

***Acacia mackenziei*, a new species of *Acacia* section *Lycopodiifoliae*  
(Fabaceae: Mimosoideae) with conservation significance from the east  
Kimberley region in northern Western Australia**

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### Abstract

Maslin, B.R. & Barrett, R.L. *Acacia mackenziei*, a new species of *Acacia* section *Lycopodiifoliae* (Fabaceae: Mimosoideae) with conservation significance from the east Kimberley region in northern Western Australia. *Nuytsia* 24: 187–192 (2014). Studies of *Acacia* Mill. sect. *Lycopodiifoliae* Pedley have resulted in the recognition of a new species, *A. mackenziei* Maslin & R.L.Barrett, which is most closely related to *A. anasilla* A.S.George. The new species occurs in the east Kimberley region of Western Australia where it is restricted to a single sandstone range near Kununurra. *Acacia mackenziei* is classified as a Priority One taxon under Department of Parks and Wildlife Conservation Codes for Western Australian Flora.

### Introduction

The species described here belongs to *Acacia* Mill. sect. *Lycopodiifoliae* Pedley, a group of 23 species that predominate in tropical and sub-tropical Australia from Western Australia eastwards through the Northern Territory to Queensland; a few species extend south to the adjacent arid zone (George 2001). These distinctive species are most easily recognised by their innocuous phyllodes that are arranged in regular whorls at the nodes. Section *Lycopodiifoliae* was revised by Pedley (1972) and subsequently reviewed by George (1999, 2001); four additional species belonging to the section were recently described by Maslin *et al.* (2013) and Maslin and Cowie (2014).

The description of this new species adds to the increasing number of taxa recognised as endemic to east Kimberley sandstone ranges, and further surveys in this region may well identify more (Barker 1990; Dunlop & Done 1992; Lazarides 1995, 1997; Duretto 1997; Halford 1997; Craven *et al.* 2003; Barrett *et al.* 2005; Barrett 2007; Barrett & Barrett 2011; Maslin *et al.* 2013; R. & M. Barrett, unpubl. data).

The new species has been included in the online identification key to Australian acacias (Maslin 2014).

## Taxonomy

**Acacia mackenziei** Maslin & R.L.Barrett, *sp. nov.*

*Type:* south-east of Kununurra, Western Australia [precise locality withheld for conservation reasons], 8 April 2013, *R.L. Barrett, M.D. Barrett & B. Anderson* 7850 (*holo:* PERTH 08552282; *iso:* BRI, CANB, DNA, K, MEL, PERTH 08552304 & 08552290).

Spindly, single-stemmed, sparingly and openly branched, erect *shrub* 1–2 m tall, with slender stems and branches. *Branchlets* terete, obscurely ribbed or ribs not evident, densely pubescent, the hairs short, straight or shallowly curved, patent or slightly retrorse, soft and white. *Stipules* setaceous to linear-triangular, (1–)1.5–2.5(–3) mm long, erect, straight to shallowly incurved, shiny resinous, light brown but aging yellow, glabrous. *Phyllodes* in regular whorls 2–12 mm apart, 14–20 per whorl, linear but gradually narrowed towards the base, 4–10 mm long (excluding mucro), 0.4–0.7 mm wide, ascending to erect or patent, straight to shallowly recurved (curving over entire length or only near apex), mostly horizontally flattened to compressed, slightly thickened, obscurely longitudinally furrowed or wrinkled when dry, green, sparsely to moderately pubescent, the fine hairs not prominent, very short (to *c.* 0.1 mm long), wide-spreading, straight to shallowly curved and white; with 1 or 3 *longitudinal nerves* on lower surface, midrib the most pronounced when 3-nerved, the nerves not especially prominent, nerveless on upper surface; *apex* abruptly contracted to a distinct, setose mucro 1–1.5 mm long, the mucro straight to shallowly curved and light brown except yellow when young; *pulvinus* indistinct. *Gland* not visible. *Inflorescences* simple; *peduncles* 10–17 mm long, pubescent with hairs similar to those on branchlets except less dense, base ebracteate; *heads* globular, *c.* 7 mm diam. (when dry), yellow, 35–45-flowered. *Bracteoles* narrowly lanceolate, 2.5–3.5 mm long, slightly exerted beyond flowers in buds; *claws* oblong and short; *laminae* 0.3–0.5 mm wide, shiny resinous, light brown, glabrous, striate, long-acuminate to caudate. *Calyx* 1/3–2/5 length of corolla, glabrous, shortly dissected (1/4–1/3 its length) into 5–10, linear to narrowly triangular lobes. *Corolla* 2–2.5 mm long, the petals 5, striate but sometimes obscurely so and glabrous or with a few, short hairs at their apices. *Pods* narrowly oblong, 25–50 mm long, 6–7 mm wide, dehiscing unilaterally, flat but raised over seeds along midline, not constricted between seeds, thinly coriaceous, straight or a few shallowly curved, dark red-brown, glabrous, reticulately nerved, abruptly narrowed at base to a short stipe 1 mm long; *marginal nerve* thickened. *Seeds* longitudinal in the pods, irregularly obloid to cubic or widely ellipsoid, 4–4.5 mm long, 2.5–3.5 mm wide, black, slightly shiny with a satin lustre; *pleurogram* obscure; *areole* small (0.5–0.7 × 0.4–0.6 mm), elliptic or widely elliptic, open or not open at end facing the aril; *funicle* expanded into a clavate, cream (perhaps white when fresh) *aril*. (Figure 1)

