

A new species of *Nicotiana* (Solanaceae) from near Broome, Western Australia

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Abstract

Symon, D.E. and Kenneally, Kevin F. A new species of *Nicotiana* (Solanaceae) from near Broome, Western Australia. *Nuytsia* 9 (3): 421-425 (1994). *Nicotiana heterantha* Symon & Kenneally is described from near Broome, Western Australia. The new species is known from only two populations, both of which are under threat from grazing. It appears most closely related to *N. rosulata* subsp. *rosulata*.

Introduction

A new species of *Nicotiana*, namely *N. heterantha*, a Kimberley endemic is described in order to validate the name for use in a forthcoming book on the plants of Broome and the Dampier Peninsula.

There have been three accounts of *Nicotiana* in Australia in recent times. A pioneering account by Burbidge (1960) brought together records up to that date and described five new species and two new subspecies. This was followed by Horton (1981) who described two new subspecies and reduced one of Burbidge's species (*N. hesperis*) to the rank of subspecies. The account of *Nicotiana* in the Flora of Australia, Purdie *et al.* (1982) was based on Horton. Since then Symon (1984) has described a new species, *N. burbridgei* from near Dalhousie Springs in the far north-east of South Australia, and Clarkson & Symon (1991) described *N. wuttkei* from north-eastern Queensland.

Taxonomy

Nicotiana heterantha Symon & Kenneally, sp. nov. (Figure 1)

Herba annua decumbens, pilis simplicibus et glandulosis. Folia radicalia petiolata; laminae ellipticae vel obovatae ad basim attenuatae; apices obtusi. Folia caulina ex axillis caespitosa. Inflorescentia racemosa, filo metallico similis; bracteis parvis; flores interdum cleistogamae. Calyx 7-9 mm longus, lobis subaequalibus, apicibus triangularibus. Corolla minute pubescens; tubus 2.5 cm

