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R. Marloth Ph.D., M.A., F.R.S.S.Af.

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SOME NEW SOUTH AFRICAN SUCCULENTS. PART II.*

BY R. MARLOTH, PH.D., M.A., F.R.S.S.Af.

(Plate XXVII.)

(Read June 16, 1909.)

Among the plants, which I am describing in this paper, are a few with a peculiar structure of their leaves. It will be remembered that a year ago † I exhibited a species of *Bulbine*, ‡ with window-leaves, pointing out at the time that such a structure has not been observed on any other plant as yet.

The very succulent, nearly egg-shaped leaves of the plant remain embedded in the ground, hence the blunt apex only becomes visible. Here the green tissue is absent, being confined to the sides of the leaf. As the sides are surrounded by soil, the light cannot reach them in the ordinary way, but only by entering through the window at the apex, illuminating the leaf from within.

Since then I have found five other species of plants with such "window-leaves," viz., four species of *Mesembrianthemum*, § and one species of *Haworthia*. || They are all stemless succulents with the leaves embedded in the ground, showing only the flat or convex apex, which is entirely devoid of green tissue. Hence, as in the case of the *Bulbine*, the light can reach the green tissue of the leaf only through the window, illuminating the leaf from within. It should be noted, that while in the case of the *Bulbine* there is no epidermis at the window the other five plants have a complete epidermis.

* Part I. appeared in the Transactions of the South African Philosophical Society, vol. xviii., pt. 1, 1907.

† See Rep. of Proc. Roy. Soc. S.A. of meeting held June 17, 1908.

‡ *Bulbine mesembrianthemoides*, Haw. See Plate XXVII., fig. 1.

§ Two of these are described in the present paper, the two others are *M. truncatellum* Haw. and *M. Hookeri*, Berger.

|| This species is the same as that named *Haworthia truncata* by Dr. Schönland in the paper read at the same meeting as the present paper; hence, in order to avoid a synonym, I have cancelled the description and name given by me.

I consider this structure to be principally a contrivance for the protection of the green tissue against the destructive action of too severe sunlight, as explained more fully in another paper.*

GERANIACEÆ.

PELARGONIUM MUNITUM, Burchell, Trav., vol. i., p. 225.

As the specimens on which Burchell founded this species were lost in the parcel which he despatched to Capetown before reaching the Roggeveld, Harvey (Flor. Cap., i., 308) referred the plant to the insufficiently known species. It is therefore advisable to complete the brief description given by Burchell.

Shrubby, thick-stemmed, 2 to 3 feet high, with a few stout branches, covered with the rigid, persistent inflorescences. Leaves bi-pinnatifid, appearing in winter. Flowers in dichotomously branched panicles, each umbel formed of 7 to 9 flowers. Sepals equal, broadly lanceolate with a membranous margin, all reflexed, the tube equal in length to the sepals. Petals subequal, the 2 upper ones very little longer and broader than the others, marked with dark pink stripes near the narrowly eared base; the upper petals 9 mm. long, the others 7 or 8 mm.; stamens 5.

The plant is fairly common on rocky hills of the South-Western Karroo (Prince Albert Road, Laingsburg, eastern side of Hex River Pass), flowering in spring. Marloth, No. 4387. (See figure in Marloth, "Das Kapland," p. 323.)

CRASSULACEÆ.

CRASSULA ALSTONII, n. spec. (Sect. *Sphæritis*.)

Planta sterilis globosa, foliis valde carnosius, sub-hemisphæricis, concavis, obtusis, dense aggregatis, squamis setiformibus brevibus, dense obtectis. Inflorescentia longiuscule pedunculata, cymosa, cymis 3- to 5-floratis, glomeratis vel breviter stipitatis. Flores albi, sepalis ovatis, pilosis, petalis liberis, lanceolatis, acutis, conniventibus, apice recurvis, sepalis duplo longioribus. Squamæ sessiles, cuneatæ, apice emarginatæ.

