



Lycium hantamense (Solanaceae), a new species from the Hantam–Roggeveld Centre of Plant Endemism, South Africa

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Received 23 June 2006; received in revised form 4 December 2006; accepted 6 December 2006

Abstract

Lycium hantamense, a new species is described. This species was discovered in the Hantam–Roggeveld Centre of Plant Endemism of the Succulent Karoo Region, South Africa. *L. hantamense* belongs to a unique group of seven polyploid, functionally dioecious species in a genus of normally diploid, hermaphrodite species. This new species resembles *L. strandveldense* most closely.

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Keywords: *Lycium hantamense* sp. nov.; *Lycium*; Solanaceae; South Africa

1. Introduction

Lycium L., a genus of approximately 75 species (D’Arcy, 1991), is widespread throughout the world with centres of diversity in South America, North America and southern Africa, respectively 30 (Bernadello, 1986), 21 (Chiang, 1981) and 25 (*L. hantamense* included) (Venter, 2000) species. Traditionally, *Lycium* was regarded as a genus of hermaphrodite species, but recently cryptic functional dioecy was discovered in six of the southern African species (Venter, 2000). The new species, *L. hantamense* is the seventh species in this group.

Most of these dioecious species are concentrated in the Succulent Karoo Biome of the arid western region of southern Africa, where winter rainfall prevails. *L. hantamense* was discovered in the Hantam–Roggeveld Centre of Plant Endemism of this biome (Van Wyk and Smith, 2001). The area in which *L. hantamense* commonly grows, is known as the Hantam of the Bokkeveld Plateau, and hence the epithet of the new species.

2. Materials and methods

Fresh material was collected and photographs were taken of the plant habit, flowers and fruit in the field. Male buds were fixed in

Carnoy’s fixative (Carnoy, 1886) for chromosome counts. SEM micrographs were made with a Jeol Winsem 6400 microscope at the University of the Free State. External morphology was studied with an Olympus SZ40 stereo photo-microscope.

3. Results

3.1. Description

Lycium hantamense A.M.Venter, sp. nov. praebet affinitatem cum dioecio *Lycio strandveldensi* A.M.Venter fruticoso habitu, succulentis foliis obovatis, masculinis et femineis floribus separatis in plantis diversis atque duae species sunt endemicae in regionibus occidentalibus Africae Australis. Folia tamen et calyces *L. hantamense* sunt dense hirsuti glandulosis pilis et corollae sunt buccinatae. Folia et calyces *L. strandveldense* sunt glabri et corollae sunt magis tubulares forma.

3.2. Type

South Africa, Northern Cape Province, Nieuwoudtville District, Farm Glenlyon, 31° 24.708’S 19° 9.115’E, 05/08/2005, Venter A.M. 687 (BLFU, holo.; K, NBG, PRE, iso.).

Dioecious erect shrubs of 1.2–2.0 m high. Stems stout, rigid; young stems light brown to brownish-green, glandular-hirsute; older stems grey to brownish-grey, glabrous; thorns numerous,

