

Studies in the Ericoideae. I. The genera *Eremia* and *Eremiella*

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ABSTRACT

A revision of the genus *Eremia*, in which seven species are recognized, and of the monotypic genus *Eremiella* is presented. Both genera belong to the Ericaceae-Ericoideae and are endemic in the south-western part of the Cape Province. The revision necessitated the inclusion of the monotypic genus *Eremiopsis* N.E. Br. under *Eremia*. This is the first in a series on the minor genera of the Ericoideae in Southern Africa.

Résumé

ETUDES SUR LES ERICOIDEAE. I. LES GENRES EREMIA ET EREMIELLA

Une révision du genre *Eremia*, dans lequel sept espèces sont reconnues, et du genre monotypique *Eremiella* est présentée. Les deux genres appartiennent aux Ericaceae-Ericoideae et sont endémiques dans la partie sud-ouest de la province du Cap. La révision a nécessité l'inclusion du genre monotypique *Eremiopsis* N.E. Br sous *Eremia*. Cet article est le premier d'une série sur les genres mineurs d'Ericoideae en Afrique australe.

HISTORICAL OUTLINE

David Don proposed "An Attempt at a New Arrangement of the Ericaceae" in 1834. In this paper he pointed out that the generic characters in the family are not so strongly marked, but on that account a subdivision should not be disregarded. He disapproved of the large size of the genus *Erica*, which he attempted to subdivide into a number of minor groups giving each of them generic status.

Don upheld the genera *Calluna* and *Salaxis* of Salisbary and *Blaeria* of Linnaeus and described the monotypic genus *Eremia* basing it on *Erica totta* Thunb. He separated off the rest of the species of *Erica* into sixteen minor genera equivalent to the sections used by Guthrie and Bolus in Flora Capensis (1905). This arrangement was repeated the same year in his brother's work (G. Don, 1834).

Klotzsch (1838a) upheld *Eremia* and added *E. bartlingiana* based on Drège material in Berlin. Rach (1853), in examining the Thunberg herbarium concurred with Klotzsch in treating *E. totta* and *E. bartlingiana* as two distinct species. The species was recognized by subsequent authors until N. E. Brown (1905) rightly showed that there was no justification for keeping it separate from *E. totta*. In the addenda to his slightly earlier work, Klotzsch (1838b) described *Eremia parviflora* and *Eremia recurvata*. The former is now placed under *Grisebachia*.

The following year Bentham (1839) rearranged the Ericaceae in his work for De Candolle's Prodrromus. He reduced most of Don's genera to sections of *Erica* and upheld *Eremia* in a much enlarged form. He placed *Eremia* in his subtribe Salaxidae characterized by single ovules in each ovary cell.

Bentham divided *Eremia* into four sections as follows:

Section *Eremiastra* characterized by a 4-celled sessile ovary, 8 stamens and approximate bracteoles (*E. totta*).

Section *Poderemia* characterized by a 4-celled stipitate ovary, 8 stamens and remote bracteoles (*E. tubercularis*).

Section *Micreremia* characterized by a 2-celled ovary, 8 stamens and approximate bracteoles (*E. brevifolia*, *E. parviflora* and *E. recurvata*).

Section *Hexastemon* characterized by a 2-celled ovary, 6 stamens and approximate bracteoles (*E. lanata*).

This enlarged and altered treatment of the genus brought together a heteromorphous collection of species some of which bear no relation to each other at specific level. It was repeated in Bentham & Hooker (1876).

Bolus (1894) described *Eremia rhodopis* and placed it in *Eremia* as construed by Bentham. Later Bolus (1905) realized the close relationship between the two species in section *Poderemia* and some species in the genus *Erica*, section *Euryloma*, and proceeded to place *Eremia rhodopis* and *Eremia tubercularis* into *Erica*.

Drude (1897) recognized *Eremia*, but changed its circumscription entirely by including several previously described genera and subdividing the genus into four sections. He retained the sections *Poderemia*, *Eremiastrum* and *Hexastemon* established by Bentham and added the section *Grisebachia* based on Klotzsch's genus. This latter section included the genera *Finckea*, *Acrostemon* and *Comocephalus* described by Klotzsch. These were subsequently removed by N. E. Brown (1905) and placed under *Grisebachia* and *Acrostemon* as separate genera, a view which is upheld by myself.

N. E. Brown (1905) changed Bentham's treatment to one without any sections and removed two of the species included by Bentham to other genera, *Eremia lanata* (Klotzsch) Benth. to *Hexastemon lanatus* Klotzsch, upholding the change of *Eremia tubercularis* (Salisb.) Benth. to *Erica tubercularis* Salisb. by Bolus in the same work (1905). He retained *Eremia parviflora* Klotzsch commenting that he had not seen any material, but later (1906) included it in the synonymy of *Grisebachia eremioides* MacOwan, after examining Klotzsch's type. This view is upheld in the present work. He also placed *Eremia bartlingiana* under the synonymy of *Eremia totta*.

Brown's treatment effectively removed the discordant elements from Bentham's *Eremia* thus reducing the generic circumscription to include species with 2- or 4-celled uniovulate ovaries and 8 stamens.

Phillips (1926) repeated the arrangement in Flora Capensis and retained *Eremia* unaltered.

When dealing with specimens from the Ceres Wildflower Show, Compton (1935) came across what he regarded as four distinct undescribed species of *Eremia* and named them *E. florifera*, *E. peltata*, *E. calycina* and *E. virgata*. This involved no major alterations to the generic circumscription. Compton pointed out the close similarity between *Eremia* and *Erica* particularly in regard to his *Eremia florifera*.

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Phillips (1944) put forward his proposals for a reclassification of the family in South Africa for the second edition of his *Genera* (1951). He stressed the character of ovule number as the principal criterion in the subdivision of the family. He believed that the very similar looking minor genera were more uniform in their general appearance than the species in the single genus *Erica* and should be recognized as such.

This latter statement is quite correct, but that is as far as it goes. The variation found in *Erica* is almost entirely in size, shape and colour whereas in the minor genera the remarkable variation is in the number of parts per floral whorl and their combinations.

With the above two criteria in mind, Phillips proceeded to recircumscribe all of the genera. He retained *Eremia* purely on grounds of priority and reduced the following genera to synonymy under *Eremia*: *Platycalyx*, *Hexastemon*, *Arachnocalyx*, *Grisebachia*, *Acrostemon*, *Simocheilus*, *Thoracosperma* and *Aniserica*, in fact all those genera with uniovulate ovaries other than 1-celled.

Phillips appeared to ignore other characters and definite close relationships between genera. He reduced *Eremiopsis* to synonymy under *Scyphogyne* thus completely obscuring its close relationship with *Eremia* with which it is combined in this present paper. Further discussion of Phillip's treatment of the other genera will appear under the relevant genera when published in this series.

MORPHOLOGY

In habit most of the species of *Eremia* are erect or prostrate and spreading. *E. totta*, *E. recurvata* and *E. curvistyla* are usually laxly spreading with *E. peltata* and *E. brevifolia* erect and almost fastigiate. Masson's record of the latter at "3 to 4 feet high" seems very unlikely. *E. florifera* is described by Compton as erect. *E. calycina* forms a low compact shrublet.

The branches of all species are never entirely glabrous. There is usually some short pubescence with another type of hairiness admixed, either long and hispid or gland-tipped.

The leaves are all ericoid and are 3-nate in all species except *E. brevifolia* in which they are 4-nate. In most species, the leaves are erect and imbricate, but in *E. recurvata* and *E. curvistyla* they are characteristically erect-spreading to much recurved.

The flowers of all species are terminal either at the ends of main branches or more often at the ends of short lateral branchlets. These may then be aggregated together to form a congested pseudospike as in *E. totta* and *E. curvistyla*. The 3-bracteolate flowers are usually 3-nate or as much as 10-nate in *E. recurvata*. In *E. brevifolia* the bracteoles are so enlarged that the inflorescence of 4 flowers becomes involucrate with the bracteoles giving the basic colour.

The calyx in all species is 4-lobed or 4-partite. In *E. curvistyla*, *E. calycina*, *E. florifera*, *E. peltata* and *E. recurvata* there is a distinct tubular base, which is most marked in *E. calycina*. The tube is distinctly narrow with spreading lobes in all of these except *E. recurvata*. In *E. totta* the calyx segments are free or very slightly joined at the base. They are entirely free in *E. brevifolia*. In all species except *E. brevifolia* the calyx segments are more or less equal. In this species the type is odd in having the adaxial and abaxial segments different in shape, but similar in size.

The number of stamens in all specimens examined was constantly 8 and is important in the generic classification. In *E. peltata* Compton recorded "stamens 8, sometimes but rarely 6". This I have not found in any of the flowers examined. The record of Compton's must have been a chance flower. All stamens are free at anthesis and have slender linear or filiform filaments. In *E. recurvata* the filaments are dilated towards the base.

The anthers are all manifest or just included, the most visible being in *E. peltata*. The majority of anthers are bilobed and not bipartite with completely free cells. Only in *E. curvistyla* and *E. recurvata* are the anthers bipartite, but not as markedly as is found in *Eremiella* or *Grisebachia*.

The pollen is of two types. The grains are in tetrads in *E. totta* and *E. florifera* and single in the other species. The former condition is typical of the Ericaceae and is shared with *Erica*, the latter with many of the other minor genera.

The ovary is either 1, 2 or 4-celled, but always with a single subapical pendulous ovule in each cell. In *E. totta* and *E. florifera* the ovary has 4 cells as in *Erica*. In *E. peltata*, *E. calycina*, *E. recurvata* and *E. brevifolia* the ovary always has 2 cells and is erect and regular with an apical style. In *E. curvistyla* the ovary is obliquely 1-celled with the style arising from the eccentric apex and curving upwards. In one collection of this species 2-celled regular ovaries were found in about 80% of the flowers.

As in most species of the Ericoideae, the ovary is seated on a nectariferous disc in *E. totta*, *E. florifera*, *E. curvistyla*, *E. calycina* and *E. recurvata*. This is absent in *E. peltata* and *E. brevifolia*.

The stigma varies from simple in *E. totta*, *E. florifera*, *E. calycina* and *E. recurvata* to slightly capitellate in *E. totta*, capitate in *E. brevifolia* and peltate-crateriform in *E. peltata*.

Mature fruits and seeds have not been seen in any of the species. When old flowers are examined it is found that the fruits are either very hard and nut-like with mostly soft juicy seeds inside, if they have developed, or they are soft and thinwalled and disintegrate. In the latter case soft juicy seeds occur unlike the hard dry type occurring in *Erica*. An examination of developing ovaries shows distinct "suture" lines down the locules suggesting loculicidal dehiscence which does not seem to occur. This problem is met with in the majority of minor genera and needs a considerable amount of field study to elucidate.

DELIMITATION OF THE GENUS *EREMIA*

As defined in the present work the genus *Eremia* is characterized by having 3 bracteoles, 4 sepals which are free or partly fused, a 4-lobed corolla, 8 free stamens and an ovary with 4, 2 or 1 cell with a single ovule in each cell. The important character is the stamen number.

When first described by D. Don in 1834, *Eremia* was based on the single species *E. totta* with 4 uniovulate cells to the ovary. The uniovulate condition of the ovary served to distinguish it from the genus *Erica* and still is the only real differentiating character.

Klotzsch (1838) altered the generic circumscription by introducing the 2-celled *Eremia recurvata*. Bentham (1839) added *Eremia brevifolia* and proceeded to broaden the limits by including Salisbury's *Erica tubercularis*, which has more than one ovule per cell and also Klotzsch's *Hexastemon lanatus* with 6 stamens.

Bolus (1905) included *Erica trichroma*, *Erica tubercularis* and *Erica rhodopis* in the section *Euryloma* of *Erica* on the grounds that they have ovaries with cells generally more than 1-ovuled. He stated under *Erica trichroma* that the ovule number is not constantly 1. He examined *Niven* 147 and found 12 ovules in the 4 cells, in *Masson* s.n. he found 17 ovules, in *Schlechter* 10278, 17 ovules and in *Schlechter* 7530, 6 and 7 ovules. In both *Erica rhodopis* and *Erica tubercularis* he regarded the ovaries as 4-celled with sometimes only one ovule per cell.

An examination of numerous flowers of my own collection of *Erica trichroma* showed 12 ovules per cell (Oliver 4176). I also examined my collection of *Erica rhodopis* (Oliver & Palser 73) and found most of the ovaries had 7 ovules, i.e. one cell had only 1 ovule, and only a few had 8 ovules.

Erica trichroma and *Erica tubercularis* are closely related and bear no resemblance to any of the species of *Eremia*. *Erica rhodopis* on the other hand has a superficial resemblance to *Eremia calycina*, but is more closely related to the former two species. It occurs in the Houw Hoek to Hermanus area.

It would appear from the above that the key character to use in separating *Eremia* from *Erica* both of which have 4-celled ovaries is:

Ovules 4 or less per ovary..... *Eremia*

Ovules more than 4 per ovary..... *Erica*

In describing *Eremia florifera* Compton pointed to its close resemblance to the section *Arsace* in the genus *Erica*, particularly to the material that is classified as *Erica copiosa* Wendl. and occurs in the Ceres district. The ovule number in this species is, however, at least 7 per cell as opposed to the single one in *E. florifera*.

Eremia totta and *E. florifera* are the only 4-celled species in the genus and with their 8 stamens are very closely allied to the genus *Erica*. The overlap between these two species and the *Erica* spp. mentioned above suggests the possibility of combining the two genera. This step would, however, complicate the position regarding the relationship between *Erica* and *Philippia* and *Blaeria*.

The basic ovary character of the genus *Erica*, which at present contains 625 species, is 4-cells with numerous ovules per cell. The very few exceptions to this should in no way be used to bring about the recircumscription of such a large genus. It will thus be necessary in the treatment of the minor genera to regard some of the slightly overlapping genera allied to *Erica* as "genera of convenience".

The 2-celled uniovulate erect ovary found in *Eremia peltata*, *E. calycina*, *E. recurvata* and *E. brevifolia* is constant in all the material examined. In nearly all the material examined belonging to *Eremiopsis curvistyla* it was found that the ovary was constantly 1-celled, uniovulate and oblique with a remarkable eccentric curved style. This appeared to be a very good character for distinguishing this taxon from all other Ericoideae. However, an examination of *Esterhuysen* 29687 showed that the majority of flowers had 2-celled uniovulate erect ovaries of the *Eremia* type and a few of the *Eremiopsis* type. This factor made it impossible to place the material in either *Eremia* or *Eremiopsis* with any certainty.

The question then arose whether to keep *Eremiopsis curvistyla* as a separate monotypic genus with a partial overlap of the basic generic characters or to incorporate it into *Eremia*. This had to be looked at

in the light of the generic differentiating characters used between other genera in the subfamily. It was decided to incorporate *Eremiopsis curvistyla* into *Eremia* and regard it as an aberrant reduced form in the process of evolving into a separate genus. Also, to retain a monotypic genus there should be a very distinct discontinuity with no overlap at all.

In *Eremia* a further close relationship occurs with certain species in the genus *Grisebachia* and the monotypic genus *Eremiella*. *Grisebachia* exhibits very little variation having constantly 4-stamens and bipartite anthers. It is a relatively natural genus of closely related species easily distinguishable from all other genera. There is a remarkable similarity between *Grisebachia parviflora* and *Eremia curvistyla* and to some extent *G. minutiflora*, all of which have a similar sprawling habit and flower shape. *E. curvistyla* has the bipartite anthers of the *Grisebachia* type, but the 8 stamens of *Eremia*. Undoubtedly these species had some closer ancestral relationship in a *Grisebachia-Eremia* complex.

PHYTOGEOGRAPHY

The genus *Eremia* is endemic in the south-western and southern parts of the Cape Province corresponding to the Western and Southern Phytogeographical Groups proposed by Weimarck (1941). There is a conspicuous concentration of species in his north-western centre comprising the Winterhoek and Cedarberg Subcentres where six of the seven species occur. *E. totta*, the most widespread and common species in the genus, is spread further south as far as French Hoek and the Hottentots-Holland in Weimarck's South-western Centre. Of particular interest is the northern record of this species from the Heerenlogementberg where very few Ericaceae have been recorded. The species also occurs in the "island floras" on the Piquetberg mountains, Riebeeck Kasteel and Paarl Mountain and on the Paardeberg near Malmesbury. Of the other species in this area, *E. peltata* is of interest in extending out of the Bokkeveld onto the Bonteberg near Touws River where isolated patches of Cape flora occur on the mountains of the eastern end of the Little Karoo.

