

## *Crassula sandrae*, a new species from the southern Cape, South Africa

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Photographs: Niels H.G. Jacobsen except figure 2.

**Summary:** A new species of *Crassula* L., *C. sandrae* N.H.G. Jacobsen, a succulent from the Western Cape Province of South Africa, is described. It is intermediate in floral morphology and habit between *C. tetragona* L. and *C. biplanata* Haw. of the Section *Acutifolia* (Schönland) Toelken, differing from both, but is most similar in habit and inflorescence to *C. biplanata*.

**Zusammenfassung:** Eine neue Art von *Crassula* L., *C. sandrae* N. H. G. Jacobsen, eine Sukkulente aus der südafrikanischen Provinz Western Cape, wird beschrieben. Sie steht bezüglich Blütenmorphologie und Habitus zwischen den Arten *C. tetragona* L. und *C. biplanata* Haw. der Sektion *Acutifolia* (Schönland) Toelken, unterscheidet sich aber von beiden, wobei sie im Habitus und Blütenstand der *C. biplanata* am ähnlichsten ist.

### Introduction

A specimen and photos of an unusual stonecrop from the Farm Uitsig, Hoeko in the Ladismith District of the Western Cape Province, South Africa were brought to the author's attention in June 2018. At this time only dried inflorescences were present, making identification difficult. The plant was thought to be *Crassula biplanata*. (Figure 1) but with some similarity to *C. tetragona* L. *sens. lat.* and perhaps some forms of *C. mollis* Thunb.

This plant flowered in January 2019 and, on examination, the flowers were found to have morphological similarities to both *C. biplanata* and *C. tetragona* subsp. *lignescens* Tölken, both species belonging in the Section *Acutifolia* (Schönl.) Tölken, but very different from the that of *C. mollis* of the Section *Globulea* (Haw.) Harv., the difference being the tubular corolla with a large terminal appendage and incurved petal apex on the petals of the latter, in contrast with the flowers of the Section *Acutifolia*, which lack such structures. Subsequently additional specimens of this taxon were collected from Camferskloof on the Outeniqua Mountains and from the Swartberg, the additional material and consistent differences making it possible to describe it as a new species.

***Crassula sandrae*** N.H.G. Jacobsen **sp. nov.** TYPE: South Africa, Western Cape Province. Farm Uitsig, Ladismith District, (3321AD) *NHG Jacobsen* 7334 (holotype SCHG; isotypes, GRA, PRE). 21 Oct. 2018. (Figures 2 and 3a, 3b).

**Diagnosis:** *C. sandrae* differs from *C. biplanata* in the small 3–4mm long, urceolate corolla in contrast with the large 5–6mm tubular corolla of the latter and the 2–3mm campanulate corolla of *C. tetragona* subsp. *lignescens*. Differences also include the elliptic petals and large calyx of *C. sandrae*, the latter extending over 40–60% of the corolla, both similar to that of *C. t.* subsp. *lignescens*, but in contrast to the lanceolate petals and short calyx of *C. biplanata* the latter extending over 20–30% of the corolla. *C. sandrae* differs from both in the apiculate petals and indistinct dorsal appendage, an extension of the mid-dorsal ridge. **Paratypes:** SOUTH AFRICA. Western Cape Province; George District, Camferskloof, (3322CD) *NHG Jacobsen* 7406 (SCHG), 15 Nov. 2019; Oudtshoorn District, Platberg Hiking Trail, Swartberg, (3322AC) *J. Potgieter* 667 (SCHG) 31 January 2020.

