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## A NEW *NICOTIANA* (SOLANACEAE) FROM NEAR COOBER PEDY, SOUTH AUSTRALIA

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### Abstract

*Nicotiana truncata* Symon is described from desert loams in washes and creeklines in the gibber desert between Coober Pedy and Oodnadatta, South Australia. The chromosome number  $2n = 36$  is reported.

### Introduction

The first collection of this species appears to have been made by E.H. Ising in 1955. The mixed collection included *N. simulans* and was filed under that species. It was seen by P. Horton and thought to be a possible hybrid with *N. glauca* Grah.

The second collection was made by Mr A.C. Robinson during the Biological Survey of the Stony Deserts. It was recognised as something different but the specimen was inadequate. It was next collected by Mr R.J. Bates (*Bates 46914*), who brought back ample material from Fishhole Creek, SW of Oodnadatta. This finding prompted a rapid visit to the area by the author.

### *Nicotiana truncata* Symon, *sp. nov.*

Herba annua (15-) 30 (-50) cm alta. *Folia* rosulata in terra plerumque plana, petiolum 5–12 cm anguste super alatum, laminae plerumque 10 × 7 cm, ovatae, ad basim attenuatae, apice rotundata, glabrae aliquantum carnosae nitidae et virides. *Inflorescentia* paniculata, primo ramo folio subtento, ramis superioribus bractea 3–4 mm longa subtentatis; *pedicellus* 3–5 mm sub anthesi, ad 15 mm in fructu longus; *calyx* 5 mm sub anthesi, tubularis, truncatus, acumenibus 0.5–1 mm longis; *tubus corollae* 15 mm longus 2 mm latus, limbus 10–11 mm latus, lobi rotundati et emarginati, albus; *stamina* quattuor in fauci, quintum in corollae tubo semiadnatum. *Ovarium* 2–2.5 mm, conicum, infra disco carnosum; *stylum* 14–16 mm longum, stigma breviter bilobatum. *Capsula* c. 10 × 7 mm, apex 2–3 mm longior quam calyx. *Semina* 1 mm, reniformia, grasse reticulata, copiosa. Fig. 1.

*Typus*: South Australia, shallow silty wash in gibber plain, 36 km SW of Oodnadatta, l.v.1997, *Symon 15679*. Hardly a creek, no trees, with *Astrebla*, *Flaveria*, *Solanum*, *Goodenia*, *Tribulus* and *Convolvulus* (Holo.: AD 99721096; iso.: BRI, CANB, K, MEL, MO, NSW, NT, PERTH).

Annual (15-) 30 (-50) cm tall. Petiole 5–12 cm narrowly winged above, glabrous. *Leaves* mostly in a radical rosette flat on the ground, only in large vigorous plants are leaves elevated and one present at the first branch of the inflorescence, lamina commonly 10 × 7 cm, exceptionally 25 × 15 cm, ovate, narrowly cuneate below and continuing along the petiole as a narrow wing, apex rounded, glabrous above and below, somewhat fleshy, shiny green. *Inflorescences* 1–5 or 6, from the rosette, the first branch at about mid point often subtended by a leaf, higher order branches subtended by a bract 3–4 mm long. *Pedicel* 3–5 mm at anthesis lengthening to 15 mm in fruit. *Calyx* 5 mm at anthesis, tubular, truncate, the lobes reduced to acumens 0.5–1 mm long, pedicel and calyx minutely pubescent with glandular hairs. *Corolla tube* 15 mm long, 2 mm diameter, slightly contracted above the ovary and throat cup, slightly expanded about the anthers; *limb* c. 5 mm long, expanded to 10–11 mm diameter, the lobes rounded, slightly emarginate, white. *Stamens* 5, four with short filaments attached at the throat cup, the fifth filament attached to the tube near the ovary apex, its anther remaining below the others. *Ovary* 2–2.5 mm, conical, with subtending disc. *Style* 14–16 mm; stigma shortly bilobed, projecting above the anthers. *Capsule* c. 10 mm long, 7 mm wide, relatively stout, apex projecting 2–3 mm above the