The only representative of the genus outside the above area is *E. brevifolia* which is restricted to a single locality, Attaquaskloof, in the Outeniqua Mountains about 200 km east of the rest of the genus. This disjunction should be looked at in conjunction with the occurrence slightly further east of the closely related monotypic genus *Eremiella*.

All of the species occur on dry stony soils of the Table Mountain Series in the Cape System associated with other members of typical mountain fynbos. Most of them grow on dry rocky slopes, but *E. calycina* is found on dry sandy flats of the Cold Bokkeveld north of Ceres.

EREMIA

Eremia D. Don emend. E. G. H. Oliver. Eremia D. Don in *Edin. New. Phil. Journ.* 17: 156 (1834); *G. Don, Gen. Syst.* 3: 828 (1834); *Klotzsch in Linnaea* 12: 218 (1838); *Benth. in DC., Prodr.* 7: 699 (1839) pro parte; et in *Benth. & Hook. f., Gen. Pl.* 2: 592 (1876); *Drude in Pflanzenfam.* 4,1: 63 (1897) pro parte; *N.E. Br. in Fl. Cap.* 4,1: 332 (1905); *Phill., Gen. ed.* 1, 460 (1926); *Compton in J.S. Afr. Bot.* 1: 150 (1935); *Phill. in J.S. Afr. Bot.* 10: 71 (1944) pro parte minore; et *Gen. ed.* 2, 560 (1951). Type species: *E. totta* (Thunb.) D. Don.

Eremiopsis *N.E. Br. in Fl. Cap.* 4,1: 390 (1906).

FIG. 1.—Distribution of the genus *Eremia*.

The generic name is derived from the Greek word, *eremos*, meaning single or solitary and refers to the solitary ovule in each cell of the ovary.

Perennial woody shrublets, erect up to 30 cm or prostrate and spreading. *Leaves* 3-nate, in one species 4-nate, erect, imbricate to spreading and recurved. *Flowers* terminal usually on short lateral branchlets, often forming congested pseudo-spikes. *Bracteoles* 3, mostly approximate, small and inconspicuous to large forming an involucre around the inflorescence, glabrous rarely pubescent, ciliate. *Calyx* 4-partite or lobed, small to enlarged and conspicuous; segments mostly equal, sometimes in two slightly dissimilar ranks, in one species slightly unequal, glabrous rarely pubescent, ciliate with simple, gland-tipped or plumose hairs, in one species sparsely villous

never lanate. *Corolla* 4-lobed, urceolate, campanulate or cyathiform, glabrous rarely puberulous. *Stamens* 8, free, included or manifest. *Anthers* bipartite or bilobed, aristate or muticous. *Pollen* in tetrads or single-grained. *Ovary* 2- or 4-celled with a single subapical pendulous ovule in each cell, ovoid, or obliquely 1-celled with a single oblique subapical ovule. *Nectariferous disc* present or absent. *Style* exerted or included, apical and straight erect in 2- or 4-celled ovaries or eccentric and crooked in 1-celled oblique ovaries. *Stigma* simple, capitate or peltate-crateriform. *Fruit* a hard apparently indehiscent nut or soft and dry, breaking by decay.

The genus is divided into 2 subgenera on the ovary characters.

KEY TO THE SPECIES

- Ovary 4-celled.....Subgenus: *Eremia*
 Corolla 4-lobed and swollen in lower half; sepals free, 2-3 mm long; anthers muticous...1. *E. totta*
 Corolla rounded and narrow in lower half; sepals united at base, up to 0,9 mm long; anthers aristate.....2. *E. florifera*
- Ovary 2- or 1-celled.....Subgenus: *Metagyne*
 Ovary 2-celled; style apical:
 Stigma peltate-crateriform.....3. *E. peltata*
 Stigma simple or capitate:
 Anthers aristate, scabrid, not bearded:
 Leaves more or less erect, adpressed.....4. *E. calycina*
 Leaves spreading-recurved:
 Calyx lobes orbicular to broadly elliptic, cilia much shorter than the width of the lobe.....5. *E. curvistyla*
 Calyx lobes narrowly ovate to ovate-acute, cilia longer than the width of the lobe.....6. *E. recurvata*
 Anthers muticous, smooth, bearded in front.....7. *E. brevifolia*
 Ovary 1-celled; style eccentrically placed.....5. *E. curvistyla*

Subgenus *Eremia*

Ovary 4-celled with a single ovule in each cell. Pollen in tetrads.

TYPE: *E. totta* (Thunb.) D. Don.

The subgenus contains two species, *E. totta* and *E. florifera*, which possess the characters used in the original circumscription of the genus.

1. *Eremia totta* (Thunb.) D. Don in Edin. New Phil. Journ. 17: 156 (1834); Klotzsch in Linnaea 12: 218 (1838) pro parte; Benth. in D.C., Prodr. 7: 699 (1839) pro parte; N.E. Br. in Fl. Cap. 4, 1: 332 (1905). Type: Cape, *Thunberg* (x) no. 9437 (UPS).

Erica totta Thunb., Diss. Bot. (Erica) 18 (1785); Prodr. 70 (1794); Diss. Acad. (Erica) 2: 215 (1800). Fl. Cap. 348 (1811); Bartl. in Linnaea 7: 647 (1832) pro parte.

Euremia totta (Thunb.) Rach. in Linnaea 26: 789 (1855).

Erica ferox Salisb. in Trans. Linn. Soc. 6: 324 (1802), nom. illegit. Type as for *E. totta*.

Erica pectinata Bartl. in Linnaea 7: 647 (1832). Type: Tulbagh Kloof, *Ludwig & Beil s.n.* (B, holo.†; iso?).

Eremia bartlingiana Klotzsch in Linnaea 12: 218 (1838); Benth. in DC., Prodr.: 699 (1839). Type: Du Toits Kloof, *Drège s.n.* (B, holo.†; K!; P!).

Euremia bartlingiana (Klotzsch) Rach in Linnaea 26: 789 (1855).

Eremia totta var. *bartlingiana* (Klotzsch) N.E. Br. in Fl. Cap. 4, 1: 333 (1905).

Low, spreading shrublet to 30 cm high, rarely higher. Branches stout, minutely pubescent all over sometimes sparsely so, with sparse or dense, long, spreading hairs which are minutely hispid mostly more so towards their bases and with few to many simple shorter gland-tipped hairs admixed. Leaves 3-nate, spreading or reflexed but curved upwards, 2–3 mm long without the petiole, angular when dried, narrowly elliptic to linear-elliptic, minutely pubescent all over, rarely glabrous, with long, white, spreading hairs becoming subechinate on the sides and abaxial surface, hairs often hispid when young; petiole usually adpressed, up to 0.5 mm long, pubescent or glabrous, with short hairs on the margins. Flowers terminal, (2)3(4)-nate on ends of minute axillary branchlets clustered together at the ends of short lateral branchlets to give a congested pseudo-spike; pedicels 0.5–1.3 mm long, glabrous or puberulous, sometimes shortly glandular pubescent; bracteoles 3, adpressed to the calyx 0.7–2, 1 mm long and up to 2 mm broad, elliptic to ovate to depressed ovate, acute, rarely obtuse, keel-tipped, glabrous or occasionally puberulous, serrulate-ciliate or fimbriate with mostly hispid cilia, not glandular, occasionally with a few stout hairs on the keel-tip, white. Calyx equally 4-partite or occasionally slightly joined at the base, reaching from halfway to completely up the corolla-tube; segments 1.7–3.5 mm long and 1.4–2 mm broad, elliptic-oblong to broadly elliptic, sometimes obovate, mostly obtuse and cucullate, with or rarely without a keel-tip, glabrous or puberulous, serrulate-ciliate or fimbriate, the "cilia" often minutely hispid and gland-tipped mostly towards the apex where the glands become subsessile, occasionally with a few hairs on the keel-tip. Corolla 4-lobed, 2.5–3.9 mm long and up to 2.6 mm wide, mostly urceolate with varying degrees of narrow neck from a large inflated markedly 4-winged base, the wings alternating with the sepals, rarely constricted below

the erect broad rounded lobes, glabrous or rarely minutely puberulous, white. Stamens 8, free, included; filaments filiform, glabrous, up to 1.8 mm long; anthers 0.9×0.2 mm oblong, bilobed to bipartite dorsifixed near the base, smooth or slightly scabrid, mucicous; pore about half length of the cell; pollen in tetrads. Ovary 4-celled, with a single pendulous subapical ovule in each cell, 0.8×1.1 mm, broadly and obtusely conical to ellipsoid 4-angled, glabrous to densely lanate mainly at the apex; style up to 3 mm long; included or shortly exserted, filiform, glabrous, stigma simple to subcapitellate. FIG. 2.

A low, spreading shrublet, rarely erect, occurring frequently on dry mountain slopes from the Vanrhynsdorp district south-wards to the Caledon district, the most widespread and commonest species in the genus.

CAPE.—3118 (Vanrhynsdorp): Heerenlogementberg, 300–600 m (–DC), Sept. 1962, *Taylor 3946* (STE); 3218 (Clanwilliam): Pilaarsberg, Pakhuis, 910 m (–BB), Sept. 1967, *Kerfoot 5918* (NBG); Schimmelberg (–BD), Oct. 1939, *Pillans 9114* (BOL); Redlinghuys, 180 m (–CB), Oct. 1958, *Acocks 19794* (K; PRE; Z); Gruyskop, Piquetberg (–DA), Nov. 1934, *Pillans 7214* (BOL; K); Kapteins Mountain, 1 036 m (–DA), Oct. 1935, *Pillans 7772* (BOL); Kapteinskloof (–DA/DC), Sept. 1955, *Van Niekerk 625* (BOL; STE); Grey's Pass (–DB), Oct. 1925, *Levyns 1361* (CT); Pikenier's Pass (–DB), Nov. 1910, *Pillans 5124* (BOL; K); Zebrakop, 1 450 m (–DB), Nov. 1934 *Pillans 7567* (BOL); Waboom, Piquetberg, 760 m (–DB), Oct. 1963, *Taylor 5352* (K; STE); Mouton Valley, Piquetberg, 760 m (–DC), Oct. 1922, *Marloth 11504* (PRE; STE); Versveld Pass (–DD), Nov. 1934, *Pillans 7166* (BOL); Piquetberg between Versveld Pass and Zebrakop, 762 m (–DD), Sept. 1962, *Taylor 3902* (STE); Piquetberg Mountain, 600–900 m (–DC/DD), Nov. 1828, *Drège s.n.* (P); 578 m, Oct. 1892, *Guthrie 2655* (BOL); 760 m, Nov. 1951, *Johnson 291* (NBG; STE); Sept. 1927, *Levyns 2167* (CT); Sept. 1949, *Martin 246* (NBG); Nov. 1951, *Martin 906* (NBG); 3219 (Wuppertal): Krakadouw 914 m (–AA), Oct. 1897, *Bodkin s.n.* (BOL); Pakhuis Pass (–AA), Sept. 1940, *Bond 588* (NBG); Koudeberg near Wuppertal, 1 100 m (–AA), Aug. 1896, *Schlechter 8750* (BM; K; PRE); Pakhuis Pass at Leipoldt's Grave (–AA), Nov. 1971, *Schlieben & Ellis 12453* (PRE; STE); Charity Peak, 1 066 m (–AA), Sept. 1936, *Thorne in SAM 54845* (SAM); Niewoudt Pass, 610 m (–AC), Sept. 1934, *Compton 4920* (BOL; NBG); Uitkyk Peak, 1 520 m (–AC), Dec. 1941, *Esterhuysen 7369* (BOL); Algeria (–AC), Oct. 1930, *Galpin 10562* (PRE); Scorpion's Poort, 1 220 m (–AC), Oct. 1923, *Pocock 497* (PRE, STE); Sneeuwberg hut area (–AC), Dec. 1964, *Taylor 6175* (STE); Uitkyk Pass (–AC), Sept. 1937, *Wall 42* (S); Blaauwberg (–AA/AC), Dec. 1830, *Drège s.n.* (P); Middelberg Pass, 610 m (–CA), Nov. 1955, *Baker 828* (BM); Elandskloof (–CA), Sept. 1944, *Compton 16129* (NBG; STE); 1 066 m, Sept. 1936, *Levyns 5770* (CT); Warmbaths, Citrusdal (–CA), Sept. 1911, *Stephens 6891* (K; NH; PRE); *Stephens 7038* (BM; K; SAM; STE); Skoongesig, Bokkeveld (–CC), Aug. 1969, *Hanekom 1270* (K; PRE); Cardouw Pass, 910 m (–CC), Nov. 1951, *Maguire 1208* (NBG; STE); Onderboskloof (–CC), Sept. 1958, *Middlemost 1971* (NBG; STE); Berghof, Porterville mountains, 790 m (–CC), Sept. 1972, *Oliver 3937* (MO; PRE; STE). Without precise locality: Clanwilliam district, Oct.–Feb., *Leipoldt 212* (BOL; SAM); Cedarberg, Aug. 1896, *Mann sub Marloth 11377* (PRE); Cedarberg, Oct. 1923, *Pocock 116* (STE); 3318 (Cape Town); Riebeek Kasteel (–BD), Oct. 1968, *Bayliss 4330* (MO; NBG); 600 m, Oct. 1968, *Marsh 1032* (K; PRE; STE); *Niven 69* (G–DC); *Niven 83* (K); Sept. 1929, *Pillans 7009* (BOL); Paardeberg (–DB), Oct., *Beil in SAM 41319* (SAM); Paarl Mountain (–DB), *Bolus 2948* (K); 610 m, Oct. 1942, *Henderson 1190* (NBG); at Gordon Rock, Sept. 1961, *Jordaan 1288* (STE); Aug. 1883, *Wilms 3403* (K); Swartboskloof (–DD), Sept. 1936, *Borchers 418* (STE); Aug. 1961, *Van der Merwe 26–71* (PRE); Stellenbosch Mountain (–DD), Sept. 1917, *Garside 1009* (K); Sept. 1946, *Rehm s.n.* (M); June 1946, *Strey 448* (PRE); Stellenbosch (–DD), Oct. 1891, *Guthrie 2372* (BOL); *Harvey s.n.* (E); Jonkershoek (–DD), Sept. 1928, *Markotter 2018* (STE); Oct. 1846, *Prior s.n.* (K; PRE); Elsenberg, Warwick Farm, (–DD), Oct. 1938, *Penfold 154* (NBG); 3319 (Worcester); Winterhoek, 700 m (–AA), Nov. 1879, *Bolus 5192* (BM; BOL; Z); Inkruij, Witsenberg (–AA), Oct. 1945, *Esterhuysen 23449* (BOL; STE); Saronsberg, 450–610 m (–AA), May 1956, *Esterhuysen 25812* (BOL; STE); Little Winterhoek, 1 200 m (–AA), Oct. 1884, *Marloth 500* (PRE); Sneeuwgat (–AA), Nov. 1916, *Phillips 1816* (SAM); Oct. 1934, *Thorne in SAM 51252* (SAM; STE); near Saron, 550 m (–AA), Oct. 1896, *Schlechter 10687* (BM; E; G; K; MO; P; S; W; Z); Ertjieslandkloof (–AB), Sept. 1944, *Compton 16099* (NBG); Gydo Pass

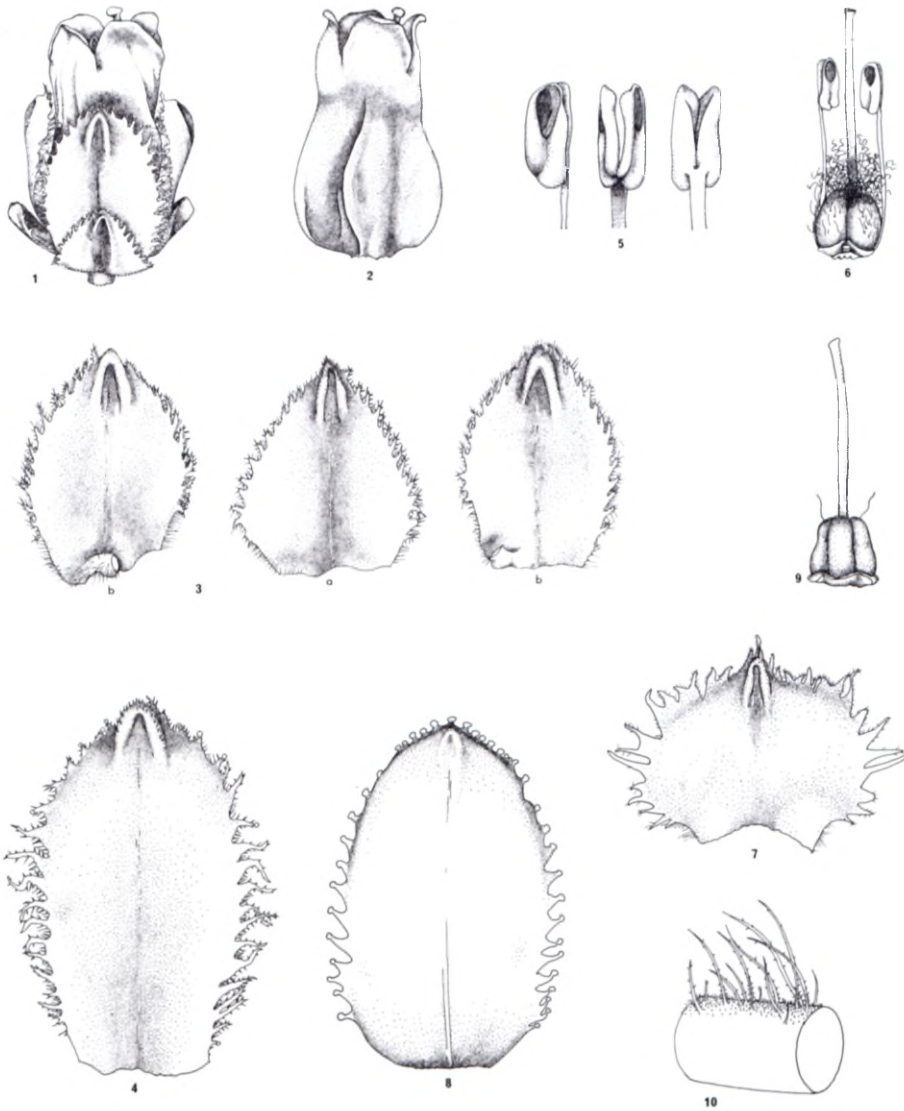


FIG. 2.—*Eremia totta*. 1, flower $\times 10$. 2, corolla, $\times 10$. 3, bracteoles: a, median; b, laterals, all $\times 20$. 4, sepal, $\times 20$. 5, anther, side, front and back views, all $\times 20$. 6, androecium and gynoecium $\times 10$. All drawn from the type, *Thunberg* 9437 (UPS). 7, median bracteole, $\times 20$, drawn from *Taylor* 6175 (STE). 8, sepal, $\times 20$, drawn from *Hutchinson* 614 (PRE). 9, gynoecium, $\times 10$, drawn from *Oliver* 4064 (STE). 10, hairs found on an average young branch, $\times 20$.

