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Silene dewinteri, a new species of the Caryophyllaceae from the south-western Cape

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ABSTRACT

A new species of *Silene*, *S.* **dewinteri** Bocquet, is described from the sand-dunes of the coastal region of the south-western Cape. The species is closely related to *S. crassifolia* L. and *S. clandestina* Jacq.

RESUME

Une nouvelle espèce de Silene, S. **dewinteri** *Bocquet, est décrite des dunes de sable de la côte du sud-ouest de la province du Cap. Elle est étroitement apparenté aux* S. crassifolia *L. et* S. clandestina *Jacq.*

INTRODUCTION

During the course of a journey undertaken to collect material for a revision of the South African species of the genus *Silene*, I had the opportunity of collecting extensively in the region of Cape Town. One of the localities visited was the coastal area in the vicinity of Table View, 18 km north of Cape Town. This is one of the localities often cited by Ecklon and Zeyher in their "Enumeratio" (1834) under the name of "Rietvalley" or "Riedvalley". I was trying to trace an elusive species listed as "*Silene Constantia*" in Ecklon and Zeyher's work—a species closely related to *S. clandestina* Jacq. I found the plant growing in populations on the sand dunes of the coast between Table View and Melkbosstrand mostly side by side with populations of *S. crassifolia* L.

The plant is an annual species with a spreading habit, fleshy leaves, thickened calyx and protruding calyx nerves. Unfortunately, the name *S. constantia* cannot be given to this species, because it applies to another species (see p.000 under Nomenclature). I therefore name the plant *S. dewinteri* in honour of Dr B. de Winter, Director of the Botanical Research Institute, Pretoria.

DESCRIPTION

Silene dewinteri *Bocquet* sp. nov., *S. clandestinae* Jacq. valde affinis, a quo tamen habitu diffuso, foliis crassis, calyce incrassato nervis prominentibus differt.

S. constantia Eckl. & Zeyhr., Enum. 32 (1834), quoad descr., typo et synonymia excludendis.

Radix simplex, tenuis. *Caulis* 7–20 cm altus, e basi ramosus, ramis expansis, procumbentibus, interdum quasi geniculatis, pilis retrorse appressis. *Folia* anguste elliptica vel anguste oblanceolata, 3–6 (–10) × 15–40 (–60) mm magna, plus minusve hirta, marginibus hirtis, basin versus ciliatis, succulenta, circa 1 mm crassa, id est statu sicco valde rugata. *Racemus* 3–7-florus, floribus secundis, primum vix cernuis, maturitate fructus perfecta erectis. *Calyx* incrassatus, hirsutus, anthesi campanulatus et 4–5 × 12 mm, maturitate fructus conspicue clavatus et tum 5–6 × 12 mm magnus, nervis crassis prominentibusque. *Petala* bifida, ungue calycem breviter superante, in fauce appendicibus binis 0,5–1 mm altis praedita, limbo 5–8 mm longo, intus sordide blanco, extus virescente vel brunnescente. *Gonophorum* 4–5 mm altum, glabrum. *Ovarium* viride, ovoideum, stylis 3 praeditum. *Capsula* brunnea, 3 × 8–9 mm magna, dentibus 6

FIG. 1.—*Silene dewinteri*. Holotype plant (*Bocquet* 17774) growing on sand dunes at Table View, south-western Cape. The maturing capsules, broader calyx with bulging nerves, thick leaves and spreading habit of the whole plant are evident.

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se aperiens, calycem maturitate fructus perfecta superans. *Semina* fusca, dorso alis 2 undulatis in ambobus lateribus circumdato. *n=12*. FIG. 1.

TYPE.—Cape Province, Table View, 18 km N of Cape Town, low undulating sand dunes between coastal dune and marshy hinterland, on semi-barren sand in disturbed area near a new settlement, 1975-11-09, *Bocquet* 17774 (ZT, holo.).

The species is endemic to the south-western Cape. See Fig. 2.