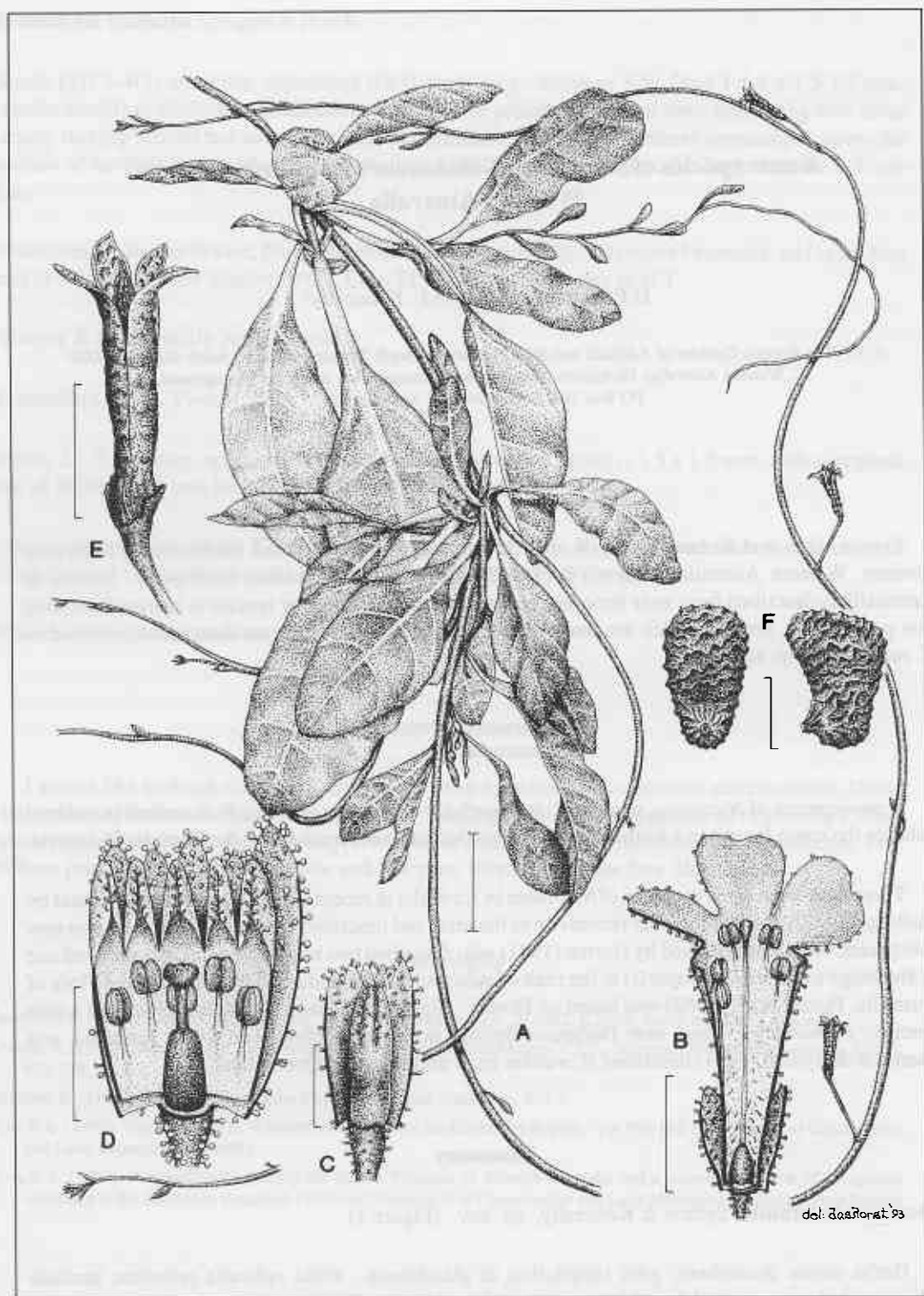


Figure 1. *Nicotiana heterantha* A - flowering plant (scale bar = 4 cm), B - corolla of chasmogamous flower (scale bar = 1.75 cm), C - bud of cleistogamous flower, D - corolla of cleistogamous flower, (C and D scale bar = 4 mm), E - capsule (scale bar = 4.5 mm), F - seeds (scale bar = 0.5 mm). Drawn from a pot plant grown from seed of *Kenneally* 11338.

longus; limbus 0.7-1 cm longus; lobi limbi emarginati. Stamina quattor subdidynama in fauci, quintum brevi filamento semiadnatum. Capsula ellipsoidea 8-10 mm longa. Semina angularia reniformia brunnea reticulata.

Typus: Buckleys Bore, 11 km N of Broome, Dampier Peninsula, 17° 51'S, 122° 13'E, Western Australia, *J.B. Martin* 225, 8 Mar. 1992 (holo: PERTH 2169819; iso: AD, CANB, K).

Annual or short-lived *perennial* herb, branching near the base. Decumbent *stems* develop tufts of leaves at the lower nodes. *Leaves* at first basal, 2-10 x 1-4.5 cm, commonly c. 7 x 2.5 cm, petiolate, elliptic to obovate, apex obtuse, base attenuate, margin entire, petiole 2-2.5 cm, narrowly winged, attachment to stem simple. Leaves at first basal and cauline, these in time replaced by tufts of leaves at the stem nodes and in the lower parts of the inflorescence. *Indumentum* of simple and minute globular-headed glandular hairs, more common on young parts and calyces but never conspicuous, leaves and wiry stems glabrescent. *Inflorescence* a simple or sparsely branched raceme, the axis relatively slender and wiry, to 1 m long, decumbent. Stem leaves soon reduced to linear-triangular *bracts* 3-5 mm long, tufts of leaves develop at the lower nodes (see above), from these axillary tufts of leaves short flowering axes 1-5 cm long with 2-5 flowers may develop; *pedicel* c. 7 mm long. *Chasmogamous flowers* (*Kenneally* 11338): *calyx* 7-9 mm long, the lobes joined by membrane 2-3 mm, the lobes free for 2 mm, lobe apex triangular, all minutely glandular pubescent within the lower half, limb 0.7-1 cm long, divided about halfway, lobe apex emarginate. Four upper anthers on filaments 1.5-2 mm long, the lower fifth anther on filament 6-7 mm long. *Anthers* 1 mm long; *style* 2.8 cm long; stigma capitate, exerted just beyond the four anthers. *Ovary* 2 mm, conical, sparsely minutely glandular pubescent, base surrounded by circular fleshy disc. *Cleistogamous flowers*: *calyx* as above but corolla tube and lobes c. 5 mm long, not expanding. *Capsule* c. 8-10 mm long, apex acute, equal to or exceeding the calyx, dividing to four valves when mature, the calyx tube and capsule often slightly constricted at about one-quarter of their length, the lower quarter somewhat thicker and hardened. *Seeds* to 1 mm long, bluntly triangular to angularly reniform, reticulate with sharp-edged wavy ridges, the cells deeply concave, brown.