(-AB), Oct. 1928, *Hutchinson* 1009 (BOL; K); Witsenberg Pass (-AC), Dec. 1919, *Andreae* 129 (STE); Witsenberg (-AC), Oct. 1927, *Barnard* in *SAM* 20961 (SAM); Witsenberg (-AC), Dec., *Zeyher* 1116 (BM; G; K; P; SAM; STE); Oct., *Zeyher* in *SAM* 41316 (SAM); Tulbagh Waterfall, 450 m (-AC), Oct. 1882, *Bolus* 5303 (BOL); 300-600 m, Nov., *Ecklon & Zeyher* s.n. (K); Oct. 1928, *Herre* in *STE* 8976 (STE); Sept. 1946, *Rehm* s.n. (M); Sept. 1892, *Schlechter* 1439 (BM; K); 300 m, Sept. 1903, *Thode* in *STE* 5465 (STE); Ceres Peak (-AD), Oct. 1933, *Acocks* 1829 & 1838 (S); Gorge W. of Ceres (-AD), Sept. 1928, *Hutchinson* 614 (BM; BOL; K; PRE); Ceres (AD), Oct. 1924, *Levyns* 1078 (CT); Hill close to Ceres, 500 m (-AD), Aug. 1921, *Marloth* 10353 (PRE; STE); Mostertshoek, 1 600 m (-AD), Oct. 1894, *Marloth* 2002 (PRE); Schurfteberg, Ceres (-AD), Nov. 1941, *Pillans* 9696 (BOL); Witsenberg Vlakte (-A?), Oct. 1941, *Walgate* 392 (NBG); Matroosberg, (-BC), Oct. 1893, *Marloth* 2014 (STE); Hex River Valley (-BC), Sept. 1881, *Tyson* 700 (BOL; K); Bainskloof (-CA), May 1939, *Bond* s.n. (NBG); Oct., *Ecklon* in *SAM* 41320 (SAM); Oct. 1930, *Fries*, *Norlindh* & *Weimarck* 1713 (S); Sept. 1938, *Hafstrom* & *Acocks* 1053 (PRE; S); Sept. 1936, *Lindeberg* s.n. (S); 550 m, Sept. 1885, *Marloth* 647 (PRE); Sept. 1931, *Neethling* s.n. (STE); near Stoneman Station, Bainskloof (-CA), July 1956, *Rycroft* 1947 (NBG); Seven Sisters Mountain Paarl (-CA), Oct. 1943, *Esterhuysen* 9027 (BOL); Molenaar's Peak (-CA), Oct. 1947, *Stokoe* in *SAM* 62525 (SAM); Dutoitskloof, 300-450 m (CA), Sept. 1828, *Drege* s.n. (K; P); Dutoitskloof Tunnel (-CA), Oct. 1951, *Maguire* 1141 (NBG); Peak north of Chavonnesberg, 1 220 m (-CB), Dec. 1921, *Andreae* 826 (STE); Chavonnesberg (-CB), 1922, *Stokoe* in *PRE* 32029 (PRE); Veld Reserve, Worcester, (-CB), July 1934, *Van Breda* 33 (PRE); Franschoek (-CC), Oct. 1946, *Barker* 4159 (NBG); 550 m, Sept. 1895, *Bolus* s.n. (PRE); Dec. 1934, *Hafstrom* s.n. (LD; S); 300 m, April 1887, *MacOwan* sub *Herb. Norm.* 756

(BM; BOL; G; K; P; SAM; UPS; W; Z); *MacOwan* 2826 (E; SAM); Dec. 1933, *Meebold* 14960 (M); Oct. 1846, *Prior* s.n. (K); Franschoek Pass, 914 m (-CC), Sept. 1935, *Compton* 5673 (BOL); April 1931, *Levyns* 3421 (CT); Franschoek, foot of mountains behind Kriel (-CC), Oct. 1913, *Phillips* 1233 (SAM); Berg River Hoek (-CC), Sept. 1946, *Compton* 18317 (NBG); Sept. 1946, *Leighton* 2053 (PRE); Zachariashoek, 426 m (-CC), Sept. 1968, *Kruger* 704 (STE); 730 m, Oct. 1972, *Oliver* 4064 (K; MO; PRE; STE); 1 220 m, Aug. 1961, *Van der Merwe* 818 (PRE); Wemmershoek Mountains, N. of Paardekop, 1 220 m (-CC), Oct. 1943, *Wasserfall* 492 (NBG); Wemmershoek Mountains, Turkkloof, 457 m (-CC), Oct. 1943, *Wasserfall* 508 (NBG); Scherpenheuvel (-DA), Sept. 1951, *Barker* 7522 (NBG; STE); Wildepaardeberg (-DC), *Stokoe*, 6255 (BOL). Without precise locality: Worcester, 1859, *Cooper* 1703 (BM; K; W; Z); Drakenstein et Dutoitskloof, 760. 1 060 m, *Drege* s.n. (G-DC); Worcester, Tulbaghkloof, Tulbagh, foot of Winterhoek, Witsenberg and at Vogelvlei, Sept., *Ecklon and Zeyher* s.n. (E; K; LD; MO; P; S; UPS; Z); Tulbagh, Oct. 1890, *Guthrie* 2078 (BOL); Tulbagh, Oct. 1901, *Kassner* 1127 (E); Tulbagh, *Pappe* s.n. (K); Ceres Nov. 1933 *Meebold* 14961 (M); Worcester mountains, Oct., *Zeyher* s.n. (SAM). 3418 (Simonstown): Helderberg, 610 m (-BB), Sept. 1907, *Dümmer* 565 (E); Sir Lowry's Pass (-BB), Sept. 1936, *Hafstrom and Lindeberg* s.n. (S); Lourensford, 250 m (-BB), Aug. 1948, *Parker* 4338, (K; NBG). 3419 (Caledon): Flats E, of Viljoen's Pass (-AA), Sept. 1949, *Davis* in *SAM* 62547 (BM; SAM); *Stokoe* in *SAM* 62546 (SAM); Boschmanskloof, Elgin area, (-AA?), Oct. 1948, *Stokoe* s.n. (SAM; STE). Without locality: *Auge* s.n. (BM); *Drege* s.n. (BM; G; LD; MO; P; S; W); *Ecklon* s.n. (M; W); *Admiral Grey* s.n. (K; S); *Gueinzius* 262 (G; W); *Gueinzius* s.n. (S); *Harvey* s.n. (K); *Masson* s.n. (BM); *Niven* s.n. (K); *Roxburgh* s.n. (G; K); *Herb. Salisb.* s.n. (K); *Scholl* 271 (W); *Thunberg* α β (UPS).

FIG. 3.—Distribution of *Eremia totta*. The variation in the flowers for a selection of specimens is shown. 1, *Jordaan* 1288. 2, *Schlechter* 10687. 3, *Pillans* 7214 4, *Acocks* 19794, 5, *Taylor* 3946. 6, *Taylor* 5352. 7, *Schlieben & Ellis* 12453. 8, *Taylor* 6175. 9, *Hanekom* 1270. 10, *Oliver* 3937. 11, *Barker* 7522. 12, *Oliver* 4064. 13, *Prior* s.n. (Jonkershoek). All $\times 2$.

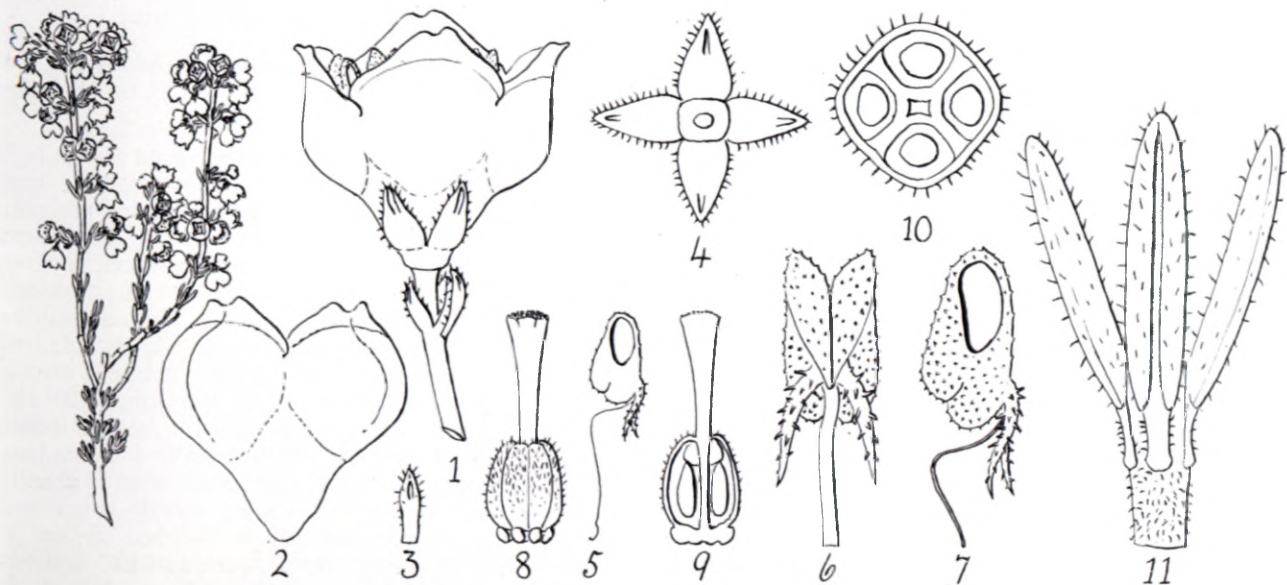


FIG. 4.—*Eremia florifera*. Twig, $\times 1.5$. 1, flower, $\times 18$. 2, corolla, $\times 18$. 3, median bracteole, $\times 18$. 4, calyx, ventral view, $\times 18$. 5, stamen, side view, $\times 18$. 6, anther, back view, $\times 36$. 7, anther, side view, $\times 36$. 8, gynoecium, $\times 18$. 9, gynoecium, cut longitudinally, $\times 18$. 10, ovary, cut transversely, $\times 36$. 11, whorl of leaves, $\times 18$. All drawn from the holotype, *Compton* 4927 (BOL).

E. totta is distinct in the genus for its large white flowers which turn yellow-brown when dried. Florally it is easily distinguishable in the subgenus by its large free sepals and bracteoles.

Originally described as a species of *Erica* by Thunberg the species formed the type of Don's new genus *Eremia*. Despite this latter fact *E. totta* is not typical of the species included under *Eremia* in the present revision.

Several authors found grounds for splitting off additional species from *E. totta*. Bartling described *Erica pectinata* and Klotzsch *Eremia bartlingiana*. These were both based on variations in corolla shape and hairiness of the ovary, characters which have subsequently been found to be variable and of no taxonomic significance. N. E. Brown reduced the latter species to a variety of *E. totta*, but I have not upheld this.

There is much variation in the hairs on the ovary from very crisped lanate to glabrous, sometimes with only one or two long hairs present. In his type description, Thunberg makes no mention of the ovary. There are two sheets in his herbarium, α and β , and N. E. Brown states that both specimens on sheet α have lanate ovaries, while specimen β has only a few hairs. I have chosen the first as the lectotype.

The variation in the pubescence on the sepals and bracteoles appears to be randomly distributed and not correlated with other characters. This is also true of the sepals and bracteoles which vary in shape and size and in their relationship to the length of the corolla. In *Schlieben and Ellis* 12453 the sepals are broadly ovate and less than half the length of the corolla-tube whereas in *Schlechter* 10687 they are elliptic and as long as the corolla-tube (FIG. 3).

E. totta is the most widespread and common species in the genus, occurring in dry sandy or rocky areas from the Cedarberg to the Stellenbosch mountains. It is one of the few *Ericaceae* which have been recorded from the "island" floras of Paarl Mountain, Riebeeck's Kasteel and Paardeberg. A very unusual and interesting record is *Taylor* 3946 from the Heerenlogementberg in the Vredendal district.

2. *Eremia florifera* Compton in J.S. Afr. Bot. 1: 149 (1935). Type: Ceres Wildflower Show, Oct. 1934, *Compton* 4927 (BOL!).

Erect, much-branched shrublet. *Branches* slender, puberulous, internodes more or less elongate; branchlets lateral, fasciculate. *Leaves* 3-nate, erect-spreading, linear-oblong, up to 3,0 mm long with petiole 0,6 mm long, obtuse, sulcate, setose when young, glabrescent. *Flowers* numerous, in small terminal clusters or clumped laterally on short branchlets; pedicels up to 0,7 mm long, glabrous; bracteoles more or less median, subequal to unequal, the middle up to 0,9 mm long the laterals 0,6 mm, all oblong, scarious, glabrous, shortly ciliate, sometimes keel-tipped. *Calyx* 4-lobed to about two-thirds the way down, glabrous; tube 0,3 mm long; lobes ovate almost angular-ovate, slightly spreading, 0,6 mm long, 0,3 mm broad, shortly ciliate. *Corolla* 1,7 mm long, cyathiform, slightly contracted at the base, glabrous, pink; tube 1,3 mm long; lobes 0,4 mm long, broad, obtuse, entire. *Stamens* 8, free, included; filaments filiform, 0,8 mm long; anthers 0,4 mm long, ovoid, smooth to minutely scabrid, dark brown, with long pale scabrid awns; pore about third to half the length of the cell; pollen in tetrads. *Ovary* 4-celled, with a single subapical pendulous ovule per cell, oblong-ovoid 0,4 mm long, puberulous; style short

thick 0,7 mm long; stigma included, simple obconic. F.G. 4, reproduced from Compton's original drawing.

CAPE.—Without precise locality; Ceres Wildflower Show, Oct. 1934, *Compton* 4927 (BOL).

E. florifera is placed with *E. totta* in the subgenus *Eremia* on account of the possession of a 4-celled ovary and pollen grains in tetrads. It can easily be distinguished by its much smaller flowers, small inconspicuous bracteoles and sepals, cyathiform corolla and aristate anthers.

Compton (1935) drew attention to the close resemblance of this species to members of the section *Arsace* in the genus *Erica*, especially to what Guthrie and Bolus regard as *Erica copiosa* Wendl. var. *longicauda* H.Bol. The only basic difference between *E. florifera* and the *Erica* spp. is in the number of ovules. In the latter the number of ovules is 7–8 per cell.