The plant forms globular bodies, in shape somewhat similar to the more widely spread *Crassula columnaris*, but easily distinguished from that plant by the canescent outer surface of the leaves, which is of the

* Ber. Deutsch. Bot. Ges., xxvii., p. 362, 1909.

same nature as in *C. namaquensis*, Schönland et Baker. Leaves about 12 mm. long, 15 mm. broad, and 3 to 5 mm. thick, quite obtuse or with a faintly indicated apex. The erect stout and very short hairs are so closely set that they give the leaf a whitish or grey appearance. Peduncle 2 to 3 inches high, branching above, with 3 to many glomerules. Flowers 3 to 4 mm. in length; petals white with a green or reddish midrib below and a pointed apex, bearing a minute red gland at the back. (Fig. 7.)

Collected near Anenous, in Little Namaqualand, by Mr. Garwood Alston, and flowering in my garden at Capetown in April.

Marloth, No. 4679. Also received by Mr. N. S. Pillans from other parts of Little Namaqualand.

AIZOACEÆ.

MESEMBRIANTHEMUM OPTICUM, n. spec. (Sect. *Sphæroidea*.)

Planta acaulis, ramosa, pulvinum depressum formans. Corpuscula truncata, glauca, non-punctata sunt, sed facies terminalis margine fauceque albido-marginata est. Ovarium inclusum, compressum; calyx exsertus, sepalis 5, ovalibus, fuscis, hyalino-marginatis. Petala numerosa, roseo-alba, linearia, libera, sepalis duplo longiora. Styli 5, filiformes. Capsula tubiniformis, stipitata, corpuscula haud superans.

Diam. of the cushion-shaped plant 2 to 4 cm., number of corpuscula 4 to 15, each corpusculum 15 mm. long, with a diam. of 10 to 12 mm. at the upper face. Length of sepals 4 mm., of the petals 6 to 8 mm.

The two leaves which form the corpusculum are not joined near the upper end; they are glaucous-green below, but whitish on the terminal, almost flat face, the latter being surrounded by a whitish-brown margin and the whole body encased in a wrinkled, whitish-brown sheath, which is mostly split at one side leaving the truncate end of the leaves quite free.

The flowers open only in bright sunlight, the petals are pure white or tinged with pink; the small ovary and its very succulent stalk are compressed and almost 2-edged; the styles greenish, the filaments white, the anthers yellow. (Fig. 5.)

Growing in sand-covered fissures of gneiss-rocks near Prince of Wales Bay, in Great Namaqualand, flowering April, 1909. Altitude 50 m. Marloth, 4675.

This is one of the few plants which possess leaves with an apical window, through which the light enters, illuminating the green tissue from within. The plants are almost buried in the sand, the apex only

of the leaves being visible. In this portion, viz., at the apex, the leaf possesses no chlorophyll, hence the water-storing tissue is here in direct contact with the epidermis, thus being able to diffuse the light that enters through the window, before it reaches the green tissue.

MESEMBRIANTHEMUM FIMBRIATUM Sond. (See Sonder in Flor. Cap., ii., p. 393.) (Amended description.)

Calyx tubular, membranous, the segments oval, membranous, the edges transparent; petals 15 to 20, connate into a membranous tube, the free limb linear, slightly exceeding the sepals, white or cream-coloured; stamens, incl. of the yellow, linear anthers, about as long as the sepals. Styles 6, yellow, filiform, longer than the petals. Diam. of corpusculum 3 to 4 mm., exerted part of flower (in wild plants) 3 mm. long. The corpuscula are closely pressed against each other, forming hemispherical, cushion-shaped lumps, 1 to 3 inches in diam.; grey or whitish in appearance, as the dry sheaths only are visible.

The plant lives in the fissures of the bare rocks in the coastbelt of Great and Little Namaqualand and is able to do without rain, as the spongy sheaths and the hairs, which fringe the fissure of the corpusculum, absorb sufficient water from dew and mist, both yielding an ample supply in those regions. The root-system of each lump is only small. Flowering near Angra Pequena in May, 1909. Marloth, No. 4674.

MESEMBRIANTHEMUM RHOPALOPHYLLUM, Schlechter et Diels. (Schultze, Aus Namaland und Kalahari, p. 692.)

The original diagnosis of this species was made from sterile specimens. As plants found by me at the same locality as the original specimens, viz., in the neighbourhood of the Prince of Wales Bay, in Great Namaqualand, have now flowered in my garden, I am able to add the following description of the flowers:—

Flores solitarii, pendunculis basi bibracteatis folia superantibus. Sepala 5, ovata, olivacea, membranaceo-marginata. Petala pluriseriata, lineari-lanceolata. Styli 5, fimbriati.

