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Acacia equisetifolia, a rare, new species of *Acacia* sect. *Lycopodiifoliae* (Fabaceae: Mimosoideae) from the Top End of the Northern Territory

Bruce R. Maslin[1] and Ian D. Cowie[2]

[1]Western Australian Herbarium, Department of Parks and Wildlife, Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
[2]Northern Territory Herbarium, Department of Land Resource Management, P.O. Box 496, Palmerston, Northern Territory 0831
[1]Corresponding author, email: bruce.maslin@dpaw.wa.gov.au

Abstract

Maslin, B.R. & Cowie, I.D. *Acacia equisetifolia*, a rare, new species of *Acacia* sect. *Lycopodiifoliae* (Fabaceae: Mimosoideae) from the Top End of the Northern Territory. *Nuytsia* 24: 1–5 (2014). *Acacia equisetifolia* Maslin & Cowie, a new species known only from Kakadu National Park, Northern Territory, is described. The new species, formerly known by the phrase name *Acacia* sp. Graveside Gorge (V.J. Levitzke 806), is very closely related to *A. hippuroides* Heward ex Benth. which occurs about 1,000 km to the south-west, in the western Kimberley region of Western Australia. The main morphological features separating these two species are the nature of branchlet and peduncle indumentum and various pod attributes.

Introduction

The new species described here belongs to *Acacia* Mill. sect. *Lycopodiifoliae* Pedley, a small, distinctive group of species characterised by having phyllodes arranged in regular whorls. George (1999) provides a terse review of this section and George (2001) provides descriptions of the species known at that time. Apart from the new species described below, three additional species have recently been added to the section (see Maslin *et al*. 2013), bringing the total number to 22. It is quite possible that further research, particularly of entities in Western Australia, will result in the recognition of further taxa for this section.

The new species is found on the western Arnhem Land sandstone plateau which is well-known as a centre of endemism for plant species in the Northern Territory, with many having restricted distributions (Woinarski *et al.* 2006). Following botanical exploration of the area from the 1970s onwards, revisions of plant genera have revealed the presence of substantial numbers of new species from a wide range of genera, e.g. *Boronia Sm.* (Duretto 1997; Duretto & Ladiges 1997), *Hibbertia* Andrews (Toelken 2010), *Mitrasacme* Labill. (Dunlop 1996), *Spermacoce* L. (Harwood & Dessein 2005) and *Triumfetta* L. (Halford 1997). Among these are a number of new species of phyllodinous *Acacia*, but none from sect. *Lycopodiifoliae* (Pedley 1999; Tindale & Kodela 1992; Tindale *et al.* 1996). While the new species was first collected in 1981, the gathering lacked collection locality details, making relocation difficult. It was not found again until 2004, during a survey of a number of rare and threatened plant species in Kakadu National Park (Kerrigan 2004). Subsequent surveys were undertaken to better establish its distribution, abundance and threats, and additional collections were made (Kerrigan *et al.* 2006, 2007).

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Taxonomy

Acacia equisetifolia Maslin & Cowie, *sp. nov.*

Type: Kakadu National Park, Northern Territory [precise locality withheld for conservation reasons], 19 March 2004, *K.G. Brennan* 6203 (*holo*: PERTH 08455457; *iso*: DNA).

Acacia sp. Graveside Gorge (V.J. Levitzke 806), *Australian Plant Census*, http://www.anbg.gov.au/chah/apc/index.html [accessed May 2013].

Erect *shrubs* to *c.* 1 m tall. *Branchlets* terete, ribs not evident, densely villous, the hairs long (mostly *c.* 1 mm), weak, white, commonly antrorsely or retrorsely shallowly curved, sometimes straight and patent. *Stipules* very narrowly triangular, 1–2 mm long, scarious, erect on upper nodes but aging subpatent, straight to shallowly incurved, reddish brown or light brown. *Phyllodes* in regular, crowded whorls 2–7(–10) mm apart, 10–17 per whorl, (10–)15–20 mm long, slender (0.3–0.4 mm wide), ascending to erect when young but patent with age, shallowly to moderately incurved, a few substraight, terete, sub-terete or flattish, very obscurely wrinkled when dry, dull green, villosulous, the hairs white; *longitudinal nerves* not visible; *apices* excentrically mucronate with a straight point 0.1–0.3 mm long. *Gland* not visible. *Inflorescences* simple, one per whorl; *peduncles* (10–)15–30(–40) mm long, densely villous as on branchlets; *heads* globular, 7–9 mm diam. (when dry), 30–35-flowered, bright yellow. *Bracteoles* 1–1.5 mm long, not exserted in buds, narrowly oblong to oblong-lanceolate, claws short and often slightly expanded into narrowly elliptic, acute laminae. *Flowers* 5-merous; *sepals* very small (¼ or less the length of the petals), free, oblong to oblong-elliptic, nerveless, glabrous or with a few tolerably long white hairs at the apex; *petals c.* 2 mm long, nerveless or very obscurely 1-nerved, apically short-pilose otherwise glabrous. *Pods* (slightly immature) oblong to narrowly oblong, 10–30 mm long, 8–10 mm wide, flat but obviously raised over seeds, not or scarcely constricted between the seeds, ±thinly crustaceous, straight to slightly curved, blackish, viscid, villous, nerveless or with very few and obscure anastomosing nerves, sessile. *Seeds* (slightly immature) transverse to ±oblique in the pods, obloid, 4.5–5 mm long, 2.5–3 mm wide; *pleurogram* continuous (not open at hilar end); *areole* oblong, 1 × 0.3 mm; *funicle* expanded into a thickened, once-folded *aril* beneath the seed. (Figure 1)

