



Lachenalia arenicola (Asparagaceae: Scilloideae), a new species from western South Africa

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Introduction

Lachenalia Jacquin in Murray (1784: 314) is a deciduous, geophytic genus endemic to western, southern, southeastern and central South Africa and to western and southern Namibia (Duncan *et al.* 2005). All South African members produce leaves in the winter, including those from essentially summer-rainfall areas, and *L. pearsonii* (Glover 1915: 105) Barker (1969: 321) from southern Namibia is the only summer-growing species (Duncan & Condy 2013). Flower and seed characters are most important for identification of *Lachenalia*, especially perianth shape including the perianth tube shape and length, relative position of outer and inner tepals, stamen orientation, seed shape and strophiole length. A recent monograph of *Lachenalia* provided a new classification for the genus based on a phylogenetic study of morphological characters and recognized 133 species (Duncan 2012). Living material of a new species from the Namaqualand coastal plain became available for study in 2013, although pressed specimens were first gathered in 2006. The total number of species for the genus now stands at 134.

Lachenalia arenicola G.D.Duncan & N.A.Helme, *sp. nov.* (Fig. 1)

This new species differs from *L. xerophila* Schlechter in Duncan (1997: 14) in its disc-shaped perianth tube, brownish mauve outer tepals, subequal outer and inner tepals, straight filaments, globose ovaries, obcordate capsules and smaller, ovoid seeds with inflated, longer strophioles; differs from *L. glauca* (Barker 1989: 639) Duncan (2012: 299) in its disc-shaped perianth tube, longer outer and inner tepals, strongly inflated scape, globose bulb and strongly cartilaginous leaf margins.

Type:—South Africa. Northern Cape: Farm Roode Heuvel 502, 15 km NE of Groen River mouth, common in deep brown sand on flats and dunes, 30.706°S, 17.605°W, 20 August 2013, Helme 7793 (holotype NBG!, isotype BOL!).

Deciduous, winter-green geophyte, 100–200 mm high. Bulb globose, 10–13 mm in diam., solitary; tunic multilayered, papery, outer layers light brown, inner layer translucent white; cataphylls 2, membranous, translucent white, upper cataphyll 22 mm long, apex acute, lower cataphyll 10 mm long, apex obtuse. Leaf solitary, broadly lanceolate, 50–110 × 15–22 mm, spreading to suberect, leathery, upper surface glaucous, lower surface flushed with purple; margins undulate, strongly coriaceous, yellowish green or brownish maroon; clasping leaf base mostly subterranean, white, 45–70 mm long; primary seedling leaf terete, erect. Inflorescence a raceme, many-flowered, sterile apex 10–15 mm long; peduncle erect to suberect, 40–100 mm long, light green, heavily mottled with purplish or pinkish brown, upper portion strongly inflated to base of rachis; rachis strongly inflated, 50–60 mm long, brownish pink at base, shading to bright pink above; bracts minute, ovate at base of inflorescence, becoming lanceolate above, 0.8–2.0 × 0.5–1.2 mm, white; pedicels 2–6 mm long, shortest at base of rachis, suberect at anthesis, becoming strongly decurved in fruit, white or light to deep brownish pink. Perianth zygomorphic, oblong campanulate, cernuous; tube disc-shaped, 1 mm long, brownish mauve; outer tepals lanceolate, 10–11 × 2 mm, slightly spreading, brownish mauve, ageing to yellowish brown; apical gibbosity prominent, broadly linear or lanceolate, purplish brown; inner tepals obovate, slightly spreading, protruding up to 0.5 mm beyond outer tepals, translucent white, median keel dark brown. Stamens well exerted, more or less straight; filaments white, 8.0–9.0 mm long; anthers oblong, 1.1 mm long; pollen yellow at anthesis. Ovary globose, light green, 2.0 × 1.7 mm. Capsule narrowly obcordate, 6.0–7.0 × 4.0–5.0 mm, pendent. Seed ovoid, 1.1 × 0.9 mm, glossy, black; strophiole 0.7–0.8 mm long, inflated. Flowering time: August.



FIGURE 1. Flowering plant of *Lachenalia arenicola* near the Groen River, southern Namaqualand. Photograph: Nick Helme.