Pedicele about 1 inch long, provided with 2 small, connate, succulent bracts at its base. Flowers pure white or tinged with pink; petals 12–14 mm., spreading in the sun. Styles short, fimbriate, especially at their inner side.

The leaves of this plant are embedded in the sandy soil like those of *Mes. marginatum*, described in this paper, and they possess a similarly constructed apical window through which they receive their light. Marloth, No. 4681.

MESEMBRIANTHEMUM DIGITIFORME, Thunb.

Planta subacaulis, radice lignosa, foliis oppositis, inæqualibus, basi in corpusculo cylindrico connatis, apicem versus liberis, valde cylindricis, rotundatis. Flores sublaterales, sessiles, solitarii, parvi, albi, ovario incluso.

A number of stout branches arise from a common, stout, woody root, forming a lump as big as a fist or a small head. Each branch consists only of one pair of leaves, which form a fleshy corpusculum, somewhat like those of the section *Sphæroidea*, but of a different structure. The greater portion of this body is formed by one leaf, which sheathes round the smaller one, thus forming a cylindrical fleshy mass, 1 to $1\frac{1}{2}$ inches in length and $\frac{3}{4}$ inch in diam., which is terminated by the ends of the two leaves; the free end of the smaller one is $\frac{1}{2}$ inch long, the other one 1 inch long and $\frac{1}{2}$ to $\frac{3}{4}$ inch in diam., the apex of both being rounded. The flower appears at the junction of the two leaves, the ovary remaining enclosed, the petals being very stiff, white, lasting two weeks or longer. Diam. of flower 8 to 10 mm.

The corpusculum is surrounded by numerous sheaths, the remains of former generations of leaves, the youngest generally reaching as far as the junction of the leaves. The leaves are soft and juicy, bright green, with a thin skin. Owing to the large amount of watery sap contained in the leaves they are readily eaten by the stock in times of drought, otherwise not touched owing to their saline taste. (Fig. 3.)

Found on a stony plain near Van Rhynsdorp by Mr. W. Spilhaus. Flowering in my garden at Capetown in December, 1906. Marloth, No. 4677.

MESEMBRIANTHEMUM CINEREUM, n. spec. (Sect. *Subquadrifolia*.)

Planta acaulis. Folia 4–6, dense aggregata, hemisphærice-triquetra, superne plana, apice obtusissima, papillis erectis, piliformibus, brevissimis dense obtecta et cinerea. Flores solitarii, inter folia superiora sessiles; sepala 5, valde inæqualia, tria carnosia foliis similia, duo minora membranacea; petala linearia, rigida, uni-seriata, recurva, alba, nitida. Stamina alba antheris flavis. Capsula subsessilis.

Stemless or nearly so, often several short branches from a woody root, forming a compact lump, 5 to 20 cm. in diam. The leaves are very closely pressed against each other, flat above, thicker than broad when young, but of the shape of half a chestnut when fully grown, with a blunt carinal angle. The surface of the leaves is grey or whitish, owing to its being densely covered with short and minute papillæ of a similar structure as found in several species of *Crassula*.

Length of leaves 20 to 25 mm.; width and thickness 14 to 18 mm.; diam. of flower 20 mm. The sepals hardly project above the upper pair of leaves, the petals are glossy white, 10 to 12 mm. long, curving back and remaining spread out night and day. Diam. of capsule 8 mm. (Fig. 2.)

Growing on cliffs of grey-coloured limestone a few miles east of Prince of Wales Bay in Great Namaqualand at an alt. of 50 to 100 m. Flowering in June. Marloth, No. 4680.

EUPHORBIACEÆ.

EUPHORBIA BASUTICA, n. spec. (Sect. *Medusea*.)

Planta humilis, paullo ramosa, non rosulata, podariis rhomboideis, obtuse-pyramidalibus. Folia brevissima, lineari-ovalia, concava, decidua. Cyathia in apicibus ramorum sessilia, foliolis 3-4 ovato-cuneatis, ciliatis suffulta. Involucrum campanulatum lobis latissimis, brevissimis, truncatis, denticulatis, viridibus; glandulis sub-stipitatis, transverse-ovalibus, concavis, punctatis, sub-viridibus, in 4-5 lacinias breves partitis; styli breves, involucro haud superantes, stigmatibus crassis, ovalibus.