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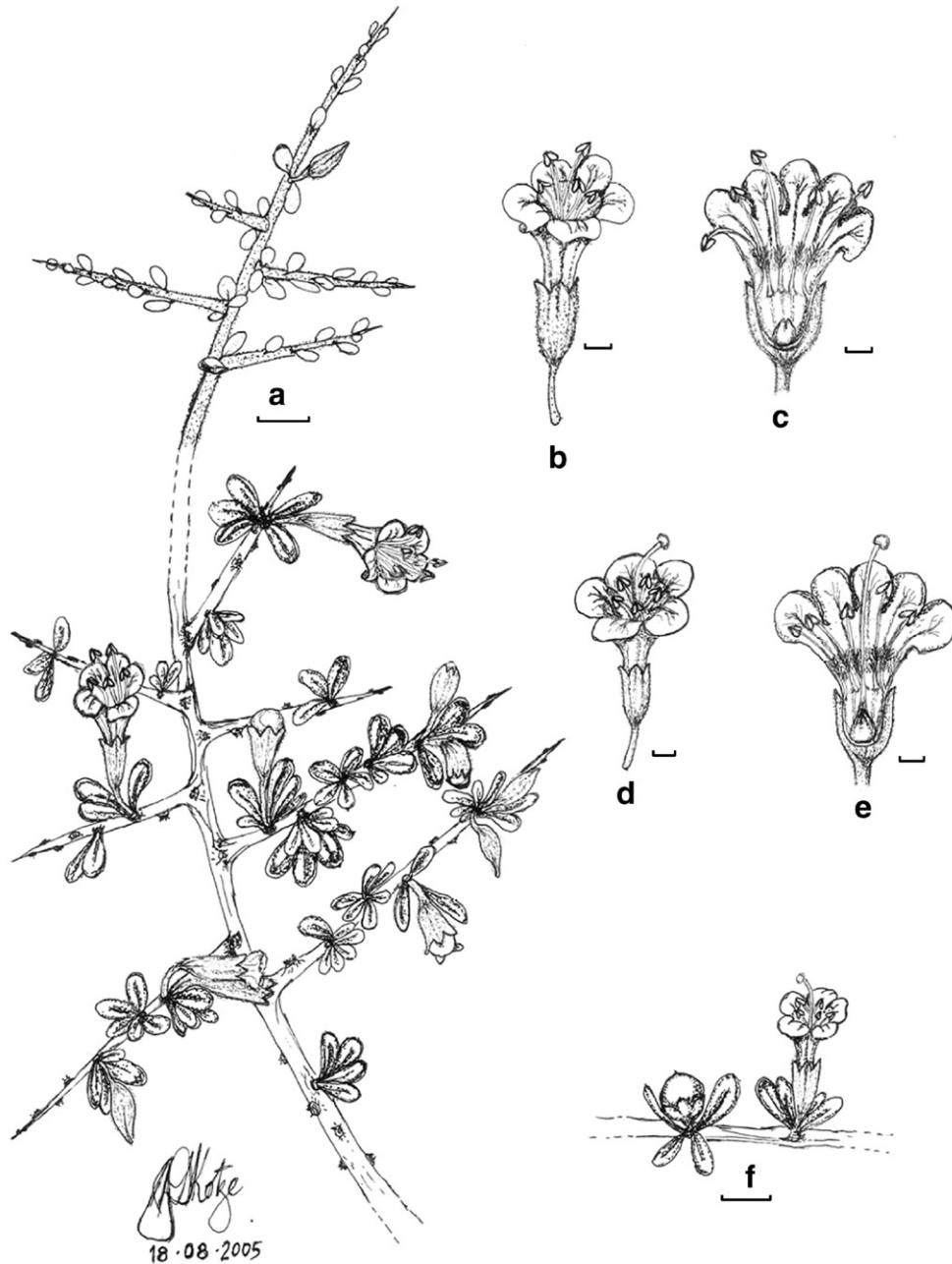


Fig. 1. *Lycium hantamense*: (a) plant habit, (b) external view of male flower, (c) male flower opened showing fertile stamens and ovary lacking style and stigma, (d) external view of female flower, (e) female flower opened showing complete pistil and infertile stamens, (f) stem with berry and flower. Scale bars: (a and f)=10 mm, (b, c, d and e)=3 mm ((a, b and c) Venter A.M. 686; (d and e) Venter A.M. 685; (f) Venter A.M. 687).

20–60 mm long. *Leaves* in fascicles on brachyblasts, sessile or sub-sessile on petioles to 1 mm long, blade ovate or obovate to narrowly elliptical, obtuse or rarely acute, 13–18×3–5 mm, succulent, bright green, densely glandular-hirsute. *Flowers* functionally unisexual, 5-merous, rarely 4-merous, pedicels 5–7(–8) mm long. *Male flowers*: *calyx* tubular, glandular-hirsute, (6–)7–9×(3–)4–5 mm, lobes sub-equal, triangular to narrowly triangular, acute, 2–3 mm long; *corolla tube* greenish-white, cylindrical, (8–)11–15×3–5 mm, glabrous, lobes spreading, sub-orbicular, purple with dark purple venation, 3.5–4(–5)×3.5–4 mm; *stamens* sub-equal, conspicuously

exserted from corolla mouth, 8–10 mm long, filaments inserted 4–6 mm above corolla base, just below middle of tube, densely pilose at base, anthers fertile; *ovary* broadly ovoid, 2.0–2.5×2.0–2.5 mm; style 0.5–3.0 mm long or absent; stigma absent; nectary annular, surrounding ovary base, pale yellow. *Female flowers* as in male flowers, except, corolla tube 11–12×3–4 mm; *stamens* reaching corolla mouth and anthers infertile; *style* 14–15 mm long, conspicuously exserted from corolla mouth, stigma fertile, green. *Berries* broadly ovoid to spherical, 7–8×7–8 mm, yellow. *Seeds* sub-discoid to ovate, 2.0–2.5 mm long. (Fig. 1–3). $2n=2x=48$.