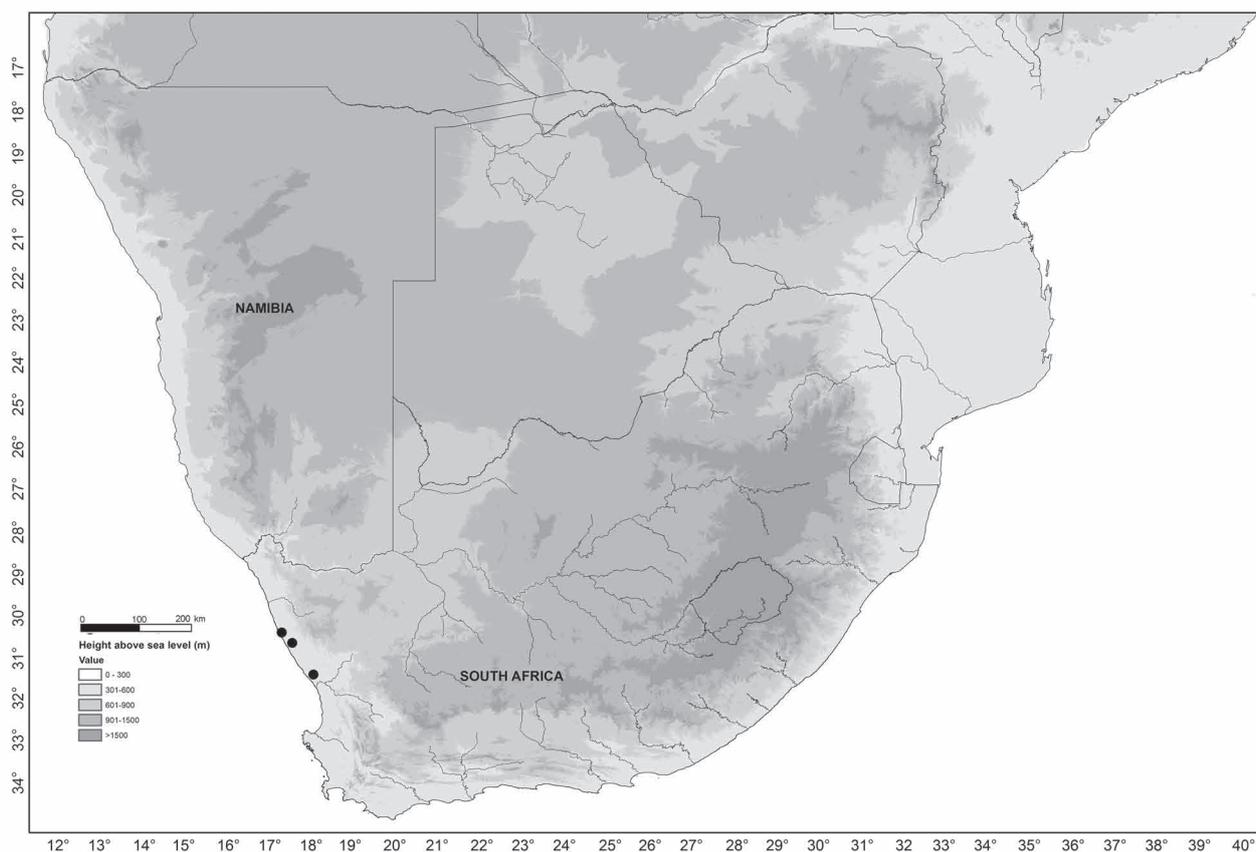


FIGURE 2. Known distribution of *Lachenalia arenicola* in the Western and Northern Cape, South Africa.

Etymology:—The specific epithet *arenicola* refers to the sandy habitat in which the species occurs.

Other material examined:—SOUTH AFRICA. Western Cape: 12 km NW of Koekenaap, on dunes southeast of Skaapvlei, 31.499°S, 18.177°W, 27-08-2012, *Helme 7535* (photo) (NBG); 15 km NW of Koekenaap, 31.485°S 18.115°W, Aug. 2013, *Jangle s.n.* (photo) (NBG). Northern Cape: Namaqua National Park, S of Farm Taaibosduin on track to Hondeklipbaai road via Jantjieskop, 30.288°S, 17.432°W, 12-08-2006, *Steyn 1011* (PRE).

History:—The earliest record of *Lachenalia arenicola* appears to be a collection made by H.M. Steyn on 12 August 2006, south of the Farm Taaibosduin on the Namaqualand coastal plain in the Namaqua National Park (*Steyn 1011*). It was subsequently recorded by N.A. Helme on 27 August 2012, who photographed it 12 km northwest of Koekenaap, on dunes southeast of Skaapvlei (photo specimen: *Helme 7535*). The type collection was made by Helme in 2013 when he returned to the coastal plain and collected the type material on 20 August, 100 km to the north on Roode Heuvel 502, northeast of the mouth of Groen River. In mid-August 2013, the plant was recorded by R. Jangle, who photographed it 15 km northwest of Koekenaap (photo specimen: *Jangle s.n.*).

