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NOTES ON SOME PLANTS OF SOUTHERN AFRICA CHIEFLY FROM NATAL: III*

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ABSTRACT. This paper includes annotations of 91 plants, often based on examination of the type specimens. Four are not African, but have either synonyms or correct names which have appeared in the literature as African: these are *Curculigo scorzonerifolia* (incl. *C. luzulifolia*), *Helichrysum arenarium* (incl. *H. adscendens*), *H. crassifolium* (incl. *H. lamarckii*) and *Staehelina petiolata* (incl. *S. arborescens*). Thirteen of the plants annotated belong to Amaryllidaceae (incl. Hypoxidaceae) and give rise to discussion on subterranean ovaries and ovarial beaks. Five species belong to Campanulaceae, four of them being placed in a new genus, *Craterocapsa*, segregated from *Wahlenbergia*. No less than seventy belong to Compositae in which 17 new species and 2 new subspecies are described, while 15 new combinations or new names are proposed. There is a discussion on the variation within *Helichrysum* in relation to neighbouring genera, and the Ethiopian genus *Chiliocephalum* is reduced to *Helichrysum*. In *Printzia* the relations of *P. laxa* and *P. pyrifolia* are discussed and a hypothesis that *P. pyrifolia* originated as an early-flowering variant within the area of *P. laxa* is advanced. Under *Senecio cissampelinus* the status of the genera *Mikaniopsis* and *Cissampelopsis* is discussed. Notes on individual species of *Kalanchoë* (Crassulaceae), *Galopina* (Rubiaceae) and *Selago* (Selaginaceae) complete the total.

The title of this paper is still appropriate in intention, but the present contribution deals not only with plants from Natal but, because they are interlocked historically or taxonomically, also with plants from S America, the Balearic Islands, Crete and mainland Europe, and makes reference to certain Australian genera as well! Less unexpectedly we have also been concerned with African plants from the Cape Peninsula to Ethiopia. We owe our usual debt of gratitude to the authorities and staff at Kew and the British Museum, and on this occasion it is a particular pleasure to thank the Directors and staff at Paris, Zürich and Geneva for their assistance and for their kind hospitality.

* Continued from Notes R.B.G. Edinb. 31: 33 (1971). Arranged alphabetically by families then by genera and species; figures are numbered consecutively through the series.

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AMARYLLIDACEAE (incl. Hypoxidaceae*)

64-66 Apodolirion Baker in Journ. Bot. 16: 75 (1878); Benth. in Benth. & Hook. f., Gen. Pl. 3: 722 (1883); Baker, Handb. Amaryllid. 26 (1888) et in Thiselton-Dyer, Fl. Cap. 6: 197 (1896); Marloth, Fl. S. Afr. 4: 114 (1915); Phillips, Gen. S. Afr. Fl. Pl. 163 (1926), ed. 2, 203 (1951); Traub, Genera Amaryllid. 68 (1963); Burtt in Israel Journ. Bot. 19: 87 (1970).
Lectotype: *A. buchananii* (Bak.) Bak.

When Baker proposed the genus *Apodolirion*, he included three species: *A. mackenii*, *A. buchananii* and *A. bolusii*. One of these, *A. buchananii*, he had previously described in the genus *Cyphonema* (now a synonym of *Cyrtanthus*): it was the only species of which both bulb and leaves were known at that time, and it is now the best-known species of the genus. It is therefore the correct lectotype, and has been so designated by Phillips (Gen. S. Afr. Fl. Pl. ed. 2, 203, 1951).

Up until 1934 there was no description of the fruit of *Apodolirion* available; then Pole Evans (in Fl. Pl. S. Afr. 14: t. 533, 1934) illustrated and described that of *A. macowanii*. This species has an orange club-shaped fleshy aromatic fruit just like that of the allied genus *Gethyllis*, and a fruit of this type has since 1934 formed part of the generic description of *Apodolirion*.

It was not until 1970 that the fruit of *Apodolirion buchananii*, the lectotype of the genus, became known. Then Mr F. B. Wright of the Kamberg Nature Reserve marked flowering plants and later collected the fruit. It was at once apparent why fruit had remained unknown for so long. The capsules are small, ellipsoid, and scarcely appear above the level of the soil; they have a thin membranous wall which very soon ruptures irregularly and allows the seeds to escape. The seeds themselves have a translucent outer layer and the embryo inside is bright green. Germination is immediate, and in fact may take place within the fruit. Not only are the fruits insignificant, *Apodolirion buchananii*, a plant of the grasslands, produces but a single grass-like leaf. Conspicuous as it is in flower, it is scarcely likely to be found in fruit unless the spot has been marked.

In fruit, then, *Apodolirion buchananii* is quite different from *A. macowanii*. What we now have to do is to write into the generic description of *Apodolirion* these newly discovered features of fruit and seed. Then we have to decide whether *A. macowanii* is really an *Apodolirion* or whether it should be transferred to *Gethyllis*.

It was expected that the seed of *Gethyllis* and *Apodolirion macowanii* would show some difference from that of *A. buchananii*. In *A. buchananii* seed must germinate close to where it falls, for it clearly would not stand desiccation. The fleshy fruits of *Gethyllis* however are aromatic and are avidly eaten by animals, and children. Yet it seems that the seeds have a thin membranous skin, soft endosperm and green embryo just as in *A. buchananii*: this information is taken from herbarium notes of *G. britteniana* (*Hardy & Bayliss* 1157 PRE), for a photocopy of which, and for other help, I am indebted to Mrs A. A. Mauve, and from a fruit (species not named) kindly sent to me in alcohol by Dr M. de Vos. The dispersal biology of these seeds is yet another item that needs further study.

* This inclusion is dictated by convenience of arrangement in this particular paper, not from taxonomic conviction.

Hitherto the chief recorded difference between these two genera has been in the arrangement of the stamens: all inserted at one level in *Gethyllis*, inserted at two different levels in *Apodolirion*. Additionally the perianth of *Gethyllis* is hypocrateriform (a narrow tube with flat spreading limb), while that of *Apodolirion* is infundibuliform (widening gradually above the slender tube, the segments remaining semi-erect). In both these features there seems no doubt that *Apodolirion macowanii* is placed in its correct genus, though the perianth shows an approach to that of *Gethyllis*, having more spreading segments than in *A. buchananii*.

No mention has yet been made of vegetative features. Most species of *Gethyllis* have four leaves or more, they may be hairy (with characteristic squamose indumentum) or glabrous; they are often crisped or spirally twisted and firm. In *Apodolirion buchananii* there is usually only a single leaf, sometimes two; they are straight (or very slightly falcate), glabrous and soft. In *A. macowanii* there are two undulate or twisted glabrous leaves. The bulb of *Gethyllis* is usually 2·5 cm or more in diameter and the plants are characteristically found in sandy open ground. The bulb of *Apodolirion buchananii* is much smaller, only about 1 cm in diameter, and the plant grows in grassland. *Apodolirion macowanii* has a bulb 2·5 cm in diameter and grows in riverside sands.

Thus, apart from its low leaf number, *Apodolirion macowanii* is closer to *Gethyllis* in vegetative features, ecology and fruit: it is closer to *Apodolirion* in staminal arrangement and leaf number: perianth is somewhat intermediate.

Of the remaining species of the genus two are scarcely distinct from *A. buchananii* and are mentioned under that species below. The other two are from the Cape: of these, *A. bolusii* Bak. from Cave Mt., Graaff Reinet has not, to our knowledge, been collected in fruit. *A. lanceolatum* (see no. 65) appears to have a fleshy fruit: to quote from the notes (*Marloth* 13491, 13506, PRE) "fruit a succulent, indehiscent 3-celled capsule": at first "white, sprinkled with red, tip green, turning yellow when ripe": "seeds globose, the outer testa membranous the inner mucilaginous". The fruit, however, appears to be ovoid rather than cylindrical-clavate as in *A. macowanii* or *Gethyllis*, and the fruits of these could not be described as succulent, 3-celled capsules. *A. lanceolatum* therefore seems to add another slightly different pattern of fruit to *Apodolirion*, of which it has the typical biseriate stamens.

An alleged difference between *Apodolirion* and *Gethyllis* that has not yet been mentioned refers to the spathe. This is said to be cylindrical in *Apodolirion*, monophyllous in *Gethyllis*. In *Apodolirion* the lower part forms a cylindric tube around the ovary and is bifid at the top, the two free teeth being on opposite sides of the tube: in the illustrations of spathe-type given by Sealy (in Journ. Roy. Hort. Soc. 62: 198, 1937) this is the *Pyrolirion*-type (fig. 61/3 & 61/12). In *Gethyllis* I have been able to examine only *G. spiralis* (Thunb.) L.f. (*Dümmer* 943) and *G. afra* L. (*Zeyher* 1663), but both show exactly the same spathe structure, although the free parts are larger and more conspicuous. The spathe is frequently left unmentioned in specific descriptions and is useless as a taxonomic character until more fully investigated.

It is clear that we do not yet have adequate knowledge of the plants to enable a decision to be made on the definition of *Apodolirion*.

The fruits of *A. buchananii* deserve further consideration in relation to those of some other monocotyledons in the same area. Species of *Hypoxis*, and

Rhodohypoxis baurii (Bak.) Nel have fruits which are borne well above ground and dehisce by a circumscissile lid. In *Rhodohypoxis rubella* (Bak.) Nel and in the genus *Empodium* (see nos. 68-76 below) the perianth limb is raised by the intercalation of a long or short beak to the ovary. The ovary itself matures close to the ground. In these cases, as in *Apodolirion buchananii* the fruit has a thin membranous wall which ruptures irregularly.

Rhodohypoxis is, taxonomically, of particular importance as its unique floral configuration makes untenable any idea that fruit differences are, in this case, of generic value (see further discussion on p. 310).

64. Apodolirion buchananii (Baker) Baker in Journ. Bot. 75 (1878), Handb. Amaryllid. 26 (1888), in Hook., Ic. Pl. 14: t. 1388 (1882), in Dyer, Fl. Cap. 6: 197 (1896); Trauseld, Wild Flow. Natal Drakensberg, 28, 29 (1969).
Type: Natal, sine loc., *Buchanan* (K!).
Syn.: *Cyphonema buchananii* Baker in Journ. Bot. 14: 66 (1876).

The following description is based on material collected on the Kamberg Nature Reserve, Estcourt dist., Natal, by Mr F. B. Wright and cultivated at R.B.G. Edinburgh.

Bulb ovoid to almost spherical, 1·5–2·5 × 1–1·5 cm, flat at the base and there producing a tuft of rather fleshy contractile (?) roots. *Sheathing leaves* 2, membranous, tubular with rudimentary lamina. *Foliage leaf* 1 (or two, very rarely 3?), hysteranthous, c. 15–20 × 0·25–0·3 cm, linear, dark green, blunt at the tip, mid-rib well marked. *Peduncle* hidden within sheaths, 12 mm long. *Spathe* tubular for c. 1·2 cm, bifid above, the free parts on opposite sides 5–7 mm long, membranous. *Pedicel* at flowering time scarcely any; in fruit c. 10 mm long, gradually expanded upwards. *Ovary* subterranean, 4–6 × 2·5 mm, cylindric, red-spotted, with numerous ovules. *Perianth* tube variable in length, c. 5–10 cm long, distinctly tubular to top of ovary but lumen small and nearly filled by the style, usually dull reddish outside, expanded at top into funnel 5 mm long; segments equal in length, 2·5–4 cm, the outer ones 7–8 mm, the inner 4·5–5 mm wide, more or less elliptic, dull red outside, whitish within, recurving from middle when flower fully expanded. *Stamens* in two series; filaments rather fleshy, decurrent to base of funnel; outer series becoming free 2 mm below base of segment, free filament 2 mm, inner series becoming free 2·5 mm above base of segment, free part 2·5 mm; anthers pale-yellow, 3·5–4 mm long, those of the outer series dorsifixed, those of the inner series almost basifixed. *Style* reaching to top of lower anther; stigma shortly 3-lobed. *Capsule* oval or somewhat club-shaped, just reaching to soil level, the thin wall rupturing irregularly to permit escape of seeds, which may begin to germinate in the capsule (at least in cultivation). *Seed* ellipsoid, c. 4 × 2·5 mm, the outer coats translucent, the embryo bright green.

The importance of this species in relation to the generic concept of *Apodolirion* has been discussed above. Its geographical range is uncertain because its specific limits are uncertain. Two other species are recorded from the summer rainfall area of Natal and the eastern Transvaal: *A. ettae* Bak. (from Umbumbulu, Umlaas, south of Durban, and also from E Transvaal) and *A. mackenii* Bak. (from Noodsberg, New Hanover distr., Natal, and Lebombo Mts., Moçambique). In Baker's key in Flora Capensis *A. ettae*

has a shorter perianth tube, *A. mackenii* a longer one than *A. buchananii*. But this is a difficult character unless soil level is marked and surrounding vegetation recorded; but nevertheless it cannot be disregarded. However one would expect other differences as well. Herbarium material consists of pressed corollas, and until living flowers, leaves and fruits can be examined it is profitless to speculate how many species there may be. Certainly, *Apodolirion* is found along the face of the Drakensberg, at least from Underberg district northwards, from the Midlands down to about 600 m (near Dumisa, Krantzkloof and Eshowe), and up through the eastern Transvaal at least as far as Mt. Anderson in Lydenburg distr., from where I have seen a transparency taken by Mr Eliot Hodgkin. Field observations and collection of fruiting specimens are restricted, I think, to Mr Wright's work at Kamberg. They are badly needed from elsewhere, but are not easy to make. The plants flower in spring, and are often conspicuous on burnt ground, but the fruit and leaves must be sought in midsummer: they are so inconspicuous that the marking of flowering plants by stakes is essential.

65. Apodolirion lanceolatum (Thunb.) Bak., Handb. Amaryllid. 26 (1888), et in Dyer, Fl. Cap. 6: 197 (1896).
Type: Cape, Swellendam, Buffeljagts R., *Thunberg* (UPS).
Syn.: *Papiria lanceolata* Thunb. in Phys. Sallsk. Handl. Lund 1: 112 (1776)—not seen.
Gethyllis lanceolata (Thunb.) L. f., Suppl. 198 (1781).
CAPE. Swellendam distr., Helpmekaar, Bruintjes River, Drew, 15 xii 1927, *Joubert* in herb. Marloth 13506, Apr. 1928, 13506B (PRE); *ibidem*, Oct. 1927, *Joubert* in herb. Marloth 13491 (PRE).

For notes on fruit form see the discussion under the generic heading above. The authorities cited should be noted: the combination is often attributed to Bentham and the basionym to the younger Linnaeus.

66. Apodolirion macowanii Baker, Handb. Amaryllid. 26 (1888) et in Dyer, Fl. Cap. 6: 198 (1896); Pole Evans in Fl. Pl. S. Afr. 14: t. 533 (1934).
Type: Cape, sandy ground at Port Elizabeth and on the banks of the Coega River, *Macowan* 1928 (K!).
CAPE. North end Parklands, Port Elizabeth, sea level, open grass veldt, fl. white flushed pink, 4 i 1933, *Long* 887 (K); Port Elizabeth, *Cruden* (K). Uitenhage, Zwartkops R., Dec. 1923, *Rogers* 28222 (Z).

Rogers 28222 agrees well with the plant illustrated in Flowering Plants of South Africa, having two strongly undulate leaves. The flowers show the beginnings of the development of the ovary into fruit and it is linear, 2 cm long—that is to say *Gethyllis*-like as figured for *A. macowanii*. This matter is discussed above under the generic heading.

67. Curculigo scorzonerifolia (Lam.) Baker in Journ. Linn. Soc. 17: 124 (1878).
Type: St. Vincent & St. Domingo, *Plumier* (n.v.)
Syn.: *Hypoxis scorzonerifolia* Lam., Encycl. Méth. 3: 183 (1783).
Hypoxis luzulifolia DC. in Redouté, Liliac. t. 260 (1809).

The synonym *Hypoxis luzulifolia* has hitherto been treated as a South African plant and was quoted by Baker (in Dyer, Fl. Cap. 6: 173, 1896) under

Curculigo plicata. De Candolle said that his description was based on a specimen collected at the Cape by Brugière; he described, and the illustration shows, a long slender style with a capitate stigma. This fits *Curculigo* sens. strict., but is quite foreign to the South African part of the genus, which is now *Empodium* Salisb.

It so happens that De Candolle also described another of Brugière's plants as South African: as an endemic genus of Compositae that he called *Pachyrhynchus.* It has never been collected again in South Africa and Dr B. Nordenstam was led to reinvestigate the genus: he discovered that it was simply the South American *Lucilia acutifolia.*

The illustration of *Hypoxis luzulifolia* fits well with the South American *Curculigo scorzonerifolia.* It thus appears that two of Brugière's plants that De Candolle thought to be South African were of S. American origin.