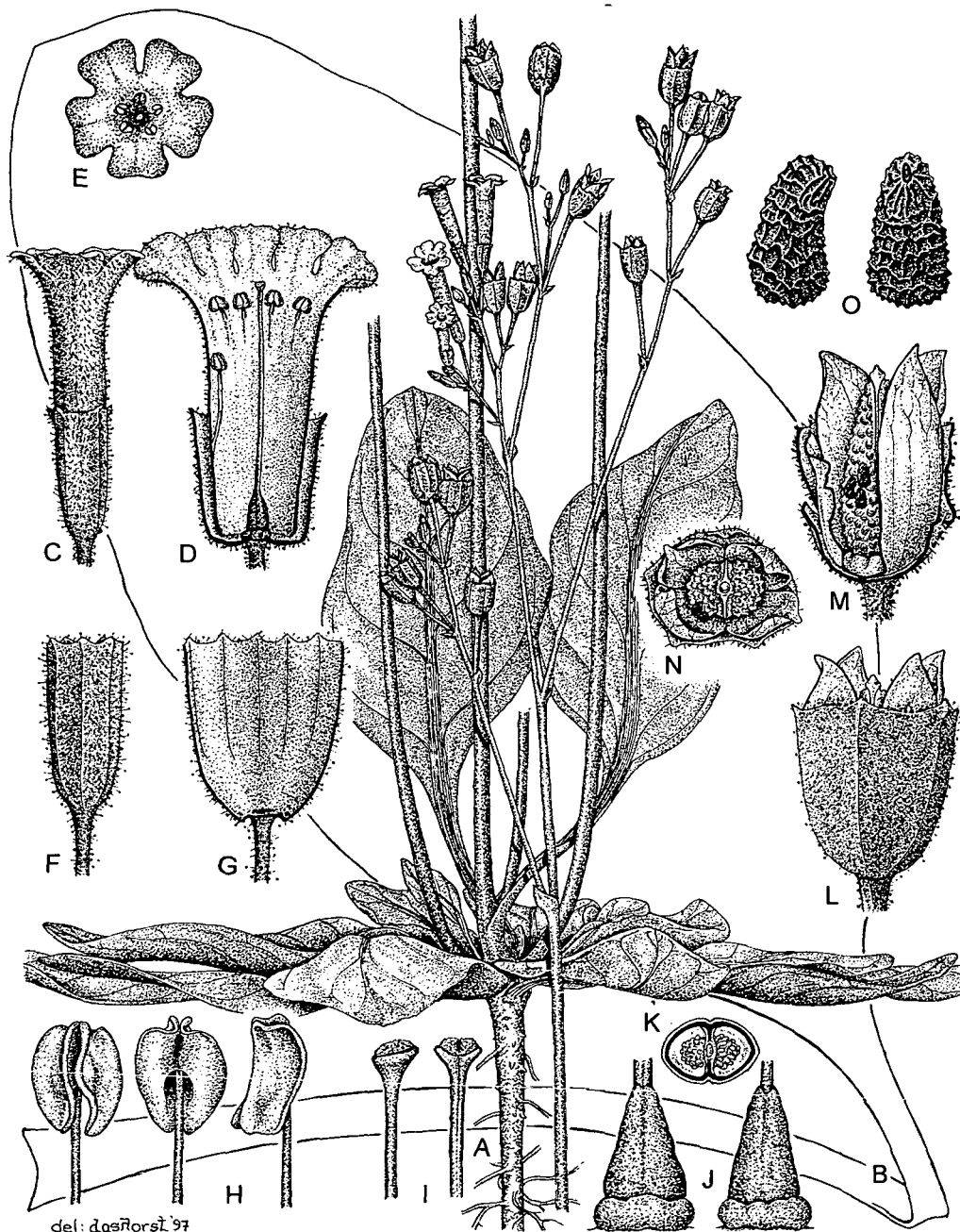


Fig. 1. *Nicotiana truncata* Symon (A–O, Symon 15679: AD). A, habit  $\times 1$ ; B, leaf in outline  $\times 1$ ; C, closed flower  $\times 3$ ; D, open flower  $\times 3$ ; E, flower viewed from above  $\times 3$ ; F, closed calyx  $\times 4$ ; G, open calyx  $\times 4$ ; H, anther in front, back and side view  $\times 20$ ; I, two aspects of style and stigma  $\times 10$ ; J, ovary and basal disc  $\times 10$ ; K, cross-section through ovary  $\times 10$ ; L, dehiscent capsule  $\times 4$ ; M, dehiscent capsule with part of calyx removed  $\times 4$ ; N, dehiscent capsule viewed from above  $\times 4$ ; O, two aspects of seed  $\times 30$ .

closely investing truncate calyx, valves four. *Seeds* 1 mm long, reniform, coarsely reticulate, abundant. *Chromosome number*  $2n = 36$ .

#### *Diagnostic features*

The new species is distinct from all other Australian *Nicotiana* species in its truncate calyx and slightly fleshy, glabrous leaves. The mature capsule approximates that of the introduced *N. glauca*, but in that the calyx lobes, although short, are distinct and the valves scarcely exceed the calyx. The plants are otherwise wholly distinct.

#### *Distribution*

The new species was found to be abundant at localised sites between Coober Pedy and Oodnadatta and more of it was collected between 31 km NE of Coober Pedy to Fishhole Creek about 32 km SW of Oodnadatta. The landscape is of shallow undulating gibber plains cut by shallow washes to creek lines of various size that contribute to the Lora, Archaringa and Neales drainage system.