**Description:** A low bushy succulent subshrub 4–17cm tall but reaching 28cm on flowering in cultivation, well branched from the base. **Stem and branches** carnosose, glabrous, olive-green, becoming brownish to pale green along younger parts, primary branches reaching 11.6mm in diam. and secondary branches 7.9mm in diam. **Leaves** green, subulate, arcuate to spreading, acute to acuminate, up to 25mm long, 3.4mm diam. and in 8–14 pairs along branches, connate for approximately 1mm; minute hydathodes present; older leaves die off but remain on stem and branches. Internodes between leaves, short, 3–6mm in length, leaf scars distinct at basal nodes. **Inflorescence** an erect, more or less flat-topped thyrse. **Peduncle** arises in leaf axils at branchlet apices, glabrous, greenish tinged purplish, 90–140mm long with (0)1–2 pairs of bracts at nodes without flowers. **Bracts** similar to leaves but much smaller, linear-lanceolate, flat above, convex below, acute, glabrous, green, margins entire and connate at base. **Thyrse** small, few flowered, dichotomously branched, with paired



**Figure 1.** *Crassula biplanata* in situ, with withered flowers along a sandstone ridge, Gatbos, Wilderness Heights, George District, Southern Cape. Flowers turn reddish-brown when flowering is over.

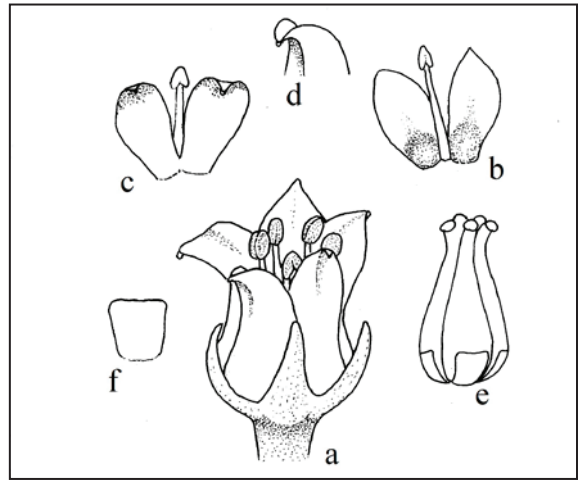


dichasia each with from 3–9 flowers, the dichasia often separated by a single flower. **Flowers** pedicellate, urceolate, corolla white, 3.3–4.0mm long; **calyx** glabrous extending over 40% or more of the length of the corolla with triangular to linear-triangular lobes, lobes bluntly acute to acute, margins entire, pale green to white; **petals** broadly elliptic to oblong, fused at base for 0.4mm, glabrous, translucent white with reticulate or net-veining, slightly granular dorsally, apex apiculate with an indistinct dorsal appendage, an extension of the mid-dorsal ridge; **stamens** 2mm long with brown to blackish anthers and free, tapered filaments widest at base; **carpels** slender, pyriform, white with translucent erect to recurved styles and apical stigmas; **nectary** wider than long, with curved sides, emarginate, yellow to orange.

**Figure 2.** *C. sandrae*, in situ along a stony slope, Uitsig farm, Ladysmith District, southern Cape. Photograph: S. Taylor.



**Figure 3a.** *C. sandrae*, inflorescence and flowers showing apiculate petals.



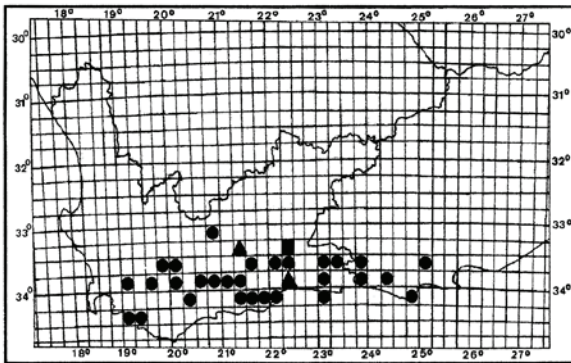
**Figure 3b.** *C. sandrae*: a. flower; b. petals and stamen: ventral view; c. dorsal view; d. petal apex with appendage; e. carpels; f. nectary.

**Phenology:** Plants were not in flower in the field during June and October but displayed numerous dried inflorescences. A plant in cultivation from the type locality produced buds in late December and flowered from January-March, marginally into April. Plants from Camferskloof produced buds during November and started flowering towards the end of December and into January. Photographs on iSpot of plants in flower in the field were taken in January and early April respectively.

