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A NEW SPECIES OF *NICOTIANA* (SOLANACEAE) FROM DALHOUSIE SPRINGS, SOUTH AUSTRALIA

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Abstract

A new species *Nicotiana burbidgeae* Symon is described from northern South Australia, with the chromosome number $n = 21$.

Introduction

In her recent revision of *Nicotiana* in Australia, Horton (1981) 21 referred to *N. benthamiana* anomalous collections from Dalhousie Springs in the far north of South Australia, Symon 9294, 9354, 9895. At the time of her writing, a provisional chromosome number of $n = 21$ (*N. benthamiana* $n = 19$) had been obtained, but as the cytological preparation was not ideal a decision on whether this was a new species was deferred. The plant has been again cultivated and Mr Peter Ellis has confirmed that the chromosome number is $n = 21$. This fact together with various morphological differences persuade me that the taxon is an undescribed species.

Nicotiana burbidgeae Symon, sp. nov.

Nicotiana similis *N. benthamiana* sed basi lignescenti, foliis sessilibus subcordatis succulentis, floribus majoribus quoque tubo calycis 7 cm longo et limbo corollae 5 cm diametro differt. Numerus chromosomatum $n = 21$.

Type: D. Symon 9294, South Australia, south east of Dalhousie Springs complex, low silty terrace along small saline stream, at base of low gypseous creek embankment with grey mudstone. Grid 345710, approx. 26°30 S, 135°30 E. 24.ix.1974 (AD, holo; ADW, CANB, L, MO, NT iso), Figure 2.

Erect leafy herb to at least 75 cm high with several branches near base, ? annual or short lived perennial, lower stems distinctly woody, to 1.5 cm diam. (Figure 1). *Indumentum* on all parts abundant, minute, erect, gland-tipped hairs, some of those on calyx with swollen hemispherical bases (Figure 3). *Leaves* mostly cauline, basal ones to 10 x 7 cm, oval, apex obtuse, base broadly attached, sub-cordate, sessile, leaves of the middle stem region to 6 x 3 cm, rather more obovate, those of the flowering stem region commonly cordate-deltoid, gradually decreasing in size upwards, all rather thick and relatively fleshy. *Inflorescence* of solitary interfoliar flowers distributed along upper parts of leafy stems; pedicels to 12 mm in fruit with distinct articulation at base. *Calyx* to 2 cm long; lobes lanceolate, the upper $\frac{1}{4}$ free, middle region joined by a distinct intersepal membrane which extends almost to base of calyx. *Corolla* tube 4-7 cm long, rather variable (see note below), c. 2.5 mm wide at top of calyx, tube proper slightly enlarged around ovary, throat cylinder narrowly tapered upwards to 3-3.5 mm diam., throat cup 5 mm long, symmetrical, marked with green veins which extend to limb; *corolla* limb to 5 cm diam. (closing in bright light), lobes broadly triangular, fused for more than half their length, slightly emarginate at junction of interacuminal membranes forming a pentagonal limb, mid-veins green below. Upper 4 *stamens* subdidynamous in throat cup, fifth stamen c. 12 mm below

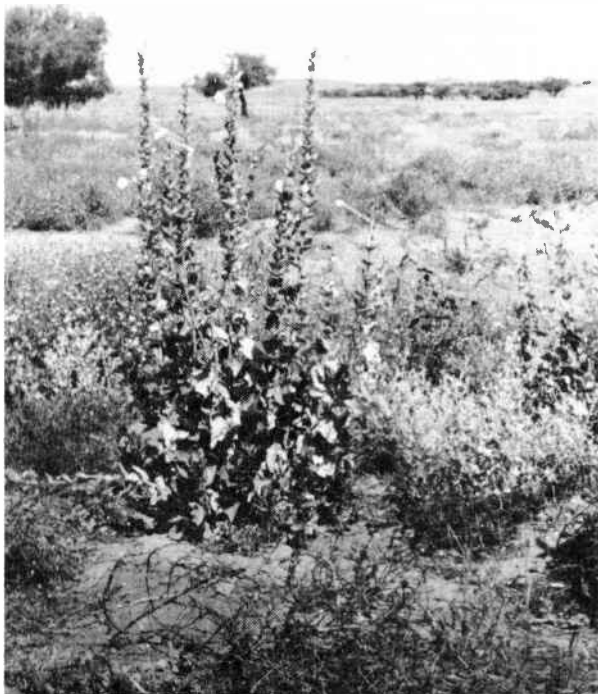


Fig. 1. Mature plant at Dalhousie Springs.



Fig. 2. Holotype of *N. burbridgeae* Symon 9294 (AD).

the upper four, free filament, c. 1.5 cm long; *ovary* c. 5 mm long, broadly conical, subtended by an orange, fleshy disc; style variable in length to 7 cm long exceeding anthers (see note below), stigma terminal, discoid. *Mature capsule* c. 12 mm long, about equal to enveloping calyx, narrowly ovate to oblong, dehiscent by 2 major and 2 minor fissures. *Seeds* c. 1 mm long, reniform, testa with serpentine wrinkles, Figure 4.