The relationship between *E. florifera* and the genus *Erica* is in fact closer than its relationship with *E. totta*. It would seem highly probable that these two species evolved from ancestral *Erica* stock completely independently.

No locality can be given for the species as it has only been recorded once at the Ceres Wildflower Show in October, 1934. At the flower shows organized in some centres of the south-western Cape, the majority of exhibits are collected in the local district, but there is no guarantee of this as a record. The Ceres District, however, fits into the distribution of the genus with 5 species occurring there.

Subgenus *Metagyne* *E. G. H. Oliver* subgen. nov. ovario bicellulare vel unicellulare, ovulo uno in quoque cellulo, pollinis granis singulis.

Ovary 2-celled or 1-celled with a single ovule in each cell, pollen grains single.

TYPE: *E. recurvata* Klotzsch.

The subgenus contains five species: *E. peltata*, *E. calycina*, *E. recurvata* and *E. brevifolia* all with erect, 2-celled ovaries and *E. curvistyla* with 1-celled, oblique ovaries, rarely 2-celled and erect.

3. *Eremia peltata* Compton in J.S. Afr. Bot. 1: 147 (1935). Type: Ceres Wildflower Show, *Compton* 4921 (BOL!).

Erect, much-branched shrublet about 30 cm high. *Branches* slender, 3-angled when young, grey-pubescent with spreading to deflexed hairs, becoming glabrous. *Leaves* 3-nate, up to 3 mm long and 0,8 mm wide including the very short petiole, erect, narrowly elliptic to occasionally ovate, obtuse, sulcate, glabrous, slightly puberulous on adaxial surface, minutely ciliate and with sessile glands admixed. *Flowers* 1- to 6-nate, mostly 3-nate, terminal, erect or slightly nodding; pedicel 1,2 mm long, glabrous; bracteoles 3, scattered on pedicel but laterals usually median, the middle one remote, up to 1,2 mm long, ovate or laterals narrowly elliptic and often assymmetric, all carinate, glabrous, scarious, shortly ciliate with sessile glands admixed. *Calyx* 4-lobed divided to two-thirds the way down, campanulate, scarious, glabrous, pink; tube up to 0,5 mm long, subquadrate; lobes up to 1,2 mm long and broad, ovate to very broadly ovate or elliptic, obtuse, subcucullate, keel-tipped, shortly ciliate and with sessile glands admixed. *Corolla* 4-lobed, up to 2,2 mm long, glabrous, pink; tube up to 1,5 mm long, tubular to narrowly obconic at the base then broadly obconic; lobes up to 0,7 mm long and 1,5 mm broad, broadly orbicular, obtuse, erect or slightly spreading, minutely crenulate. *Stamens* 8, very rarely 6, free; filaments straight,

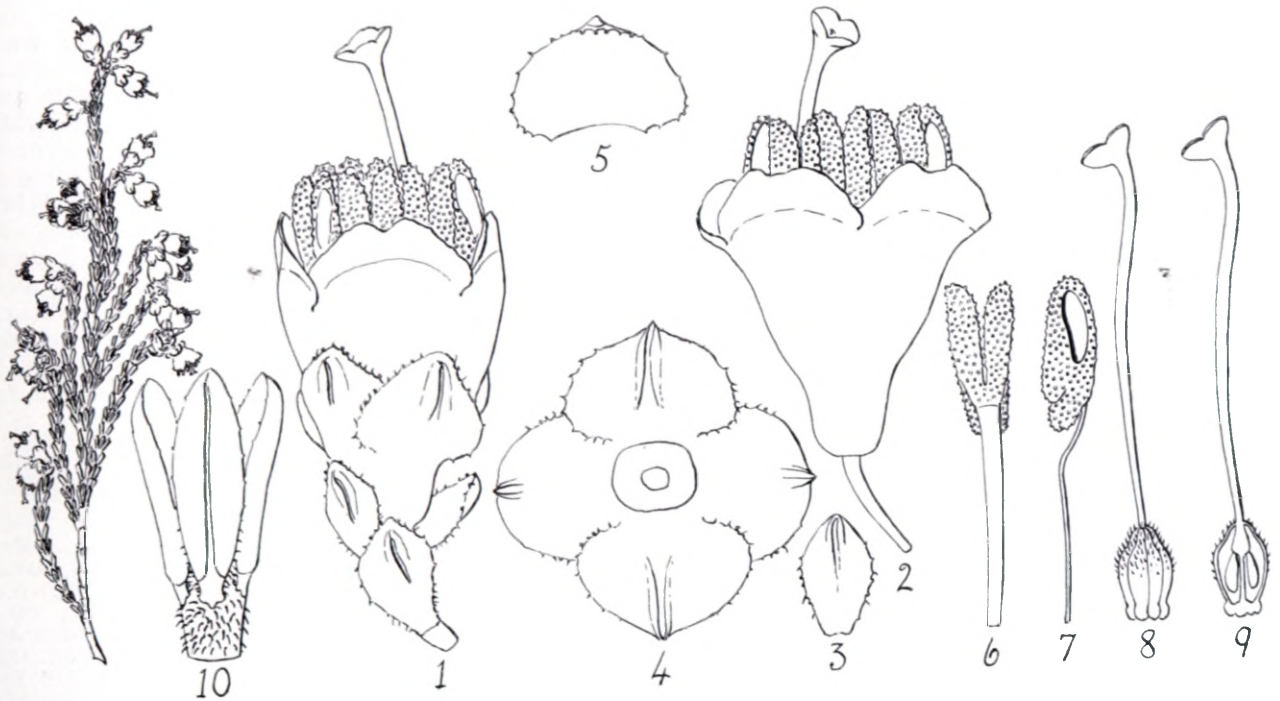


FIG. 5.—*Eremia peltata*. Twig, $\times 1.6$. 1, flower. 2, flower with bracteoles and calyx removed. 3, median bracteole. 4, calyx, ventral view. 5, sepal, inner surface. 6, stamen, back view. 7, stamen, side view. 8, gynoecium. 9, gynoecium, cut longitudinally. 10, whorl of leaves. All drawn $\times 18$ from the holotype, *Compton 4921* (BOL).

linear, 1.5 mm long, glabrous; anthers up to 1.2 mm long, oblong-ellipsoid, sometimes with a prognathous base and colourless hairs, partly exerted, bipartite, dorsifixed near the base, scabrid, dark brown mucous; pollen grains single. Ovary 2-celled with a single pendulous subapical ovule in each cell, up to 0.7 mm long, ovoid, compressed, puberulous on upper half with or without a very small nectariferous disc; style up to 3 mm long, slender, glabrous; stigma far exerted, peltate-crateriform with slight lobes inside, red. FIG. 5, reproduced from Compton's original drawing.

A small erect shrublet in habit, the species occurs on dry sandy slopes in the southern part of the Ceres district.

CAPE.—3319 (Worcester): South Cold Bokkeveld mountains near Sandberg (-AB), Oct. 1940, *Bond 653* (BOL; K; NBG; PRE); *Esterhuysen 3461* (BOL); Gydo, 1 220 m (-AB), Nov. 1946, *Compton 18748* (NBG); 13 km beyond Gydo Pass (-AB) Oct. 1928, *Hutchinson 1044* (BOL; K); Eselfontein (-AD), Oct. 1953, *Esterhuysen 21876* (BOL); 610 m, Aug. 1958, *Esterhuysen 27858* (BOL); Baviaansberg, 1 220 m (-BA), Nov. 1962, *Esterhuysen 29848* (BOL); Jan. 1956, *Stokoe in SAM 68392* (SAM); N. aspect on Matroosberg, 1 220 m (-BC), Sept. 1924, *Levyns 957* (BOL; CT); Welvaart at base of Sanddrift Peaks, 990 m (-BC), Oct. 1974, *Oliver 5086* (B; BM; BOL; C; E; G; K; M; MO; NBG; P; PRE; S; STE; W; Z); Conical Peak (-BC), Dec. 1940, *Stokoe 7716* (BOL); Bonteberg, Eikenboschhoek, 1 220 m (-BD), Nov. 1940, *Compton 9920* (NBG); *Esterhuysen 3778* (BOL). Without precise locality: Ceres Wildflower Show, Oct. 1925, *Pillans in BOL 18421* (BOL); Oct. 1934, *Compton 4921* (BOL).

E. peltata is a very distinct species easily recognizable in the genus by its peltate-crateriform stigma.

In some characters it is similar to *E. brevifolia*. Both species are odd in not having the typical ericoid nectariferous disc below the ovary. This, coupled with the dull greenish white colour of their flowers, manifest to semi-exserted anthers with large pores and their stigmas, peltate in *E. peltata* and capitate in *E. brevifolia*, suggests that they are both wind pollinated. All other species in the genus are either distinctly white or pink with simple stigmas.

The species is fairly uniform over its distribution range. The only noticeable variation occurs in the anthers, which vary in shape sometimes in the same flower. They sometimes have a remarkable prognathous base and occasional long colourless hairs of the type found in *E. brevifolia*. Compton recorded that there were 8 stamens "sometimes but rarely 6". This I have not seen in any of the specimens I have examined.

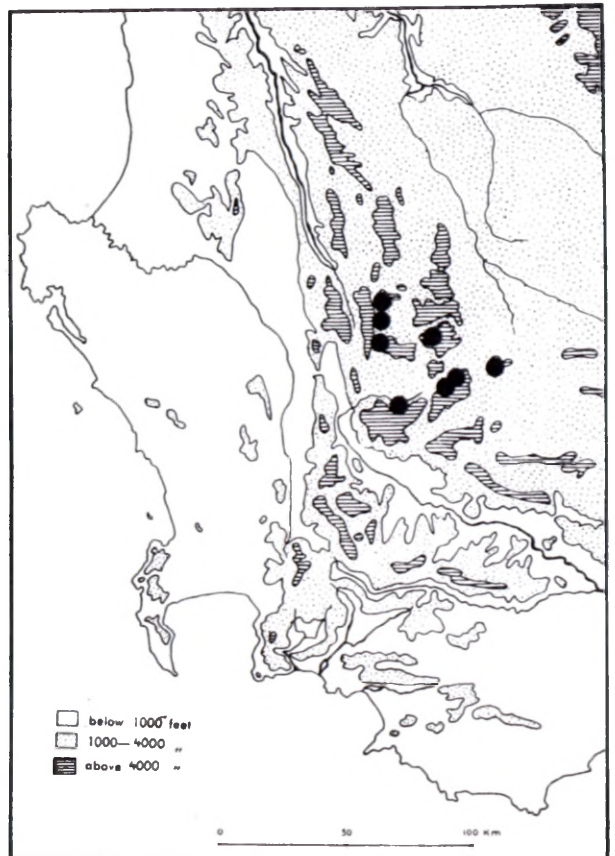


FIG. 6.—Distribution of *Eremia peltata*.

E. peltata occurs in a distinct part of the distribution range of the genus in the southern and eastern parts of the Ceres district, where it grows on dry sandy, stony mountain slopes. Only in the Cold Bokkeveld around Gydo and Sandberg does it overlap with other species. The species occurs on the Bonteberg north of Touws River where islands of the Cape Flora occur in karroid vegetation types.

The species flowers from September to December.

The exact locality of the type specimen is unfortunately not known as it came from the Ceres Wildflower Show.

4. *Eremia calycina* Compton in J.S. Afr. Bot. 1: 146 (1935). Type: Cold Bokkeveld, Rosendal, Compton 4939 (BOL!).

E. virgata Compton in J.S. Afr. Bot. 1: 148 (1935). Type: Ceres Wildflower Show, Compton 4933 (BOL!).

Erect, compact or diffuse shrublet up to 30 cm. Branches slender, virgate or flexuose, grey-puberulous with crisped hairs when young. Leaves 3-nate, 1,5–2 mm long and 0,7 mm broad, imbricate or shorter than the internodes, erect, adpressed, oblong-elliptic, slightly hooded at apex and gibbous at the base, sulcate, glabrous, ciliate and with sessile glands when young. Flowers 1- to 5-nate, terminal on main branches or short lateral branchlets, deflexed or subcernuous; pedicels up to 0,5 mm long; bracteoles 3, subbasal, subequal, up to 0,8 mm long, erect, oblong, obtuse, glabrous, ciliate mainly towards apex, pink. Calyx 4-lobed, campanulate, scarious, glabrous, up to 1,9 mm long, divided from half to two-thirds; tube up to 1 mm long and 1 mm diameter; lobes up to 1 mm long, the outer two up to 1,7 mm broad, the inner two to 1,5 mm, broadly orbiculate, inflexed in upper half, broadly hooded, keeled near top, rigidly scarious, pink, margins crenulate to serrulate, sometimes ciliate and with a few sessile glands admixed. Corolla 4-lobed, up to 2,7 mm long, obconic to obconic-campanulate, glabrous, pink; tube

up to 1,7 mm long; lobes very broad, up to 1 mm long and 1,2 mm broad, obtuse, crenulate, erect. Stamens 8 free; filaments filiform, glabrous, bent at apex, up to 1,6 mm long; anthers manifest to subincluded, up to 0,5 mm long, ovoid, bipartite, scabrid, attached dorsally near the base, aristate to subcristate; pore half length of cell; appendages up to 0,5 mm long, pointing downwards, free or slightly decurrent; pollen grains single. Ovary 2-celled, with single pendulous subapical ovule in each cell, up to 0,9 mm long and 0,6 mm broad, ovoid, compressed, subacute, puberulous at top, with a nectariferous disc; style filiform, up to 2,5 mm long; stigma far exerted, simple sometimes slightly lobed. FIG. 7, reproduced from Compton's drawing (Compton *l.c.* for *E. virgata*).

A low-growing shrublet compact or diffuse in habit occurring on dry open sandy flats in the Cold Bokkeveld region of the Ceres district.

CAPE.—3219 (Wuppertal). Elandsloof mountains (–CA), Sept. 1936, Compton 6661 (BOL; NBG; PRE); Elandsloof, sandflats, 910 m (–CA) Sept. 1944, Compton 16131 (NBG); Sept. 1936, Lewis in BOL 21999 (BOL); De Straat, 790 m (–CA), Oct. 1972, Oliver 4025 (K; PRE; STE; W); Oliver 4026 (PRE; STE); Wagenboomsrivier, 910 m (–CA), Sept. 1936, Compton 6663 (NBG); 838 m, Oct. 1972, Oliver 4010 (B; BM; E; G; K; MEL; MO; NBG; P; PRE; S; STE); Rosendal, 910 m (–CD), Sept. 1934, Compton 4939 (BOL). 3319 (Worcester) Gydo, 1066 m (–AB), Nov. 1946, Compton 18714 (NBG); near Sandberg (–AB), Oct. 1940, Esterhuysen 3460 (BOL); Esterhuysen 3481 (BOL; NBG); Ertjieslandkloof (–AB), Nov. 1946 Leighton 2277 (K); erroneously as Pillans 2277 (BOL; PRE); Hartebeestkloof, 1000 m (–AB), Nov. 1974, Oliver 5169 (K; NBG; PRE; STE). Without locality: Ceres Wildflower Show Oct. 1936, Compton 6589 (BOL; NBG; PRE); Oct. 1934, Compton 4933 (BOL).