68–76. Empodium Salisb., Gen. Pl. Liriogamae, ed. Gray, 43 (1866); Garside in Adamson & Salter, Fl. Cape Penins. 214 (1950); Bullock in Kew Bull. 15: 389 (1962).

Type species: *E. plicata* (Thunb.) Garside.

Syn.: *Fabricia* Thunb. in Fabricius, Reise Norw. 28 (1779), p.p.—non Adans.
Curculigo sect. *Empodium* (Salisb.) Benth. in Benth. & Hook. f. Gen. Pl. 3: 718 (1883); Pax in Engl. & Prantl, Nat. Pflanzenfam. 2(5): 121 (1888).
Forbesia [Eckl., Topogr. Verz. 1: 4 (1827) nomen nudum, ex] Nel in Bot. Jahrb. 51: 243 et 287 (1914); Phillips, Gen. S. Afr. Pl. 164 (1926), ed. 2, 205 (1951); Pax & K. Hoffm. in Engl. & Prantl, Natürl. Pflanzenfam. 2 Aufl. 15a: 425 (1930); de Vos in Journ. S. Afr. Bot. 15: 13–22 (1949).
[*Curculigo* auctt. p.p., non Gaertn.; Baker in Dyer, Fl. Cap. 6: 173 (1896); Hutch., Fam. Fl. Pl. ed. 2, 2: 678 (1959); Geerinck in Bull. Jard. Bot. Nat. Belg. 39: 70 (1969)].

The above citation shows clearly enough that there is as yet no unanimity on the treatment of the genus *Curculigo.* The problem to be solved is whether the species of *Curculigo* sens. strict, *Molineria* Colla (an Indo-Malayan segregate which is not further discussed here) and *Empodium* are more closely related to one another than they are to other parts of the family. Technical characters are always difficult to find in the monocotyledons and one must sometimes define groups in words that sound unconvincing till the plants are examined. So it is here. The statement of results given by Nel in his paper of 1914 may not immediately carry conviction, but when the plants are laid out for examination it is difficult not to be persuaded. Briefly Nel suggested that *Hypoxis* sens. lat. included two main groups *Spiloxene* (which he called *Ianthe*) and *Hypoxis* proper. Now *Empodium* (which he called *Forbesia*) he placed next to *Spiloxene*, while *Curculigo* sens. strict. he placed next to *Hypoxis* sens. strict.

The main reason for including *Empodium* in *Curculigo* is that both genera are usually characterized by the possession of a long beak to the ovary, and this results in the ovary itself being hidden in the leaf sheaths (and sometimes being actually subterranean) at flowering time. The character of a long ovary beak, not always associated with a subterranean ovary, is known in several groups of monocotyledons. It is found as a specific character in

Rhodohypoxis and some species of *Iris*, and is a regular feature of *Gynandriris* (Iridaceae), *Orchidantha* (Lowiaceae), *Cyphostigma* (Zingiberaceae): no doubt other instances will come to light when attention is focused on this feature. The achaenial beak of many Compositae (e.g. *Taraxacum*, *Lactuca*) may be morphologically comparable but is biologically very different. Devices giving subterranean protection for the young ovary have been developed many times in the monocotyledons (an account, already known to be incomplete, is given by Burtt in Israel J. Bot. 19: 77–90, 1970).

The situation in the neighbouring genus *Rhodohypoxis* is particularly instructive. *Rhodohypoxis* shows marked generic individuality on account of the form of the flower which Milne-Redhead (in Bot. Mag. t. 9412, 1935) has very aptly described as having a "blind look": a phrase that sums up the way in which the inner tepals are inflexed in their lower part so that the mouth of the perianth is almost entirely closed. But such a closed flower would receive little attention from insect-pollinators were no other access provided. In *Rhodohypoxis* there is such a provision. The inner tepals, whose bent claws close the mouth, have, for this very reason, their blades at a slightly higher level than the blades of the outer tepals. As a result three small lateral openings appear just above the base of each outer tepal and just between the claws of the inner tepals which are here divergent. The resulting arrangement begins to give a hint of the architecture of the *Iris* flower. There are three quite separate openings all leading to the same chamber where anthers and stigma are located: in the *Iris*-type flower there are, as it were, three part-flowers each with its own anther and stigma, but the stigmas all communicating through a common style to the same ovary (and any single stigma capable of effecting the fertilization of the whole ovary). Pollination has not, so far as we are aware, been observed in *Rhodohypoxis*; however the variability of *R. baurii*, which may be found in huge populations showing every shade of colour from white to crimson, is almost decisive evidence that cross-pollination occurs.

This apparent digression has a definite purpose here: to emphasise that the half-dozen species of *Rhodohypoxis* form a closely knit genus on account of this highly distinctive flower-form. The genus is unmistakable in the field. Thus structural variation within this pattern is properly taken as intra-generic.

This variation takes two forms. Typically, that is to say in the type species *R. baurii* and its close allies, the ovary is placed immediately below the perianth and the fruit, borne on the erect flower-stalk, is circumscissile, the top half of the ovary falling with the withered perianth. In a much smaller-flowered undescribed species (*Hilliard & Burtt* 6705 from Naude's Nek) the perianth disarticulates some 2-3 mm above the ovary: the flower stalk bends over so that the ovary lies on the surface of the marshy ground where the plant grows, and the fruit is thin-walled and apparently ruptures irregularly.

In *Rhodohypoxis rubella* the fruit is borne at or below ground level for a different reason: there is a very definite beak to the ovary up to nearly 1 cm long. As a result the ovary itself is hidden amongst the leaf sheaths and the fruit is the thin-walled, non-circumscissile type. We have, then, two forms of fruit and the presence or absence of an ovary beak within *Rhodohypoxis*, which a highly individual flower-form proclaims to be a natural genus.

Thus we find that an ovary beak occurs in several groups of monocotyledons, while at the same time it is not always constant in a genus, even in such a small and distinctive one as *Rhodohypoxis*. It can, of itself, be no adequate reason for including *Empodium* in *Curculigo*.

Curculigo sens. strict. has the thick vertical rootstock, rigid, usually hairy leaves and hairy flowers of many species of *Hypoxis* sens. strict. *Empodium* has the rounded corm, more delicate leaves and more or less glabrous flowers found in *Spiloxene*. There is thus good reason to think that *Curculigo* and *Empodium* have had independent origins from *Hypoxis* sens. strict. and from *Spiloxene* respectively; both may obtain protection of the ovary by development of a long ovary-beak. If this character has developed independently in *Empodium* and *Curculigo* one must agree that Nel was justified in accepting them as distinct genera.

Curculigo may usually be separated from *Empodium* by having a long slender style with capitate stigma, whereas in *Empodium* the style is usually shorter than the stigma which is always long and tripartite. However in *Curculigo orchioides* Gaertn. the stigma is larger and tripartite, while in one species of *Empodium* (*E. gloriosum*) the style is longer than the stigma. This species nevertheless has the characteristic long anthers and crocus-like corm that mark the other species of *Empodium*.

It may be that the seeds will also provide a differential character between these two genera. Where known the ornamentations in *Curculigo* form sinuate striations whereas *Empodium* seeds have evenly distributed rounded tubercles.

It is pertinent to note here that *Spiloxene* is confined, in Africa, to the S.W. Cape, where it musters some 23 species. *Empodium*, although a genus of only 10 species, ranges from the Cape Peninsula up to the northern end of the Transvaal Drakensberg.

The genus *Empodium* was established by the publication posthumously, in 1866, of a fragment of R. A. Salisbury's projected Genera Plantarum. Having set down the essential characters, Salisbury said there were two species: "*Gethyllis plicata* Jacq. Hort. Schoenbr. 1, 42 t.80; *Curculigo plicata* β Ker Bot. Reg. No. 345". These two references are to *Curculigo plicata* (Thunb.) Dryand. and *C. plicata* var. *veratrifolia* (Willd.) Baker, to give them their names in *Curculigo*; the latter has recently been restored to specific rank; nevertheless *C. plicata* is clearly the best choice for the type species of *Empodium*.

Index Kewensis attributed the combination *Empodium plicatum* to Salisbury, but he never published the name. Garside (in Adamson & Salter, Fl. Cape Penins. 214, 1950) wrote "*E. plicatum* (L.f.) Baker (*Curculigo plicata* Dryand. in Ait.)". I cannot find that Baker ever accepted the genus *Empodium*; however the reference to *Curculigo plicata* Dryand. leads directly to *Hypoxis plicata* L.f. and the treatment of *Hypoxis* in the younger Linnaeus's *Supplementum* concludes with a note that Thunberg placed the Cape species of *Hypoxis* in the genus *Fabricia*. This is an adequate link to enable us to write *Hypoxis plicata* (Thunb.) L.f. and ultimately *Empodium plicatum* (Thunb.) Garside. The full synonymy is set out below.

Writing under the generic name *Forbesia*, Nel added 5 new species to this genus, as well as transferring to it *Curculigo namaquensis* Baker, a species he had not seen and did not include in his key.

Nel's original specimens have kindly been sent on loan to Edinburgh from Berlin-Dahlem, and we are most grateful to Dr Eckardt for this help. Nel's descriptions of underground parts are difficult to understand and are not those to be expected from examination of the specimens. He distinguishes *F. monophylla* and *F. flexilis* by the former having a rhizome, the latter a subdiscoid corm. But both have corms: the only difference on the herbarium sheets is that those of *flexilis* are intact, and are covered with reticulate tunics, whereas those of *monophylla* have been cut and have lost their tunics. All the species seen have distinct corms, with reticulate tunics formed from the fibres of the old leaf-bases: the situation seems to be just that found in the reticulate species of *Crocus*; in one species of *Empodium*, *E. occidentale*, there is a distinct basal tunic (Nel uses the latin term *asserculum*), which is not clearly visible in other species. The underground parts, however, need a much closer study than is possible in the herbarium.

Having seen Nel's original material and a certain number of more recent specimens, we have formed the view that most of the species Nel recognised are well-founded. The chief uncertainty surrounds the character of the caudate anthers. Taken alone this seems inadequate for species-separation and more field-work is needed to establish its constancy in populations and over a species area.

It has seemed useful to enumerate all the species names even though two of them are not formally transferred to *Empodium*.

Subsequent to Nel's work Mrs Bolus described a new species, *Forbesia galpinii*, from the high Drakensberg at Mont aux Sources. From her description of flower-colour, hair tufts on the leaf margins and perianth "tube" the generic position immediately seemed uncertain and, in fact, this plant is clearly referable to *Rhodohypoxis*.

Quite recently Miss M. F. Thompson has accepted *Curculigo veratrifolia* Willd., ranked as a variety since *Flora Capensis*, as a full species. This view is followed here, but without sufficient knowledge of either the plants in the field or of herbarium material to justify it independently. We are indebted to Miss Thompson for helpful comments on the first draft of these notes.

68. Empodium elongatum (Nel) B. L. Burtt, **comb. nov.**

Lectotype: Natal, Van Reenen's Pass, c. 1800 m, *Wood* 4689 (B!). Syntype: Natal, in clivo prope Van Reenen, 1500–1800 m, 17 xi 1897, *Wood* 6577 (B, n.v.; E!).

Syn.: *Forbesia elongata* Nel in Bot. Jahrb. 51: 289 (1914).

TRANSVAAL. Standerton distr., Paardekop, 1500 m, 12 x 1893, *Schlechter* 3447(Z). Carolina distr., 1620 m, farm Bergendal, 20 x 1930, *Galpin* 2369 (K); Carolina, Dec. 1917, *Moss & Rogers* 1102 (in fruit only). Ermelo distr., Ermelo, Oct. 1914, *Rogers* 14055. Pretoria distr., Hornsnek, Magaliesberge, c. 1500 m, 6 i 1956, *Schlieben* 7742 (B, Z, PRE). Pietersburg distr., Houtbosch *Rehmann* 5808 (Z).

This species ranges from Van Reenen's Pass to Woodbush, as far as present information goes. A characteristic feature, shared with *E. monophyllum*, is that the upper parts of the sheathing leaves are very dark brown. The possession of several long foliage leaves and the absence of an anther-appendage easily distinguish it from *E. monophyllum*.

There is, however, another plant which seems indistinguishable from *E. elongatum* save in the possession of appendaged anthers. It is found within the same general area and field studies are needed to see if anther-appendages are constant in different populations. Herbarium material already shows that appendage-length is variable. The following specimens with appendaged anthers have been seen:

TRANSVAAL. Barberton distr., 8 miles from Barberton on Havelock road, 1350 m, 9 xii, *Codd* 8156 (K).

SWAZILAND. Mkondo River, 24 xi 1959, *Compton* 29531 (K). Mbabane, granite hills near wireless masts, 18 i 1965, *K. Gordon-Gray* 6049 (NU).

NATAL. Paulpietersburg distr., summit of Dumbe, 24 xi, *Galpin* 9688 (K).

69. Empodium (*Forbesia flexilis* Nel in Bot. Jahrb. 51: 288, 1914).

Type: Cape, Cango [near Oudtshoorn], *Mund & Maire* (B!).

Syn.: *Curculigo plicata* var. *barberae* Baker in Journ. Linn. Soc. 17: 123 (1878) et in Dyer, Fl. Cap. 6: 173 (1896) sphalm. "*barberi*". Type: Somerset [East] Div., *Miss Bowker* (= *Mrs Barber*) s.n. (K!).
Forbesia flexilis var. *barberae* (Baker) Nel in Bot. Jahrb. 51: 288 (1914).

No formal transfer of Nel's *Forbesia flexilis* is being proposed at present. No satisfactory difference between this plant and *E. plicatum* (No. 74) has been found other than the possession by *Forbesia flexilis* of appendaged anthers. The occurrence of plants having anther appendages but otherwise inseparable from *E. elongatum* (No. 68) has just been mentioned. In the same way its seems quite possible that *Forbesia flexilis* simply represents local populations (or individuals) of *E. plicatum* with appendaged anthers. Field studies are clearly necessary.

Nel quoted the type sheet as being from South Africa, without closer locality, but it is clearly labelled Cango; that is to say on the south side of the Zwarteberg Range which lies between Oudtshoorn and the Great Karıoo.

Baker wrote the name var. *barberae* (as *barberi*) on two sheets: the Somerset plant quoted as type and another from Hopetown, quoted in *Flora Capensis*. The latter, however, is a different plant (*E. gloriosum*?) with unappendaged anthers and less developed leaves. Mrs. Barber's label says "spring and autumn". It could be that the reference to autumn belongs to the Somerset plant, which would fit with its longer leaves. This, however, is surmise.

70. Empodium gloriosum (Nel) B. L. Burtt, **comb. nov.**

Lectotype: Cape, *Zeyher* (B!). Syntype: Cape, Riversdale, *Rust* (B, n.v.)

Syn.: *Forbesia gloriosa* Nel in Bot. Jahrb. 51: 288 (1914).

CAPE. Port Elizabeth distr., Humewood, *Paterson* 2050 (Z); Port Elizabeth, common along the coast, Sept.-Feb., *ESCA* 272(Z). Uitenhage distr., Hougham Park, Coega, May 1915. *Paterson* 1006(Z). Somerset East distr., sine loc., 750 m, 28 iii 1964, *Bayliss* 2146(Z); Little Fish River, 750 m, May, *Macowan* s.n. (Z). Albany distr., Alicedale, 6 iii 1909, *Rogers* 4503(Z). Bathurst distr., Port Alfred, Esdaile, *Rogers* 17145(Z). Stockenstrom distr., stony banks of Elands R. above waterfall, March 1885, *Scott Elliot* 198 (E).

This species seems adequately distinguished by having the style longer than the stigmas.

71. Empodium monophyllum (Nel) B. L. Burtt, **comb. nov.**
Lectotype: Natal, Inanda, c. 600 m, *Wood* 543 (B! BM, E, Z). Syntype: Natal, Alexandra county [= Umzinto distr.], "Fairfield", *Rudatis* 1464 (B; BM, but localized "Ellesmere").
Syn.: *Forbesia monophylla* Nel in Bot. Jahrb. 51: 287 (1914).
NATAL. Pinetown distr., prope Krantz Kloof, c. 450 m, 13 ix 1893, *Schlechter* 3185 (Z). Inanda, *Rehmann* 8274(Z). Polela distr., Sunset Farm, Mawaqua Mt., 1950 m, 7 xi 1971, *Rennie* 79 (E, NU). Sine loc., *Wood* 273 (NU).

E. monophyllum flowers before the leaves are produced and there are only one or two leaves on each corm.

72. Empodium (*Curculigo namaquensis* Bak. in Dyer, Fl. Cap. 6: 174, 1896).
Type: Namaqualand, Ookiep, *Bolus* 6629 (BOL).
Syn.: *Forbesia namaquensis* (Bak.) Nel in Bot. Jahrb. 51: 243 in obs. et 337 (1914).

Baker described this plant as being distinct because of its long twisting rhizome. It seems likely that there was some confusion about the structure; it was probably only a side growth from the corm.