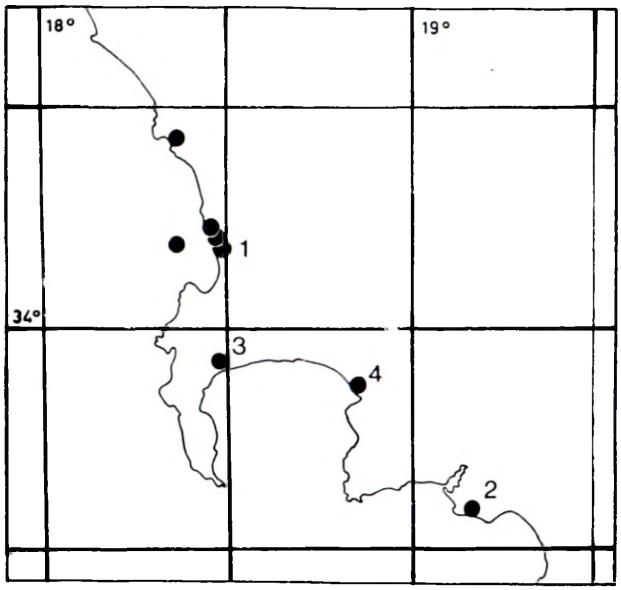

FIG. 2.—Distribution of *S. dewinteri*. 1, type locality; 2, Onrus River Mouth where *Bocquet* 17881 (chromosome count, n=12) was collected; 3 & 4, Ecklon and Zeyher's localities, "prope Constantiam" and "Hottentotsholland".

CAPE.—3318 (Cape Town): Bok Bay, WSW of Malmesbury (-CB), "flowers white", 1940-09-14, *Compton 9389* (NBG); Table Bay, between Bloubergstrand and Melkbosstrand, north of Cape Town (-CD), scattered at the foot of the coastal dune on the sea side, on half-colonized sand, bordering an extensive colony of *S. crassifolia*, 1975-11-09, *Bocquet 17781*; *17783* (ZT; PRE; NBG); seeds and preserved material from same population, *Bocquet 17818* (ZT); Bloubergstrand (-CD), 1954-09-10, *Stokoe 67560* (NBG); Robben Island, N of Cape Town (-CD) 1932-10, *Adamson s.n.* (BOL); Robben Island, 1943-08-20, *Walgate 512* (NBG); Table View, 18 km N of Cape Town (-CD), *Bocquet 17774* (holo., ZT); *17775*; *17776* (Z); "in locis arenosis (alt. 1) collium capensium prope Constantiam et Hottentotsholland" [these two localities are rather indeterminate: they correspond roughly to Muizenberg (-BA) and Strand (-BB)], s.d., *Ecklon & Zeyher s.n.* (NBG). 3419 (Caledon): Onrus River mouth, 7 km W of Hermanus (-AC), sandy areas between bushes on the low undulating dunes between rocky strand and new settlement, very near the shore, locally abundant, 1975-11-17, *Bocquet 17881* (seeds, ZT); *17882* (ZT); "Onrus riv. Sand dunes", 1958-09-28, *Willems 57* (NBG).

OBSERVATIONS

1. *Ecology, biology. S. dewinteri* is an annual growing scattered in the half-colonized parts of coastal dunes, in open localities on semi-stabilized sand. It is often accompanied by *S. crassifolia*, a perennial species, that prefers more unstable sand. The two species are rarely found in mixed colonies: they usually occur in contiguous colonies occupying different ecological situations. The ecological relations between the two species are shown in Fig. 3, a schematized section of the Bloubergstrand locality (*Bocquet* 17781). *S. dewinteri* occupies the immediate foot of the dune, where the sand is half-colonized and semi-fixed, while *S. crassifolia* occurs abundantly on the undulating area between sandbank and dune on very sparsely colonized and entirely unstable sand.

Flowering times are different for the two species: *S. dewinteri* flowers in August and September, and *S. crassifolia* from October to January. A biological barrier therefore exists between the two species. No trace of introgression or morphologically intermediate specimens was observed in the localities visited. *S. dewinteri* seems to be equally distinct from *S. clandestina*. The latter species is also an annual, but is not found as near the sea shore as *S. dewinteri*. *S. dewinteri* seems to be strictly limited to the immediate proximity of the sea.

2. *Taxonomy. S. dewinteri* has rarely been collected, probably because the more common *S. crassifolia* occurs in the same localities and depauperate forms of the perennial *S. crassifolia* can easily be mistaken for the annual *S. dewinteri*.

The affinities are clear: *S. dewinteri* is closely allied to both *S. clandestina* and *S. crassifolia*, but can be distinguished as follows:

(a) from *S. crassifolia* by its annual character, smaller calyx and thin root: *S. crassifolia* always has, even in the youngest stages, a thickened root; the older specimens build up a nearly bulbous root.

(b) from *S. clandestina* by the thicker leaves, clavate, broader and very fleshy calyx, as well as the spreading habit. Material was cultivated in Switzerland under glass from seeds of the three populations *Bocquet* 17818, 17774 and 17881. The plants are somewhat more flaccid and the leaves bigger, but the essential characters can be recognized, namely the thickness of leaves, spreading habit and broader calyx with bulging nerves.