E. calycina is probably the showiest of all the species in the genus having relatively large flowers in which the corolla, calyx and bracteoles are all bright pink. They are borne profusely on a compact shrublet. For this the species is distinct in the genus. Floral characters which serve to distinguish the species are the wide-open obconic corolla, aristate anthers and

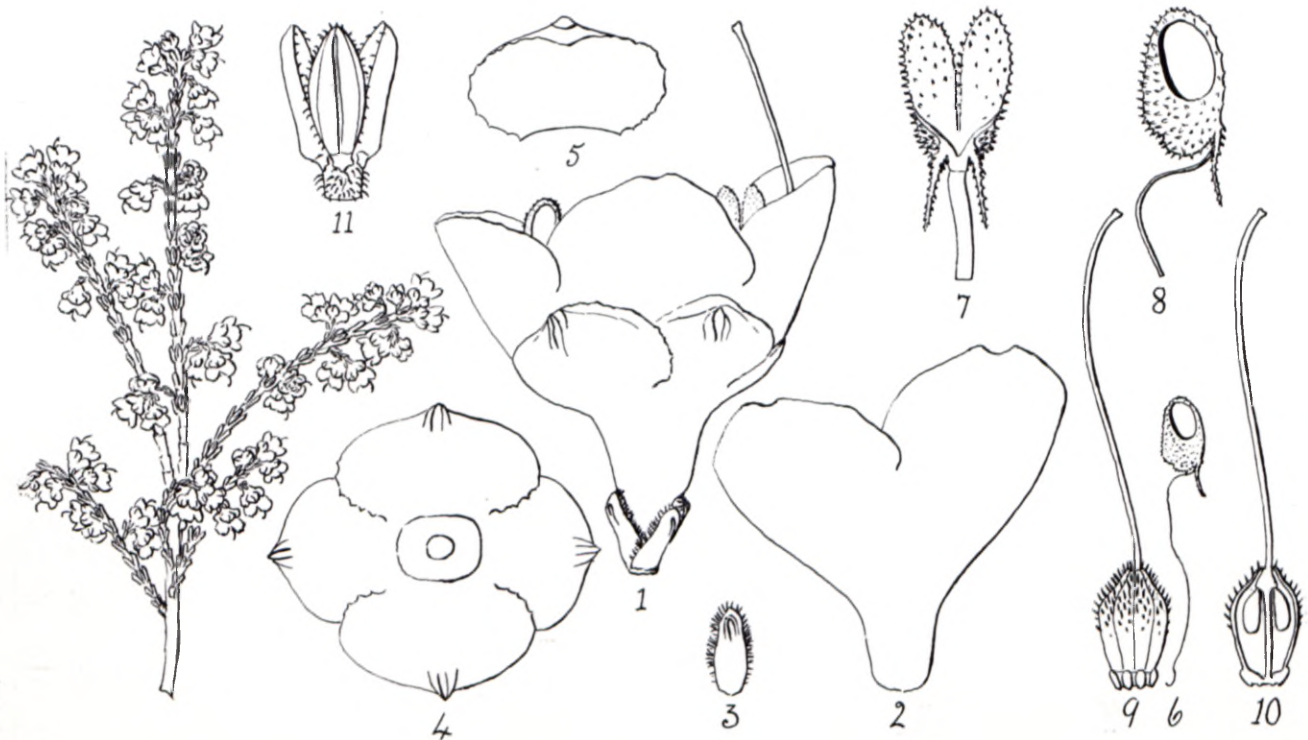


FIG. 7.—*Eremia calycina*. Twig, $\times 1,5$. 1, flower, $\times 18$. 2, corolla, $\times 18$. 3, bracteole, $\times 18$. 4, calyx, ventral view, $\times 18$. 5, sepal, inner surface, $\times 18$. 6, stamen, lateral view, $\times 18$. 7, anther, back view $\times 36$. 8, anther, side view $\times 36$. 9, gynoecium $\times 18$. 10, gynoecium, cut longitudinally, $\times 18$. 11, whorl of leaves, $\times 18$. All drawn from the holotype, Compton 4939 (BOL).

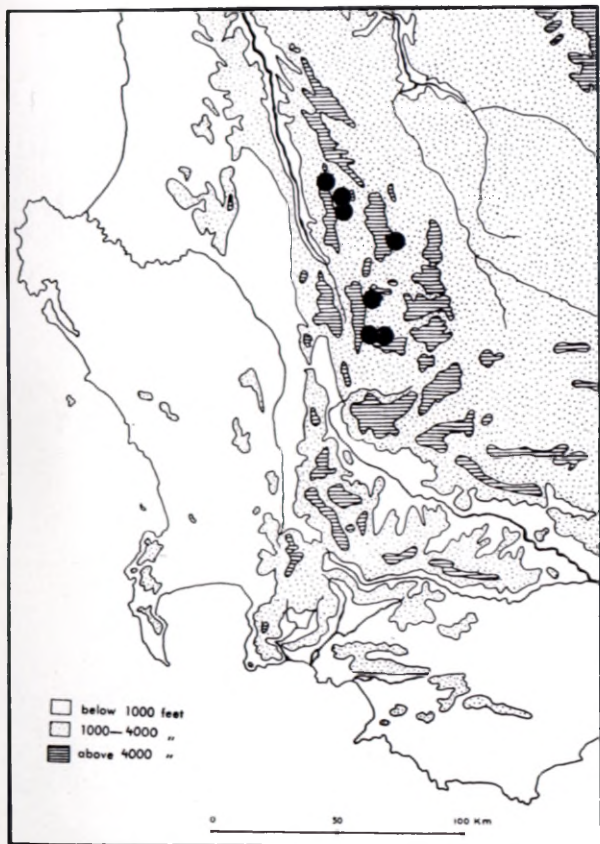


FIG. 8.—Distribution of *Eremia calycina*.

erect addressed leaves. It is probably most closely related to the previous species, *E. peltata*.

In his paper in 1935 Compton described four species. He described *E. calycina* characterizing it by the large broad calyx segments, which are inflexed and broadly cucullate at the apex and which exceed the corolla-tube in length. The latter statement is, however, not borne out by the type description or figure (cf. Fig. 7 of the present paper) where the calyx is just shorter than the corolla-tube. The former characters could easily apply to one of the other species he described, *E. virgate*. This latter species he claimed, was well distinguished in the genus by its erect virgate or tufted growth and its very short addressed leaves. This, in fact, also applies to *E. calycina*. There appeared to be no difference between the two species.

As both erect, virgate and compact to spreading shrublets occur with varying degrees of calycine flowers, the two species were combined under the more appropriate name, *E. calycina*. The first name was also preferred, because the type locality of *E. calycina* is known whereas the type of *E. virgate* was recorded from the Ceres Wildflower Show.

E. calycina occurs only on the Cold Bokkeveld Plateau, which has an average altitude of 900 m. It grows on sandy open flats among short shrubs and restiad clumps sometimes forming large conspicuous populations. It flowers from September to November.

5. *Eremia curvistyla* (N.E. Br.) E. G. H. Oliver
comb. nov.

Eremiopsis curvistyla N.E. Br. in Fl. Cap. 4,1: 390 (1906).
Syntypes: Worcester Division, *Niven* s.n. (BOL!; K!); Without locality: *Herb. Salisbury* s.n. (BOL!; K!); *Ward* s.n. (K!).
Lectotype: *Niven* s.n. (K).

Low, spreading shrublet. *Branchlets* slender, sometimes long and entwining in surrounding vegetation, puberulous with simple or glandular hairs, the grey

bark splitting irregularly and flaking off to reveal red-brown wood, with leaves mostly only on the young branchlets. *Leaves* 3-nate, curved spreading to recurved, crowded, up to 1,7 mm long excluding the petiole, mostly 1,0 mm long, oblong-lanceolate to ovate, somewhat trigonous, flat above towards the petiole, convex towards the apex, sparsely pubescent on upper surface when young becoming roughly scabrid, otherwise glabrous with an apical gland-tipped hair and with 3 or 4 on each side which soon become short setae, sometimes also shortly ciliate; petiole up to 0,5 mm long, addressed ciliate. *Flowers* (2) 3 (4)-nate on ends of short lateral branchlets, usually pendulous with 1, 2 or 3 branchlets in a whorl forming a congested spike-like group; pedicel very short, about 0,1–0,2 mm long, glabrous; bracteoles 3, approximate but spreading, subequal, the median broadly ovate, acute, $1 \times 0,6$ mm, the laterals broadly elliptic, obtuse, oblique, all long ciliate with a few short gland-tipped hairs towards the apex otherwise glabrous, soft scarious, white becoming reddish, sometimes with a green leaf-like apex, keel-tipped. *Calyx* 4-lobed, divided from two-thirds to three quarters its length, up to 1,8 mm long, cyathiform from a narrow base; tube up to 0,5 mm long, quadrangular; lobes up to $1,4 \times 1,3$ mm, orbicular to broadly elliptic, curved and spreading upwards from the narrow tube, like the bracteoles soft scarious, white becoming reddish with an acute distinct wide keel at apex, glabrous or pubescent at apex and inside the keel, long-ciliate and with many to a few short glandular hairs towards the apex. *Corolla* 4-lobed, divided for about a third of its length from 1,7–2,5 mm long, obconical to campanulate with a short pouch-like base, sometimes 4-angled with distinct ridges down the lobes, very sparsely pubescent on the lower half only, sometimes with a few hairs up the lobes otherwise glabrous, white; lobes very broad, obtuse or acute, erect with acute interstices, smooth or crenulate. *Stamens* 8 free; filaments filiform, glabrous; anthers bipartite, 0,4–0,8 mm long, included or manifest, haphazardly arranged, narrowly oblong, dorsally attached near the base, scabrid, pale brown with darker red-brown backs, aristate; awns coming off the filament at the point of attachment, about quarter the length of the cell, scabrid; pore about one-third the length of the cell; pollen grains single. *Ovary* 1(2)-celled, $0,7 \times 0,6$ mm, pubescent at apex, rarely completely glabrous; when 1-celled with a single, oblique, pendulous ovule, obliquely ovoid abaxially with the style arising from the eccentric apex of the ovary and curved upwards; when 2-celled with a single pendulous ovule in each cell and apical style; style crooked at the apex markedly so in the bud, included or exerted and becoming straighter, glabrous; stigma simple. FIG. 9

A species sprawling in habit, sometimes forming mats, on dry mountain slopes in sandy rocky places from Bainskloof northwards to Citrusdal and Piquetberg.

CAPE.—3218 (Clanwilliam): Piquetberg mountain (–D?), Oct. 1950, *Pillans 10558* (MO). 3219 (Wuppertal): Warmbaths (–CA), Sept. 1912, *Edwards in BOL 14420* (BOL); Turret Peak near Skoongesig (–CC), Sept. 1962, *Esterhuysen 29687* (BOL); Olifants River Valley, Grootfontein area, 550 m (–CC), Oct. 1972, *Oliver 4072* (BM; C; E; G; K; L; LD; MEL; MO; P; PRE; S; STE; W); Porterville mountains, Kromboskloof, 975 m (–CC), Oct. 1972, *Oliver 4091* (E; K; MEL; MO; PRE; S; STE; W); Graskop above Boboskloof, 970 m (–CC), Oct. 1968, *Williams 1330* (NBG; STE). 3319 (Worcester); Twenty-four Rivers Mountain above Porterville (–AA), Oct. 1949, *Esterhuysen 16082* (BOL; PRE); Twenty-four Rivers valley, junction of Groot and Kliphuis Rivers, 610 m (–AA), Oct. 1972, *Oliver 4100* (E; K; MO; PRE; STE; W); Great Winterhoek, 1 524 m (–AA), Jan. 1926, *Andreae 1113* (NBG; PRE; STE); Sneeuat, 1 220 m (–AA), Jan. 1952, *Esterhuysen 19817*

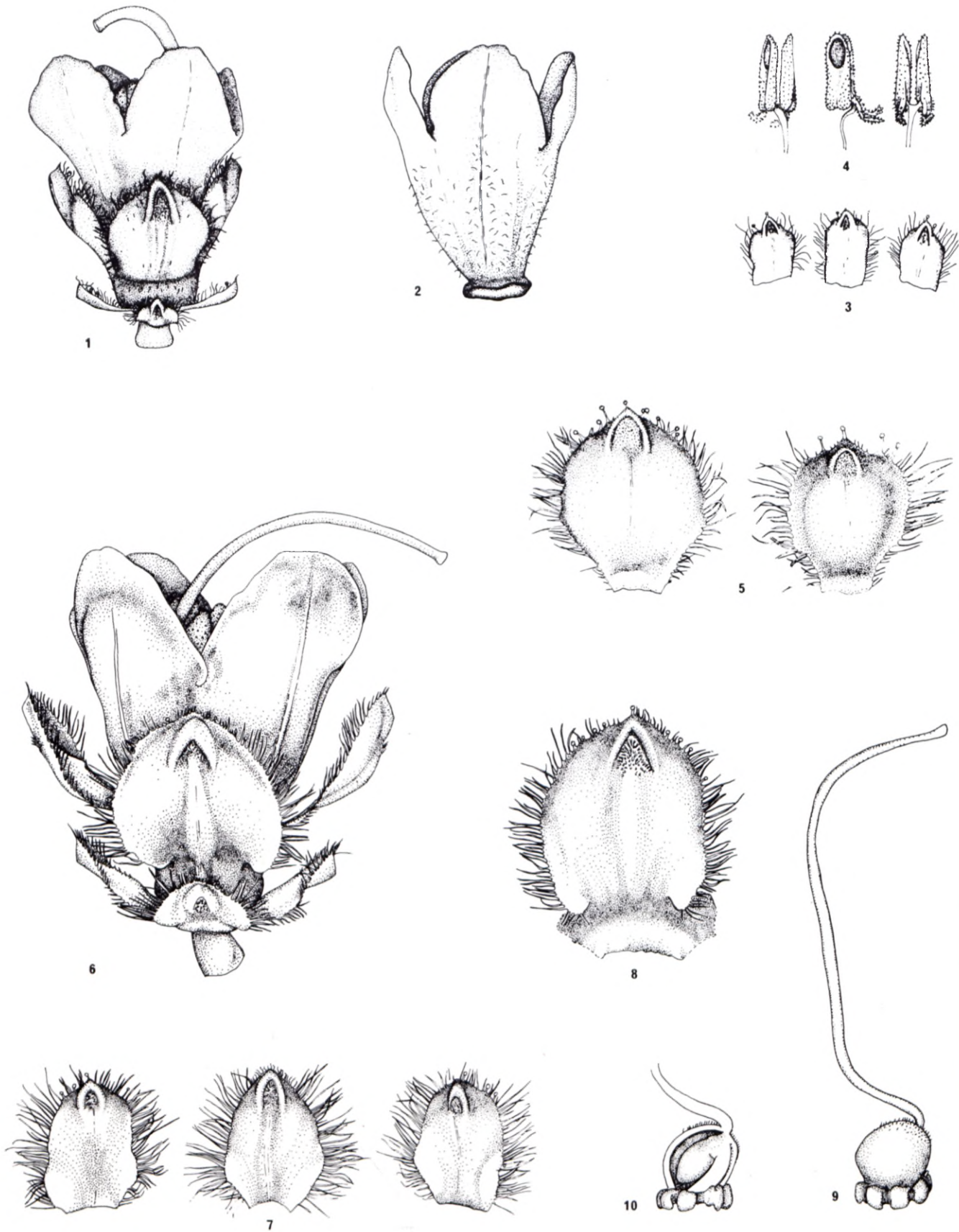


FIG. 9.—*Eremia curvistyla*. 1, flower. 2, corolla. 3, bracteoles: a, median; b, laterals. 4, anther, front, side, back views. All drawn $\times 20$ from the lectotype, *Niven* s.n. (K). 5, bracteoles: a, median; b, lateral, both drawn $\times 20$ from *Hafstrom & Lindeberg* s.n. (STE). 6, flower. 7, bracteoles: a, median; b, laterals. 8, calyx lobe. 9, gynoecium. 10, ovary, cut longitudinally to show ovule. All drawn $\times 20$ from *Oliver 4072* (STE).

(BOL; NBG; PRE); Roodesandberg, Tulbagh, 914 m (-AC), Sept. 1936, *Compton 6664* (BOL); Wolwekloof Forest Reserve, Bainskloof (-CA), Oct. 1946, *Barker 4245* (K; NBG; STE); Bainskloof (-CA), Sept. 1936, *Hafstrom & Lindeberg s.n.* (BOL; K; S; STE). Without locality: *Niven s.n.* (BOL; K); *Herb. Salisb. s.n.* (BOL; K); *Ward s.n.* (K).

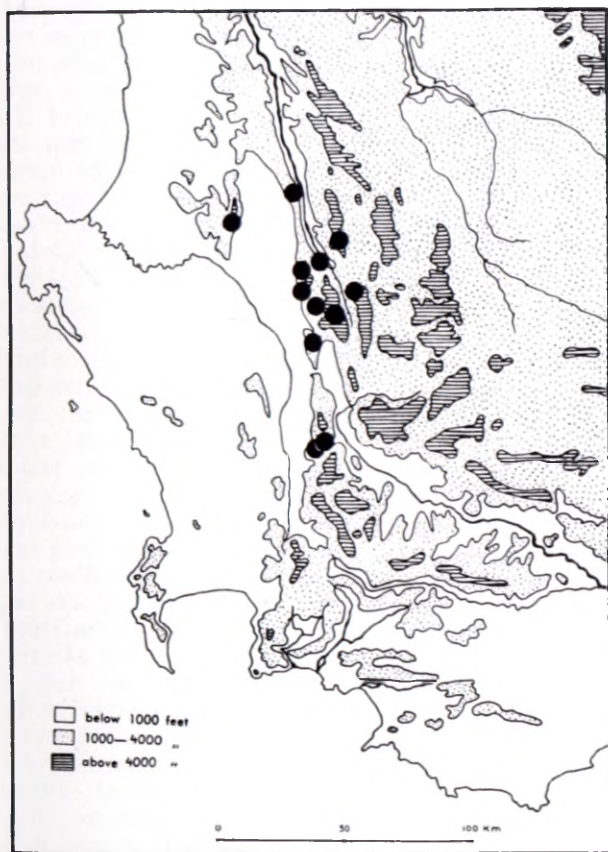


FIG. 10.—Distribution of *Eremia curvistyla*.

