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A new *Drimia* sp. from the Namib Desert in Namibia

Summary

A new miniature species in Hyacinthaceae, *Drimia occultans* G. Will. is described, from the arid southern Namib Desert. A diagnostic line drawing, photographs of the plant and flower and a locality map are included. The new species appears to be endemic to the schistose rock outcrop close to the Lower Orange River, about 12 km NE of the river mouth.

Introduction

The climatic conditions that envelop the habitat year round and within which the plants have evolved are very interesting and extremely harsh. Swartkop Hill lies within the winter rainfall Succulent Karoo biome. Rainfall records in Oranjemund show the highest precipitation between May and August, when the monthly average is about 8 mm, with the annual mean about 5 mm per month (data collected over 53 years). In certain years, no rainfall is recorded at all. Although the summer months are drier than the rainy winter months, the greatest fog condensation moving up the Lower Orange River Valley occurs in February–March. Thus, Swartkop receives some moisture from fog condensation during summer.

Due to extremely low winter temperatures on the eastern escarpment (-1 to 3 °C) and a slightly warmer cell close to the coast (5 – 7 °C), a wind reversal develops. The low pressure coastal cell draws in air from the hinterland, which compresses and drops as it moves over the eastern mountain

escarpment moving towards the coast. This warm to hot mid-winter wind is responsible for the highest annual temperatures on the coast, occasionally 30 – 35 °C and also for vicious, sandblasting winds up to 100 km/ h. However, the Swartkop Hill plants are well adjusted and evolved to survive these harsh conditions. Most of the year Swartkop is bathed in gentle sea breezes, which begin during mid-morning and gather momentum towards late afternoon. Maximum winter temperatures are in the region of 16 – 18 °C (excluding temperature reversal during east winds) with minimum temperatures about 4 – 8 °C and frost free. Summer maximums occasionally reach 20 – 22 °C with minimums dropping to about 8 °C. The Swartkop Hill plants thus endure a rather vicious, unique climatic regime.

Critical remarks

Recently the genera *Drimia*, *Litanthus*, *Rhadamanthus*, *Schizobasis*, *Tenicroa* and *Urginea* have been combined under the single genus *Drimia*, and have been separated into groups according to their previous generic classification. The genus *Drimia* is characterized by spurred bracts, short-lived flowers, which die in one day, and tepals, quickly desiccating and cohering above when flowers fade. The inflorescence is simple, wiry and rarely branched. *Drimia occultans* falls into the *Drimia* group. Of the six newly created groups, no members of the *Drimia* group have been recorded from the Spergebiet (Burke and Mannheimer 2004).

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Drimia occultans G. Will., sp. nov.

Description *Drimia occultans* G. Will., sp. nov., dissimili omne specibus drimerae gregi, tenui aciformi unifolio, tepalis non junctis et ad tertis e basibus reflexis, staminibus non connivenibus, capsula parva c. 4.5 × 3 mm facile distinguenda. Typus: Namibia, Southern Namib Desert, G. Williamson 5929 (holo. NBG iso. WIND lost).

Drimia occultans G. Will., a new species, differing from all the species in the *Drimia* group. The single leaf is very slender and needle-like; the tepals are not united for a third of their length and are reflexed from about a third from the base. The stamens do not come into contact with the style and stigma, the capsule is small, about 4.5 × 3 mm. These characters easily distinguish the plants. Type: Namibia, Southern Namib Desert, G. Williamson 5929 (holo. NBG, iso. WIND lost).

Plants arising from a bulb 10 – 12 mm in diameter. **Basal leaf sheaths** grey-brown up to 15 mm long. **Leaf** single, dark, glabrous green, terete, needle-like ± 42 × 0.5 mm, lost in summer. **Flower bract** ovate acute 0.8 × 0.7 mm with a basal spur curving outwards and upwards. **Flowering peduncle** appearing after leaves have withered and lost, 30 × 0.5 mm but up to 55 mm in cultivation. **Inflorescence** usually single, but up to 3 flowers have been noted under favorable conditions in cultivation. **Flower** 8 – 10 mm across. **Tepals**; ± 6 × 1.3 mm with a bulge towards apex; apex rounded with a central rounded marginal bulge with a ring of fine papillae; the tepals reflexed from the adaxial third — the texture glistening and almost translucent — with apical third tinged greenish and a greenish-brown, raised, longitudinal central vein. **Stamens** 5 mm long, glistening white, narrowing abruptly towards the base. **Anthers** pyramidal, yellow 0.5 mm long. **Ovary, style and stigma** 4.5 mm long **ovary** yellowish-brown, minutely muricate; **nectaries** shiny bright globules, 0.8 mm in diameter. **Capsule** with a rough texture, conspicuously 3-angled, winged and slightly ridged, surface with a dew-like texture, dark brown 4 – 4.5 × 3.5 mm. **Seeds** pyramidal to narrowly pyramidal, rough textured and dark black resembling new laid tar, 1 × 0.8 mm – 1.3 × 0.8 mm (Fig. 1).