3. *Nomenclature.* Ecklon and Zeyher intended describing our plant as a new species under the name of *S. constantia* (the specific epithet refers to Constantia, a suburb of Cape Town). The description, localities and herbarium material agree with *S. dewinteri* However, Ecklon and Zeyher cited *S. crassifolia* L

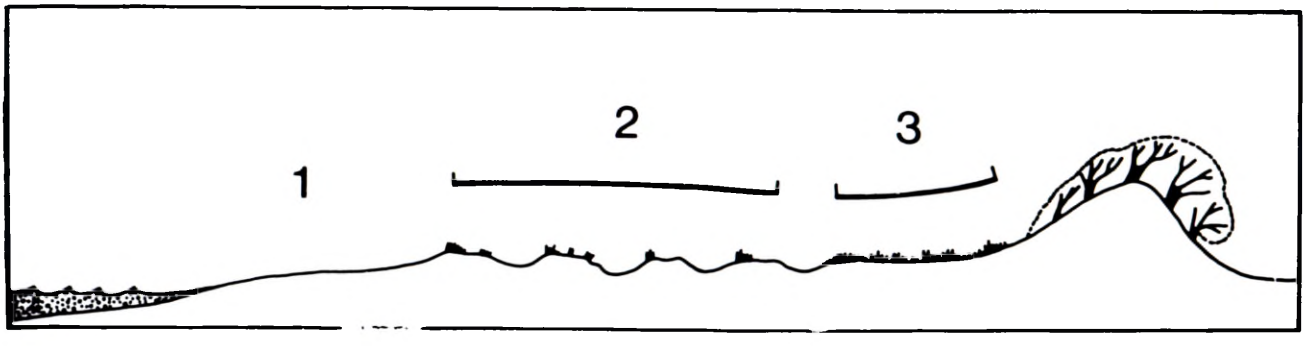

FIG. 3.—Transect of the Bloubergstrand locality (*Bocquet* 17781; 17783). 1, strand; 2, distribution of *S. crassifolia* on the undulating ground in front of the coastal dune (sparsely colonized and unstable sand); 3, *S. dewinteri*, at the foot of the coastal dune (semi-fixed and half-colonized sand).

var. *angustifolia* Bartling (1832) in synonymy and therefore *S. constantia* is automatically typified by the type of this variety. The type specimens of var. *angustifolia* were collected in the vicinity of King's Blockhouse ("Beim obersten Blockhause") on the north-eastern slopes of Devil's Peak above Rhodes Monument. These specimens represent a local form of *S. clandestina*, an ecotype of dry barren hillslopes that is commonly encountered in the Table Mountain and Lion's Head region between 100 and 400 m. It is a small, erect plant with very narrow leaves, but there is no good reason why it should be recognized and described as a distinct infraspecific taxon.

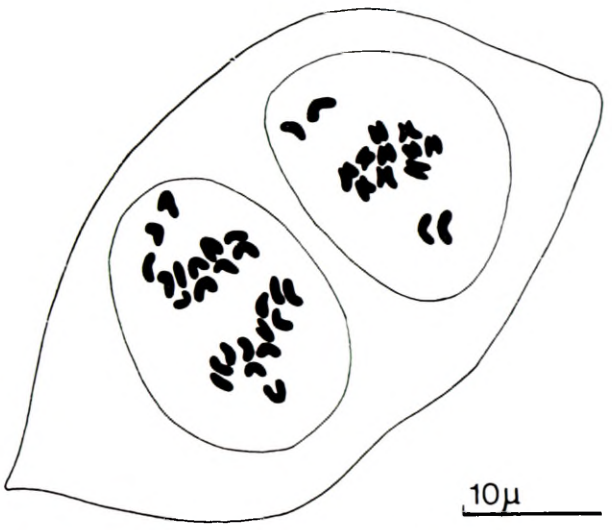

FIG. 4.—*S. dewinteri*. n=12. Anaphase II, microsporogenesis.

4. *Cytology*. Chromosome counts on flower buds of cultivated material yielded the number n=12. Material: *Bocquet* 17881; Carnoy-acetocarmine treatment; 10 counts from 3 slides and 2 buds. Fig. 4 shows an anaphase; the chromosomes are small, but not as contracted as they usually are in meiotic phases of *Silene* species. In most *Silene* species they appear at this stage as more or less isodiametric spots.

ACKNOWLEDGEMENTS

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UITTREKSEL

'n Nuwe species van Silene, S. **dewinteri** *Bocquet, word beskryf van die sandduine van die kusstreek van die suidwestelike Kaap. Die species is naverwant aan* S. crassifolia *L. en* S. clandestina *Jacq.*