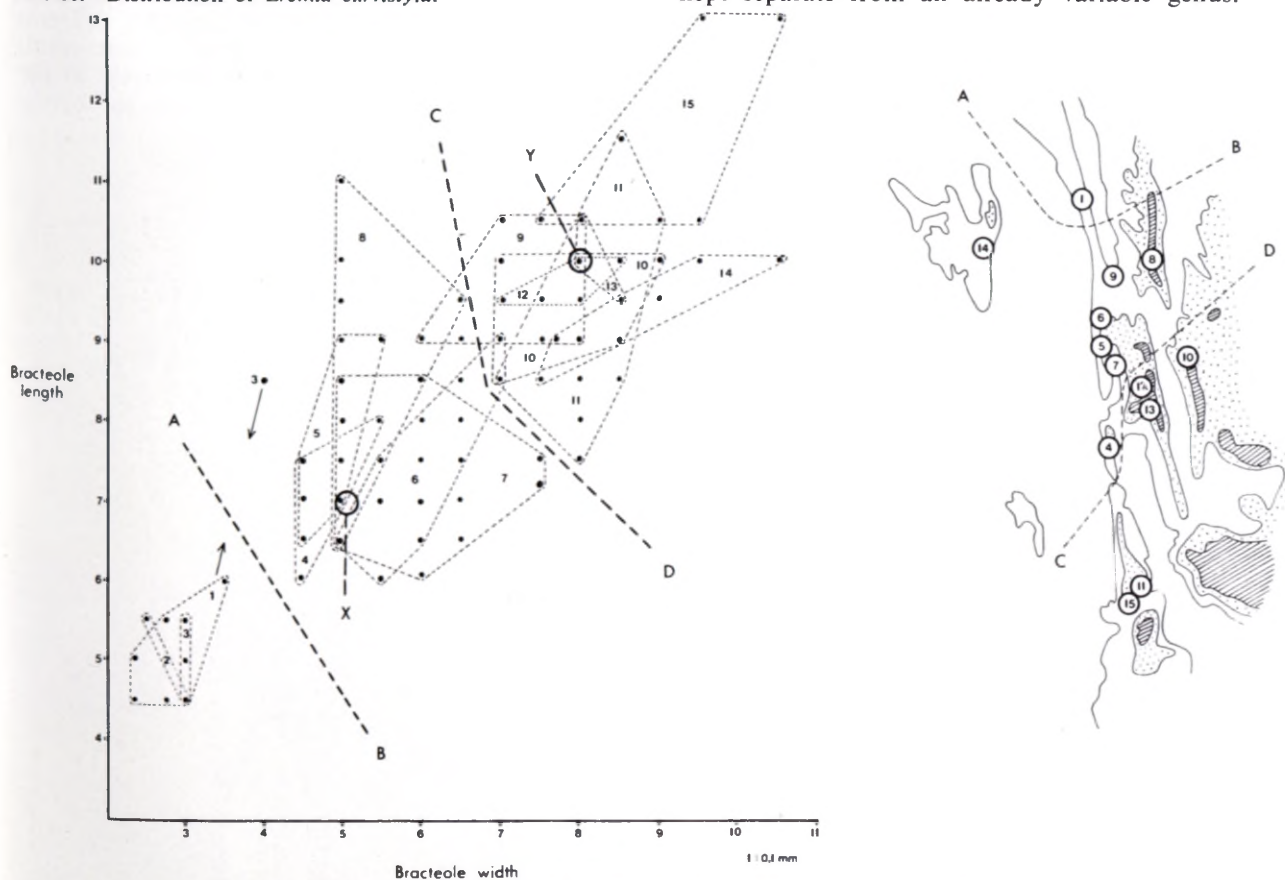


FIG. 11.—Variation in bracteole size in *Eremia curvistyla*. The scatter diagram illustrates the variation ranges in 15 specimens and the map gives the locality of each specimen. The lines A-B, C-D and foci X and Y are referred to in the text. 1, *Edwards*, s.n. 2, *Herb. Salisb.* s.n. 3, *Niven* s.n. 4, *Compton 6664*. 5, *Esterhuysen 16082*. 6, *Oliver 4091*. 7, *Oliver 4100*. 8, *Esterhuysen 29687*. 9, *Oliver 4072*. 10, *Williams 1330*. 11, *Barker 4245*. 12, *Andreae 1113*. 13, *Esterhuysen 19817*. 14, *Pillans 10558*. 15, *Hafstrom & Lindeberg*, s.n.

On ovary structure *E. curvistyla* is distinct in the genus having an oblique 1-celled ovary and markedly eccentric curved style. In its sprawling habit it is similar to *E. recurvata*, but is easily distinguishable by its shortly ciliate calyx as opposed to the long hirsute calyx of the latter.

The species is very similar to *Grisebachia parviflora* (see under Excluded Species) which was originally erroneously described as a species of *Eremia*. A comparison with the figure of this species to be published later in this series will show the remarkable similarity. The most noticeable difference lies in the generic character of stamen number—8 in *E. curvistyla* and 4 in *G. parviflora*. Externally, the large bracteoles and sepals of *E. curvistyla* are very different from the narrower ones of the latter species. The two species are sympatric with *G. parviflora* having the wider distribution range.

This species was first described by N. E. Brown as a separate monotypic genus, *Eremiopsis*, characterized by its unusual ovary, oblique, 1-celled with an eccentric markedly curved style. On first examination this condition suggests an abortive 2-celled ovary. An investigation of 14 different collections showed this character to be constant. However, a collection, *Esterhuysen 29687* from the northern Cold Bokkeveld, when examined was found to have an equal quantity of 1-celled oblique ovaries and 2-celled erect ovaries as in *Eremia*.

Consideration was given to retaining the species in a separate monotypic genus. With the above definite overlap of generic characters it was felt that separation could not be upheld. The concept of "a genus of convenience", which will appear several times in the treatment of the Ericoideae, could not be considered in the case of a monotypic genus being kept separate from an already variable genus.

The variation found in *E. curvistyla* occurs in the size of the flowers and in the shape and size of the bracteoles. Fig. 11 shows the distribution of bracteole sizes (length \times breadth) of 15 collections. The median bracteole was included as it is subequal in nearly all of the collections. The specimens are numbered in order of increase in size ratios and are plotted on the map accordingly.

There is a distinct disjunction in bracteole size at line A-B. The odd ratio is of an unusually developed median bracteole and can be ignored. Unfortunately only one of the three specimens is localized, *Edwards s.n.* from the Olifants River Mountains above Warmbaths. Without further exact collections in this group no taxonomic recognition can as yet be given to it. In the future, if there are further collections an assessment of this disjunction can be made.

The remainder of the collections are slightly separable along line C-D given two foci X & Y of maximum overlap. This is correlated with a slight distributional grouping as shown in the map. The collection *Oliver 4072* (No. 9) is anomalous falling on the wrong side of the line C-D. *Pillans 10558* (No. 14) is similarly anomalous.

In his type description N. E. Brown cited three syntypes, but labelled the sheet of *Niven s.n.* as the type. *Niven s.n.* is now selected as the lectotype.

6. *Eremia recurvata* Klotzsch in *Linnaea* 12: 498 (1838); Benth. in *D.C., Prodr.* 7: 700 (1839); N.E. Br. in *Fl. Cap.* 4, 1: 333 (1905). Type: Cedarbergen, *Drege s.n.* (B, holo.†; isos?). Neotype: Cedarberg, near Ezelbank, *Drege 2965* (E, neo.!, BM!, BOL!, G!, G-DC!, K!, MO!, P!, PRE!, W!).

Shrublets, sprawling or erect up to 30 cm. *Branches* rigid, spreading, minutely puberulous with a few glands or rarely gland-puberulous, with later some long white hairs admixed which are sometimes hispid, becoming glabrous and grey, occasionally with distinct ridges below the leaf-bases when young. *Leaves* 3-nate, erect, spreading-recurved to squarrose-recurved, 2 \times 1 mm, ovate to broadly ovate, fairly

flat at base becoming thick and rounded towards apex, at first minutely puberulous above becoming glabrous with some long spreading hairs which may be gland-tipped, also with subsessile glands, apiculate with a long gland-tipped hair; petiole adpressed, shortly ciliate. *Flowers* 1-10-nate on ends of branches; pedicels up to 1,5 mm long, pubescent sometimes with long white hairs as well; bracteoles 3, subapproximate to approximate, usually more or less spreading, usually leaflike, up to 1,7 \times 0,9 mm, the median broader than laterals which may be linear-oblong and acute, all pubescent towards the base, long-ciliate, often gland-tipped, also with sessile glands on margins, slightly sulcate. *Calyx* 4-lobed, joined for quarter to half its length, up to 2,3 mm long; lobes up to 0,9 mm broad, narrowly ovate-acute to ovate-acute, thinly beset with long soft hairs and with dark sessile to subsessile glands on edge of inner surface, edged with fine short hairs towards the base and finely pubescent, sometimes glandular, very slightly sulcate, forming a cup at the base, often with 4 main ridges opposite each segment and 4 opposite the interstices. *Corolla* 4-lobed, to 3,5 mm long, conical to campanulate, obscurely to markedly 4-angled, glabrous except for thin pubescence near apex of each lobe and sometimes spread down the ridge, very noticeable in bud stage, white; lobes very broadly rounded, erect. *Stamens* 8, free, included; filaments up to 1,2 mm long, linear to narrowly oblong-elliptic, glabrous, transparent but dark at the apex, tapering into the sigmoid apex below the anther; anthers up to 0,7 mm long, narrowly ovoid, narrowed upwards with contiguous separate cells, bigibbous at the base, minutely scabrid, awned, golden brown; awns narrowly lanceolate, from half to equal the length of the cell, ciliate, pale; pore very small; pollen grains single. *Ovary* 2-celled, with a single pendulous ovule in each cell, 0,5 mm long and broad, broadly ellipsoid to globose-ovoid, obtuse, very sparsely pubescent to pubescent at the apex; style filiform, glabrous, included to shortly exerted; stigma simple. FIG. 12.

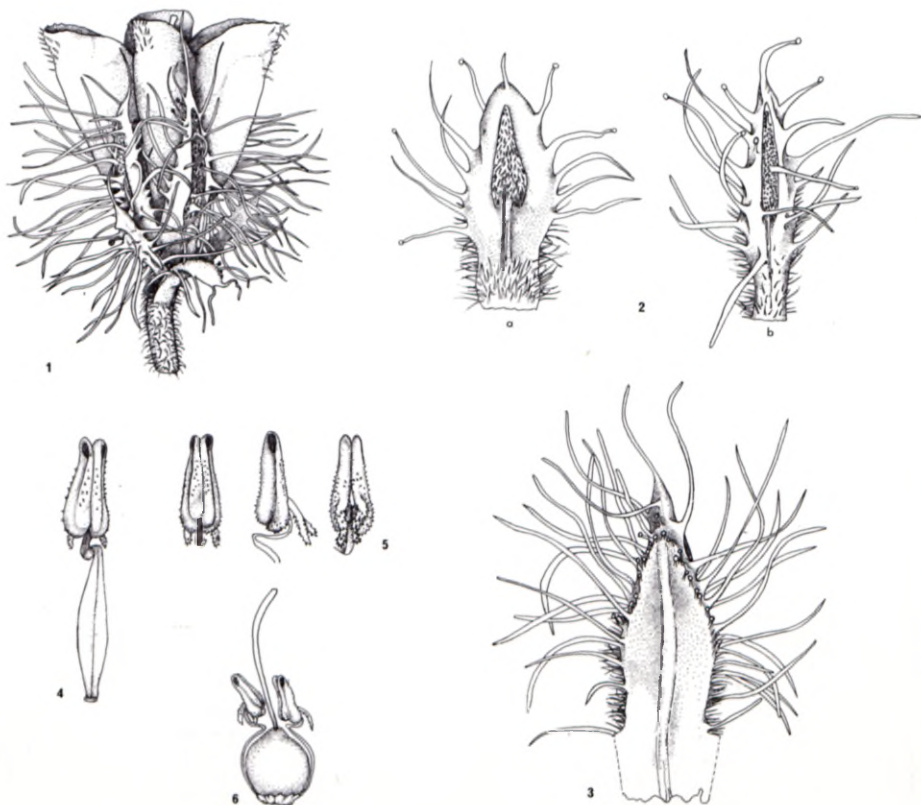


FIG. 12.—*Eremia recurvata*. 1, flower, $\times 10$. 2, bracteoles: a, median; b, lateral, both $\times 20$. 3, sepal, inner surface, $\times 20$. 4, stamen, $\times 20$. 5, anther, front, side and rear views, $\times 20$. 6, androecium and gynoecium, $\times 10$. All drawn from the neotype, *Drege 2965* (E).

A species mostly sprawling in habit occurring in the drier regions of the south-western Cape between Ceres and Clanwilliam, found mainly in dry sandy rocky places.

CAPE.—3219 (Wuppertal); Between Pakhuis and Heuningvlei (-AA), Dec. 1941, *Esterhuysen 7446* (BOL; K); vlakte at Heuningvlei (-AA), Jan. 1949, *Esterhuysen 15012* (BOL); Northern Cedarberg between Koupoort and Boontjieskloof, 914 m (-AA), Oct. 1945, *Esterhuysen 12197* (BOL; NBG; PRE); Kradadousberg, 1 500 m (-AA), Dec. 1941, *Esterhuysen 7507* (BOL; K); Dec. 1941, *Stokoe in SAM 55051* (BM; NBG; PRE; SAM); Krakadouw Heights, 1 220 m (-AA), Oct. 1923, *Pocock 697* (STE); Blaawberg (?-AA/CA), Jan. 1831, *Drège s.n.* (P); 1 200–1 500 m, Dec., *Drège s.n.* (SAM); Middelberg Plateau (-AC), Dec. 1941, *Compton 12719* (NBG); Dec. 1939, *Esterhuysen 2464* (BOL; K); Middelberg, 1 500 m (-AC), Dec. 1941, *Esterhuysen 7226* (BOL; K; NBG; NH; PRE); Uityk Peak, 1 500 m (-AC), Dec. 1941, *Esterhuysen 7367* (BOL; K; PRE); Cedarberg near Ezelbank, 1 220 m (-AC), Dec. 1830, *Drège 2965* (BM; BOL; E; G; G-DC; K; MO; P; PRE; W); Sneeu-berg shale band, 1 676 m (-AC), Dec. 1964, *Taylor 6133* (K; PRE; STE); Matjiesrivier (-AD), Jan. 1944, *Wagener 291* (NBG); Gideonskop in S. Cedarberg, 1 220 m (-CB), Nov. 1939, *Stokoe 8350* (BOL; K; NBG; NH; PRE); Schurweberg Peak, 1 370 m (-CD), Jan. 1962, *Esterhuysen 29439* (BOL; STE); Schurweberg above Excelsior, 1 220 m (-CD), Dec. 1961, *Oliver 1606* (PRE; S; STE). 3319 (Worcester): Hartbeestkloof, S. slopes of Vaalboskloofberg, 1 200 m (-AB), Nov. 1974, *Oliver 5146* (STE). Cold Bokkeveld, mountains near Kleinvlei, 1 670 m (-AB), Jan. 1897, *Schlechter 10053* (BM; BOL; E; G; K; MO; P; PRE; STE; W; Z).