*Characteristic features.* Spindly, single-stemmed, sparingly branched, erect *shrub* 1–2 m tall. *Branchlets* densely pubescent with short, patent or slightly retrorse hairs. *Stipules* setaceous to linear-triangular, mostly 1.5–2.5 mm long, light brown aging yellow. *Phyllodes* 14–20 per whorl, 4–10 mm long, 0.4–0.7 mm wide, ascending to erect to patent, mostly flat, straight to shallowly recurved, green, pubescent by fine, very short hairs (to *c.* 0.1 mm long), with 1 or 3 *longitudinal nerves* on lower surface; *apex* terminated by a setose point 1–1.5 mm long. *Peduncles* 10–17 mm long. *Bracteoles* narrowly lanceolate, 2.5–3.5 mm long, slightly exerted in buds, glabrous, long-acuminate to caudate. *Calyx* 1/3–2/5 length of corolla, shortly dissected into 5–10, linear to narrowly triangular lobes. *Petals* 5, striate, glabrous or sparsely short-hairy at apices. *Pods* narrowly oblong, 6–7 mm wide, flat but raised over seeds along midline, stipe 1 mm long; *marginal nerve* thickened. *Seeds* longitudinal, irregularly obloid to cubic or widely ellipsoid, black, slightly shiny.



Figure 1. *Acacia mackenziei*. A – habitat at type location with Ben Anderson holding top of mature plant; B – habit on sandstone slope; C – flowering and fruiting branchlet with compact and well-spaced phyllodes; D – straight phyllodes with short mucro; E – fruiting branchlet with compact phyllodes; F – recurved phyllodes with longer mucro. Voucher: *R.L. Barrett, M.D. Barrett & B. Anderson 7850*. Images by R.L. Barrett.

*Other specimens examined.* WESTERN AUSTRALIA: [localities withheld for conservation reasons] 8 Apr. 2013, *R.L. Barrett, M.D. Barrett & B. Anderson* 7848 (PERTH); 29 Jan. 1982, *K.F. Kenneally s.n.* (BRI, PERTH 07883358 & 07925360).

*Distribution and habitat.* Occurs in the east Kimberley region of northern Western Australia to the south-east of Kununurra. It is presently known from only a single sandstone range where the population occurs on both sides of a high ridge dissected by a narrow gorge. Two sub-populations were located about 1 km apart, with about 40 plants in the first and about 20 plants in the second.

*Phenology.* The paucity of collections prevents a comprehensive assessment of phenology. However, existing specimens show flowering as commencing in the late 'wet season' at the end of January, and continuing until at least early April. Pods with mature seeds often occur on plants with flowers at anthesis.

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

*Etymology.* It is a great pleasure to name this new species for Norman (Norm) McKenzie, Senior Principal Research Scientist with the Western Australian Department of Parks and Wildlife. Norm has devoted 40 years to studying the biogeography of Western Australia, including the Kimberley region. His work has underpinned knowledge of the State's biological assets and its conservation priorities, and has been pivotal in the establishment of a comprehensive conservation reserve system. Although primarily a mammalogist, Norm always incorporated a botanical component to biological surveys and worked closely with the botanists on his teams.