Diagnostic features and affinities:—*Lachenalia arenicola* is recognized by its moderately dense raceme of cernuous, oblong campanulate, brownish mauve flowers with disc-shaped perianth tubes, inner tepals that scarcely protrude and outer tepals with prominent purplish brown gibbositities (Fig. 1). It has well exerted, more or less straight stamens and pedicels that change orientation after flowering, becoming strongly decurved during the fruiting stage. The plant is further recognized by a solitary, broadly lanceolate, glaucous leaf with strongly coriaceous margins, a strongly inflated peduncle and rachis and an ovoid seed with a glossy testa and an inflated strophiole. *Lachenalia arenicola* is included in subgenus *Lachenalia* on account of its zygomorphic perianth and into section *Oblongae* on account of its oblong-campanulate perianth shape (Duncan 2012). It appears closely allied to *L. xerophila* and *L. glauca*. *Lachenalia xerophila* has a similar oblong-campanulate, cernuous perianth with well exerted stamens, strongly inflated peduncle and rachis, and globose bulb, but differs in its white perianth with a cup-shaped perianth tube, inner tepals which protrude well beyond the outer tepals, declinate stamens, ellipsoid ovary and capsule, and much larger, oblong seed (1.8–1.9 × 0.9–1.0 mm) with a rudimentary strophiole 0.3 mm long. *Lachenalia glauca* resembles *L. arenicola* in its oblong campanulate, cernuous perianth, greyish mauve outer tepals, well exerted, straight filaments and globose, glossy black seed with an inflated strophiole, but differs in having a cup-shaped perianth tube, shorter outer and inner

tepals (6–8 mm; 7–8 mm, respectively), ovoid bulb, longer leaves without strongly cartilaginous margins and its peduncle is only slightly to moderately inflated. *Lachenalia glauca* also differs in having strongly coconut-scented flowers and a later flowering period, September to October.

Distribution and habitat:—Available records indicate that *L. arenicola* is confined to the Namaqualand coastal plain in the Succulent Karoo Biome, occurring from northwestern Koekenaap in the south to near Hondeklipbaai in the north (Fig. 2). It grows in deep aeolian, slightly acidic red or brown loose sand in Namaqualand Sand Fynbos and is absent from alkaline sands of adjacent Namaqualand Strandveld. The species occurs as scattered, solitary individuals on flats and vegetated dunes in openings between shrubs and restios. Plants often occur in association with the restio *Willdenowia incurvata* (Thunberg 1788: 18) Linder (1985: 494), and northwest of Koekenaap they have been observed growing in association with the geophyte *Haemanthus pubescens* Linnaeus (1782: 193) subsp. *leipoldtii* Snijman (1984: 117) (R. Jangle, pers. obs., August 2013).

Conservation assessment:—The species is rare at the site southeast of Skaapvlei (<20 plants seen) but fairly common at the type locality at Roode Heuvel (>50 plants seen). A portion of the population (<20%) at the Roode Heuvel site is likely to be lost to a proposed mineral sand mine, but no other significant threats are currently evident there. It has not been recorded from the approximately 10000ha Namakwa Sands mineral sand mine area at Brand se Baai, in spite of fairly intensive sampling in that area over the last fifteen years. The EOO (Extent of Occurrence) is estimated at 100,000 ha or 1000 km². About 10% of the total Namaqualand Sand Fynbos is currently formally conserved within the Namaqua National Park, but mineral sand mining is likely to be an ongoing threat to large parts of the remaining habitat, as mining companies own and are currently prospecting on various properties in the region. The species is assessed as VU D2 in terms of the IUCN 3.1 categories of threat, as the total known population is estimated at less than 1000 plants in only four known locations, and there is a real threat of mineral sand mining in at least one of the populations.

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References

- Barker, W.F. (1969) A new combination in *Lachenalia* with notes on the species. *Journal of South African Botany* 35: 321–322.
- Barker, W.F. (1989) New taxa and nomenclatural changes in *Lachenalia* (Liliaceae-Hyacinthoideae) from the Cape Province. *South African Journal of Botany* 55: 630–646.
- Duncan, G.D. (1997) Five new species of *Lachenalia* (Hyacinthaceae) from arid areas of South Africa. *Bothalia* 27: 14–15.
- Duncan, G.D. (2012) *The genus Lachenalia. Botanical magazine monograph*. Royal Botanic Gardens, Kew, 479 pp.
- Duncan, G.D. & Condry, G. (2013) *Lachenalia pearsonii*. *Flowering Plants of Africa* 63: 32–37.
- Duncan, G.D., Edwards, T.J. & Mitchell, A. (2005) Character variation and a cladistic analysis of the genus *Lachenalia* Jacq.f. ex Murray (Hyacinthaceae). *Acta Horticulturae* 673: 113–120.
- Glover, R. (1915) *Scilla pearsonii*. Flowering plants and ferns collected on the Great Karasburg by the Percy Sladen Memorial Expedition, 1912–1913. In: Bolus, F., Bolus, L. & Glover, R. (Eds.) *The annals of the Bolus Herbarium* 1. University of Cape Town, Cape Town, pp. 105–106.
- Linder, H.P. (1985) Conspectus of the African species of Restionaceae. *Bothalia* 15: 387–503.
- Linnaeus, C. (1782) *Supplementum plantarum*. Orphanotropheum, Brunsvig, 468 pp.
- Murray, J.A. (1784) *Linnaeus systema vegetabilium*. Dieterich, Gottingen, 1004 pp.
- Snijman, D. (1984) A revision of the genus *Haemanthus* L. (Amaryllidaceae). *Journal of South African Botany* 12: 1–139.
- Thunberg, C.P. (1788) *Dissertatio Restio*. Edman, Uppsala, 23 pp.
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