The area is gypseous with plates of glass-like gypsum on shallow banks and exposures. The shallow washes and creek beds often consist of deeply cracking fine silty clay loam. The surface is often puffy and tiring to walk on when dry and almost impossible when wet. The *Nicotiana* was only found on such sites and did not occur on the surrounding gibber plains.

#### *Conservation status*

The species is not known to occur in a Conservation Reserve. The area in which it occurs is under Pastoral Lease. The barren landscape is lightly grazed, although there was no sign of grazing activity at the time of collecting. It is suspected that the plants spend much of their time as seed and only appear after very irregular good rains.

#### *Etymology*

From the Latin *truncatus*, ending abruptly as if cut across and referring to the distinctive truncate calyx tube.

Note on the chromosomes and figure supplied by Dr J. N. Timmis, Genetics Department, University of Adelaide.

Flowering heads were fixed in 3:1 ethanol:acetic acid and transferred to 70% ethanol. Anthers from a single plant were dissected and squash preparations pollen mother cells prepared in acetic orcein. Cells at late diplotene of meiosis were

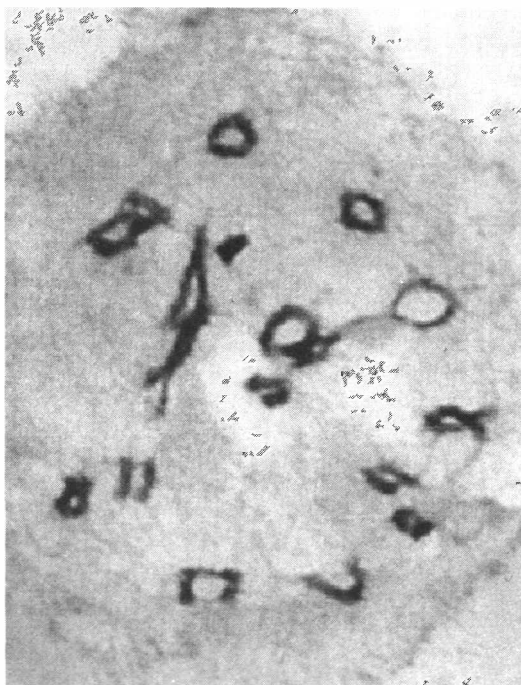


Fig. 2. Meiosis in *Nicotiana truncata*.