Characteristic features. *Branchlets* densely villous with long (mostly *c.* 1 mm), weak, white hairs that are commonly antrorsely or retrorsely shallowly curved. *Stipules* 1–2 mm long. *Phyllodes* in crowded, regular whorls, (10–)15–20 mm long, slender (0.3–0.4 mm wide), ascending to erect (young) aging patent, mostly shallowly to moderately incurved, terete, sub-terete or flattish, dull green, villosulous, mucro 0.1–0.3 mm long; *longitudinal nerves* not visible. *Peduncles* villous as on branchlets. *Sepals* very small (¼ or less the length of the petals), free, oblong to oblong-elliptic; *petals* nerveless or very obscurely 1-nerved, apically short-pilose. *Pods* 8–10 mm wide, flat but obviously raised over seeds, straight to slightly curved, blackish, viscid, villous, ±nerveless. *Seeds* transverse to ±oblique in the pods.

Other specimens examined. NORTHERN TERRITORY: [localities withheld for conservation reasons] 14 Feb. 2006, *K.G. Brennan* 6735 (DNA, NT); 25 Feb. 2005, *J.L. Egan* 5531 (DNA); Oct. 1981, *V.J. Levitzke* 806 (DNA); Darwin Botanic Gardens, Salonika St Nursery, 4 Aug. 2006, *B. Wirf* 304 (DNA).

Distribution. Known only from Kakadu National Park, 220 km east-south-east of Darwin, Northern Territory. It has a very restricted distribution, with a total recorded population of less than 1,000 mature individuals distributed quite unequally across two subpopulations about 1 km apart.

Figure 1. *Acacia equisetifolia*. A – plant *in situ* showing buds, heads at peak anthesis and old heads; B – flowering plant *in situ* showing buds, heads at peak anthesis, old heads and young pods; C – branchlet close-up showing characteristic densely white-villous indumentum and slender phyllodes with a very short apical point. Photographs by Kym Brennan.

Habitat. Recorded as growing on rocky sandstone slopes and ledges at the tops of sheer cliffs.

Phenology. Because of the paucity of collections it is difficult to accurately determine the phenology of this species; however, flowers at anthesis have been collected in February and near-mature pods in March, August and October.

Conservation status. This species has been assessed against IUCN criteria and is regarded as Critically Endangered under both Northern Territory and Commonwealth legislation (IUCN 2001; IUCN Standards and Petitions Subcommittee 2011; Kerrigan *et al.* 2006, 2007). The smaller subpopulation is estimated at 150 plants and the other at 700–800 plants. When first discovered in 2004, the smaller population consisted of only one mature adult and 20 small seedlings but numbers appear to have increased substantially in subsequent years. *Acacia equisetifolia* is regarded as threatened because of its very small area of occupancy and extent of occurrence, and extreme fluctuations in numbers. These factors, coupled with a high risk of unfavourable fire regimes, place the species at risk of rapid reduction to extinction. Research is needed to establish basic life history parameters, the longevity of seed and the role of fire and other ecological processes in the distribution and abundance of the species. Further survey in the general area may locate additional subpopulations.

Etymology. The species name is in allusion to the superficial similarity of the phyllodes, especially their shape and arrangement, to species of *Equisetum* L.

Affinities. *Acacia equisetifolia* is a member of *Acacia* sect. *Lycopodiifoliae* Pedley and is closely related to *A. hippuroides* Heward ex Benth. which occurs in the west Kimberley region of Western Australia, about 1,000 km to the south-west of where the new species is found. The significant characters shared by these two species include their relatively long phyllodes with minute apical points, non-striate petals, very small, free, oblong to elliptic sepals, rather similar pods and transverse seeds. Although *A. equisetifolia* is regarded here as a distinct species it could equally be treated as an infraspecific taxon within *A. hippuroides*. However, given their wide geographic separation and the nature of their morphological differences, it is subjectively judged that recognition at species rank is acceptable. Furthermore, it is noted that the morphological differences between some other species-pairs within sect. *Lycopodiifoliae* are sometimes not particularly large, for example, *A. anasilla* A.S.George is distinguished from *A. lycopodiifolia* Cunn. ex Hook. primarily by its longer phyllodes with longer apical points, while *A. hippuroides* and *A. zatrichota* A.S.George are distinguished mainly by the colour of their branchlet indumentum and the number of phyllodes per whorl (*fide* George 1999). Note: George (*l.c.*) provisionally recorded the seeds of *A. zatrichota* as longitudinal in the pods, however, they are transverse.

Morphologically, *A hippuroides* is most obviously and reliably distinguished from *A. equisetifolia* by the indumentum of its peduncles and upper branchlets which possess normally pale golden hairs that are generally shorter (*c.* 0.5 mm long), slightly more rigid, consistently patent and more or less straight. Although the calyx of *A. hippuroides* is very short like that of *A. equisetifolia*, it is normally dissected for ¼–¾ its length into triangular or oblong lobes; only rarely is it dissected to the base (Pedley 1972; George 2001: 388) as in the new species. The pods of *A. hippuroides* are often more strongly curved, wider (8–15 mm) and more obviously viscid than those of *A. equisetifolia*; they are also reticulately nerved although the nerves are sometimes rather obscure and the indumentum is generally sparser.

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