E. veratrifolium almost certainly occurs in the same area and until further studies have been made it is unwise to transfer Baker's species to *Empodium*.

73. Empodium occidentale (Nel) B. L. Burtt, **comb. nov.**
Type: W. Cape, [Calvinia distr.?] Hantam, *Meyer* (B!)
Syn.: *Forbesia occidentalis* Nel in Bot. Jahrb. 51: 289 (1914).

This species does not seem to have been re-collected. It has two distinctive features: its blunt perianth segments and the characteristic basal tunic of the corm.

74. Empodium plicatum (Thunb.) Garside in Adamson & Salter, Fl. Cape Penins. 214 (1950); Mason, W. Cape Sandveld Flowers 50, t. 14 f. 7 (1972).
Type: Cape of Good Hope, *Thunberg* (UPS)
Syn.: *Fabricia plicata* Thunb. in Fabricius, Reise Norw. 29 (1779).
Hypoxis plicata (Thunb.) Linn. f., Suppl. 197 (1781).
Gethyllis plicata (Thunb.) Jacq., Hort. Schoenbr. 1: 42, t.80 (1797).
Curculigo plicata (Thunb.) Dryand. in Ait., Hort. Kew. ed. 2, 2: 253 (1811); Baker in Fl. Cap. 6: 173 (1896); Marloth, Fl. S. Afr. 4: 116, t. 33c, Fig. 34a (1915).
Forbesia plicata (Thunb.) Nel in Bot. Jahrb. 51: 291 (1914).
CAPE. Stellenbosch, former golf links, 14 vi 1963, *Bos* 43 (K); Stellenbosch flats, 1100 m, 29 iv 1913, *Garside* 459 (K). Cape, at foot of Signal Hill, Apr. 1908 (mature leaf June 1908), *Dümmer* 1340; Camps Bay, *Rehmann* 1594 (Z); Cape Town, *Rehmann* 1492 (Z); Doornhoogde in der Kapfläche, *Ecklon & Zeyher* (Z); Cape Flats, near Claremont, 30 iii 1892, *Schlechter* 601 (Z); Kapsche Dunen, *Ecklon & Zeyher* 4141 (Z); Lion Mt., *Bergius* (B).

Hypoxis luzulifolia DC., quoted as a synonym by Baker in *Flora Capensis*, is here referred to the South American *Curculigo scorzonerifolia* (Lam.) Bak.
(see No. 67 on page 307).

75. Empodium veratrifolium (Willd.) M. F. Thompson in Journ. S. Afr. Bot. 38(3): 163 (1972); Mason, W. Cape Sandveld Flowers, 50, t. 14 f. 6 (1972).
Type: Jacquin, Icones Rariores, 2, t. 367.
Syn.: [*Hypoxis plicata* auct.; Jacq., Ic. Rar. 2, t. 367 (1786–93), et Collect. suppl. 55 (1796)—non (Thunb.) L.f.].
Hypoxis veratrifolia Willd., Sp. Pl. 2: 109 (1799).
Curculigo plicata (Thunb.) Dryand. var. β, Ker in Bot. Reg. 4: t. 345 (1819).
Curculigo plicata var. *veratrifolia* (Willd.) Baker in Dyer, Fl. Cap. 6: 173 (1896).
Forbesia plicata (Thunb.) Nel var. *veratrifolia* (Willd.) Nel in Bot. Jahrb. 51: 290 (1914).
CAPE. Clanwilliam distr., Doorn Bridge, 31 vi 1936, *Salter* 6117. Calvinia distr., Hantam Mts., 1869, *Meyer* (B).
See also No. 72 on page 313.

76. Empodium sp.
LESOTHO. Qacha's Nek distr., Mt. Sauer, trouvé au sommet dans l'herbe, fleur jaune, trouvé aussi au bord d'un ruisseau á Uplands, x 1913, *Jacottet* 510—B593(Z).

This small neat species has only once been collected, so far as we know. It appears to represent an undescribed species, but further material, and mature foliage leaf (which is apparently solitary) is desirable before giving it a name. The outer tepals are 13·5 × 4·25 mm, the inner 12·25 × 3·5 mm. The very short filaments are united into a shallow cup around the style: the free part is 0·5 mm, the fused basal part 0.25 mm; the anthers are 7 × 1 mm, without any appendage. The style about equals the stigmatic branches, 2·75 mm, and seems to retain a histological identity deep into the beak of the ovary which is c. 5 cm long, the ovary itself being hidden within the sheathing leaves.

CAMPANULACEAE

77–80. Craterocapsa Hilliard & Burtt, **genus novum** a *Wahlenbergia* Roth capsula operculo, nec valvis, dehiscente, ab *Edraiantho* A.DC. operculo et seminibus ellipsoideis, nec applanatis, a *Roella* L. capsulae structura, foliis nec decurrentibus nec fasciculos foliosos in axillis gerentibus differt.
Syn.: *Wahlenbergia* § *Montanae* v. Brehm. in Bot. Jahrb. 53: 68 (1915), pro parte (*W. pusilla, W. squarrosa, W. acauli excl.*)

Herbae perennes, prostratae, foliis alternis vel (in *C. montano*) interdum paucis in eadem planta oppositis. *Flores* sessiles vel breviter pedicellati, plerumque singuli (in *C. congesta* pauci aggregati), terminales vel pseudo-laterales. *Calyx* tubo libero lobis anguste triangularibus vel foliaceis multo breviore. *Corolla* infundibularis, lobis 5 tubo brevioribus. *Stamina* libera, filamentis inferne dilatatis. *Stylus* basi incrassatus vel disco circumcinctus, superne in lobos 3 (raro 2) divisus. *Ovarium* omnino inferum, campanulatum, 3-loculare (raro 2-loculare); ovula in placenta supra medium axem oriente numerosa. *Fructus* capsularis, operculo dehiscens, maturitate septis dissolutis unilocularis. *Semina* ellipsoidea, leviter angulata.
Typus generis: *C. tarsodes* Hilliard & Burtt.

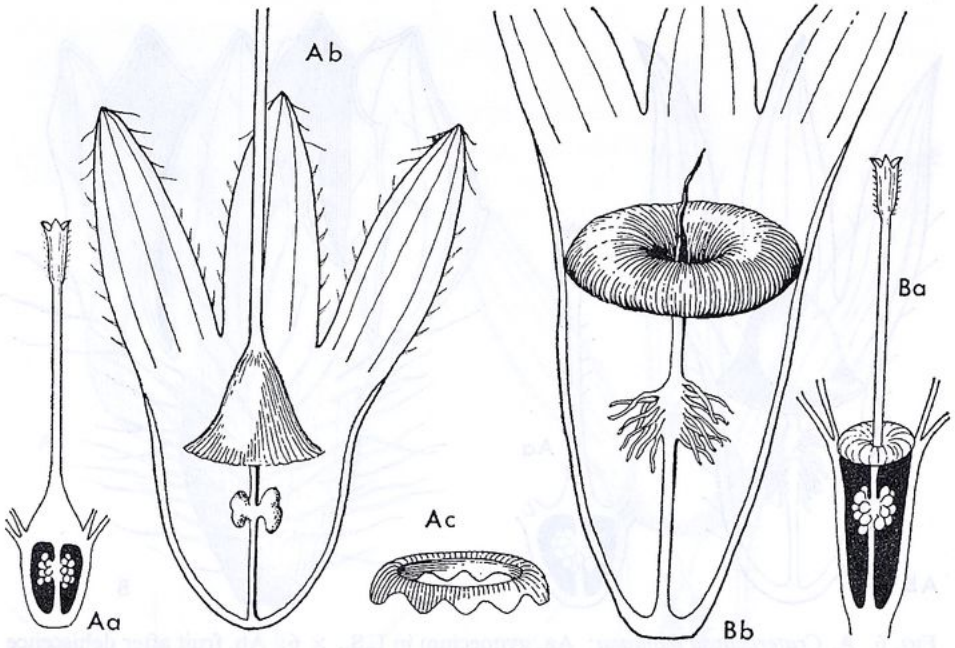

FIG. 5. A, *Craterocapsa tarsodes*: Aa, gynoecium in L.S., × 6; Ab, fruit after dehiscence in L.S., the plug replaced intact, × 9; Ac, ring of tissue from top of ovary (for details see text), × 9. B, *Craterocapsa congesta*: Ba, gynoecium in L.S., × 6; Bb, fruit after dehiscence in L.S., the plug replaced intact, × 9.

In January 1969, we collected on Ngeli Mt. in southern Natal a plant that showed obvious affinity to one common in the Natal Drakensberg and familiar to us under the name *Wahlenbergia montana*. As, however, there were apparent differences, we looked into the structure of the Ngeli plant more closely. The first discovery was that the fruit did not seem to be that of a *Wahlenbergia* and in fact approximated, from the descriptions, more to that of *Roella*. We soon found that the Drakensberg plant had a rather similar fruit. Furthermore, the latter plant was wrongly known as *W. montana*, which proved to be a closely related species of the eastern Cape and Lesotho. The investigation was now in full swing and three other plants known as *W. ovalis* v. Brehm., *W. basutica* Phillips and *Roella* ? *insizwae* Zahlbr. were soon involved. For reasons set out in detail below we have finally concluded that this small group (there are four good species) deserves recognition at generic level.

Throughout the Campanulaceae, primary generic characters depend upon fruit structure. In the species with which we are now concerned, the cup-shaped ovary is generally trilocular, sometimes bilocular. The membranes separating the loculi are exceedingly delicate and the mature capsule is one-chambered. It forms a deep chalice crowned by the persistent calyx. The lid of the chalice, described in some detail below, lifts cleanly out to release the seeds, whence the generic name *Craterocapsa*.

In *C. tarsodes*, (the Drakensberg "*Wahlenbergia montana*"), the base of the style broadens out to form a shallow cone filling the base of the calyx tube. There is no disc (fig. 5Aa). The mature capsule is closed by a domed lid

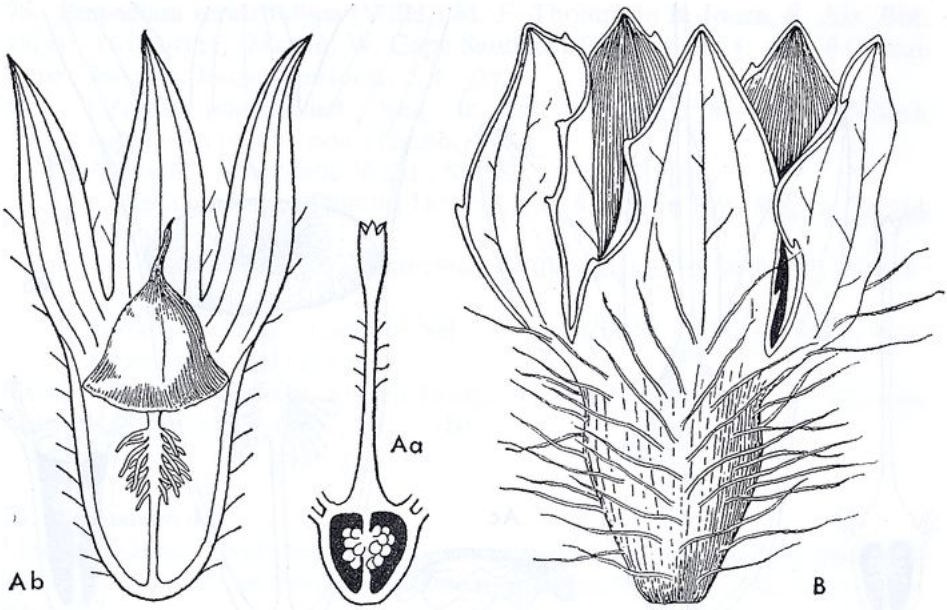

FIG. 6. A, *Craterocapsa montana*: Aa, gynoecium in L.S., × 6; Ab, fruit after dehiscence in L.S., the plug replaced intact, × 8. B. *Craterocapsa insizwae*, calyx and ovary, × 8.

formed from the now much enlarged style base. Dehiscence can be very neat: a narrow ring of hardened tissue (a 10-toothed crown, the teeth presumably the stubs of vascular strands) separates from the style base and the calyx wall and lifts out, intact or in pieces, to release the seeds (fig. 5 Ab, Ac). The centre-piece remains attached to the axis of the capsule. On the other hand, it seems that the axis often degenerates quickly, and the lid becomes completely detached and simply falls out.

C. montana, too, lacks a disc, and the swollen style base and top of the ovary together crown the mature capsule (fig. 6A). The part of this lid or plug derived from the top of the ovary forms a thin, narrow "skirt" surrounding the now much swollen and domed style base. Old capsules may be seen, wall intact, seeds inside, but the style base still held firmly in place by the vascular strands of the "skirt", the rest of its tissue long since rotted away. At this stage, the calyx will have partly rotted away too. On the other hand, the plug may fall out cleanly to release the seeds. Before dehiscence, the plug may become more or less hollow and some of the seeds are pushed up into it. Dehiscence in *C. insizwae* is similar to that of *C. montana*. *C. congesta*, however, differs from all three. Here, the style base does not broaden out, but is surrounded by a fleshy disc (fig. 5B). This disc together with the top of the ovary form a lid, swollen at the edge, depressed centrally, which eventually lifts out to release the seeds. The style base does not swell, but merely withers away.

Such a mode of dehiscence turns one's thoughts to *Roella*. In revising *Roella*, R. S. Adamson (in Journ. S. Afr. Bot. 17: 129, 1951) merely describes the capsule as "opening by a hole or pore at the top at the position of the base of the style" and gives no further details. However, the century-old observations of Bentham are much more perceptive. He said (Bentham & Hooker,

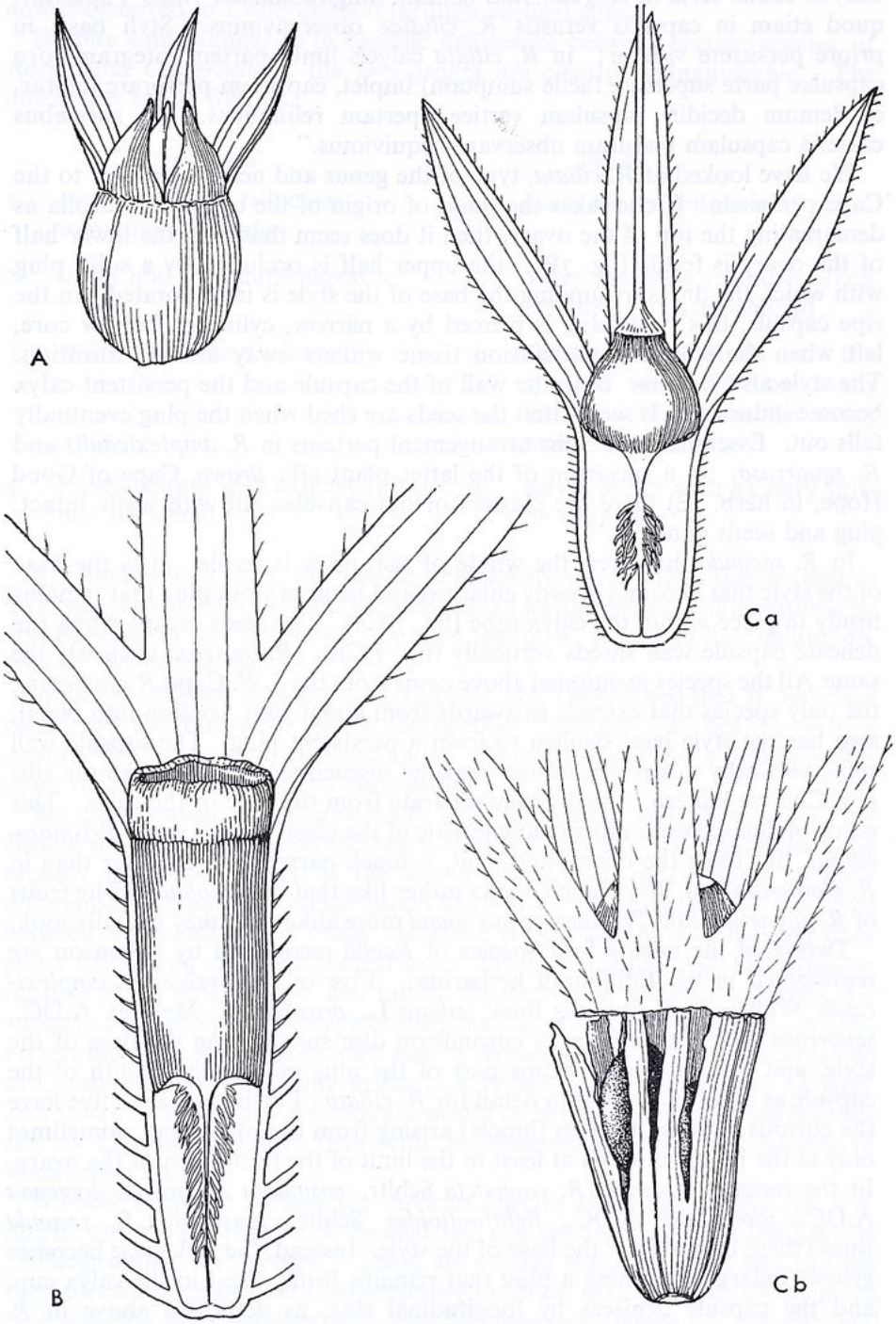

FIG. 7. A, *Wahlenbergia intricatissima*, capsule, two lobes of calyx removed, × 6. B, *Roella ciliata* fruit after dehiscence in L.S., plug replaced intact, × 6. C, *Roella secunda*; Ca, fruit (except the plug) in L.S., × 12; Cb, fruit, showing dehiscence, × 12.