Chromosome number, $n = 21$ fide P. Ellis, Voucher ADW.

Distribution: South Australia, south east end of the Dalhousie Springs complex.

Notes

As discussed by Horton (1981) p. 21, this species is most closely related to *N. benthamiana*, from which it differs in its more woody stems, the rather fleshy nature of the foliage, the sessile cauline leaves, considerably larger flowers, reniform rather than oblong or trapezoid-reniform seeds, different chromosome number and different ecology.

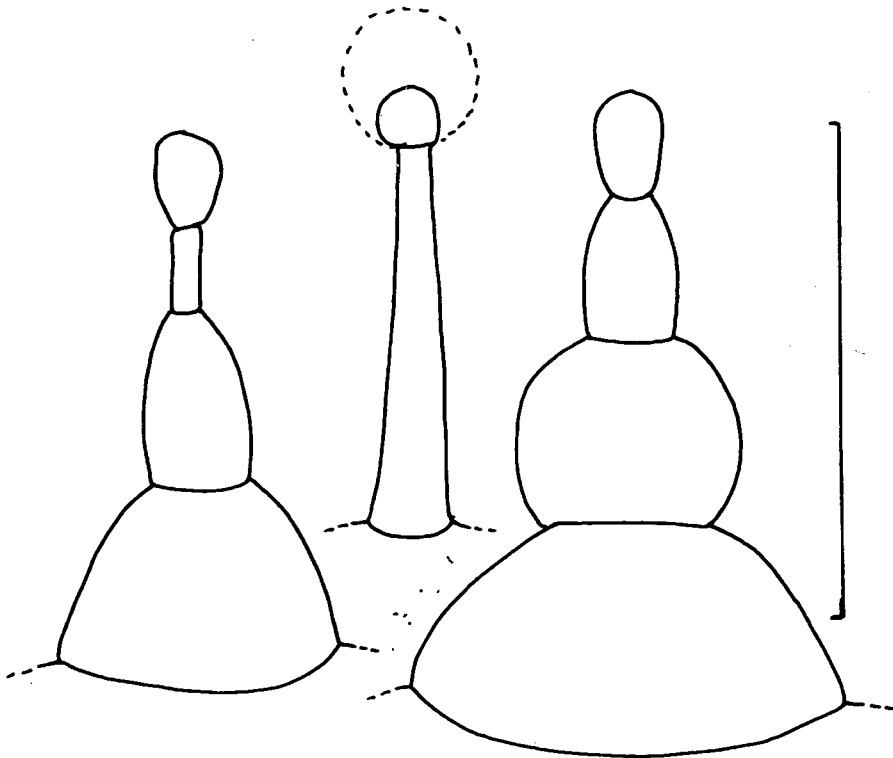


Fig. 3. Calyx hairs of *N. burbidgeae* (Scale = 0.25 mm)

From plants in cultivation, Mr R.D. Pearce reports a number of flowers in which the styles are not fully developed and style lengths between 2 cm and 7 cm have been noted. All of these flowers are fertile and set seed when pollinated. No explanation is available for this variability, but it may represent incipient cleistogamy common in some other Australian species of *Nicotiana*. The new species has a hair type not illustrated by either Burbidge or Horton. On the calyx and pedicel are hairs with a greatly enlarged basal cell which is almost hemispherical in shape and bears several swollen cells above it, Figure 3. The hairs most similar to these are illustrated by Burbidge (1960) (p. 376) for *N. simulans*. The swollen hairs are not as abundant as the simple glandular hairs, nor do they appear on the leaves, stem or corolla. After drying, the swollen hairs are not obvious on herbarium specimens and may therefore appear on some other species as well when fresh material is available. Another feature of plants in cultivation was the change in corolla tube length as the growing season changed from summer to winter. The summer flowers had tubes to 7-8 cm long while in winter the same plants produced flowers with tubes reduced to 4 cm. Plants collected in the field in June had tube length c. 4 cm while those collected in September had a tube length c. 5.5 cm. This character is apparently greatly influenced by environmental factors.