Distribution: Republic of Namibia, Swartkop Hill, east of Oranjemund, Feb. 1998 (holo. NBG). Endemic, possibly due to minute size and under-collecting.

Habitat: Southwest aspect of Swartkop Hill about 70 m alt. and 9 km east of Oranjemund in the southwest corner of the Namib Desert in Namibia. The hill comprises a private protected Nature Reserve within the closed diamond area, which is administered by the diamond mining group NAMDEB. The plants occur in sandy patches, sheltered between slabs of grey-blue to black metamorphosed schist covered in places by fine windblown sand. The southwest rocky aspect is steep and faces the southwest flowing Orange River about 12 km from where it reaches the sea. The more gently sloping northern portion of the hill borders the Namib dune sea. Plants are very few and scattered making them difficult to detect. The southwest aspect of Swartkop is generally undisturbed.

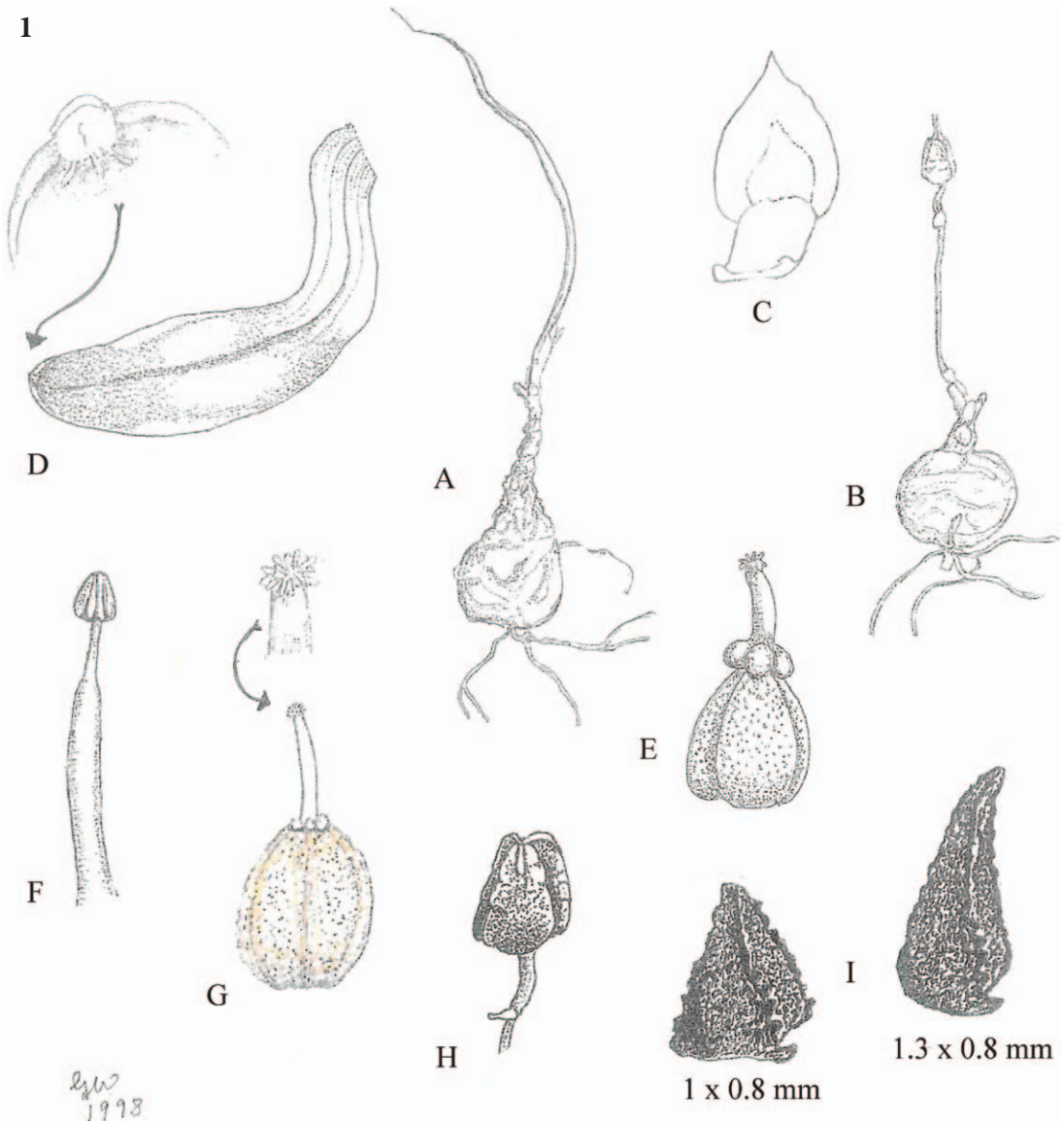
Plant associates on Swartkop Hill The flora is interesting in that it represents the meeting place of intrusions from three separate vegetation groups which occur in the Orange River valley towards the east, the southern end of the Namib Desert from the north and the north-western Richtersveld in South Africa from the south. *Cheiridopsis verrucosa*, *Avonia garipeensis*, *Euphorbia stapelioides*, *Tylecodon schaeferianus*, *Dregeochloa pumila* (the only succulent grass), a miniature Geraniaceae - *Monsonia multifidum*, *Lachenalia klinghardtiana*, and *Strumaria bidentata* are all endemics, shared by both sides of the Orange River.