Gen. Pl. 2: 559, 1876) "De capsulae dehiscentia ulterius inquirendum est. Calycis tubus certe in *R. glomerata* demum longitudinaliter rimis 5 aperitur, quod etiam in capsulis vetustis *R. ciliatae* observavimus. Styli basis in priore persistere videtur; in *R. ciliata* calycis limbi partem integram (pro capsulae parte superiore facile sumptam) implet, capsulam perforare dicitur, et demum decidit, capsulam vertice apertam relinquens. In speciebus caeteris capsulam maturam observare nequivimus."

We have looked at *R. ciliata*, type of the genus and nearly confined to the Cape peninsula. If one takes the point of origin of the calyx and corolla as demarcating the top of the ovary, then it does seem that only the lower half of the ovary is fertile (fig. 7B): the upper half is occluded by a solid plug with which the disc surrounding the base of the style is incorporated. In the ripe capsule, this stout plug is pierced by a narrow, cylindric, hollow core, left when the stigmatic transfusion tissue withers away after fertilization. The style also withers. Both the wall of the capsule and the persistent calyx become indurated. It seems that the seeds are shed when the plug eventually falls out. Essentially the same arrangement pertains in *R. amplexicaulis* and *R. squarrosa*. In a specimen of the latter plant (*W. Brown*, Cape of Good Hope, in herb. E) there are clusters of old capsules, all with walls intact, plug and seeds gone.

In *R. secunda*, however, the whole of the ovary is fertile. It is the base of the style that becomes grossly enlarged and forms a stout plug that remains firmly in place within the calyx tube (fig. 7 Ca). The seeds escape when the delicate capsule wall shreds vertically (fig. 7 Cb). *R. muscosa* is clearly the same. All the species mentioned above come from the S.W. Cape. *R. glomerata*, the only species that extends eastwards from about East London into Natal, also has the style base swollen to form a persistent plug. The capsule wall splits vertically down five sutures and the segments gape apart like the ribs of a Chinese lantern. Finally they separate from the base of the calyx. This mode of dehiscence is more characteristic of the closely allied genus *Prismatocarpus*, but there the ovary, and fruit, is much narrower and longer than in *R. glomerata* and, at a glance, looks rather like that of *Epilobium*. The fruits of *R. glomerata* and *Prismatocarpus sound* more alike than they actually look.

Twelve of the twenty four species of *Roella* recognised by Adamson are represented in the Edinburgh herbarium. Five of the twelve (*R. amplexicaulis* Wolley-Dod, *bryoides* Buek, *ciliata* L., *prostrata* E. Mey. ex A.DC., *squarrosa* Berg.) have a fleshy coroniform disc surrounding the base of the style, and this eventually forms part of the plug closing the mouth of the capsule as described above in detail for *R. ciliata*. Furthermore, all five have the curious feature of leaves (bracts) arising from the ovary wall, sometimes only at the base, but often at least to the limit of the fertile part of the ovary. In the remaining seven (*R. compacta* Schltr., *cuspidata* Adamson, *dregeana* A.DC., *glomerata* A.DC., *lightfootioides* Schltr., *muscosa* L.f., *secunda* Buek) there is no disc at the base of the style. Instead, the style base becomes grossly enlarged, forming a plug that remains firmly fixed in the calyx cup, and the capsule dehisces by longitudinal slits, as described above in *R. secunda* and *R. glomerata*. These species lack leaves on the ovary wall, except occasionally at the very base. Although the species are not adequately described for these characters, it seems likely that the species in Adamson's series *Ciliatae*, *Prostratae* and *Squarrosae* have the seeds escaping through an

apical hole, those in the series *Spicatae* and *Muscosae* (excluding *R.* ? *insizwae*, now transferred to *Craterocapsa*) through vertical slits.

Despite some similarity in capsule dehiscence between certain species of *Roella* and *Craterocapsa*, the two genera are clearly distinguishable. The differences are as follows.

Craterocapsa	*Roella*
1. ovary generally trilocular sometimes bilocular.	1. ovary always bilocular
2. ovary and fruit cup-shaped	2. ovary narrowly cylindric, fruit cylindric or barrel-shaped.
3. ovary wall without leaves	3. perhaps two thirds of the species with few or many leaves arising from the ovary wall.
4. leaves neither with axillary tufts nor decurrent.	4. leaves either with axillary tufts or decurrent.

In *Wahlenbergia* itself, the capsule dehisces by apical valves that project to a varying extent above the base of the calyx (see the series of illustrations by von Brehmer in Bot. Jahrb. 53: 23 fig. 3, 29 fig. 6, 36 and 37 figs. 9a and 9b, also fig. 7A in this text).

Sonder (in Harvey & Sonder, Fl. Cap. 3: 573, 1865) noted that *W. montana* resembled the European genus *Edraianthus*. Sonder was dealing with a mixture of *Craterocapsa montana* and *C. tarsodes*; *C. congesta* bears an even more striking resemblance to *Edraianthus*.

We have considered the possibility that *Edraianthus* and *Craterocapsa* are closely allied, but the resemblance is chiefly in habit. In *Edraianthus* the broadly expanded bracts of the flower cluster are much more strongly differentiated from the foliage leaves than any in *Craterocapsa*: the septa between the loculi of the ovary are more robust and have a marked dark green thickening near the central axis: the fruit dehisces by the irregular rupture of the flattish top: and finally the seeds, and indeed the ovules, are strongly compressed. The type of seed that occurs in *Edraianthus* is, in fact, very common in *Campanula* itself and in *Asyneuma* and other genera classed as Campanulineae (Wagenitz in Engl. & Prantl, Syll. Pflanzenfam. 12 Aufl. 480, 1964). It seems that *Edraianthus* would be better placed as an indehiscent ally of *Campanula* rather than with *Wahlenbergia*, *Roella* and *Jasione* in Wahlenbergiinae.

W. von Brehmer revised the African species of *Wahlenbergia* (in Bot. Jahrb. 53: 9–143, 1915) and divided the 150 species he recognised into 30 "Artengruppen" or "greges". These are printed with the sign § but, though they are clearly equivalent taxonomically to series, they can scarcely be given that standing nomenclaturally as they are nowhere assigned a conventional formal rank. *Wahlenbergia montana* gave its name to § *Montanae*, where it was associated, rightly, with *W. ovalis* v. Br. and, wrongly, with *W. pusilla* A. Rich. from East Africa and Ethiopia, and *W. acaulis* A.DC. and *W. squarrosa* v. Br. from the Western Cape.

W. pusilla (cf. Fries in Notizbl. Bot. Gart. Berlin 8: 39, 1923, and Hedberg in Symb. Bot. Upsal. 15: 185, fig. 11, 1957) seems to be a good species of *Wahlenbergia*, the capsule opening by apical valves. Its dwarf habit and solitary flowers make it taxonomically isolated: the ovary, furthermore appears to be bilocular.

W. acaulis and *W. squarrosa* are closely allied to each other but show numerous differences from *Wahlenbergia*. In *W. acaulis*, of which alone we have seen ripe fruits, the segments of the fruiting calyx are separated by protuberant folds or gussets. These appear to be what von Brehmer refers to as "foliola squamiformia"; they are only just visible in the flowering stage (cf. the figure of *W. acaulis*; Oliver in Hook., Ic. Pl. t. 1543, 1896), and there is a hint of them in the type specimen of *W. squarrosa*, in which von Brehmer says they are lacking. In the fruit they are associated with much swollen bases to the calyx segments. The top of the capsule remains as a slightly undulating lid and it seems likely that the gussets and swollen bases of the calyx-segments act mechanically, permitting the escape of seed from under the lid only in certain conditions. The seeds themselves are turbinate with 5 narrow wings, quite unlike any seen elsewhere in *Wahlenbergia*.

The status of these two species has not yet been finally determined; they will quite probably form the nucleus of a new genus, but it suffices for the moment to demonstrate that they have nothing to do with the plants to which von Brehmer allied them, particularly to those we now place in *Craterocapsa*.

Key to the species of Craterocapsa

1a. Flowers sessile. Ovary and calyx tube glabrous or occasionally ciliate on the ribs 2

1b. Flowers on pedicels 1–20 mm long, very variable even on the same plant. Ovary and calyx tube villous with long white spreading hairs 3

2a. Flowers opening only one at a time, strictly terminal but soon overtopped by a shoot from the uppermost leaf axil, and then appearing lateral. Base of style expanded but not surrounded by a fleshy disc . . . . . *C. tarsodes*

2b. Flowers usually several open together, rarely only one, clustered at the tips of the branches and terminating their growth. Base of style not expanded but surrounded by a flat fleshy disc . *C. congesta*

3a. Stems often leafy, but leaves tending to become rosetted at the branch-tips, lanceolate to elliptic, gradually narrowed to a petiole-like base . . . . . *C. montana*

3b. Leaves evenly distributed along the branches, ovate, abruptly contracted to the petiole-like base . . . . *C. insizwae*

77. Craterocapsa congesta Hilliard & Burtt, **species nova.** Fig. 5B.

Herba perennis, prostrata, radice longa crassa rosulis foliorum una vel pluribus coronata; ramuli laterales simplices, ex axillis foliorum inferiorum radiantes, foliosi, foliis glomeratis flores circumcingentibus terminati. *Folia* lineari-lanceolata, usque ad 35 × 3 mm, rosulata eis caulium florentium

duplo longiora, apice acuta, margine incrassata obscure dentata parte basali ciliata excepta. *Flores* sessiles, plures, raro singuli, apicibus ramulorum foliis latioribus bracteiformibus circumcincti. *Calyx* tubo libero 1–2 mm longo, costis ciliato vel glabro; lobi lanceolati, acuti, apiculati, 2·5–4·5 mm longi, marginibus et interdum dorsaliter ciliatis. *Corolla* infundibularis, pallide purpureo-caerulea; tubus 4–10 mm longus; lobi 3·5–8 × 2·5–4·5 mm, extra pubescentes et sub apice ciliati, intus pilis paucis tenuibus sub sinubus instructi. *Stamina* 5, libera; filamenta plana, superne filiformia dimidio inferiore abrupte dilatata humeris ciliatis; antherae liberae, longitudinaliter dehiscentes, glabrae. *Ovarium* inferum, triloculare, 10–costatum, costis ciliatum vel glabrum, c. 3 mm longum; ovula numerosa. *Stylus* teres, basi haud dilatatus sed disco carnoso plano margine crenato circumcinctus, superne sub stigmate incrassatus et pubescens; stigma in lobos 3 breves pubescentes recurvos divisum. *Capsula* c. 5 mm longa, calyce indurato coronata, operculo dehiscens. *Semina* rubro-brunnea, ellipsoidea, trigona, 0·75 mm longa.
Type. Natal, Mt. Ngeli, *Hilliard & Burtt* 5835 (E holo; NU iso).

A prostrate perennial herb with a long stout taproot crowned with one or several leaf rosettes from beneath which radiate slender, leafy simple stems terminating in a cluster of leaves surrounding the flowers. *Leaves* linear-lanceolate, up to 35 × 3 mm, those on the flowering stems about half the length of the basal rosette leaves, margins ciliate particularly in the lower half. *Flowers* sessile, terminal, usually several crowded together, rarely only one, variable in size, bluish-mauve. *Ovary* glabrous or ciliate on the ribs, style surrounded at the base by a fleshy disc that, together with the top of the ovary, forms the flattish lid of the capsule.

LESOTHO. Mokhotlong, on top of "Temrock Peak", *Liebenberg* 5767 (PRE); slope of Matelile high mountains, *Dieterlen* 1305 (PRE); top of Blue Mountain, *Whellan* 1460 (PRE); Lehaha-la-Sekhonyana, 28° 19′E, 29° 23′ S, *Guillarmod* 226 (PRE); Ntibokho valley, 28° 18′ E, 29° 20′ S, *Guillarmod* 290 (PRE); Sani Pass, 2820 m, 17 ii 1973, *Hilliard* 5314 (E, NU).
NATAL. Estcourt distr., plateau at summit of Giant's Castle Pass, *Wright* 1060 (E, NU). Impendle distr., Hlatimba pass, to Lesotho summit plateau, c. 2790 m, 2 xii 1972, *Wright* 1317 (E, NU).
CAPE. Maraisburg [between Hofmeyr and Tarkastad], 1220 m, *Archibald* 2643 (GRA). Barkly East distr., Wittebergen, Ben Mcdhui, *Galpin* 6762 (GRA, K, NH, PRE). Mt. Ayliff distr., Insizwa Mt., *Hilliard & Burtt* 6563 (E, K, NU, S). Mt. Currie Distr., summit Mt. Currie, *Tyson* 1764 p.p. (K); Fort Donald, *Tyson* 1649 p.p. (K); Vaalbank, *Haygarth* (herb, *Wood* 4181) (K, Z).

C. congesta is readily distinguishable by its unbranched flowering stems with terminal flowers closely surrounded by leaves, and by the fleshy disc at the base of the style, which does not swell as the capsule matures, so the lid is flattish, not domed as in the other species.

The plants grow in small colonies in short, stony grassland, mostly at relatively high altitudes, and this is perhaps why the species is poorly represented in herbaria. Galpin collected it on Ben Mcdhui on the Cape-Lesotho border in 1904, and von Brehmer (loc. cit.) cited this specimen with

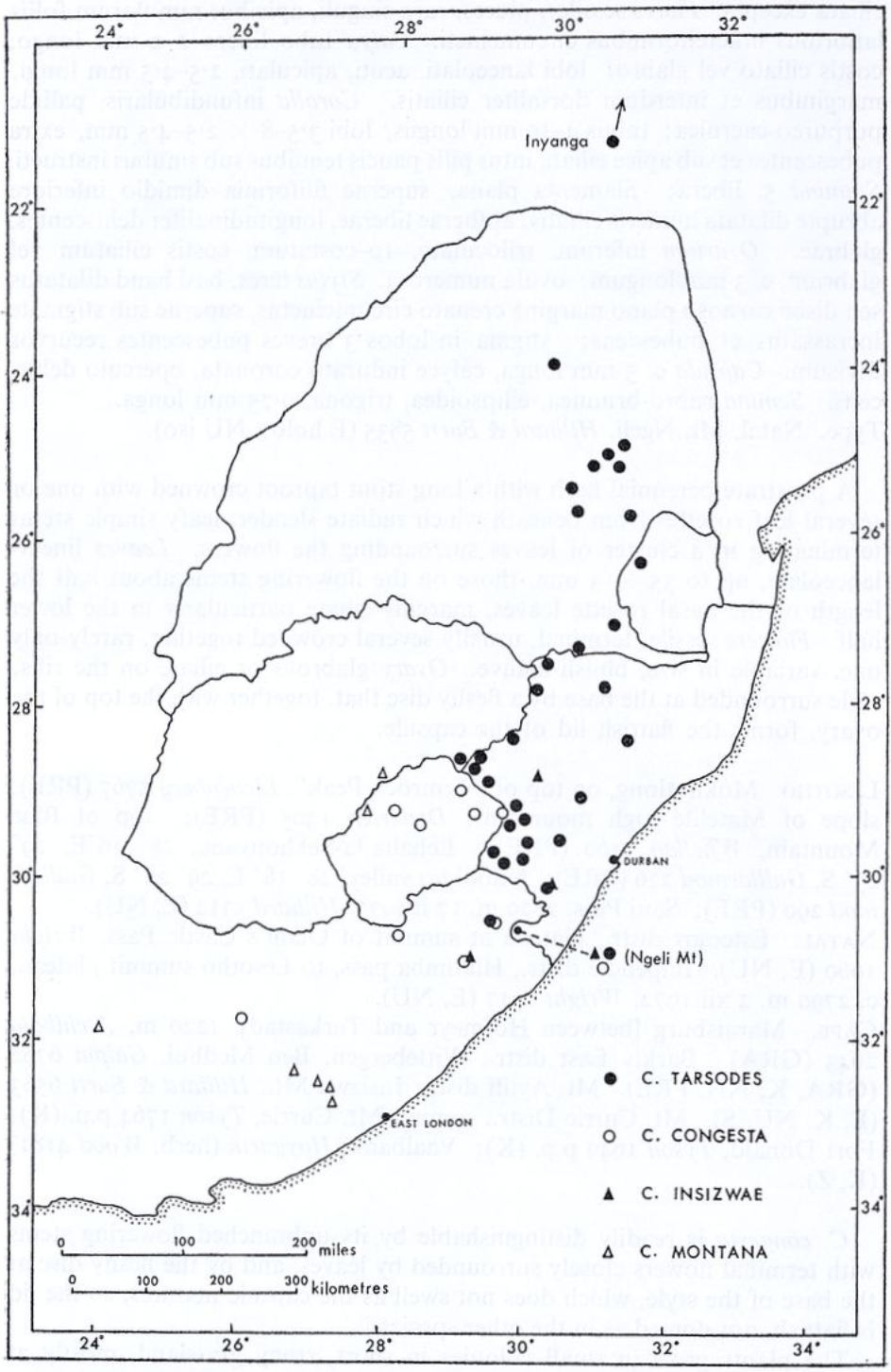

FIG. 8. Map of south-east Africa showing distribution of the species of *Craterocapsa*.

reservation as *W. montana*. There is, however, good material in several herbaria, and it is clearly *C. congesta*. Tyson collected it on Mt. Currie and at Fort Donald in 1884, both localities near Kokstad and not far from Ngeli. Haygarth (4181 in herb. Wood) had it from Vaalbank, also near Kokstad, in 1889. Von Brehmer cited this latter specimen as *W. montana*.