**Etymology:** The species is named for Sandra Taylor the author's stepdaughter who found and photographed the plant and assisted in further field surveys of stonecrops.

**Distribution and habitat:** Recorded on the Uitsig farm, Ladismith District, Camferskloof near Herold in the Outeniqua Mountains and on the

Platberg Hiking Trail, Swartberg, between Oudtshoorn and Prince Albert, Little Karoo (Figure 4). At the type locality plants grow fully exposed on stony slopes together with grasses, shrubs and many crassula species such as *C. pubescens* Thunb. subsp. *pubescens*, *C. mollis* Thunb., *C. perforata* Thunb., *C. rupestris* Thunb., *C. muscosa* var. *muscosa* L., *C. tetragona* subsp. *lignescens* and *C. cultrata* L. the vegetation is Montagu Shale Renosterveld (Rebello et al., 2006) at an altitude of 700m a.s.l. Plants at Camferskloof near Herold grow in short grassland in sandy soil derived from Table Mountain sandstone along south-facing slopes of the Outeniqua Mountains in North Outeniqua Sandstone Fynbos (Rebello et al, op. cit.) at 650m a.s.l. At both places, plants were localised, growing clumped to scattered. Swartberg plants are small up to 10cm tall as they grow in shallow soil on bedrock in North Swartberg Sandstone Fynbos (Rebello et al, op. cit.), the inflorescence comprising half or more of the plant.



**Figure 4.** The distribution of *Crassula sandrae* (solid square) and *C. biplanata* (solid circle) with solid triangle reflecting overlap. Localities of *C. biplanata* from Tölken (1977).

## Discussion

Plants of *C. sandrae* can be superficially confused as a form of *C. tetragona sens. lat.*, but are low, extensively branched shrublets similar in habit to *C. biplanata* and unlike the slender plants of *C. tetragona* subsp. *lignescens* (Figure 5) with which it is sympatric at the type locality. A comparison of various morphological attributes of the three species can be seen in Table 1.

The leaves of mature plants are usually longer than that recorded for *C. biplanata* and within the range described for *C. tetragona sens. lat.* (Tölken, 1985), but are slender and apically acuminate, without a bloom and the older leaves are persistent. The inflorescence is initially most

Taxon			
Characteristics	<i>C. sandrae</i>	<i>C. biplanata</i>	<i>C. t. subsp. lignescens</i>
Habit	bushy	bushy	almost virgate
Inflorescens	divaricate	condensed	dendritic
Leaf apices	acute to acuminate	acut	acute
Leaf length	< 25mm	18–15mm	12–20mm
Calix as % of corolla	40–60%	20–30%	30–50%
Corolla	urceolate	tubular	campanulate
Corolla length	3.5–4.0mm	4.5–6.0mm	2.0–3.0mm
Petals	broadly elliptic, recurved apically	lanceolate to obolanceolate, recurved apically	broadly elliptic, recurved mesially
Petal apex	apiculate	bluntly acute	bluntly acute
Petal appendage	present	absent	absent
Stamens	2mm	3–4mm	1–2mm
Carpels	pear-shaped	bottle-shaped	pear-shaped
Nectary	transversely oblong to almost square, slightly emarginate	transversely oblong, slightly emarginate	almost square, usually truncate

**Table 1.** A comparison of the habit and floristic characters of *Crassula sandrae*, *C. biplanata* and *C. tetragona* subsp.. *lignescens*. Data from personal observations and Tölken (1985).

similar to that of *C. biplanata* but is dichotomously branched becoming divaricate, unlike the dendritic inflorescence of *C. tetragona* (Figure 6). Each branchlet terminates in an erect, almost uniformly elongate peduncle (Figure 2), atypical for either *C. tetragona* or *C. biplanata*. The corolla of *C. sandrae* is urceolate and smaller than the tubular corolla of *C. biplanata* but larger than the campanulate flowers of *C. tetragona*. The petals of *C. sandrae* are apiculate unlike that of both *C. biplanata* and *C. tetragona* and recurve apically similar to *C. biplanata* (Figure 7) but unlike that of *C. tetragona* which start curving outwards mesially.