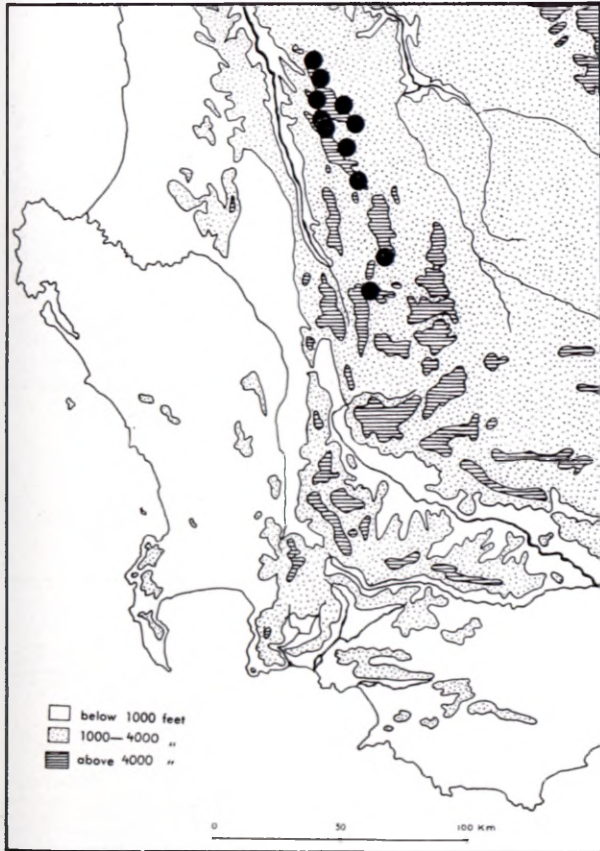


FIG. 13.—Distribution of *Eremia recurvata*.

This species can be easily recognized by its long-ciliate calyx, conical often markedly 4-angled corolla, dilated filaments and anthers with very small pores. In habit and general appearance it is very similar to *E. curvistyla*. It has no closely related species.

E. recurvata does not have much variation. Bentham described the stamens as mostly 8, sometimes seen as 6 or 7. This I have not found in any of the material I examined.

In some specimens from the northern part of the distribution range e.g. *Stokoe in SAM 55051* from Krakadow and *Esterhuysen 7446* from the Pakhuis Pass area, there is a tendency for the plants to possess more glands on the branches, leaves, bracteoles and sepals. On the branches in particular there are short-stalked glands in addition to the longer gland-tipped hairs.

The Drège neotype seems to be the only collection with narrow linear bracteoles; all others have broader more elliptic leaflike bracteoles, particularly the median bracteole. Klotzsch in his type description describes the bracteoles as linear, thus confirming his examination of the Drège material. However, he describes the ovary as glabrous. This is somewhat odd as the Drège material I have dissected is the most pilose of all the specimens examined.

The holotype in Berlin is no longer extant. Klotzsch gave only "Cederbergen-Drège" in his type description. Numerous Drège specimens were distributed to herbaria, some numbered, some with a locality in the Cedarberg and some with a locality which cannot be traced with any certainty (Blaawberg). The material distributed as "Cedarberg prope Ezelbank" is labelled as *Drège 2965* in ten herbaria. Unfortunately most of the specimens are rather scanty. The specimen in Edinburgh is better than most and is chosen as the neotype.

7. *Eremia brevifolia* Benth. in DC., Prodr. 7: 700 (1839); N.E. Br. in Fl. Cap. 4, 1: 334 (1905). Syn-types: Cape, Attaquaskloof, George Division, *Masson 57* (BOL!; K!; MEL!); *Niven 85* (BM!; G-DC!; K!). Lectotype: *Masson 57* (K).

Erect sparse shrublets to 30 cm. Branches erect, puberulous with long stiffer often gland-tipped hairs inbetween. Leaves 4-nate, up to 2,0 mm long, oblong-ovate to ovate, incurved-spreading with petiole adpressed, mostly open-backed, subacute, glabrous but ciliate and edged with sessile glands and one or two gland-tipped hairs on the lower half; petiole glabrous, gland-edged. Flowers 3- to 5-nate, terminal in involucrate heads; pedicel almost none to 0,6 mm long; bracteoles 3, large, approximate, unequal, the median larger 1,7×1,3 mm or 1,3 mm×1,3 mm, transversely broadly ovate, the laterals up to 1,3 mm long, obliquely ovate to elliptic, all acute, pilose in middle to varying degrees, ciliate and edged with sessile red glands, keel-tipped, green turning reddish. Calyx 4-partite, equal to unequal in shape, the segment opposite bracteoles spatulate, two laterals obliquely spatulate abaxially, outer sepal narrowly oblong, otherwise all narrowly oblong, acute, pilose, gland-edged and slightly ciliate, with or without keel-tip, green. Corolla 4-lobed, 1,5×1,7 mm, ellipsoid to broadly ellipsoid with 8 convolutions in lower half alternating with stamens, sparsely puberulous on upper half, white; lobes very broadly obtuse, erect. Stamens 8, free; filaments 0,7 mm long, placed in convolutions of corolla, glabrous; anthers 0,9 mm long, oblong, slightly projecting below middle with contiguous parallel cells, dorsally basifixed, manifest to half exserted, bearded on front edge otherwise glabrous, golden brown, mucous; pore two-thirds length of the cell; pollen grains single. Ovary 2-celled, with 1 pendulous ovule per cell, ovoid, pilose, no nectaries present; style filiform, glabrous; stigma capitate, from manifest to exserted. FIG. 14.

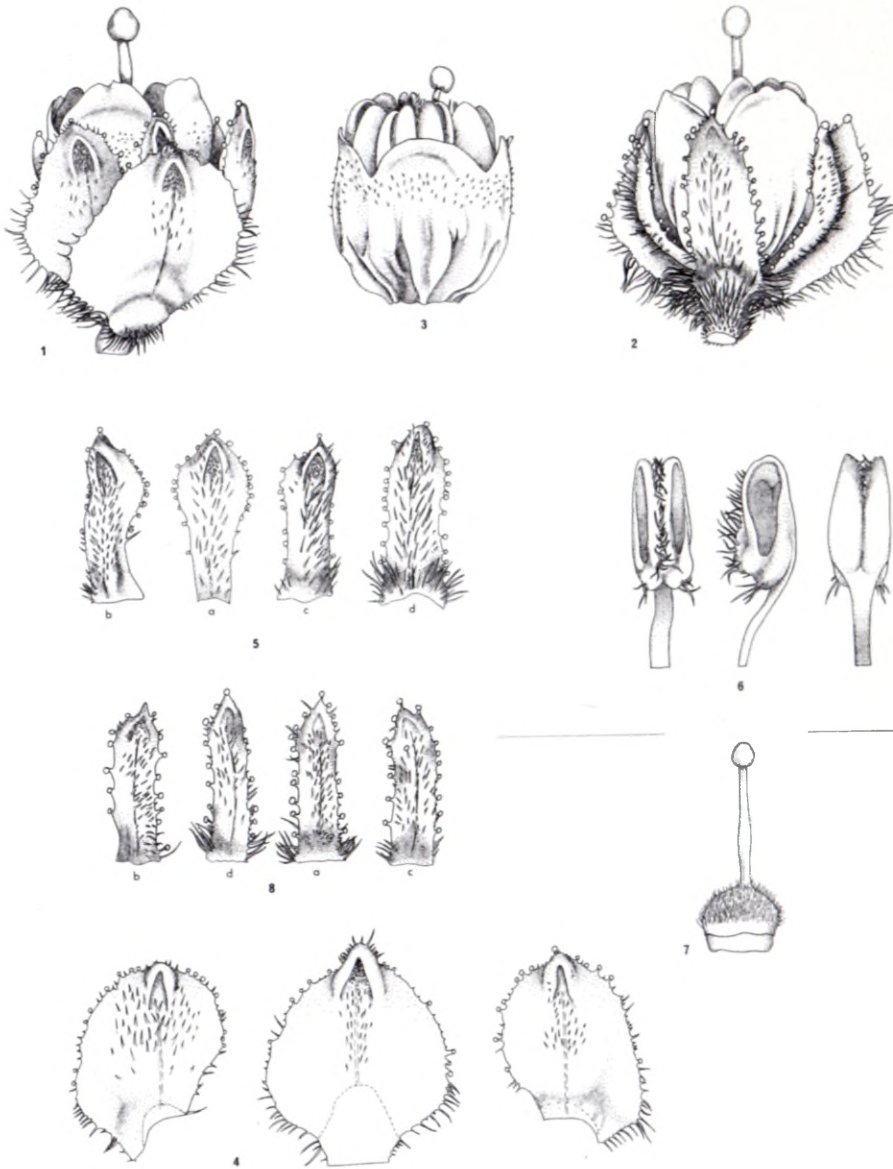


FIG. 14.—*Eremia brevifolia*. 1, flower, abaxial view. 2, flower, adaxial view. 3, flower with bracteoles and calyx removed. 4, 3 bracteoles. 5, sepals: a, abaxial; b and c, laterals; d, adaxial. 6, anther, front, side and back views. 7, gynoecium. All drawn from the lectotype, *Masson 57* (K). 8, sepals: a, abaxial; b and c, laterals; d, adaxial, all drawn from *Oliver 4128* (STE). All drawn $\times 10$.

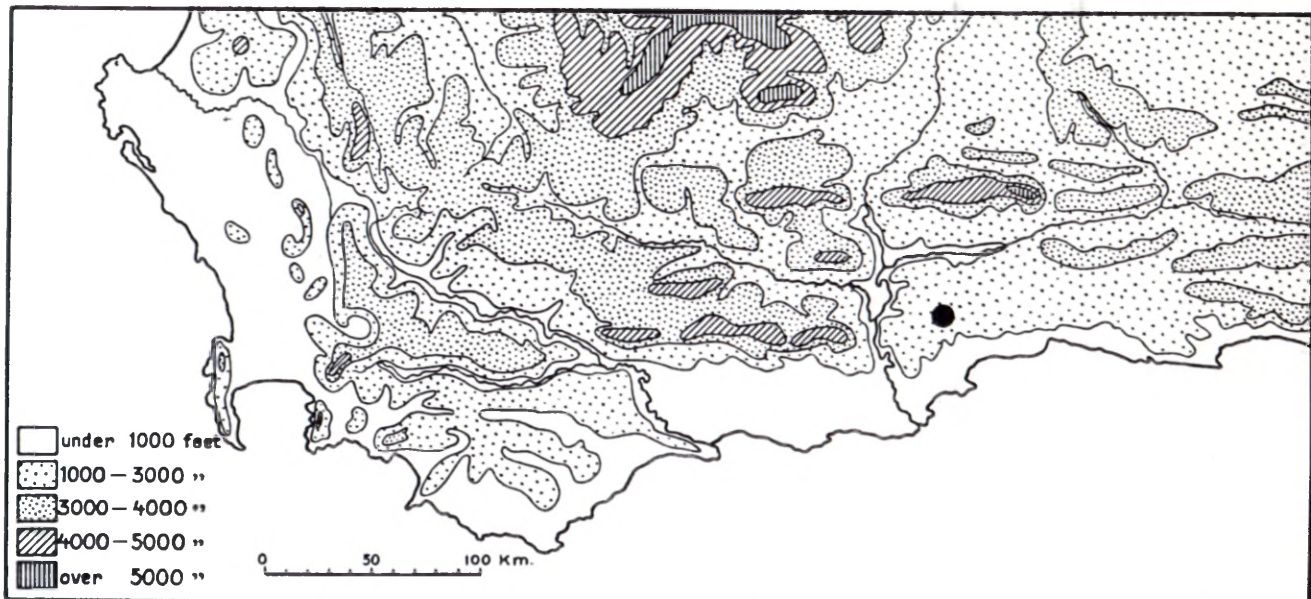


FIG. 15— Distribution of *Eremia brevifolia*.

Very localized sparse erect shrublets found only on the mountains around the old Voortrekker Pass in Attaquaskloof in the Langeberg Range north-west of Mossel Bay.

CAPE.—3321 (Ladismith), Attaquaskloof, alpine (–DD), Nov. 1773, *Masson 57* (BOL; K; MEL); *Niven 85* (BM; G–DC; K); summit of old Voortrekker Pass in Attaquaskloof, 838 m (–DD), Nov. 1972, *Oliver 4128* (BM; BOL; C; E; G; K; MEL; MO; NBG; P; PRE; S; STE; W).

Eremia brevifolia is easily distinguishable from the other species in this genus by its capitate involucre inflorescences, free narrowly oblong sepals, large bearded anthers and capitate stigma.

Two distinct forms can be recognized in the available three collections based on the sepal shape:

Form A: Abaxial sepal spatulate, lateral sepals obliquely spatulate, adaxial sepal narrowly oblong (*Masson 57*).

Form B: Sepals all narrowly oblong (*Niven 85* and *Oliver 4128*).

All three collections come from the same general area, Attaquaskloof, with only *Oliver 4128* being an exact locality. *Niven 85* matches *Oliver 4128* and most probably came from the same population. Without any exact information about the spatial relationship between the two forms A and B no further comment can be made at present. Only when a thorough examination of the Attaquaskloof mountains has been made can the correct taxonomic position of these forms be worked out.

Masson travelled through the Attaquaskloof in the company of Thunberg in November 1773.

Bentham described *Eremia brevifolia* in DC. Prodr. and based his description on two specimens, one in De Candolle's herbarium, the other belonging to Lee, both according to Bentham collected by Masson. The specimen in Geneva is, however, *Niven 85*, not a Masson collection. Thus Bentham unknowingly based his species on two syntypes.

It has been stated above that the Masson and Niven collections can be assigned to two different forms on the shape of the sepals. Bentham's type description describes the calyx as "calycis laciniis oblong-spathulatis". He could thus have only been referring to the Masson sheet in Herb. Lee, now at Kew. This has been selected as the lectotype. The Niven sheet in Geneva has not been dissected and examined critically to see whether it matches the Niven material in the British Museum or Kew. I accept that they are duplicates.

There is some confusion about the collectors of the early specimens as N. E. Brown (1905) queries the collector of *Niven 85*. The label on the specimen in the British Museum was in my opinion written by Niven as No. 85. The sheets marked No. 57 are in a different hand and labelled as Fr. Masson, but there appears to be no guarantee of this as the handwriting does not match exactly that on letters in the Kew Archives. N. E. Brown complicated the issue by changing an almost identical label on the type of *Grisebachia niveni* from Fr. Masson to Niven.

Masson states on the label of the Kew specimen that the plants are 3 or 4 ft high. Those seen by myself on the summit of the Voortrekker Pass were at the most 1 ft (30 cm) high and this was in old established vegetation that had not been burnt for some considerable time.

The taxonomic position of *Eremia brevifolia* is somewhat obscure. It is placed within the genus *Eremia* on a summation of characters, but bears no relationship to any of the other species included in that genus. It is the only species in the genus with 4-nate leaves. As has been stated under the phyto-geographical section, the species is geographically far removed from the main distribution centre of the genus in the south-western Cape.

The possibility cannot be ruled out that evolution of this species has taken place independently of the rest of the genus *Eremia*, both having evolved from ancestral *Erica* stock by reduction in the cells of the ovary and number of ovules.

In general appearance, there is a remarkable similarity between *Eremia brevifolia* and *Eremiella outeniquae* Compton, which occurs on mountain peaks not far east of Attaquaskloof. Both have 4-nate similar leaves and flowers in small, terminal, capitate clusters where the bracteoles are enlarged and larger than the sepals. Both have a similar habit, although the latter can form low compact shrublets. Both grow in similar open dry places at high altitudes in the Langeberg and Outeniqua Mountains.

However, in the internal floral parts the remarkable combinations found in *Eremiella outeniquae* serve to distinguish them easily. *Eremiella* having 3 corolla lobes, 6 stamens and a 3-celled ovary.

EXCLUDED SPECIES

Eremia lanata (Klotzsch) Benth. in D.C., Prodr. 6: 700 (1839) based on *Hexastemon lanatus* Klotzsch in Linnaea 12: 220 (1838) = *Acrostemon xeranthemifolius* (Salisb.) E. G. H. Oliver comb. nov., based on *Erica xeranthemifolia* Salisb. in Trans. Linn. Soc. 6: 339 (1802).

Eremia parviflora Klotzsch in Linnaea 12: 498 (1838) = *Grisebachia parviflora* (Klotzsch) Druce in Rep. Bot. Soc. Exch. Club. Br. Isl. 1916: 625 (1917).

Eremia rhodopis H. Bol. in J. Bot. 1894, 239 (1894) = *Erica rhodopis* (H. Bol.) H. Bol. in Fl. Cap. 4, 1: 97 (1905).

Eremia tubercularis (Salisb.) Benth. in DC., Prodr. 7: 700 (1839) = *Erica tubercularis* Salisb. in Trans. Linn. Soc. 6: 330 (1802); Guth. & Bol. in Fl. Cap. 4, 1: 97 (1905).

EREMIELLA

Eremiella Compton in J.S. Afr. Bot. 19: 119 (1953). Type species: *E. outeniquae* Compton.

The name is the diminutive form of *Eremia* and refers to the superficial resemblance to some of the species in that genus.