The species ranges from Maraisburg, between Hofmeyr and Tarkastad in the eastern Cape, to the high Drakensberg on the Cape-Lesotho-Natal border and the mountains of Lesotho itself, and to Ngeli Mt. and the nearby mountains of East Griqualand, mostly between 2440 and 3350 m above sea level but at only 1500 to 2000 m on Mt. Insizwa and 1220 m at Maraisburg. It flowers from December to March.

78. Craterocapsa insizwae (Zahlbr.) Hilliard & Burtt, **comb. nov.** Fig. 6B.
Type: Cape, Transkei, Mt. Insizwa, leg. *Krook* (Pl. Penther. 2759 W!).
Syn.: *Roella ? insizwae* A. Zahlbr. in Ann. K. K. Hofmus. Wien 18: 401 (1903).
Wahlenbergia ovalis v. Brehm, in Bot. Jahrb. 53: 130 (1915).
Types: Natal, Bloukrantz river, c. 1250 m, *Schlechter* 6874* (lectotype Z!); Ixopo, c. 1350 m, *Schlechter* 6660 (syntype, n.v.).

A well-branched, prostrate perennial herb, stems villous with spreading hairs, rooting. *Leaves* evenly distributed, ovate, up to 12 × 7 mm, abruptly contracted to the petiole-like base, lower surface thinly villous, upper glabrous or nearly so. *Flowers* mauve-blue, solitary, apparently axillary, pedicels 1–20 mm long, very variable even on a single plant. *Ovary* villous, hairs patent, style base broadened to form the top of the ovary, accrescent into the domed lid of the capsule.
NATAL. Alfred distr., Weza, Ingeli slopes, *Strey* 6319 (NH, NU).

C. insizwae is obviously closely related to *C. montana* and has the same habit and ecological preferences, but flowers later, in January and February. As in *C. montana*, the flowers appear to be axillary, but are, more strictly, terminal and overtopped by younger growth. *C. insizwae* is distinguished by having leaves evenly distributed along the branches, not tending to be rosetted at the branch tips as in *C. montana*, by their shape, ovate and more abruptly contracted at the base than in *C. montana*, and by its leaf-like calyx lobes (fig. 6B).

C. insizwae is known from only four collections: from Mt. Insizwa, south of Kokstad, and nearby Ngeli Mt. on the Cape-Natal border, Ixopo in southern Natal, and the Bloukrantz river north of Estcourt. In the type material (Mt. Insizwa) and in *Strey* 6319 from nearby Ngeli Mt., the ovary is 2-celled. *Schlechter* 6874 (lectotype of *Wahlenbergia ovalis*, from the Bloukrantz river) has a 3-celled ovary, but accords so well in other respects with *C. insizwae* that it is with only slight doubt that we include it here. The other two species of *Craterocapsa* seem consistently to have a 3-celled ovary.

79. Craterocapsa montana (A. DC.) Hilliard & Burtt, **comb. nov.** Fig. 6A.
Type: Cape, Katberg, alt. 5000–6000 ft., *Drège* 3395 (holo G–DC!; iso BM!, E!, K!).

* *Schlechter* 6874 (GRA) is a true *Wahlenbergia* aff. *W. undulata*.

Syn.: *Wahlenbergia montana* A. DC., Prodr. 7: 430 (1839); Sonder in Harv. & Sond., Fl. Cap. 3: 573 (1865) excl. var. *glabrata* Sond.; v. Brehmer in Bot. Jahrb. 53: 130 (1915) pp.. et excl. vars.
W. basutica E. P. Phillips in Ann. S. Afr. Mus. 16: 181 (1917); Batten & Bokelmann, Wild Flow. Eastern Cape 147, pl. 118 fig. 2 (1966); Guillarmod, Fl. Lesotho 263 (1971). Type: Lesotho, Leribe, *Dieterlen* 622 (GRA! K!).

A prostrate perennial herb with numerous branching, rooting stems radiating from the crown, villous when young, hairs patent. *Leaves* opposite or alternate, often tending to be crowded at the tips of the branchlets, lanceolate to elliptic, 6–10 (–20) × 3–6 mm, tapering to a broad, flat petiole-like base, margins ciliate, the hairs extending particularly to the midvein below, often to the upper surface as well. *Flowers* solitary in upper leaf axils, pedicels villous, 1–20 mm long, very variable even on one plant, flowers mauve-blue. *Ovary* villous, hairs patent, style base broadened into a shallow cone filling the base of the calyx tube, accrescent, finally forming the domed lid of the capsule.
LESOTHO. Mamathes, 27° 50′ E, 29° 8′ S, *Guillarmod* 394 (PRE).
ORANGE FREE STATE. Ficksburg, farm "Strathcona", *Galpin* 13847 (K, PRE).
CAPE. Victoria East distr., Hogsback, *Rattray* 402 (PRE). Stockenstrom distr., top of Katberg Pass, *Sidey* 3786 (PRE). Keiskammahoek distr., Ghulu Kop, *Dyer* 655 (PRE); ibidem, *Dyer* 309 (GRA). Kingwilliamstown distr., Pirie, *Sim* 1537 (GRA, NU). Somerset East distr., Boschberg, *MacOwan* 1624 (BM, K, Z). Graaff Reinet distr., Murraysburg, Koudeveld Mts., *Tyson* 415 (GRA).

Plants of *C. montana* sprawl on bare, often stony, earth or in short, sparse grassland. A central leaf rosette is sometimes present (probably young plants) and these leaves tend to be longer and narrower than the stem leaves. Although the flowers appear to be axillary, they are probably more strictly terminal, but are soon overtopped by new shoots growing out from the uppermost leaf axil.

C. montana ranges from the Koudeveld Mts. near Murraysburg, NW of Graaff Reinet, to the Amatolas, then with an apparent distributional gap until it occurs again on the Orange Free State—Lesotho border between Maseru, Ficksburg and Leribe, between 1220 and 1830 m above sea level. It flowers from October to December.

E. P. Phillips placed both *C. tarsodes* and *C. congesta* under *Wahlenbergia montana* and was thus led to redescribe the true *W. montana*, which he called *W. basutica*.

80. Craterocapsa tarsodes Hilliard & Burtt, **species nova.** Fig. 5A.
Type: Natal, Lions River distr., boundary gates between 'Roslyn' and 'Silverdale' on main private road, 1530 m, 14 i 1973, *Wright* 1346 (holo. E, iso NU).
Syn.: *Wahlenbergia montana* var. *glabrata* Sonder in Harv. & Sond., Fl. Cap. 3: 573 (1865); v. Brehmer in Bot. Jahrb. 53: 131 (1915). Type: Drakensberg (sphalm. Draakensteenberg), *Cooper* (K! E! Z!).
W. montana var. *angustisepala* v. Brehm. in Bot. Jahrb. 53: 131 (1915).

Types: Natal, Weenen County, *Medley Wood* 905 (E!) and Van Reenen, *Medley Wood* 6574.

[*W. montana* auctt., non DC.; Wood, Handb. Natal Fl. 76 (1907); v. Brehmer in Bot. Jahrb. 53: 130 (1915) p.p.; Bews, Fl. Natal & Zululand 204 (1921); Killick in Bot. Surv. S. Afr. Mem. 34: 138 (1963); Compton in Journ. S. Afr. Bot. Suppl. 6: 73 and 168 (1966); Edwards in Bot. Surv. S. Afr. Mem. 36: 275 (1967); Trauseld, Wild Flow. Natal Drakensberg 189 (1969); Guillarmod, Fl. Lesotho 264 (1971).]

Herba perennis, prostrata, radicans, radice crassa fusiformi interdum radicibus lateralibus fusiformibus etiam praesentibus; caules ramosi, juveniles glabri vel pilis albis patentibus praediti, foliosi vel tandem basibus foliorum persistentibus asperi. *Folia* plurima ad apices ramulorum rosulata, lanceolata vel elliptica, (5–) 15–25 (–40) × (3–) 5 (–12) mm ad basin latam planam petioliformem attenuata; laminae margines incrassatae, remote denticulatae, late undulatae; pars basalis membranacea, marginibus ciliatis, interdum ciliis subtus in costa etiam praesentibus. *Flores* sessiles, solitarii, terminales, sed gemma foliosa mox superati pseudolaterales. *Calyx* tubo libero 1–2 mm longo; lobi 5, lanceolati, 3–8 mm longi, apiculati, marginibus incrassatis ciliatis, ciliis ad apicem versus retrorsis. *Corolla* infundibularis, pallide caerulea vel alba; tubus 6–12 mm longus; lobi 6–10 × 3–6.5 mm, extra glabri vel pubescentes et ciliis longis 2–3 sub apice instructi, intus sub sinubus loborum pilosi. *Stamina* 5, libera; filamenta plana, superne filiformia dimidio inferiore abrupte dilatata et humeris ciliata; antherae liberae, glabrae, longitudinaliter dehiscentes. *Ovarium* inferum, triloculare, glabrum, 10-costatum; ovula numerosa. *Stylus* teres, basi conico-ampliatus basin tubi calycini implens, superne sub stigmate abrupte incrassatus et pubescens; stigma trilobatum, lobis brevibus recurvis pubescentibus. *Capsula* 2–3 mm longa, calyce indurato coronata, operculo (vel interdum annulo basin persistentem styli circumcingente) dehiscens. *Semina* 0.75 mm longa, rubrobrunnea, ellipsoidea, trigona.

A mat-forming perennial herb with a thick fusiform taproot, stems prostrate, branching. *Leaves* mostly rosetted at the tips of the branchlets, lanceolate to elliptic, (5–) 15–25 (–40) × (3–) 5 (–12) mm, tapering to a broad flat, petiole-like base, margins here ciliate, otherwise leaf generally glabrous, occasionally sparsely hairy below. *Flowers* sessile, apparently solitary in the axils of the rosette leaves, opening in succession, variable in size, pale blue or white. *Ovary* glabrous, style base broadened into a shallow cone filling the base of the calyx tube, accrescent, finally forming the domed lid of the capsule.

RHODESIA. Inyanga distr., Mt. Inyangani near summit, *Wild* 4906 (K).

TRANSVAAL. Pietersburg distr., Haenertsburg, *Mogg* 16641 (PRE). Pilgrims rest distr., 1 ml. SE Graskop, *Codd & de Winter* 3320 (PRE). Lydenburg distr., Lydenburg, *Atherstone* (K); Mt. Anderson, *Meeuse* 10055 (PRE); Kemps Heights, 18 mls. SE Lydenburg, *Marais* 62 (PRE); near Helvetia, *Young* A 260 (PRE); Zwagershoek, *Obermeijer* 324 (PRE). Sabie distr., Ross Hill above Sabie, *Smuts & Gillett* 2245 (PRE); Sabie, *Rogers* 18506 (PRE). Belfast distr., Machadodorp, mt. top on Lydenburg road, *Galpin* 13087 (PRE); Dullstroom, Suikerboskop, *Galpin* 13192 (K, PRE); Elandspruitberg, *Schlechter* 3854 (GRA, K, NBG, PRE, Z). Barberton distr.,

Berlin, Godwan River Station, *Hofmeyr* 9 (PRE). Piet Retief distr., Iswepe, *Sidey* 1591 (PRE). Wakkerstroom distr., Oshoek, *Devenish* 788 (K, PRE). SWAZILAND. Near Mbabane, Dalriach, *Bolus* 12098 (K, PRE); Mbabane, *Dawson* 21 (BM).
NATAL. Vryheid distr., Lancaster Hill, *Galpin* 9824 (K, PRE). Newcastle distr., Muller's Pass, Normandien Forest Reserve, *Edwards* 2383 (NU); summit Majuba, *Hilliard* 2283 (NU). Klipriver distr., Van Reenen, *Medley Wood* 9655 (NH). Bergville distr., Oliviershoek Pass, *Werdermann & Oberdieck* 1505 (K); ibidem, *Gillett* 1144 (NH); Cathedral area, *Schelpe* 934 (NH, NU); Mont aux Sources, summit of Dooley, *Bayer & McClean* 175 (K, NU, PRE); Cathedral Peak, *Killick* 1214 (K). Babanango distr., Babanango, *King* 472 (NH). Estcourt distr., Cathkin Peak, *Galpin* 11753 (K), *Strey* 7818 (NH); Champagne Castle, *McBean* 32 (E, NU); Giants Castle Game Reserve, *McKeown* 72 (NU); near Giants Castle hut, *Wright* 1156 (E, NU); Tabamhlope, *Miller* 423 (PRE). Impendhle distr., Impendhle, "Tillietudlum", *Huntley* 463 (NU); path from Loteni N.R. to Hlatimba Pass, c. 1950 m, 25 xii 1972, *Wright* 1345 (E, NU). Polela distr., Bulwer, *Bayer* 323 (NH). Pietermaritzburg distr., Zwaartkop, *Medley Wood* 10239 (E, NH, NU). Umvoti distr., Greytown, *Wylie* s.n. (NH 22468). Ixopo distr., Ixopo, "Maxwell", *Evans* 710 (NH). Alfred distr., Weza, Ngeli slopes, *Strey* 6340 (K, NH). Underberg distr., 20 miles SSW of Underberg, *Acocks* 22039 (PRE); Himeville, *Bews* 49 (PRE).
ORANGE FREE STATE. Harrismith distr., Harrismith, *Sankey* 150 (K); Platberg, *Hilliard* 5258 (NU). Witzieshoek distr., Witzieshoek, *Junod* s.n. (G, Trans. Mus. herb. no. 17344, PRE); Bestersvlei, *Flanagan* 1852 (PRE).
CAPE. Mt. Currie distr., Fort Donald, *Tyson* 1649 p.p. (K); Mt. Currie, *Tyson* 1764 p.p. (K).

Some plants (probably young ones) have a central rosette of leaves from the base of which radiate slender leafy branches terminating in leaf rosettes. Generally, however, they are caespitose, with numerous rosettes, each terminating a short, stout branch, which is often rough with old leaf bases. Occasionally the internodes are elongated and the plants are more diffuse. There is a good deal of variation in leaf size, and plants from the Transvaal tend on the whole to be larger and stouter than those from Natal. The flowers appear to be solitary in each rosette because they open in succession. They also appear to be axillary, but strictly they are terminal and growth is sympodial.

The plants form mats, often extensive, in poor stony grassland, on bare earth, or on broken rock sheets, from Ngeli Mt. on the Cape-Natal border through the more elevated parts of Natal to the eastern Transvaal and neighbouring parts of Swaziland, having been recorded as far north as Haenertsburg in the NE Transvaal, between c. 1200 and 2300 m above sea-level, flowering from mid November to March. There is also one record of this species from Mt. Inyangani, Rhodesia, at 2560 m.

81. Roella muscosa Linn. f., Suppl. 143 (1781); Thunb., Prodr. Pl. Cap. 38 (1794), Fl. Cap. 2: 30 (1818) et (ed. Schultes) 175 (1823); Roem. & Schultes, Syst. Veg. 5: 75 (1819-20); A. DC., Mon. Campan. 177 (1830) et in DC., Prodr. 7: 447 (1839); Sond. in Harv. & Sond., Fl. Cap. 3: 595 (1865); Adamson in Journ. S. Afr. Bot. 17: 155 (1951).

Syn.: *Wahlenbergia solitaria* v. Brehmer in Bot. Jahrb. 53: 132 (1915).
Type: *Drège* 6305.