Although Tölken (1977, p. 256) mentions that the petals of *C. biplanata* each have a dorsal ridge with an indistinct petal appendage this could not be confirmed and he omitted mention of this from the description in a follow-up publication (Tölken, 1985). The apices of this taxon tending to be bluntly acute or slightly notched when viewed laterally, the petal apex extending as far to slightly further than the dorsal ridge (Figure 8).

The stamens in both *C. sandrae* and *C. biplanata* have free filaments which are broadest

at the base. Tölken (1977, p. 256) mentions the latter with filaments somewhat constricted where fused to the petal tube similar to that of *C. tetragona* but this could not be ascertained at this time.

The carpels of *C. sandrae* are pear-shaped, similar to that of *C. tetragona* mostly differing from that of *C. biplanata* which tend to be bottle-shaped with distinct shoulders suddenly tapering to slender styles and small stigmas. The nectary of *C. sandrae* is longer than wide, slightly cuneate, with curved sides and slightly emarginate to truncate, similar to the emarginate, horizontally oblong to square one of *C. biplanata*, also with curved sides, but differing from the truncate, square to oblong-cuneate nectary of *C. t. subsp.. lignescens*.

Plants of *C. sandrae* from well separated localities are consistent in habit and floral morphology and grow sympatrically with *C. tetragona* subsp.. *lignescens* on the Uitsig farm, while *C. biplanata* has not been recorded at the type locality. Photographs on iSpot indicate that the latter may grow in the same vicinity as *C. sandrae* at Camferskloof but none was seen at this site. On the Swartberg plants grew together with *C. smutsii* Schönl.



**Figure 5.** *C. tetragona* subsp. *lignescens* growing in situ on the Rolbaken Nature Reserve, near Dysselford, Little Karoo.



**Figure 6.** The inflorescence of *C. tetragona* subsp. *lignescens* from the Uitsig farm, Ladismith District. Note the different branching of the inflorescence compared to that of *C. sandrae*.



**Figure 7.** *C. biplanata* from Herold, George District, southern Cape: inflorescence and flowers.

## Conclusion

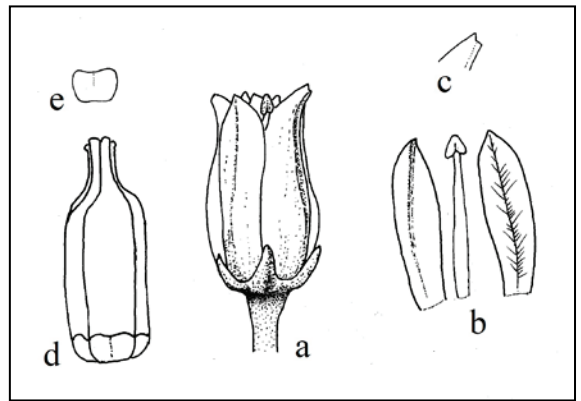
*C. sandrae* does not strictly conform to the morphological characteristics of the Section *Acutifolia* as described by Tölken (1985) due to the presence of the indistinct dorsal appendage. The habit and inflorescence of *C. sandrae* are very similar to that of *C. biplanata*, but differ from those of *C. tetragona lignescens*. The consistent differences in habit and morphology and, in some instances, sympatry with a lack of intergrades are sufficient to warrant species status for this taxon.

## Acknowledgements

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**Figure 8.** *C. biplanata*: a. flower; b. petal – left, dorsal view, right, ventral view and anther; c. petal apex; d. carpels; e. nectary (Wilderness Heights, George District, southern Cape, NHGJ 6964 SCHG).