*Common name.* Norm's Whorled Wattle.

*Variation.* Phyllode length, curvature, orientation and disposition in this species vary considerably, probably related to seasonal growth conditions. For example, on the type collection the phyllodes range from long (10 mm), straight and erect with whorls 7–12 mm apart to short (5 mm), shallowly recurved and somewhat spreading with whorls 2–3 mm apart. Because of this variation the general facies of different branchlets, or parts of branchlets, can appear somewhat dissimilar with respect to their foliage.

*Affinities.* *Acacia mackenziei* is most closely related to *A. anasilla* A.S. George. The significant characters shared by these two species include the following: phyllodes 14–20 per whorl with nerves visible on lower surface (at least when dry) and the mucro distinct and setose, bracteoles narrowly lanceolate and long-acuminate, calyx shorter than 1/2 length of corolla and shortly dissected into linear to narrowly triangular lobes, petals striate, pods more or less sessile and relatively narrow, and seeds irregularly shaped and longitudinally oriented within the pods. Furthermore, both these species are normally erect, sparingly branched, somewhat spindly shrubs 1–2 m tall and as such are unusual within sect. *Lycopodiifoliae* where most other taxa are of lower stature and/or more extensively branched. Although the differences between *A. anasilla* and *A. mackenziei* are not especially great they are such that the overall facies of the species appears very different (especially insofar as their branchlet and phyllode indumentum is concerned; see discussion below). While it could be argued that these taxa might be better treated as subspecies, the differences between them are subjectively judged as being at least as significant as those used by George (1999) to separate *A. anasilla* from its highly polymorphic close relative, *A. lycopodiifolia* A.Cunn. ex Hook.

*Acacia anasilla* is distinguished from *A. mackenziei* by its branchlet indumentum being denser and more conspicuous, peduncles longer (17–30 mm), calyx generally shorter (*c.* 1/4 the length of the petals) and petal apices consistently and more obviously hairy (the indumentum denser and hairs longer). The phyllodes of *A. anasilla* differ most obviously from those of *A. mackenziei* in having longer apical setae (1.5–4 mm) and a more conspicuous indumentum of longer hairs (0.2–0.4 mm). Indeed, because of the density and length of these phyllode hairs *A. anasilla* characteristically presents as having smoky grey foliage, whereas *A. mackenziei* with its shorter, less obvious phyllode indumentum presents as having green foliage. The phyllodes of *A. anasilla* further differ than those of *A. mackenziei* in being slightly narrower (0.3–0.4 mm wide) and vary from sub-terete to flat; although the basic phyllode nervature is the same in both species, in *A. anasilla* the phyllodes are only rarely (incipiently) 3-nerved on their lower surface. *Acacia anasilla* is scattered in the Kimberley region with populations occurring north of Fitzroy Crossing and in the general vicinity of Turkey Creek, about 200 km to the east. *Acacia mackenziei* is currently known from a single population located about 150 km to the north of Turkey Creek.

*Acacia mackenziei* also has affinities with *A. perryi* Pedley and *A. prolata* Maslin, M.D. Barrett & R.L. Barrett but both these species differ in having normally nerveless phyllodes (rarely obscurely 1-nerved on their lower surface). *Acacia perryi* is further distinguished from *A. mackenziei* by its phyllodes, which possess longer hairs (0.2–0.3 mm) and a non-setose mucro that is somewhat thickened, subulate and more or less sub-rigid, and by its petals, which have a denser indumentum of longer hairs. *Acacia perryi* has a widespread, scattered distribution in sub-tropical Australia, extending from Mornington Station (north of Fitzroy Crossing) east to central Northern Territory. The closest known populations of *A. perryi* to those of *A. mackenziei* are from Purnululu National Park in Western Australia (about 150 km to the south) and Gregory National Park in the Northern Territory (about 150 km to the south-east). *Acacia prolata* is further distinguished from the new species by its normally free sepals that are 1/2 or slightly more than 1/2 the length of the petals. This species occurs in the far north-west Kimberley region (Maslin *et al.* 2013) about 500 km to the west of where *A. mackenziei* grows.

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