Roella muscosa was placed by Adamson in his Series *Muscosae* together with *R. insizwae* Zahlbr., a species known to Adamson from description only but now found by us to be referable to *Craterocapsa* (see above, no. 78). *Wahlenbergia solitaria* was based on Drège 6305 (quoted by Adamson under *R. muscosa*) and formed the sole species of § *Solitariae*. The description given by von Brehmer fits *R. muscosa* well. The species is clearly a very isolated one in the genus. Its fruit structure, and that of some other species of *Roella*, is described in the discussion on *Craterocapsa*.

Compositae

The following notes and descriptions of new species form a precursor to a full account of the Compositae of Natal in preparation by one of us (O.M.H.). Harvey's treatment of the family in Flora Capensis is most perceptive botanically, but weak in references and synonymy, and the failure at that time to distinguish between homonyms and misidentifications can be most confusing. We have been able to examine many of the type specimens of the species under study and every effort has been made to check typification and nomenclature. The application of the modern Code has led to a number of unfortunate changes, but these are unavoidable.

Because Linnaeus did not accept *Helichrysum* as a genus many of his species of *Gnaphalium* and *Xeranthemum* were later transferred to it. In *Index Kewensis* a number of these transfers were accredited to D. Don in a paper (in Mem. Werner. Soc. 5: 533–563, 1824) where he did not effectively make them: he merely listed species of other genera which ought to be placed in *Helichrysum*. Not a few of these transfers were, however, effectively made by him in Sweet's Hortus Britannicus (1826) and Loudon's Hortus Britannicus (1830): these antedate independent transfers made by Lessing (1832).

Moeser's revision of *Helichrysum* in Africa (Bot. Jahrb. 44. 1910) was notably weak in relation to the earlier literature and our citations will frequently be found to be at variance with his.

The set of Drège's Compositae sent to De Candolle, and used in the compilation of the Prodromus, bore numbers and brief localities. The sets that were later distributed (by E. Meyer?) were unnumbered and labelled only with De Candolle's names; where a species had been collected in more than one locality the specimens were distinguished by the letters a, b, c following the name. Localities are to be obtained from Drège's *Zwei pflanzengeographische Dokumente* (published as a supplement to Flora, 1843). The systematic index in this work gives a reference to the classified collecting areas under which all species are listed in the body of the work. The a, b, c specimens are, of course, indexed separately, but the distinctive letters are not repeated in the lists. The detailed localities given do not agree in precise wording with the brief localities on the labels in De Candolle's herbarium, but they are close enough to enable isotypes to be recognised without difficulty.

De Candolle worked entirely from the written label and he, or his amanuensis, made some mistakes in copying. For instance, because a number of localities start with the word Zwarte, the abbreviation Zw. on the labels is

expanded to Zwarte, whereas it usually stands for 'zwischen'. For example the type of *Rhynea phylicifolia* was collected "zwischen Omsamcaba und Omsamwubo" not at "Zwarte Omsamcaba und Omsamwubo". The Sneeuwberge are frequently corrupted to Zneeuroberg, and the Zuureberg to Zeeuroberg: it is not surprising that confusion eventually ensued and the specimen of *Senecio concolor* from the Zuureberg was misquoted in print as coming from the Zneeurobergen, a rather seriously misleading statement. A mistake less likely to cause trouble is the frequent citation of Wittbergen as Willbergen, but confusion between the Drakensberg and Drakensteenberg is here (as elsewhere in S African botany) an occasional error.

82–85. Athanasia L.

The resemblance between *Athanasia acerosa* (DC.) Harv. and *Pentzia pinnatifida* Oliv. is very striking, despite the difference in the size of the heads; but they are placed in different genera, indeed, in different subtribes of Anthemideae, because of the presence of receptacular paleae in *Athanasia* (subtribe Anthemidinae), their absence in *Pentzia* (subtribe Chrysantheminae). There is another plant, described below as *Athanasia villosa*, which is clearly allied to both the above species, but is intermediate in having a variable number of paleae. *Pentzia woodii* is close enough in general facies to require attention at the same time.

Athanasia acerosa has loosely imbricated, gutter-shaped involucral bracts, the innermost of which embrace the outer flowers and were interpreted by De Candolle (Prodr. 6: 92, 1838) as marginal paleae, and he was followed by Harvey (in Harv. & Sond., Fl. Cap 3: 199, 1865) who accordingly placed the species in *Athanasia*. Examination of a large number of heads of *A. acerosa* shows that receptacular paleae, as distinct from marginal ones, appear occasionally. More important, as will be seen, *A. acerosa* has cylindric, 10-ribbed achenes; some of the ribs, often alternate ones, become enlarged with embedded, elongated resin sacs. The achene is crowned with a thickened, often crenate, rim, produced into a very shallow crown.

Pentzia pinnatifida also has cylindric, 10-ribbed achenes, the alternate ribs with elongated resin sacs, and a short coroniform pappus. Its gutter-shaped involucral bracts resemble those of *Athanasia acerosa*, and marginal paleae, as distinct from the concave conduplicate inner involucral bracts, are sometimes present. *Athanasia villosa* has achenes similar to those of *Pentzia pinnatifida*, but with an even shallower crown, generally only a thickened rim. The involucral bracts are also similar though less strongly conduplicate, and the receptacle may be epaleate or up to half the flowers in a head may be subtended by paleae. *Pentzia woodii* has cylindric, uniformly 10-ribbed achenes without resin sacs, and crowned with a thickened, crenulate rim. The involucral bracts are flatter than in the other three species, and there are no receptacular paleae. But the achenes are so similar that the four species must be placed together. Difficulty in deciding their generic position led to a brief survey of the immediately available material of these largely Cape genera.

Pentzia dentata (L.) O. Kuntze, type of the genus, has an obliquely wedge-shaped, 5-ribbed ovary with a membranous, ear-shaped pappus. There are large, sessile, ellipsoid, superficial glands between the ribs. The achene becomes mucilaginous when wet. *P. calva* S. Moore, *P. cooperi* Harv., *P. elegans* DC., *P. grandiflora* (Thunb.) Hutch., *P. incana* (Thunb.) O. Kuntze,

P. lanata Hutch. and *P. pinnatisecta* Hutch. all have the same type of ovary, though in some species the pappus may be reduced to a shallow crown, and the glands are sometimes wanting. *P. globifera* (Thunb.) Hutch., *P. suffruticosa* (L.) Merxm. and *P. tortuosa* (DC.) Fenzl differ in that the corolla is 4-lobed (4- or 5-lobed in *P. tortuosa*) and compressed, not 5-lobed nor more or less terete as in *P. dentata*, etc., while the annual species *P. annua* DC., *P. albida* (DC.) Hutch. and *P. intermedia* Hutch., also with 4-lobed compressed corollas, differ further in their biseriate, not multiseriate involucres. These last two groups, at present placed in *Pentzia*, may well belong elsewhere, but do not concern us here. However, the point to be made is that *Pentzia* sens. strict. and sens. lat. is characterized by an obliquely wedge-shaped, 5-ribbed ovary. Superficial glands between the ribs are present in many species, and in many species the achenes become mucilaginous when wet. The achenes of *P. pinnatifida* and its allies are clearly different.

Cylindric, 10-ribbed achenes without superficial glands but often with immersed resin sacs, and not becoming mucilaginous when wet, were found to be characteristic of *Athanasia* sections *Athanasia*, *Hymenolepis* and *Morysia*. These sections are separated by differences in pappus: in sect. *Athanasia* (which is not represented in Natal) it consists of peculiar short, jointed, brittle hairs, in *Hymenolepis* of scales, and it is wanting in *Morysia*.

In *Athanasia parviflora* Murray (syn. *Hymenolepis leptocephala* Cass., type of the genus and of the section *Hymenolepis*), 5 alternate ribs in the achene become prominent, with large embedded resin sacs like beads on a string. The pappus is of flat scales composed of cells similar in structure to those of the "hairs" in section *Athanasia*, and often welded together at the base to produce a lacerated crown. *A. incisa* (DC.) Harv. and *A. schizolepis* Harv. are similar to *A. parviflora*. These are SW Cape species.

The species of the eastern Cape and Natal, also placed in sect. *Hymenolepis*, *A. coronopifolia* Harv., *A. dregeana* (DC.) Harv., *A. leucoclada* (DC.) Harv., *A. montana* Wood & Evans, *A. punctata* (DC.) Harv., *A. thodei* Bolus and *A. tridens* Oliv., all have cylindric, 10-ribbed achenes, without resin sacs, and with a coroniform pappus, completely or partly divided into 10 scales.

In *Athanasia dentata* (L.) L. (syn. *Morysia dentata* (L.) DC., type of the genus and the section *Morysia*), the cylindric achene is 10-ribbed and the 5 alternate ribs become enlarged with resin sacs just as in *A. parviflora* (and in *A. acerosa*, described above). There is no pappus, but the achene is crowned with a slightly thickened, crenate rim. *A. pectinata* (L.f.) Harv., *A. pinnata* (L.f.) Harv., and *A. spathulata* (DC.) Harv. are similar.

The structure of the achenes shows that the affinity of *Pentzia pinnatifida*, *P. woodii*, *Athanasia acerosa* and *A. villosa* lies with *Athanasia* sens. lat. The presence or absence of receptacular paleae is in some cases not even of specific importance. The affinity of *Athanasia acerosa*, *A. villosa* and *Pentzia pinnatifida* is with sect. *Morysia*. *Pentzia woodii* is more isolated, and is better placed with the summer-rainfall species now in sect. *Hymenolepis*, but possibly worth recognition as a distinct section.

82. Athanasia acerosa (DC.) Harv. in Harv. & Sond., Fl. Cap. 3: 199 (1865); Hilliard in Notes Roy. Bot. Gard. Edinb. 30: 118 (1970).

Type: Natal, between the Umkomaas and Umzimkulu rivers, *Drège* 5037 (G-DC! E! K!).

Syn.: *Morysia acerosa* DC., Prodr. 6: 92 (1838).
Athanasia natalensis Schltr. in Bot. Jahrb. 40: 95 (1907). Type: Natal, Noodsberg, Kronsberg, *Rudatis* 21 (Z!).
Pentzia stenocephala Thellung in Vierteljahrsschr. Nat. Ges. Zürich 61: 456 (1916). Types: Natal, Inanda, *Wood* s.n.; Umgeni, *ad catarrhactam*, *Rehmann* 7472; Karkloof, *Rehmann* 7417; Field's Hill, *Rehmann* 7977; Inchanga, *Rehmann* 7896 (all at Z!).

Typically a well-branched shrub about 1m tall, sometimes simple stems from a woody stock. *Leaves* varying from linear to pinnate and from glabrous to villous, considerable variation sometimes on a single plant. *Heads* narrowly cylindric, usually (3–) 4–9 (–10–13)-flowered. *Involucre* more or less glabrous, outer flowers embraced by marginal paleae, inner flowers usually nude, very rarely a palea present.

Ranges from the eastern Cape throughout Natal below 1675 m altitude and into the eastern Transvaal and Swaziland, flowering more or less the whole year round.

83. Athanasia pinnatifida (Oliv.) Hilliard, **comb. nov.**
Type: Natal, Inanda, *Wood* 168 (K! G! Z!).
Syn.: *Pentzia pinnatifida* Oliv. in Hook., Ic. Pl. t. 1340 (1881); Hutch. in Kew Bull. 1916: 253 (1916).

Tufts of simple annual stems to 35 cm from a woody perennial stock. *Leaves* pinnately cut, the lobes filiform, stems and leaves sparsely villous. *Heads* campanulate, (30–)40(–55)-flowered. *Involucre* sparsely hairy, some of the outer flowers embraced by marginal paleae and often some of the flowers in the second series also subtended by paleae.

Endemic to a small area of Natal in Richmond, Camperdown, Pinetown, New Hanover, Inanda and Ndwedwe districts, growing gregariously on stony or rocky grass slopes and flowering usually in September and October, after the grass is burnt in spring.

NATAL. Camperdown distr., near Bothas Hill railway station, c. 760 m, *Wood* s.n. (E). New Hanover distr., Table Mt., c. 920 m, *Hilliard* 3986 (E, NU). Pinetown distr., Everton, Eskotene, 610 m, *Hilliard* 4846 and 5035 (E, NU); Kloof, Forest Hills, c. 610 m, *Hilliard* 1853 (E, NU). Ndwedwe distr., Zwati, *Strey* 7745 (NU); Inanda Mt., *Hilliard* 2047 (NU). Inanda distr., Elephant's Trunk, *Strey* 6996 (NU). Richmond distr., Mid-Illovo area, farm "Ismont", *Hilliard* 3140 (NU).

84. Athanasia villosa Hilliard, **species nova** ab *A. pinnatifida* (Oliv.) Hilliard involucro dense villoso, floribus in capitulo minus quam 30, achaeniis margine crassa coronata recedit. Insuper planta tota villosiore, caulibus aequaliter foliosis, receptaculo saepe paleis paucis dispersis praedito, tempore florendi serotino (nec vernali) differt.

Type. NATAL: Alfred distr., Weza, above Mpetyne forest, 1310 m, 5 i 1964, *Hilliard* 2507 (NU holo; E, K, NH iso).

Syn.: *Pentzia pinnatifida* var. *chenoleoides* Hutch. in Kew Bull. 1916: 253, p.p. Natal, stony hill near Murchison, May, *Wood* 3110 (K, lecto!; NH!); Faku's territory [Pondoland], *Sutherland* s.n. (K!).

Suffrutex 45 cm usque alta; caules simplices vel subsimplices, 3 mm usque diametro, sericeo-villosi, dense foliosi, foliis ramulos axillares dense foliosos subfulcientibus. *Folia* usque ad 2 cm longa, primaria eis ramulorum bis majora, fere ad costam pinnatisecta, segmentis filiformibus vel angustissime linearibus usque ad 1·5 cm longis (saepe 8 mm longis vel minoribus) griseo-sericeo-villosa, primaria glabrescentia eis ramulorum adhuc dense pilosis. *Capitula* anguste campanulata, 17–28-flora, c. 6 × 5 mm, numerosa in corymbis densis terminalibus. *Bracteae involucri* 3–4 seriatae, villosae, vix imbricatae; exteriores interioribus breviores, lanceolatae, interiores c. 4 × 1 mm, oblongae, concavae, marginibus apicibusque scariosis. *Receptaculum* planum. *Flores* exteriores plerumque paleis marginalibus amplexi, interiores nudi vel pauci eorum paleis anguste oblongis leviter concavis floribus aequilongis suffulti. *Corolla* 3 mm longa, inferne anguste cylindrica, superne campanulata, glandulosa, lutea. *Ovarium* 2 mm longum, ambitu anguste obovatum, 10-costatum, margine crasso crenato coronatum. *Pappus* 0.

Hutchinson (Kew Bull. 1916, 253) erected the variety *Pentzia pinnatifida* var. *chenoleoides* on four specimens. These prove to belong to two different species. *Wood* 3110 (lectotype) and *Sutherland* s.n. are *A. villosa*; *Wood* 1007 and *Tyson* 1254 are *Pentzia woodii* Thellung, transferred below to *Athanasia*.

Both *A. villosa* and *A. pinnatifida*, like so many associated plants of grassland in the summer rainfall area of South Africa, send up annual stems from a perennial stock. The flowering stems of *A. villosa* are more uniformly leafy than those of *A. pinnatifida*, where there is generally a marked decrease in leaf size upwards. The heavy grey indumentum of *A. villosa* makes it conspicuous in the field. In this species too the axillary shoots tend to elongate whereas in *A. pinnatifida* they seem seldom to do so. This is undoubtedly because the stems of *A. pinnatifida* shoot up rapidly after the dry grass cover is burnt off in early spring and quickly flower. It is naturally these shoots that are collected. If the plants are not burnt the axillary shoots grow out to form a bushy clump that does not flower: further observations are needed to be certain that this is always so. On the other hand, the stems of *A. villosa*, though they too must start into new growth after spring burning, have a long growing season before flowering begins in late summer, and the axillary shoots have ample time to elongate. From the meagre herbarium material, it appears that the inflorescences often develop at the tips of these lateral shoots.

A. villosa should be looked for in southern Natal and Pondoland on SE- to SW-facing rocky grass slopes, probably between 600 and 1370 m above sea level, from January to May. The erratic development of paleae subtending the inner flowers makes it especially interesting.

85. Athanasia woodii (Thellung) Hilliard, **comb. nov.**

Type: Natal, near Curry's Post, 915–1220 m, *Wood* 4457 (Z!).

Syn.: *Pentzia woodii* Thellung in Vierteljahrsschr. Nat Ges. Zürich 61: 454 (1916).

P. tysonii Thellung in Vierteljahrsschr. Nat. Ges. Zürich 61: 455

(1916). Type: Cape, East Griqualand, top of Mt. Currie, 2220 m, *Tyson* 1254 (Z!).