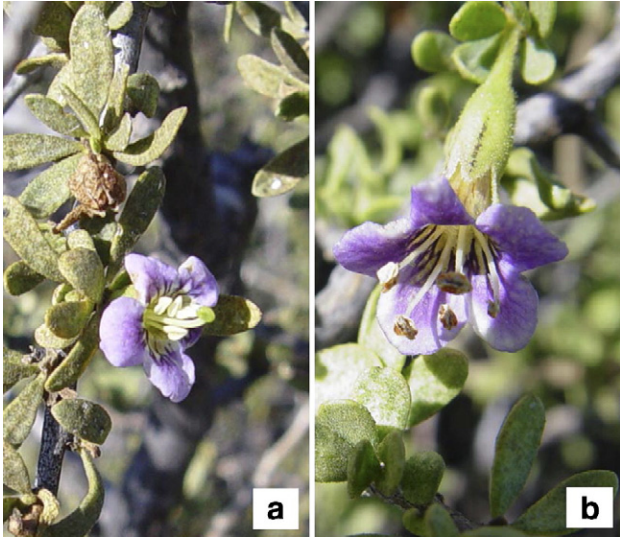


Fig. 2. *Lycium hantamense*: (a) female flower, (b) male flower ((a) Venter A.M. 687, (b) Venter A.M. 686).

3.2.1. Diagnostic characters

A thorny dioecious shrub with fascicled, succulent, bright green, densely glandular-hirsute leaves. The flowers are functionally unisexual, the corolla tube is greenish-white with the lobes spreading, and purple; the stamens with fertile anthers of the male flowers are conspicuously exserted from the corolla mouth, but their styles are short or absent and their stigmas completely absent; the stamens of the female flowers reach the corolla mouth, but their anthers are infertile, their styles and stigmas, however, are well-developed and exserted the mature berries are yellow.

Without flowers *L. hantamense* could be confused with *L. amoenum* Dammer and *L. strandveldense* from the coastal strandveld west of and below the Bokkeveld Plateau as plant

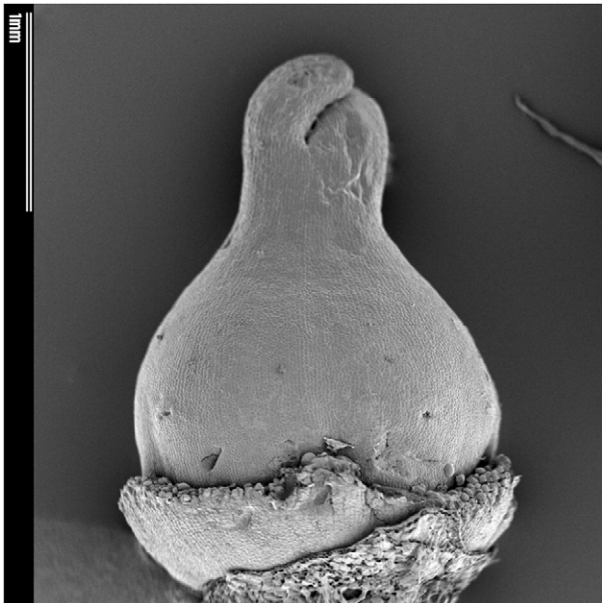


Fig. 3. *Lycium hantamense*: stunted pistil of a male flower (Venter A.M. 686).

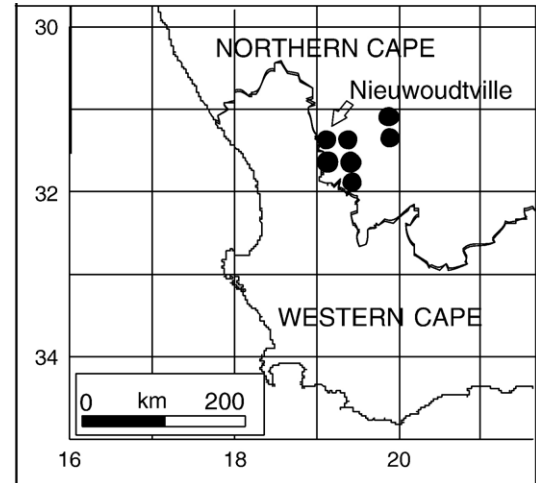


Fig. 4. Known distribution of *L. hantamense* (●).