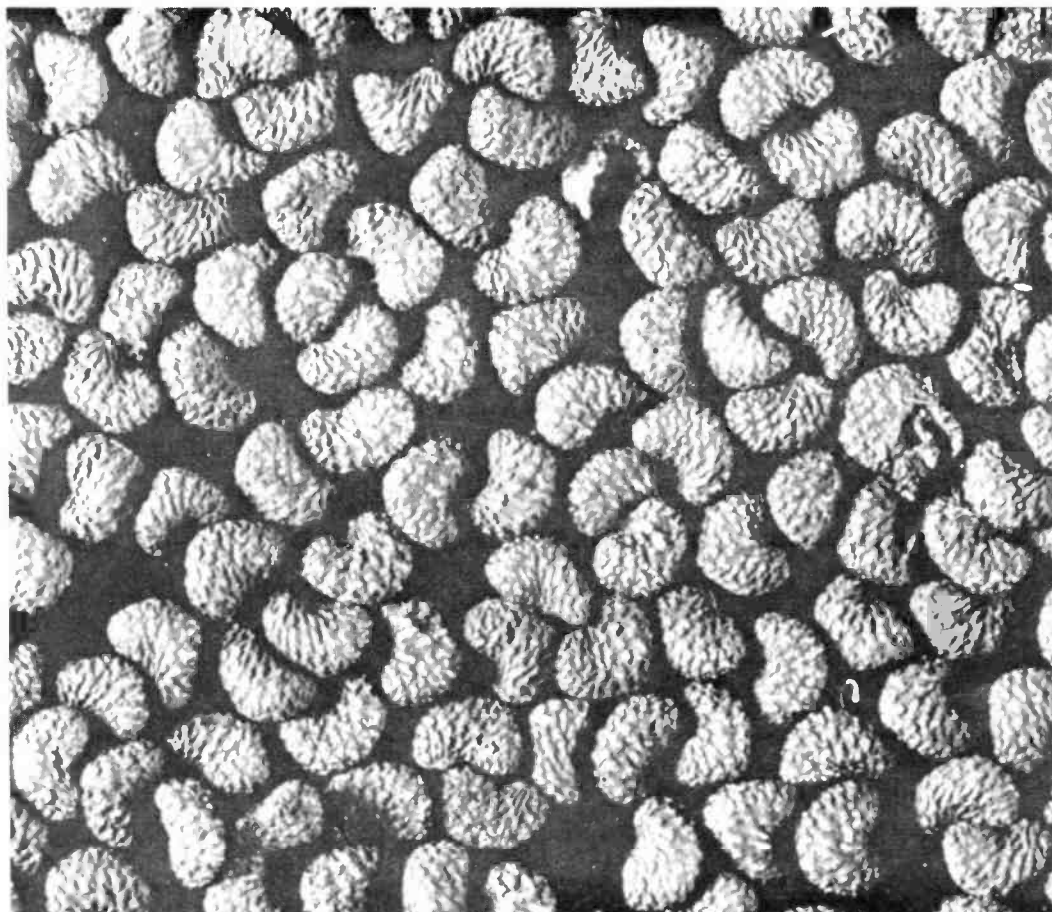


Fig. 4. Seeds of *N. burbidgeae*.

The species is named after Miss N.T. Burbidge for her contributions to taxonomic botany in Australia.

The species may be keyed out if the following addition is made to the key: Horton (1981) p. 10.

- 9. Flowering stems leafy; flowers interfoliar9a
- 9. Flowering stems leafless above; flowers in racemes or panicles 10
 - 9a. Calyx hairs not greatly swollen at base; corolla tube 25-55 mm long, corolla limb 10-20 mm diam., seeds oblong or trapezoid-reniform *N. benthamiana*
 - 9a. Some calyx hairs with hemispherical basal cell; corolla tube 40-70 mm long, corolla limb to 50 mm diam., seeds reniform *N. burbridgeae*

The following addition to the Fl. Australia, George (1982) 44 will enable it to be keyed out there.

- 3: Ellipsoid-headed glandular hairs absent
 - 7. Flowering stems leafy; flowers solitary in leaf axils or arising from internodes.....7a
 - 7a. Calyx hairs not greatly swollen at base; corolla tube 25-55 mm long, corolla limb 10-20 mm diam.; seeds oblong or trapezoid-reniform *N. benthamiana*
 - 7a. Some calyx hairs with hemispherical basal cell; corolla tube 40-70- mm long, corolla limb to 50 mm diam.; seeds reniform *N. burbridgeae*

An apparently natural hybrid between *N. burbridgeae* and *N. velutina* was collected at the same time as the type of *N. burbridgeae* (Symon 9306, ADW 48346, Dupl. AD). This isolated plant was growing in a dry, sandy stream bed and the putative parents were in the vicinity. It is intermediate in its morphology and was obvious in the field because the corolla remained open at least in the morning, in contrast to *N. velutina*. The long flowering stems bore no capsules; Miss Horton *loc. cit.* has examined the pollen and only about 4% appeared normal.

Specimens seen

SOUTH AUSTRALIA: Symon 9294, 24.ix.1974, S.E. of Dalhousie Springs complex (type collection), (AD, ADW, CANB, L, MO, NT); Symon 9354, 26.ix.1974, S end of Dalhousie Springs complex (ADW, CANB, K); Symon 9895, ix.1974, S.E. of Dalhousie Springs, seedling collected in the field and grown at the Waite Agricultural Research Institute (ADW, CANB); Symon 13123, 22.vi.1983, banks of small creeklines (headwaters of Irrapowadna and Lowther Creek) 7 km before Dalhousie ruins and c. 40 km from Pedirka. Scattered plants to 50 cm, flowering freely (ADW, BRI, NSW, PERTH, US).

References

Burbidge, N.T. (1960). The Australian species of *Nicotiana* L. (Solanaceae). *Aust. J. Bot.* 8: 342-380.
 George, A.S. (1982) Edit. "Flora of Australia" 29: 38-57. (Aust. Govt Publ. Serv.: Canberra).
 Horton, P. (1981). A taxonomic revision of *Nicotiana* (Solanaceae) in Australia. *J. Adelaide Bot. Gard.* 3: 1-56.