P. pinnatifida var. *chenoleoides* Hutch. p.p. (excl. lecto) in Kew Bull. 1916: 253 (1916).

NATAL. Bergville distr., National Park, Tugela gorge, *Hilliard* 2851 (NU). Estcourt distr., Giants Castle Game Reserve (Bannerman area), 2286 m, *Trauseld* 763 (NU); Highmoor Forest Reserve, c. 2135 m, *Hilliard* 4814 (E, NH, NU); *ibidem*, 2255 m, *Skead* 81 (NU). Mpendhle distr., "Meriondale", c. 1770 m, *Wright* (E, K, NH, NU). Lions River distr., near Curry's Post, *Wood* 1007 (BM, E); Bray Hill, Mooi River, *Johnston* 847 and 900 (E).

CAPE. Mt. Currie distr., top of Mt. Currie, *Tyson* 1254 (K, Z).

A. woodii is common in places in the Drakensberg and its foothills at altitudes between 1370 and 2285 m, from Tugela gorge in Bergville distr., Natal, to the mountains near Kokstad in East Griqualand. It flowers from about February to May.

86. Conyza obscura DC., Prodr. 5: 387 (1836); Harv. in Fl. Cap. 3: 113 (1865).

Syn.: *Webbia kraussii* Sch. Bip. in Walpers, Repert. 2: 971 (1843); Harv. in Fl. Cap. 3: 114 (1865). Type: South Africa, in collibus prope Knysna R., Jan. 1829, *Krauss* (holo. TUB!).

The type specimen of *Webbia kraussii* was kindly lent from the University of Tübingen and bears a label "*Conyza kraussii* C. H. Schultz est novum genus Karelinae Less. proximum ex recensione seriori autoris sed nondum denominatum." *Webbia kraussii* was not seen by Harvey and he was unable to place it from the description; it proves to be no more than *Conyza obscura* DC., a weedy herb, common in the eastern Cape, parts of Natal and the south-eastern Transvaal, where it will colonize roadsides and disturbed grassland.

Webbia kraussii is the type species of the genus *Webbia* Sch. Bip. (1843), non DC. (1836). Schultz repeated the generic name as he considered De Candolle's genus to be a synonym of *Vernonia*.

This is not the species published by Schultz (in Walp., Rep. 2: 972, 1843) as *Conyza kraussii*, based on a Krauss specimen from Port Natal. We have so far failed to trace this, and its identity remains unknown.

87. Cotula lineariloba (DC.) Hilliard **comb. nov.**

Syn.: *Tanacetum linearilobum* DC., Prodr. 6: 133 (1838.)

Type: Cape, Witteberg, 7–8000 ft, *Drège* 3772 (G-DC! iso E! K!).

The name *Cotula sericea* Thunb. is not available as used by Harvey (in Harv. & Sond., Fl. Cap. 3: 183, 1865) as it is a later homonym of *C. sericea* Linn. f. Harvey quoted the synonym *Tanacetum linearilobum* DC. and this epithet must now be adopted in *Cotula* for the *Drège* specimen from the Witteberg on which it is based. Whether the Thunberg specimen quoted by Harvey is conspecific is open to considerable doubt, but that does not affect the nomenclature.

88. Cotula membranifolia Hilliard, **species nova** *C. hispidae* (DC.) Harv. et *C. sociali* Hilliard affinis sed ab ambabus foliis pinnatisectis (haud pinnatis)

lobis latis simplicibus vel parce dentatis et corolla ovario aequilonga (haud eo longiore) facile distinguitur.

Herba perennis, diffusa, stolonibus foliatis nodis distalibus radicantibus et rosulas novas gerentibus, pilis longis sericeis patentibus villosa. *Folia* radicalia et caulina inferiora usque ad 75 × 15 mm, ambitu spatulata, ad duas partes costam versus pinnatisecta, lobis oblongo-ellipticis usque ad 6 × 4 mm sursum decrescentibus integris vel parce dentatis vel lobulatis, triente inferiore petioloideo plano et basi semiamplexicauli. *Caules* floriferi simplices, solitarii, terminales, ascendenti-erecti, foliati (foliis radicalibus similibus sed sursum decrescentibus et sessilibus et in bracteas transeuntibus), parte superiore nudi, glabri, sub capitulo tandem inflati. *Capitula* homogama, depressi-globosa, 13–20 mm diametro. *Involucri bracteae* plus minusve biseriatae, elliptico-oblongae, usque ad 5 × 3 mm, obtusae, glabrae, marginibus scariosis. *Receptaculum* planum, pedicellis persistentibus praeditum. *Pedicelli* florum exteriorum 0·5–0·75 mm longi, introrsum gradatim breviores. *Corolla* 2 mm longa, parte inferiore compressa et anguste alata, basi vix saccata, superne campanulata et plus minusve tetragona, parce glandulosa, flava. *Antherae* basi minute productae. *Ovarium* obovatum, compressum, 2 mm longum. *Achaenium* 2–2·5 mm longum, compressum, faciebus leviter convexis, anguste albo-alatum, ceterum brunneum, cellulis myxogenis absentibus.

Type. Cape, Maclear district, ascent to Naude's Nek, c. 2440 m, 19 ii 1971, *Hilliard & Burtt* 6614 (NU holo, E iso).

NATAL. Underberg distr., tributary of Umzimkulu river above Drakensberg Gardens Hotel, c. 2285 m, *Hilliard* (NU). Alfred distr., Ngeli Mt., SE end, c. 1980 m, 2 i 1969, *Hilliard & Burtt* 5763 (NU). Impendhle distr., catchment of S branch of Loteni river, c. 2440 m, 24 iii 1969, *Wright* 851 (NU).

C. membranifolia has exactly the same habit as *C. socialis* (no. 90 below), but is easily distinguished by its distinctly petioled and less deeply dissected radical leaves with broader lobes. There are small but constant differences in floral detail too: the pedicels of the outer flowers are shorter, the corolla equals the ovary (it is longer than the ovary in *C. socialis*), it does not envelop the top of the ovary, and the achenes do not become mucilaginous when wet.

C. membranifolia seems to be a rarer plant than *C. socialis* and does not grow in large colonies like that species. The biggest patch we have seen was along a couple of metres of the upper edge of an oozy bank, mixed with dwarf *Erica thodei* and a mauve-flowered *Lotononis*, on the road leading up to the summit of Naude's Nek. Only solitary specimens were collected on Ngeli Mt. and the upper Loteni. In the mountain valley on the upper reaches of the Umzimkulu, the plants were carpeting a damp, shady earth bank, but it was mid-June and they were not flowering. However, the distinctive leaves make identification certain.

89. Cotula paludosa Hilliard, **species nova** *C. sociali* Hilliard (infra) affinis sed foliis radicalibus distincte petiolatis tandem glabris, corollis majoribus 2–2·5 mm longis (haud 1·5 mm tantum), achaeniis cellulis myxogenis carentibus et saepe alis angustis dorsalibus/ventralibus lateralibus additis.

Herba perennis, stolonifera, tapetiformis; stolones simplices vel ramosi foliis squamosis tantum praediti, interdum nodis semper apice radicantes et

apice rosulam foliorum formantes. *Folia radicalia* alabastro sericeo-villosa, mox glabrata, ambitu oblonga, usque ad 75 × 15 mm, lamina petiolo aequali vel breviore, bipinnata, lobis linearibus usque ad 4 × 1 mm, petiolo plano basi expanso amplexicauli. *Caules* floriferi terminales, solitarii, simplices, dimidio inferiore foliati, foliis caulinis radicalibus similibus sed sursum mox minoribus et simpliciter pinnatis deinde in bracteas transeuntibus, parte superiore nudi sub capitulo vix inflati. *Capitula* homogama, depresso-globosa, 10–15 mm diametro. *Involucri* bracteae 3-seriatae, ovatae vel oblongae, usque ad 4·5 × 3·5 mm, obtusae, glabrae, marginibus scariosis. *Receptaculum* planum, pedicellis persistentibus praeditum. *Pedicelli* florum exteriorum 0·75–1 mm longi, gradatim introrsum decrescentes. *Corolla* 2–2·5 mm longa, dimidio inferiore compressa et anguste alata basi saccata, superne campanulata et plus minusve tetragona, glandulosa, primo lutea deinde rubro-brunnea. *Antherae* basi minute apiculatae. *Ovarium* ambitu obovatum, compressum, 1 mm longum. *Achaenium* 1–1·25 mm longum, compressum, faciebus leviter convexis, anguste alata, saepe ala parva vel in una vel utraque facie, brunnea alis albidis, cellulis myxogenis absentibus.
Type. Barkly East distr., Rhodes to Naude's Nek, 2620 m, 22 ii 1971, *Hilliard & Burtt* 6702 (NU holo, E iso).
CAPE. Barkly East distr., Doodmans Krans, 8 iii 1904, *Galpin* 6702 (PRE).
NATAL. Underberg distr., Sani Pass, summit, ii 1972, *Grice* s.n. (NU). Impendhle distr., summit plateau of Drakensberg near entrance to Hlatimba Pass, c. 2835 m, 2 iii 1971, *Wright* 1139 (E, NU).
LESOTHO. Without precise locality, 19 ii 1950, *Pole-Evans* 50 (4666) (PRE). Sani Pass, 2820 m, 17 ii 1973, *Hilliard* 5316 (E, NU).

C. paludosa can be found in myriads, growing in shallow standing water filling depressions on the summit plateau of the Drakensberg. Its glabrous, or very nearly glabrous, long-petioled leaves make recognition easy, and its achenes often with narrow wings on the dorsal and/or ventral faces are not matched elsewhere in this group of Drakensberg species.

90. Cotula socialis Hilliard, **species nova** *C. hispidae* (DC.) Harv. affinis sed habitu magis diffuso, foliis radicalibus sessilibus vel petiolis ad 1·5 cm longis (haud 3–5 cm), parte superiore bipinnatis, inferne pinnatis (haud omnino bi- vel tri-pinnatis), floribus exterioribus pedicellis 1–1·5 mm longis (haud 0·25–0·5 mm), corolla 1·5 mm longa (haud 1·75–2·5 mm), achaeniis cellulis myxogenis praeditis.

Herba perennis, longe et patenter sericeo-pilosa, diffusa, tapetiformis, stolones foliatos nodis distalibus radicantes et rosulas foliorum formantes emittens. *Folia* radicalia usque ad 45 × 10 mm, ambitu oblonga vel oblongo-spathulata, plerumque parte superiore bipinnata, semper inferne pinnata, lobis linearibus vel lineari-lanceolatis (2–) 2·5(–6) × 0·25–0·5 mm, fere sessilia vel petiolo plano ad 15 mm longo, basi expanso amplexicauli. *Caules floriferi* simplices, solitarii, terminales, ascendo-erecti, foliati, foliis caulinis radicalibus similibus sed sessilibus et interdum simpliciter pinnatis sursum gradatim decrescentibus et in bracteas transeuntibus, parte superiore nudi, glabri, sub capitulo inflati. *Capitula* homogama, depresso-globosa, 10–17 mm diametro. *Involucri* bracteae 2–3-seriatae, ovatae vel oblongae, usque ad 4·5 × 3 mm, obtusae, glabrae, marginibus scariosis. *Receptaculum* planum,

pedicellis persistentibus praeditis. *Pedicelli* florum exteriorum 1–1·5 mm longi, introrsum paullo decrescentes. *Corolla* 1·5 mm longa, dimidio inferiore compressa et anguste alata, basi saccata, glabra glandulis paucis brevistipitatis exceptis, superne campanulata et leviter tetragona, lutea deinde rubro-brunnea. *Antherae* basi minute apiculatae. *Ovarium* ambitu obovatum, compressum, 0·75–1 mm longum. *Achaenium* c. 1 mm longum, compressum, faciebus paullo convexis, anguste alatum, brunneum alis albidis, cellulis myxogenis praeditum.

Type. Cape, Barkly East distr., Rhodes to Naude's Nek, c. 2380 m, 21 ii 1971, *Hilliard & Burtt* 6680 (E holo; NU iso).

CAPE. Barkly East distr., Doodmans Krans Mt., c. 2590 m, 8 iii 1904, *Galpin* 6704 (K); summit of the Berg beyond Naude's Nek, 2560 m, 10 iv 1966, *Hilliard* 3952 (E, NU). Maclear distr., ascent to Naude's Nek, c. 2440 m, 19 ii 1971, *Hilliard & Burtt* 6591 b (E, NU).

NATAL. Underberg distr., summit Sani Pass, ii 1972, *Grice* s.n. (NU). Estcourt distr., summit plateau of Drakensberg in vicinity of Giants' Castle Pass, c. 3050 m, 11 ii 1971, *Wright* 1121 (E, NU).

LESOTHO. Basutoland plateau about 1 mile downstream from summit of Langalibalela Pass, c. 2835 m, 7 i 1972, *Wright* 1225 (NU); Oxbow, 2590 m, 18 xii 1969, *Williamson* 391 (K); Mokhotlong, *Guillarmod* 962 (PRE—mixed with *C. hispida*); near Pala Tseon river, *Guillarmod* 2079 (PRE).

C. socialis is easily confused with *C. hispida*, and the two are occasionally found mixed on herbarium sheets. However, they differ markedly in leaf cutting. The radical and lower stem leaves of *C. socialis* are regularly bipinnate in the upper half, the pinnae decreasing in size downwards, the leaf becoming simply pinnate in the lower part with a few rudimentary pinnae running down to the clasping base or to within a short distance of it. In *C. hispida*, the leaves have petioles about 3–5 cm long, the lower pinnae are not reduced, and the branching of the pinnae is mostly subdichotomous. There is some difference in habit too, *C. hispida* being more tufted than *C. socialis*, which produces long leafy stolons that root at the distal nodes and there produce new leaf rosettes. The plant is thus mat-forming, and will carpet bare damp earth, or form small mats on steep, broken grass slopes, sometimes growing intermixed with *C. hispida*.

The flowers of *C. socialis* are smaller than those of *C. hispida* (1·5 mm opposed to 1·75–2·5 mm) and are always borne on longer pedicels, those of the outer series being 1–1·5 mm long, grading to much shorter ones in the centre of the disc, while the pedicels in *C. hispida* are always less than 0.5 mm long. As the pedicels are persistent on the receptacle, this character is a very useful one. Although the achenes of the two species are much alike in general appearance, those of *C. socialis* become mucilaginous when wet.

91. Gnaphalium declinatum L. fil., Suppl. 365 (1781); Hedberg in Symb. Bot. Upsal. 15, 1: 199 and 336 (1957).

Type: from the Cape (LINN 989. 80!).

Syn.: *Helichrysum declinatum* (L. fil.) Less., Syn. Comp. 278 (1832); DC., Prodr. 6: 172 (1838); Harvey in Harv. & Sond., Fl. Cap. 3: 218 (1865); Moeser in Bot. Jahrb. 44: 307 (1910).

Amphidoxa gnaphalodes DC., Prodr. 6: 246 (1838); Harv. in Harv. &

Sond., Fl. Cap. 3: 263 (1865). Type: Cape, Uitenhage, *Ecklon* 1192 (G—DC!)

Gnaphalium unionis Sch. Bip. ex Oliv. & Hiern in Oliv., Fl. Trop. Afr. 3: 343 (1872). Type: Ethiopia, near Adua, *Schimper* I: 175 and near Enchetcab, *Schimper* II: 1179 (E!).

It has long been recognised (cf. sheet at K annotated by N. E. Brown) that *Amphidoxa gnaphalodes*, type species of the genus *Amphidoxa*, is no more than a form of *Gnaphalium declinatum* in which the outer, female, flowers lack a pappus. Gradations in pappus development also occur.

The species is widespread in South Africa and extends right through tropical Africa to Ethiopia. We have looked at a small amount of material, mainly from Natal, but also 14 collections from widely scattered localities in the Cape, one from Harrismith in the O.F.S., and 6 from East Africa and Ethiopia. Among Natal sheets, 18 had epappose female flowers and 2 (from Van Reenen's Pass and near Durban) had female flowers with pappus bristles. Among Cape sheets, 4 had epappose, 9 pappose female flowers (1 epappose, 2 pappose from the same locality), while one (from Kokstad, *Haygarth* s.n., NH 15805) showed a gradation from heavily pappose through sparsely pappose to epappose female flowers. The Harrismith specimen had heavily pappose female flowers, as did all the tropical African material.

Sex-linked dimorphism in pappus is not uncommon in *Gnaphalium*, *Helichrysum* and some allied genera. In *Gnaphalium declinatum* variation in both form and number of pappus bristles is sex-linked. When the female flowers are heavily pappose, then the hermaphrodite flowers too are heavily pappose, and the bristles are dimorphic. Those on the female flowers are scabrid throughout, those on the hermaphrodite flowers are scabrid below, subplumose at the tips. If the female flowers have but few bristles, then the hermaphrodite flowers also have few bristles, but always more numerous and more plumose than in the female. Finally, when the female flowers lack pappus, then the hermaphrodite flowers have few bristles (c. 5) and these are smooth, not scabrid, below and markedly plumose at the tips.

