony Gold Minesite, 13 Oct. 2006, *S. Kern & D. True* 12036 (NSW, PERTH); eastern extremity of Windarling Range (between Southern Cross and Menzies), foothills on N side of Portman Iron Ore deposit, 1 Oct. 2004, *B.R. Maslin* 8617 (AD, PERTH); Windarling Range (160 km N of Southern Cross) on lower slope of southern side of Portman Iron Ore deposit W2, 14 Dec. 2003, *S.A. McNee, G. O'Keefe & J. Lester* LCS 8817 (AD, CANB, PERTH); Windarling Range (160 km N of Southern Cross) southern slope of Portman Iron Ore deposit W3, 21 Oct. 2004, *S. McNee & G. O'Keefe* LCS 9632 (CANB, K, PERTH, NSW); Bulga Downs Station, 7 Jan. 2005, *C. Payne s.n.* (PERTH 06949347); Cashmere Downs Station, 17 Sep. 1993, *H. Pringle* 3924A (MEL, PERTH); Coolwater paddock, Lake Barlee, 28 Sep. 1993, *H. Pringle* 3984 (NSW, PERTH); Mt Elvire Station, 20 Nov. 1993, *H. Pringle* 30188 (PERTH).

Distribution and habitat. *Acacia cockertoniana* has a disjunct distribution in the south-western extremity of the arid zone in Western Australia (Western Australian Herbarium 1998–). It occurs in the vicinity of Lake Barlee (e.g. Bulga Downs Station, Cashmere Downs Station, Diemals Station and Mount Elvire Station) and on the Die Hardy Range, Windarling Range and Mt Jackson, immediately to the south. It also occurs near Mt Magnet township (*c.* 270 km north-west of Mt Jackson); two sterile specimens from *c.*120 km north-west of Mt Magnet (*Hitchcock* SH718-08 from Weld Range and *Payne* 36 from Meka Station; both at PERTH) are provisionally referred to *A. cockertoniana* but flowering or fruiting material is needed to confirm these identifications. A variant from the Jack Hills (*c.* 200 km north of Mt Magnet) is discussed below under *Variation*; this variant is currently not included within the circumscription of *A. cockertoniana*. *Acacia cockertoniana* is often abundant in the places where it occurs and current evidence suggests that it is most common in the vicinity of the Windarling Range. The discontinuous nature of the distribution of this species relates to its habitat specificity. *Acacia cockertoniana* is restricted to BIF hills and ranges and grows in iron-rich, red-brown sandy loam or silty clay. It grows in dense *Acacia* shrubland with scattered eucalypts.

Figure 1. Holotype of *Acacia cockertonia* Maslin (*S.A. McNee, G.O'Keefe & J. Lester* LCS 8815), scale = 5cm.

Flowering and fruiting periods. Flowers have been collected from October to December and judging from these specimens it is likely that the flowering period would extend to January. Pods with mature seed have been collected from late October to late November and judging from these specimens it is likely that mature seed would also occur in December and possibly January. Although the flowering and fruiting periods coincide it is rare to find specimens with both flowers and mature pods (most specimens are either in flower or in fruit). From available information it is possible that it takes about a year from flowering for seed to mature, however, such a lengthy seed maturation period would be unusual for *Acacia*. The possibility also exists that an as-yet unrecorded flowering event occurs around mid-year (associated with winter rainfall), in which case the seed maturation time would be reduced to a few months. There are many arid zone *Acacia* species that flower opportunistically in response to both summer and winter rains.

Conservation status. *Acacia cockertoniana* was formerly included on the Department of Environment and Conservation's Declared Rare and Priority Flora List as a Priority Three species (Atkins 2006), however, it has recently been removed from the List because it is now known to be more common than first thought.

Etymology. This new species is named for Geoff Cockerton (Managing Director, Landcare Holdings Pty Ltd) who first brought it to my attention and who facilitated my October 2004 visit to the Windarling Range to inspect plants in the field. Over the past decade Geoff and his staff have made a valuable contribution to science, and to the collections of the Western Australian Herbarium, by the information and specimens they have provided, especially of rangeland species of *Acacia*.