Other specimens examined. WESTERN AUSTRALIA: Coconut Well, 15 km N of Broome, 10 May 1985, *Foulkes* 237 (AD, CANB, K, PERTH); Coconut Well, 15 km N of Broome, 17 June 1984, *K.F. Kenneally* 9031 (CANB, PERTH); Buckleys Plain, 10 km N of Broome, behind O.T.C. station, 1 Sept. 1992, *Kenneally* 11338 (PERTH); Buckleys Plain O.T.C. side, 7 km N of Broome, Dampier Peninsula, 17°54'S, 122°15'E, 24 April 1992, *Martin* 226 (PERTH).

Distribution. This is the only *Nicotiana* so far collected from near Broome. It forms low spreading colonies in and out of *Melaleuca* thickets on seasonally wet black clay in an area known as Buckleys Plain north of Broome to about Coconut Well. (Figure 2)

Flowering period. May-June. The species is facultatively cleistogamous. Some specimens collected in the field clearly have well developed and open corollas, others have reduced corollas. Several plants cultivated in Adelaide during the summers were cleistogamous and signs of the corolla were scarcely visible. The cause of these variations is not known.

Affinities. The new species appears most closely related to *Nicotiana rosulata* subsp. *rosulata*, this has more erect, stouter inflorescences which are more branched above and hence the flowers are more concentrated on the terminal parts of the stems. However, there are a few specimens of *N. rosulata* subsp. *rosulata* at AD and PERTH with flowering axes equally slender to the new species. The nearest



Figure 2. *Nicotiana heterantha* forming low spreading colonies on black clay on the edge of a *Melaleuca acacioides* thicket on Buckleys Plain north of Broome.

collection of *N. rosulata* to the new species is one from Pardoo about 400 km to the southwest. *N. heterantha* differs from all other Australian species except *N. debneyi* in its chromosome number (see below). In addition the mostly cleistogamous flowers, tufted growth, and slender wiry stems distinguish it from all other Australian species.

Notes. The axillary tufts of leaves developing at the lower nodes of the inflorescences and their short racemes of flowers are unusual features distinguishing this species.

Chromosome number. $2n = 48$ (from Kenneally 11338). Root tips counted by Dr D.L. Hayman, Genetics Department, University of Adelaide. Dr Hayman comments that the presence of only one pair of chromosomes with obvious nucleolar organising regions suggests that it is an allopolyploid.

The base chromosome number for the genus *Nicotiana* is $x = 12$ and all American species have this or multiples of it (Goodspeed 1954). The only previous Australian species with multiple of $x = 12$ were the two subspecies of *N. debneyi*, $n = 24$, $2n = 48$ and hence a tetraploid (Horton 1981). *N. debneyi* occurs in eastern Australia and is the only Australian species to extend to New Caledonia and Lord Howe Island. Although the ecology of *N. heterantha* is similar to that of *N. debneyi* subsp. *monoschizocarpa*, the plants differ in many characters. All other Australian species have a long series of aneuploid numbers ranging from *N. cavicola* $n = 23$ to *N. wutkei* $n = 14$.

This number $2n = 48$ separates *N. heterantha* from *N. rosulata* $2n = 40$ in addition to morphological differences.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority One - Poorly Known Taxa. This species is known from only two populations in the same area, both of which are under threat from grazing.

Etymology. From the Greek *hetero* - different and *anthos* - flower, in reference to the two distinct types of flowers found in this species.

Acknowledgements

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References

Burbidge, N.T. (1960). The Australian species of *Nicotiana* L. Solanaceae. Austral. J. Bot. 8: 342-378.
Clarkson, J.R. & Symon, D.E. (1991). *Nicotiana wutkei* (Solanaceae), a new species from north-eastern Queensland with an unusual chromosome number. Austrobaileya 3: 389-392.
Goodspeed, T.H. (1954). The genus *Nicotiana*. Chronica Botanica, Vol. 16.
Horton, P. (1981). A taxonomic revision of *Nicotiana* (Solanaceae) in Australia. J. Adelaide Bot. Gard. 3: 1-56.
Purdie, R.W., Symon, D.E. & Haegi, L. (1982). Solanaceae. Fl. Austral. 29: 38-57.
Symon, D.E. (1984). A new species of *Nicotiana* (Solanaceae) from Dalhousie Springs, South Australia. J. Adelaide Bot. Gard. 7: 117-121.