form, leaf shape and leaf colour are very similar. Fortunately the densely glandular-hirsute leaves of *L. hantamense* distinguish it very well from the other two species. When in flower identification is easier as *L. amoenum* has bisexual flowers with the corolla broadly campanulate in contrast to *L. hantamense* and *L. strandveldense* with their functionally pistillate or staminate flowers. In *L. strandveldense* the calyx is campanulate to broadly tubular, up to 4 mm long, the corolla is mauvish-purple, the stamens and stigma reach the corolla throat and may be slightly exserted and the ellipsoid berry is red. In contrast *L. hantamense* has a tubular calyx, 7–9 mm long, a deep purple corolla, conspicuously exserted style and stamens and yellow spherical berries.

3.2.2. Distribution and habitat

L. hantamense is common on the Bokkeveld Plateau in the Nieuwoudtville and Calvinia Districts (Fig. 4). The Hantam–Roggeveld Centre, of which the Bokkeveld Plateau forms part, receives winter rains although the eastern part borders on the summer rainfall area. The mean annual precipitation is unreliable and varies from 150 to 250 mm. The summers are very hot. The soils tend to be stony and shallow and of various origins, such as Dwyka and Ecca shales, and dolerite. The dolerite derived soils, in particular, yield fertile clayey soils (Van Wyk and Smith, 2001). *L. hantamense* does not seem to be specific to any particular soil type. The Hantam–Roggeveld Centre has less succulent elements than the rest of the Succulent Karoo. More of the Cape species, in particular bulbous types, are present (Van Wyk and Smith, 2001).

3.2.3. Additional specimens studied

31S19E (Calvinia): 1 km south of Nieuwoudtville along road to Matjiesfontein (–AC), Venter A.M. 709 (BLFU); Farm Glenlyon, 1 km SE of Nieuwoudtville (–AC), Venter A.M. 685 (BLFU), 686 (BLFU); Farm Glenlyon, 2 km SE of Nieuwoudtville (–AC), Nänni I. 309 (BLFU, MASS), Nänni I. 310 (BLFU, MASS); 26 km east of Nieuwoudtville along R27 to Calvinia (–AD), Miller J.S. and Levin R.A. 06–65 (BLFU, MASS); 44 km N of Calvinia (BB), Wilman M. 16971 (BOL);

Calvinia, 1 km E of town (–BD), *Venter A.M.* 689 (BLFU); Calvinia, 1 km E of town (–BD), *Schmidt A.A.* 45 (PRE); 25 km NE of Lokenberg (–CA), *Acocks, J.H.P.* 18861 (K, PRE); 44 km from Nieuwoudtville to Clanwilliam via Botterkloof (–CB), *Spies J.J.* 4972 (BLFU).

4. Discussion

The Succulent Karoo is an important centre of plant diversity and endemism (Davis et al., 1994), and the Hantam Karoo, which includes the area between the villages Nieuwoudtville and Calvinia where *L. hantamense* is found, is regarded as an area of the highest conservation priority (Hilton-Taylor and Le Roux, 1989). *L. hantamense* may be endangered by farming as it was mainly found in road reserves.

Three of the dioecious *Lycium* species, *L. gariepense* A.M. Venter, *L. strandveldense* and *L. tetrandrum* Thunb. are restricted to the arid western coastal and semi-coastal region of South Africa and Namibia. The remaining four species, *L. arenicola* Miers, *L. hantamense*, *L. horridum* Thunb. and *L. villosum* Schinz inhabit the inland plateau in a variety of environments and vegetation types ranging from karoo shrubland to less arid savanna and grassland.

Acknowledgements

Thanks are due to: Rachel Levin, Amherst College, Massachusetts, U.S.A., who brought the new species to my attention; Niel McGregor, owner of the Farm Glenlyon where we collected the

type specimens of *L. hantamense*; the University of the Free State for financial support that made this research possible; Rudi Verhoeven, Department of Plant Sciences, University of the Free State, who prepared the SEM micrographs; Susan Reinecke, Department of Plant Sciences, University of the Free State for the chromosome count; Anet Kotze for the drawings and Louis van Ryneveld for the Latin diagnosis.

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