Affinities. Because the heads of *A. cockertoniana* vary from globular to obloid it does not fit well into either *Acacia* sect. *Juliflorae* (Benth.) Maiden & Betche (phyllodes plurinerved, flowers in cylindrical spikes) or *Acacia* sect. *Plurinerves* (Benth.) Maiden & Betche (phyllodes plurinerved, flowers in globular heads). The new species appears to be most closely related to *A. balsamea* Cowan & Maslin (1999) on the basis of phyllode nervature and general floral and carpological features. Like *A. cockertonia*, *A. balsamea* has obloid heads, thus is not robustly placed in either *Acacia* sect. *Juliflorae* or *Acacia* sect. *Plurinerves*. *Acacia balsamea* is normally readily distinguished from *A. cockertoniana* by having terete phyllodes, however, a rare flat phyllode variant occurs in the Gibson Desert (Clutterbuck Hills, *S.D. Hopper* 2833, PERTH; specimen sterile) and Little Sandy Desert (Rudall River, *R.P. Hort* 993, PERTH; specimen in flower); over 1000 km to the north of where *A. cockertoniana* occurs. These plants are shrubs 1–3 m tall and while their phyllodes and branchlets are very similar to those of *A. cockertoniana* the flowering peduncles are 8–10 mm long and the sepals are linear-spathulate. Better material of this variant is needed to further investigate its relationship to *A. cockertoniana*. The closest known populations of typical *A. balsamea* to those of *A. cockertoniana* are at Leinster, *c.* 150 km due north-east of Lake Barlee.

Acacia thoma Maslin (Western Australian Herbarium 1998–; Maslin & van Leeuwen in press) appears to have some affinities with *A. cockertoniana* but is readily distinguished by its cylindrical inflorescence spikes (10–25 mm long), sub-moniliform pods (i.e. clearly raised over and constricted between the seeds) and by its phyllode nerves, which are more numerous, narrower and not covered by an obvious, translucent layer of resin. Furthermore, *A. thoma* is a smaller shrub (mostly 2–3.5 m tall), its phyllodes normally dry a pale greyish green colour (dark green often with a yellowish brown tinge in *A. cockertoniana*) and it is distributed to the north and east of the geographic range of *A. cockertoniana* (Western Australian Herbarium 1998–; Maslin & van Leeuwen in press).

In the Windarling Range area *A. cockertoniana* is sympatric with *A. ramulosa* W.V. Fitzg.

var. *ramulosa* and grows in close proximity to *A. coolgardiensis* subsp. *effusa* R.S. Cowan & Maslin (but is not sympatric with it). Narrow phyllode forms of *A. cockertoniana* may superficially resemble either of these two taxa, which are distinguished by their terete pods (thick in *A. ramulosa* var. *ramulosa* and very narrow in *A. coolgardiensis* subsp. *effusa*) and their phyllode nerves, which are not covered with a translucent layer or resin. *Acacia ramulosa* is further recognized by its cylindrical flower spikes and *A. coolgardiensis* subsp. *effusa* by its normally sessile, obloid heads.

Variation. The phyllode width varies to some extent. For example, on plants at Windarling Range the phyllodes are mostly 2–5 mm wide (only occasionally do a few reach 6 mm) but scattered throughout the populations are some plants with consistently very narrow phyllodes (1 mm wide). The reason for this variation is unknown. Also, judging from the relatively few collections at hand, the phyllodes on plants from the western extremity of the geographic range (i.e. Mt Magnet and northwards) are consistently narrower (2–3 mm wide) than elsewhere.

An entity of uncertain taxonomic status, and known from only a few flowering specimens, occurs on banded ironstone ranges at Jack Hills, *c.* 200 km north of Mt Magnet. This entity appears to be related to *A. cockertoniana* on account of the general features of its phyllodes (especially nervature and colour) and flowers (especially the sepals), but it differs significantly from the new species in having elongated flowering spikes (1–2 cm long) and less resinous phyllodes. Fruiting material is needed to further investigate the taxonomic status of this entity. This entity has been provided with the informal name *A*. sp. Jack Hills (R. Meissner & Y. Caruso 4) and is represented at PERTH by the following specimens: *A. Capobianco* AC 658-11; *R. Meissner & Y. Caruso* 4, 5, 6 and 141.

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