This plant agrees exactly with the figure on plate 150 of De Candolle's *Plantes Grasses*, but is certainly not a form of *E. caput medusæ*—a plant occurring frequently in the neighbourhood of Capetown. Berger in "Sukkulente Euphorbien," p. 113, identifies De Candolle's figure with *E. parvimamma*, Boissier (ex *Prodromus*, xv., 2, p. 86), but his own figure of the supposed *E. parvimamma* shows the segments of the involucre to be triangularly pointed and well fimbriated, while DC.'s figure in *Pl. Gr.* and our plant possess very broad, retuse and finely denticulate segments. (Fig. 6; magnified 2x.)

Berger's plant may be *E. parvimamma*, Boiss., which was named from sterile specimens only, or not; that does not concern us here, but it is certainly different from the figure in *Plantes Grasses*. As the latter agrees so well with our plant, it became necessary to name the latter.

Syn.: *E. caput medusæ*, L., var. *minor*, DC. in *Plantes Grasses*, tab. 150.

The plant (2 specimens) was sent by Mrs. A. Dieterlen, from Leribe, in Basutoland, and flowered in Mr. E. P. Phillips' cultures at the Government Herbarium, Capetown, in February, 1909.

LILIACEÆ.

ALOE KRAPOHLIANA, n. spec. (Sect. *Acaules*.)

Acaulis. Folia numerosa, anguste-lanceolata, acuminata, supra subtusque convexa, apice incurvata, glauca, margine dense et minute den-

ticulata. Racemi 1-3, ex centro foliorum, robusti, simplices, bracteis ovato-acuminatis; floribus longe pedicellatis, nutantibus. Perianthium cylindricum, utrinque paullo attenuatum; segmenta exteriora libera vel basi haud connata, apicibus erectis; interiora paullo longiora, apicibus recurvis, faucem apertam, rotundam formantibus; stamina stylusque demum breviter exserta.

Diam. of rosette of leaves 15-20 cm.; leaves 20-30, each 6-10 cm. long, at the base 12-15 mm. broad, and half as thick, with a convex upper and lower face, curving upwards from the middle. Teeth very numerous, small, white, 1-2 mm. long, mostly straight or occasionally incurved towards the apex of the leaf. Peduncle stout, the bare portion 6-12 inches long with a few broader bracts; the floriferous part finally 6-10 inches long, with acuminate bracts, which are green with purple margins, or, especially lower down, quite purple. Flowers brick-red, the outer segments with a green midrib near the blunt apex, the inner segments pale greenish with a deep-green, oblong apex. Anthers orange, finally exserted.

Described from plants collected near Pella, in Little Namaqualand, by Mr. J. H. C. Krapohl, and flowering in my garden at Capetown in May, 1909. Marloth, 4673.

HAWORTHIA LIMIFOLIA, n. spec. (Sect. *Margaritifera*.)

Acaulis. Folia dense rosulata, ovato-lanceolata, acuminata, supra concava, obscure-viridia, non-tuberculata sed supra subtusque numerosis (15-20) lineis elevatis, undulatis transverse striata.

Diam. of rosette of leaves 6-8 cm.; leaf 3-4 cm. long and 18-20 mm. broad at its base; peduncle 20-30 cm. high, raceme 5-8 cm. long; perianth slightly 2-lipped, the tube slightly inflated below, green, 10-12 mm. long, the recurved segments 5-6 mm. long, with a touch of pink and a green midrib.

The surface-markings of the leaves are quite different from those of any other species, and might be sufficient to constitute a new section, viz., *Limifolia*, on account of the similarity of the surface to that of a coarse file.

The plants were received from Mr. Medley Wood, director of the Botanic Gardens at Durban, who obtained them originally from the country West of Delagoa Bay. Flowering at Capetown, in December, 1908. Marloth, No. 4678.

West, Newman proc.

1. *Bulbine mesembrianthemoides*, Haw. 2. *Mesembrianthemum cinereum*, Marl.
 3. *M. digitiforme*, Thunb. 4. *Haworthia limifolia* (a leaf), Marl. 5. *Mesembrianthemum opticum*, Marl. 6. *Euphorbia basutica*, Marl. 7. *Crassula Alstonii*, Marl.