Cultivation Plants survive well when grown in the original, well-drained sand and surrounded by natural flakes of grey-blue schistose rocks found in habitat. In cultivation, the leaves and flowering peduncles elongate significantly when compared with the plants on Swartkop. Usually, in habitat, only one flower develops, however, in cultivation up to two and occasionally three flowers can occur. The first collection from Swartkop Hill was made in March 1994 with a single, immature flower. The plants flowered in Feb. 1998, Jan. 2003, Jan. 2006 with the original collection still alive in August 2011.

Etymology The plant is difficult to detect due to its minute size and well-protected, hidden position amongst grey-blue, schistose rock pavement. The small, translucent flowers on an exceptionally thin, thread-like short, leafless peduncle are almost impossible to detect, thus the chosen epithet, “occultans” – hiding, alluding to its rather secret habit.

To survive the extreme climate conditions, *Drimia occultans* has evolved a number of survival tactics. They grow with a certain amount of protection between rocks. The base of the leaf is protected by thick, papyraceous scales, which resist the barrage of sandblasting, while the leaf itself, in spite of the fragile appearance,

is quite fibrous, succulent and tough. It is very difficult to press the flowers as they are rigid, fibrous and resist flattening; with excess pressure they tend to break apart, possibly also an adaptation to resist strong winds. The flowers open towards late morning with the tepals closing tightly over the stamens in late afternoon to



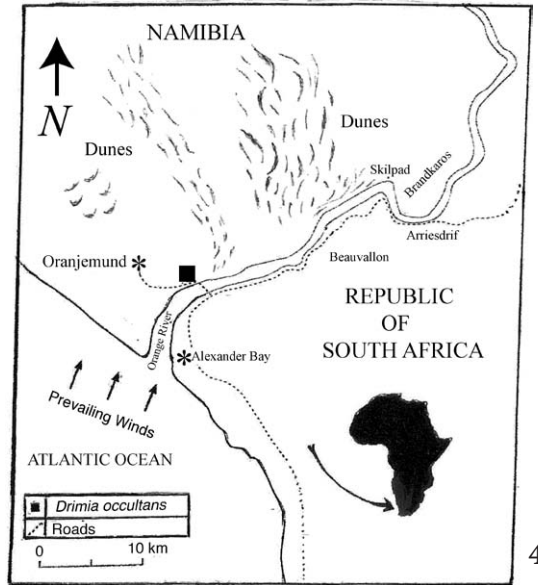
I *Drimia occultans* G. Will. sp. nov. **A.** Bulb 10-12 mm in diameter, leaf basal sheath 15 mm long, leaf $\pm 42 \times 0.5$ mm. **B.** Bulb 8×10 mm in diameter, peduncle up to 25×0.5 mm, fruit 4×3 mm. **C.** Flower bract 0.8×0.7 mm. **D.** Tepal, overall length $\pm 6 \times 1.3$ mm towards apex. **E.** Developing ovary, style and stigma with large premature nectaries, overall length ± 3 mm. **F.** Stamen 5 mm, anther 0.5 mm. **G.** Ovary, style and stigma 4.5 mm long, nectaries 0.8 mm in diameter. **H.** Capsule, 4.5×3.5 mm. **I.** Seeds. All from G. Williamson ex. hort., Feb. 1998, 5929 (NBG, WIND specimen lost)



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2 Leaf of *Drimia occultans*, 45 × 0.5 mm, above ground; basal leaf sheaths about 15 mm long. 3 Flower of *Drimia occultans*, about 10 mm in diameter. 4 Map showing locality of *Drimia occultans*, east of Oranjemund.

bring them into contact with the stigma allowing for self-pollination. *Drimia occultans* is truly a desert survivor. 🌵

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