Perennial, woody, shrublets erect up to 30 cm or low and compact about 15 cm high. *Leaves* 4-nate, erect or spreading. *Flowers* 4-nate, in terminal erect or semipendulous heads. *Bracteoles* 3, adpressed to the flower, subequal to unequal, conspicuous and larger than the sepals, sparsely pubescent and subscariosus. *Calyx* 4-partite, small compared to the corolla, sparsely hirsute and subscariosus. *Corolla* 3-lobed, divided for about quarter of its length, cyathiform, sparsely hirsute. *Stamens* 6, free, included. *Anthers* bipartite with the cells completely free and shortly stalked, basifixed, muticous. *Pollen* grains single. *Ovary* 3-celled, with a single, pendulous, apical ovule

in each cell, broadly ellipsoid and much enlarged in fruit. *Nectariferous disc* distinct. *Style* filiform, far-exserted, deciduous. *Stigma* capitellate.

A monotypic genus confined to the Outeniqua and Tzitzikama Mountains of the Southern Cape.

The genus was described by Compton very recently in the history of the minor genera of the Ericoideae. He found when identifying his collection from Ruyterskop near Mossel Bay that he was unable to place it in any known genus. After summing up the characters he decided that it was worthy of recognition as a distinct new monotypic genus.

The possession of 3 bracteoles, a 4-partite calyx, 3-lobed corolla, 6 free stamens with markedly bipartite anthers and a 3-celled ovary with a single pendulous ovule in each cell serves to distinguish *Eremiella* from all other genera in the Ericoideae.

The most closely related genus is *Eremia* which differs in having 4, 2 or 1-celled ovaries, 8 stamens and a 4-lobed corolla. To have included this species in *Eremia* would have meant a further considerable emending of the circumscription of that genus. It was decided to retain *Eremiella* as a distinct monotypic genus.

In distribution *Eremiella* is far removed from the majority of species of *Eremia* which occur in the Western Cape. But the anomalous species, *Eremia brevifolia*, grows in an area adjacent to the type locality on Ruytersberg and is superficially similar to *Eremiella outeniquae*.

Eremiella has undoubtedly evolved from some ancestral *Erica* stock by way of a reduction in the number or floral parts, i.e. 4 to 3-lobed corolla, 8 to 6 stamens, 4 to 3-celled ovary and numerous to one ovule per cell. In this evolutionary pathway *Eremia brevifolia* could well have been involved, but resulting in a combination of characters which classifies the species as belonging to the genus *Eremia*.

The single species *Eremiella outeniquae* forms a woody shrublet, erect up to 30 cm or low and compact about 15 cm high growing at high altitudes near the summits of a few scattered peaks in the Outeniqua and Tzitzikamma Mountains.

The type locality, Ruytersberg just east of the Robinson Pass in the Mossel Bay district, was visited to establish the habitat of the species. Here the plants were very localized on dry stony slopes facing south-west and west near the summit. The associated vegetation was very sparse and consisted almost entirely of low scattered restiad clumps. The habitat appeared to be remarkably dry, but no doubt water is regularly deposited in the area by the south-easterly and southerly cloudbearing winds in summer.

Eremiella outeniquae Compton in J.S. Afr. Bot 19: 120 (1953). Type: Ruyterskop, Mossel Bay Compton 21818 (NBG, holo.!; BOL!; K!; PRE!).

Low, compact shrublet up to 15 cm or erect soft shrublet up to 30 cm. *Branches* slender, hirsute. *Leaves* 4-nate, up to 2 mm long without the petiole, erect and imbricate to spreading with adpressed petiole, narrowly ovate-oblong to elliptic-oblong, acute, semi-openbacked, hirsute with long simple hairs and sometimes with a few gland-tipped hairs on the lower edges, ciliate with subsessile glands towards the apex which ends in a gland-tipped hair; petiole up to 0,7 mm long ciliate. *Flowers* terminal, 4-nate,

in closely packed heads which are erect or semi-pendulous; pedicels from very short up to 0,75 mm long, glabrous or pubescent; bracteoles 3, subequal to unequal, approximate and clasping the flower, the median 1,5×1,0 mm, elliptic-oblong, the laterals 1,5×0,6 mm, narrowly oblong to obovate, all acute, ciliate and sparsely pubescent on lower half, with a few dark sessile glands near the apex, keel-tipped, subscariosus, greenish to reddish pink. *Calyx* 4-partite, reaching up to the corolla interstices, 1,5×0,5 mm, narrowly ovate-oblong to oblong from a broader base, ciliate and pubescent, with subsessile glands towards the apex, acute, subscariosus, greenish to reddish pink. *Corolla* 3-lobed, divided about $\frac{1}{4}$ its length, 2×2 mm, cyathiform, sparsely hirsute to sometimes almost glabrous with hairs only on the lobes; lobes broad, obtuse, emarginate, sometimes ciliate towards the interstices. *Stamens* 6, free; filaments filiform, glabrous; anthers included, bipartite, 0,75 mm long, with the cells obovoid, completely free and shortly stalked, basifixed, minutely scabrid, pale brown, muticous; pore about $\frac{1}{2}$ the length of the cell; pollen grains single. *Ovary* 3-celled, with a single pendulous apical ovule in each cell, about 0,5×0,5 mm, broadly ellipsoid becoming broadly ovoid in fruit, with a nectariferous disc; style filiform, far exserted, glabrous, deciduous, up to 2,5 mm long; stigma capitellate. FIG. 16, reproduced from Compton's original drawing.

A low compact shrublet confined to the summits of a few high peaks in the Outeniqua and Tsitsikama Mountains of the southern Cape.

CAPE.—3322 (Oudtshoorn): Ruyterskop, 1370 m (—CC), Nov. 1949, Compton 21818 (BOL; K; NBG; PRE); Nov. 1972, Oliver 4115 (K; MO; PRE; STE); Jonkersberg, 1220 m (—CC), Dec. 1951 Esterhuysen 19387 (BM; BOL; S; STE); Cradockberg (—CD), Jan. 1940, Zinn in SAM 55896 (SAM; STE). 3323 (Willowmore): Formosa Peak (—DC), Jan. 1940, Stokoe 7280 (BOL; STE).

This is the only species recorded in the genus. In the five collections so far made there is very little morphological variation. The only noticeable variation occurs in the leaves, those from the Formosa Peak and Jonkersberg collections being more erect and imbricate than in the type which has more widely spaced and patent leaves.

The four localities in which the species grows occur in two disjunct areas. The three, Ruytersberg, Jonkersberg and Cradockberg, are in the mountain range north of Mossel Bay and George. Stokoe's record from Formosa Peak in the Tsitzikamma Mountains is 115 km to the east. A search will have to be made of all the intervening high peaks to establish if this disjunction is real or due to a lack of records.

The collections all possess mature flowers only. Those of Zinn and Stokoe collected in January have considerably enlarged ovaries. A visit to the Ruytersberg population in mid-November showed that the true flowering period must be from about September to December.

UITTREKSEL

Hierdie is 'n hersiening van die genus Eremia waarin 7 spesies erkenning geniet en die monotipiese genus Eremiella bespreek word. Beide genera behoort tot die Ericaceae-Ericoideae en is endemies in die suidwestelike deel van die Kaapprovinsie. Die hersiening toon die noodsaaklikheid om die monotipiese genus Eremiopsis N.E. Br. onder Eremia te plaas. Hierdie is die eerste in 'n reeks oor die kleiner genera van die Ericoideae in Suidelike Afrika.

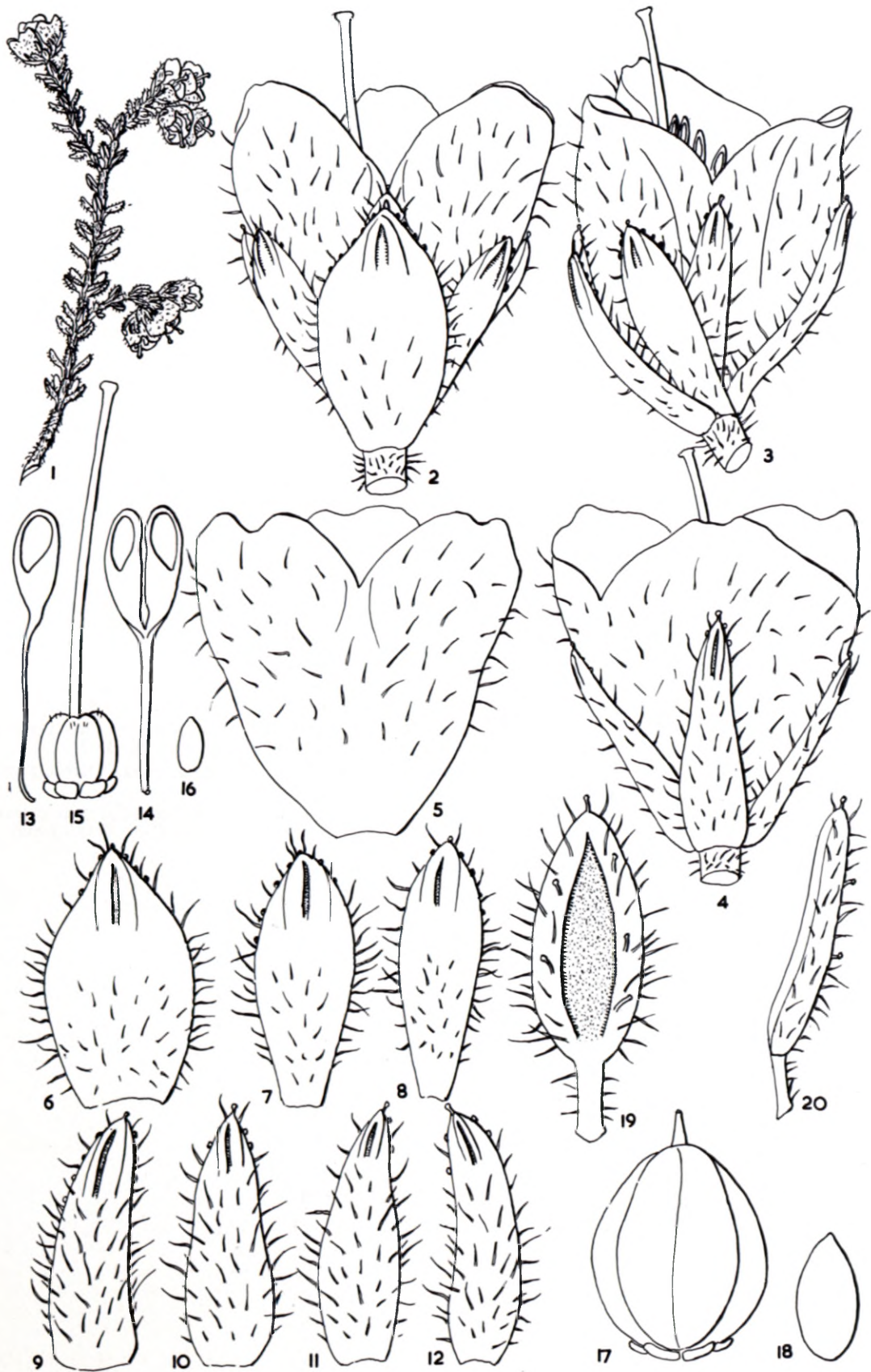
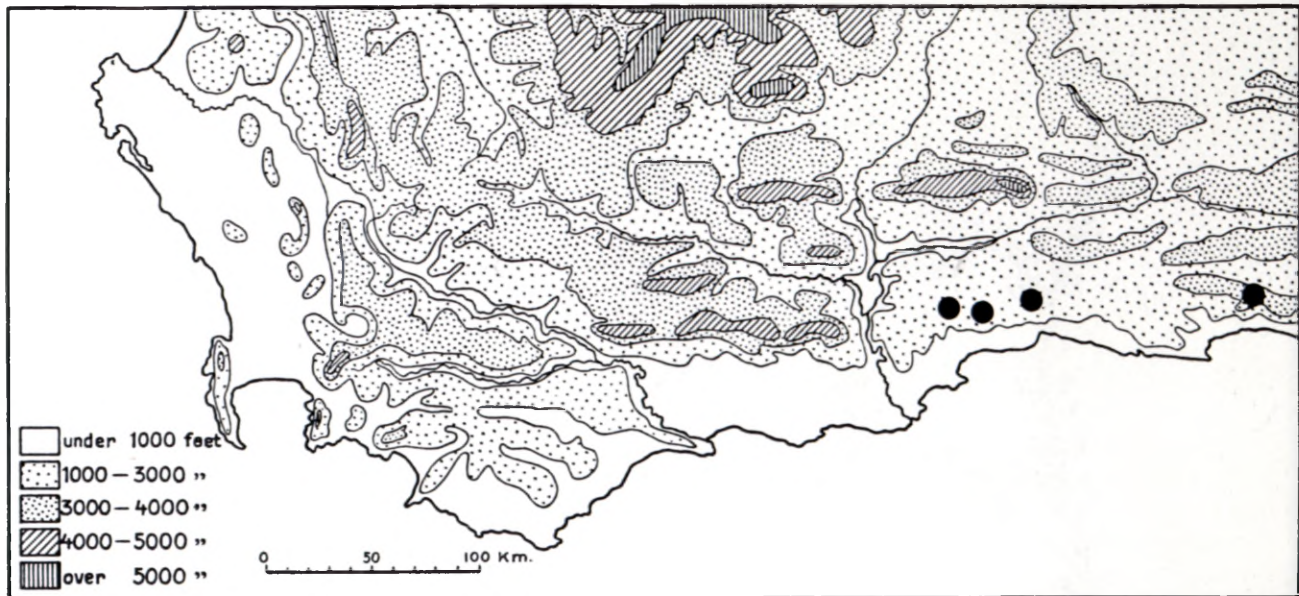


FIG. 16.—*Eremiella outeniquae*. 1, twig, $\times \frac{1}{3}$. 2, flower, abaxial view. 3, flower, side view. 4, flower, adaxial view. 5, corolla. 6, median bracteole, 7 and 8, lateral bracteoles. 9, 10, 11, 12, sepals. 13, stamen, lateral view. 14, stamen, front view. 15, gynoecium. 16, ovule. 17, fruiting ovary. 18, seed. 19, leaf, abaxial surface. 20, leaf, side view. All $\times 20$, drawn from the holotype, *Compton 21818* (NBG).

FIG. 17.—Distribution of *Eremiella outeniquae*.

REFERENCES

- BENTHAM, G., 1839. Ericaceae. In DC., *Prodr.* 7: 580-733. Paris.
- BENTHAM, G., 1876. Ericaceae. In Benth. & Hook. f., *Gen. Pl.* 2: 592. London: Reeve.
- BOLUS, H., 1905. *Erica* L. In W. T. Thiselton-Dyer, *Fl. Cap.* 4, 1: 96-98. Ashford: Reeve.
- BROWN, N. E., 1905. *Eremia* D. Don. In W. T. Thiselton-Dyer, *Fl. Cap.* 4, 1: 332-335. Ashford: Reeve.
- BROWN, N. E., 1906a. *Grisebachia* Klotzsch. In W. T. Thiselton-Dyer, *Fl. Cap.* 4, 1: 349. Ashford: Reeve.
- BROWN, N. E., 1906b. *Eremiopsis* N.E. Br. In W. T. Thiselton-Dyer, *Fl. Cap.* 4, 1: 390. Ashford: Reeve.
- COMPTON, R. H., 1934. Plantae novitates Africanæ. *J.S. Afr. Bot.* 1: 144-151.
- COMPTON, R. H., 1953. Plantae novitates Africanæ. *J.S. Afr. Bot.* 19: 120.
- DON, D., 1834. An attempt at a new arrangement of the Ericaceae. *Edin. New Phil. J.* 17: 150-160.
- DON, G., 1834. Ericaceae. In *Gen. Syst.* 3: 828. London: Rivington.
- DRUDE, O., 1897. Ericaceae-Ericoideae. In Engl. & Prantl, *Pflanzenfam.* 4, 1: 57-65. Leipzig: Engelmann.
- KLOTZSCH, J. F., 1838a. Ericacearum, genera et species. *Linnaea* 12: 211-247.
- KLOTZSCH, J. F., 1838b. Addenda. l.c. 598-9.
- PHILLIPS, E. P., 1926. Ericaceae. In *Gen.* ed. 1, 460. Pretoria: Division of Botany and Plant Pathology.
- PHILLIPS, E. P., 1944. Notes on the minor genera of the Ericaceae. *J.S. Afr. Bot.* 10: 69-73.
- RACH, L. 1855. Die Ericaceen der Thunberg'schen Sammlung. *Linnaea* 26: 789.
- WEIMARCK, H. 1941. Phytogeographical groups, centres and intervals within the Cape flora. *Lunds Univ. Arsskr.* 37: 1-143.