large and their chromosomes well spread (Fig. 2) making them most suitable for chromosome counts. The species contains 36 chromosomes which pair as 18 bivalents with no evidence of irregular or multivalent chromosome associations. This chromosome number and meiotic pairing behaviour suggests that the new species, like most other members of the *Suaveolentes* (Goodspeed, 1954), is a fertile aneuploid derived, possibly

sequentially, by the loss of 6 chromosome pairs from an ancestral allotetraploid species as the genus radiated within Australia. (Voucher *Symon 15665*)

### *Possible relationships*

*Nicotiana truncata* shares the same chromosome number with *N. amplexicaulis* and *N. gossei* but does not appear closely related to either. The first has a well developed stem to over 1 m high with pubescent leaves, mostly cauline and petiolate below, sessile and auriculate above. The corolla is of comparable size to *N. truncata*. The second is a leafy herb to 2 m, densely pubescent, the leaves mostly cauline. The calyx and corolla are much longer than the flowers of *N. truncata*. Both these species grow in sheltered sites in rocky range systems.

Both *N. rosulata* and *N. goodspeedii* have  $n = 20$  chromosomes and are similar in plant form with the foliage principally in basal rosettes with few cauline leaves. The first is sparingly pubescent but the corolla is longer and more slender. The second is virtually glabrous but the leaves are elliptic to spatulate. The corollas are comparable and *N. goodspeedii* favours alkaline soils. These two species would appear to be morphologically close to the new species despite the difference in chromosome number.

A satisfactory evolutionary tree for the Australian species of *Nicotiana* is yet to be presented. Earlier efforts by Horton & Symon were not satisfactory and not published.

### *Specimens examined*

SOUTH AUSTRALIA: *Ising*, Fish Hole, 20 miles S of Oodnadatta. Growing in swampy ground, 25.viii.1955 (AD); *Robinson D.E.N.R. 27531*, 8.3 km NE of Nasa Bore, 27°45'15", 135°14'18". Stream channel in stony desert, deep cracking gypseous clay. Open grassland with *Eragrostis setifolia* and *Iseilema vaginiflora* (AD); *Bates 46914*, Fishhole Creek, common at Fishhole creek on gypseous clay after floods. Annuals to 50 cm high, pretty white flower, distinctive calyx tube, rosettes. Not much else present except *Typhonium*, 18.iv.1997 (AD); *Symon 15665*, Giddie Giddinna Creek, 46 km NE of Coober Pedy on road to Oodnadatta. Heavy fine silty loam, deeply cracking gypseous soils, 30.iv.1997 (AD, BRI, NSW, NT, PERTH); *Symon 15671*, Fishhole Creek, 32 km SW of Oodnadatta, 30.iv.1997 (AD, CANB, CORD, K, MO, NY); *Symon 15675*, shallow creek lines at base of gibber slope 34 km SW of Oodnadatta, 30.iv.1997 (AD).

The new species may be inserted into the Key to *Nicotiana* in Vol. 29, Flora of Australia on page 44 as follows. After lead 7, "Flowering stems leafless, ..." insert:-

- 7a Calyx truncate, the lobes reduced to acumens about 1 mm long, capsule exposed.....*N. truncata*
- 7b Calyx lobes clearly developed, mostly equal to or exceeding the capsule.
- 8 Cauline leaves decurrent on the stem ...

### Acknowledgements

I am grateful to R.J. Bates who drew my attention to the new species, to G.R.M. Dashorst for the illustrative plate, Mary Marlow for the Latin and Dr J.N. Timmis for the chromosome count and photograph.

### References

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