This last state is, of course, the *Amphidoxa* condition. Within the limits of the material examined, and this caveat must be emphasised, it has a distinct distribution, being confined to the area between about 10° and 33° S latitude.

Names published in *Amphidoxa* total eight. *A. adscendens* O. Hoffm. ex Zahlbr. (described from East Griqualand), *A. engleriana* O. Hoffm. (Kuruman) and *A. filaginea* Ficalho & Hiern (Angola) and its var. *transiens* Merx. are all closely related to *Gnaphalium declinatum*. *Amphidoxa demidium* O. Hoffm. (= *Demidium filagineum* DC.) from Madagascar also seems correctly placed in this affinity. *A. glandulosa* Klatt proves to be no more than *Denekia capensis* Thunb. Both *A. villosa* O. Hoffm. and *A. lasiocephala* O. Hoffm. were wrongly placed in the genus. They have been considered synonymous and transferred to *Artemisiopsis villosa* (O. Hoffm.) Schweickerdt (cf. Merxmüller in Prodr. Fl. S.W. Afr. 139: 28, 1967).

92. Gnaphalium limicola Hilliard, **species nova** *G. declinato* Linn. fil. similis sed habitu nano, caulibus repentibus radicantibus, capitulis paucioribus (1–4) bracteis redactis (haud magnis foliaceis) suffultis, bracteis involucralibus exterioribus obtusissimis (haud acutis vel subacutis) distinguitur.

Herba repens, ramosa, perennis, caulibus griseo-pannosis nodis radicantibus dense foliatis. *Folia* oblongo-spatulata, 5–15 × 1–3 mm, apice obtusa mucronata, basi semiamplexicaulia, utrinque griseo-argenteo-pannosa. *Capitula* campanulata, c. 4–5 × 4 mm, breviter pedunculata, pedunculo communi ad 25 mm longo capitula 4 usque gerente. *Involucri bracteae* 4-seriatae; exteriores interioribus breviores, late ovatae vel ellipticae, obtusissimae, pallide brunneae, membranaceae, basi leviter griseo-lanatae; interiores anguste spatulatae, c. 3–4 mm longae, flores leviter superantes, apicibus candidis glabrae. *Flores* c. 55–75, feminei hermaphroditis saltem duplo numerosiores, omnes fertiles. *Corolla* floris feminei anguste tubularis, c. 1.5 mm longa, floris hermaphroditi tubularis sensim sursum ampliata, c. 1·5–2 mm longa. *Pappi* setae 4 vel 5, c. 2 mm longae, inferne fere laeves, superne subplumosae praecipue floris hermaphroditi, mox caducae. *Achaenium* 0·75 mm longum, papillosum.

Type. Barkly East distr., Naude's Nek, c. 2500 m, 19 ii 1971, *Hilliard & Burtt* 6639 (E holo, NU iso).

CAPE. Maclear distr., Doodmans Krans, March 1900, *Galpin* 6667 (NH, PRE).

NATAL. Underberg distr., Sani Valley, 1830 m, 16 iii 1938, *Brooke* 73 (BM).

LESOTHO. Mokhotlong, 28 ii 1949, *Guillarmod* 1017 (PRE); Tlokoeng, 14 i 1955, *Guillarmod* 2305 (PRE); Semonkong, 14 i 1954, *Guillarmod* 1782 (PRE). Without precise locality, *Dieterlen* 1344 (PRE).

G limicola is a creeping herb that forms dense, close mats in muddy streambeds and wet ditches. It bears some resemblance to *G. declinatum*, and it is compared with that species in the diagnosis, but it also has close affinity with *Helichrysum simii* Bolus, which Bolus in turn allied to *H. declinatum* (Linn. fil.) Less. *H. simii* was first collected by Sim (*Sim* 2863, Feb. 1902, NU, PRE) at Hanover in the Cape (31° 05′ S, 24° 27′ E, at approx. 1400 m alt.) and by Acocks (16349, K, PRE), some fifty years later, at the same place: it is otherwise unknown. *H. simii* and *G. limicola* have precisely the same habit and flower at the same time, in February and March. (The stems of *G. declinatum*, though decumbent or prostrate, do not root at the nodes, and the plants flower from about September onwards.) However, the leaves of *H. simii* are spathulate rather than oblong-spathulate, with a thick white indumentum, not a thin silvery-grey one as in *G. limicola*, and the heads are solitary on nude peduncles, not up to four on bracteate peduncles. The flowers of the two species are alike in all respects save that the pappus is much more copious in *H. simii* and the tips of the bristles are less markedly plumose. Moreover, the proportion of female to hermaphrodite flowers is up to 12 female, 18 hermaphrodite in *H. simii*, up to 51 female, 21 hermaphrodite in *G. limicola*. On this technicality of female flowers outnumbering hermaphrodite in one species and not in the other, they are placed in different genera.

Gnaphalium limicola, *G. declinatum* (= *Helichrysum declinatum*) and *Helichrysum simii* belong to the group of weedy herbs with opaque white tips to the involucral bracts that spans the gap between *Gnaphalium* and *Helichrysum* as they are at present defined (see p. 339).

93. Gnaphalium polifolium Thunb., Prodr. Pl. Cap. 151 (1800) et Fl. Cap. 656 (1823).

Type: Cape, *Thunberg*, (UPS).
Syn.: *Helichrysum serpyllifolium* var. *polifolium* (Thunb.) DC., Prodr. 6: 173 (1838); Moeser in Bot. Jahrb. 44: 307 (1910).
Gnaphalium dodii Levyns in Journ. S. Afr. Bot. 7: 84 (1941) et in Adamson & Salter, Fl. Cape Penin. 776 (1950). Type: Cape, Orange Kloof, *Levyns* 6369 (BOL).
CAPE. Cape of Good Hope, *Harvey* 72 (E); *Arnott* (E); Summit Table Mt., *Ecklon* 344 (E); Table Mt., Platte-Klip, *Dümmer* 679 (E); Outeniqua Pass, *Ross* 2397 (E, NU). Uniondale distr., headwaters of Wagenbooms River, *Fourcade* 2401 (BOL). Kingwilliamstown distr., Hogsback, *Rattray* 241 (BOL).
NATAL. New Hanover distr., Noodsberg, Kingscliffe, *Hilliard* 2925 (E, NU); summit Table Mt., *Hilliard* 3988 (E, NU). Ixopo distr., Umtwalume waterfall, *Strey* 4400 (PRE)
SWAZILAND. Havelock Mine, *O. B. Miller* 3069 (PRE).

When Dr Levyns described *Gnaphalium dodii*, she pointed out that it had been confused with *Helichrysum orbiculare* (i.e. *H. serpyllifolium*—no. 120 below) but that because the female flowers outnumbered the hermaphrodite ones it ought to be placed in *Gnaphalium*. The recognition of these two species as distinct entities goes back to Thunberg, but had been blurred by intervening authors. It is clear that *G. dodii* is exactly the plant that Thunberg described as *G. polifolium* and which was wrongly reduced to a variety of *Helichrysum serpyllifolium* by De Candolle and to complete synonymy by Harvey (in Fl. Cap. 3: 218, 1865).

Apart from the larger number of flowers, *G. polifolium* is distinguished from *H. serpyllifolium* by its leaves, more elliptic than those of *H. serpyllifolium* and with flat, not undulate, margins, as well as by floral details. Thus:

Gnaphalium polifolium: capitulum narrowly campanulate, involucral bracts in c. 4 series, closely imbricated, inner bracts with small dirty-white tips, more or less equalling the flowers.
Helichrysum serpyllifolium: *capitulum turbinate, involucral bracts in c. 3 series, loosely imbricated, inner bracts with conspicuous milk-white tips, a little longer than the flowers.*
Corolla of hermaphrodite flowers c. 2 mm long.
Corolla of hermaphrodite flowers c. 2·75–3 mm long.
Pappus shorter than the corolla.
Pappus equalling or a little longer than the corolla.
10–23 female, 5–18 hermaphrodite flowers in a head.
3–6 *female, 5–7 hermaphrodite flowers in a head.*

These two closely allied species are placed in different genera for technical reasons: see discussion on page 339.

Gnaphalium polifolium ranges from the Cape Peninsula through the eastern districts to central Natal and Swaziland. *Helichrysum serpyllifolium* has much the same geographical distribution, but is found at lower altitudes. For instance, in the Cape *G. polifolium* grows on Table Mt. while *H. serpyllifolium* is found on the Cape Flats, just as in Natal, *G. polifolium* is found at about 900 m above sea level, *H. serpyllifolium* near sea level. See also *H. serpyllifolium* (no. 120 below).

94–124. Helichrysum Mill., Gard. Dict. abr. ed. 4 (1754), ('*Elichrysum*') corr. Pers., *nom. conserv.*

Helichrysum is usually characterized amongst associated genera by three features: female flowers, if present, fewer than the hermaphrodite, achenes provided with a setose pappus, and receptacle epaleaceous. When the female flowers are in excess of the hermaphrodite, there is confusion with *Gnaphalium* L.; loss of pappus brings *Chiliocephalum* Benth. and *Calomeria* Vent. (*Humea* Sm.) into the picture; when the receptacle is paleaceous, *Cassinia* R. Br. and *Rhynea* DC. become involved. Yet all these variations do occur within *Helichrysum*. Their presence amongst the south east African species, and the ensuing generic problems, are briefly discussed in the following paragraphs.

The only criterion accorded any general recognition in distinguishing *Helichrysum* from *Gnaphalium* rests on the preponderance of female over hermaphrodite flowers, which characterizes *Gnaphalium*: but this criterion has long been known to be unsatisfactory. Hedberg (in Symb. Bot. Ups. 15 (1): 336–341, 1957) discussed its breakdown in two species, *Helichrysum cymosum* and *H. odoratissimum*. The range of variability within each of these species, as defined by Hedberg, transgresses the numerical boundary between the genera. Nevertheless, this is only so in a minority of the specimens: most are correctly placed in *Helichrysum* and it is there that the affinity of the species clearly lies. We return to these plants later on. A South African species of *Helichrysum* with female flowers slightly exceeding the hermaphrodite in number is *H. basalticum* (no. 96 below).

A far more difficult problem centres on *Gnaphalium declinatum* L.f. This species was transferred to *Helichrysum* by Lessing and retained there by De Candolle, Harvey and Moeser. Hedberg refers it back to *Gnaphalium*, because the female flowers are always in the majority, and includes *G. unionis* Oliv. & Hiern as a synonym. To this species also we return.

More recently D. G. Drury (in New Zealand Journ. Bot. 8: 222–248, 1970) has made a pilot re-investigation of *Gnaphalium*, largely centred on the native and introduced species found in New Zealand, but including some Asiatic representatives of *Anaphalis* DC. and some undetermined S American species of *Achyrocline* (Less.) DC. and the South African *Gnaphalium candidissimum* Lam., related to *G. declinatum*. Using morphological characters only, he was able to classify his material into three main groups, each divided into a number of subgroups. The first group includes all the commonly accepted species of *Gnaphalium*: the lectotype *G. uliginosum*, *G. sylvaticum*, *G. norvegicum*, *G. purpureum*, *G. spicatum* etc. The second group included *G. luteo-album*, *G. hypoleucum* and the specimens of *Achyrocline*. The third group included the species of *Anaphalis*, certain New Zealand species of *Gnaphalium* and the only African species in the sample, *G. candidissimum*.

The species to which we now wish to direct attention include two pairs of species, *Helichrysum serpyllifolium* (no. 120) and *Gnaphalium polifolium* (no. 93), *Helichrysum simii* and *Gnaphalium limicola* (no. 92) again in the affinity of *G. declinatum*. These species form a bridge between *Helichrysum* and part of *Gnaphalium*; there can be little doubt that the species paired together really are related to one another and are artificially separated into the two genera by the numerical criterion.

The interesting point of Drury's study, as regards the problem in South Africa, is that *Gnaphalium candidissimum* was separated from true *Gnaphalium*

and grouped with species of *Anaphalis* and the New Zealand *Gnaphalium* sect. *Anaphalioides*. Drury, in his notes, takes up the point that Harvey had remarked on the likeness of *Gnaphalium candidissimum* to *Helichrysum declinatum*: from this Drury moves to Moeser (in Bot. Jahrb. 44: 305, 1910) and suggests that the real question is whether *Helichrysum* § *Declinata* DC., as understood by Moeser, and *Gnaphalium candidissimum* should be placed in *Helichrysum* or *Anaphalis*! This is to go too fast. Moeser has a mixed bag of species in § *Declinata* of which all except *H. declinatum* and *H. serpyllifolium* have homogamous heads and seem to be correctly placed in *Helichrysum*. Furthermore, Drury (l.c. pp. 238 and 242) apparently accepts that *Anaphalis* and his Group 3 should have subdioecious capitula. Of this there is, to our knowledge, no evidence either in *G. candidissimum* or in *Helichrysum* § *Declinata*. Admittedly Grierson (in Notes R.B.G. Edinb. 31: 390, 1972) has questioned whether subdioecism holds in species of *Anaphalis* in the Sino-Himalayan region and Ceylon; nevertheless, it is not a character to be discarded lightly as yet. Be that as it may, Drury states that *G. candidissimum* stands as a well-marked subgroup of his Group 3. Our own suggestion, reached quite independently, is that there is a group of plants in Africa which at present spans the numerical boundary between *Helichrysum* and *Gnaphalium* but does not fall happily into either. This group may well prove to contain discordant elements: it is suggested merely as an indication of the scope needed for a preliminary enquiry. From *Helichrysum* it would contain at least *H. serpyllifolium* and *H. simii*, from *Gnaphalium*, *G. polifolium*, *G. candidissimum*, *G. limicola* and *G. declinatum*, which must include *Amphidoxa gnaphalodes*, other species of *Amphidoxa*, *A. filaginea* Ficalho & Hiern, *A. engleriana* O. Hoffm., and the Madagascan *A. demidium* O. Hoffm. (*Demidium filagineum* DC); further notes on *Amphidoxa* are given under *G. declinatum* (no. 91). Two other plants are marginal, but should not be left out of the preliminary survey. One is *Gnaphalium septentrionale* (Vatke) Hilliard, No. 39 of part 2 of these Notes. To the synonymy given there *Helichrysopsis stenophylla* (Oliv. & Hiern) Kirp. (in Act. Inst. Bot. V.F. Komarov Acad. Sci. USSR ser. 1, 9: 32, 1950) should be added, without prejudice to a revised circumscription of *Gnaphalium*. The other is *Rhynea phylicifolia* DC. (no. 135 below), which introduces a more shrubby habit and a paleaceous receptacle, and possibly links to the Australian and New Zealand species of *Cassinia*.

As already mentioned, Hedberg analysed tropical African material under the names *H. cymosum* and *H. odoratissimum** and found that both species included specimens that were technically *Gnaphalium* on the numerical criterion. It is instructive to compare his data with counts made on material of the same species from Natal and neighbouring territory. In this area all the material of *H. cymosum* has heads containing 1–4 female and up to 7 hermaphrodite flowers: this represents an extension of the variation found by Hedberg, but at its lower limits; no specimens show a preponderance of female flowers. The situation in *H. odoratissimum* and the closely allied *H. gymnocomum* DC. is not dissimilar: the counts fall within the range that Hedberg records but near its lower limits.

* *H. stenopterum* DC. is, we consider, a distinct species. It is likely that some of the names mentioned by Hedberg, e.g. *H. hochstetteri* and *H. engleri*, are synonyms of *H. stenopterum* rather than of *H. odoratissimum*.

Neither *Helichrysum cymosum* nor *H. odoratissimum* nor *H. gymnocomum*, as found in Natal, have any impact on the *Gnaphalium-Helichrysum* problem; however, they do have bearing upon the problem of the epappose condition as a generic criterion, which is the second point in our discussion. In *H. cymosum* a distinct epappose subspecies is now recognized (no. 101) with a range from the Cape Drakensberg to the Natal-Transvaal border. The only two Cape specimens of *H. gymnocomum* available to us (*Cooper* 620, Albert, and *Drège*, between Van Staadensberg and Bethelsdorp, isotype of *H. gymnocomum* var. *acuminatum* DC.) both have copious pappus. Natal material of this species shows an interesting reduction in number of pappus bristles, which range from 1–6, while two specimens (*Hilliard* 4802, Highmoor, and *Wright* 550, Stillerust, both in Estcourt distr.) completely lack pappus on both female and hermaphrodite flowers. An especially interesting plant (*Trauseld* 749 from Giants Castle Game Reserve) has 2 female and 3 hermaphrodite flowers in each head examined (3 in all): the hermaphrodite flowers have about 6 pappus setae while the female flowers have none. This reproduces precisely the pattern used by De Candolle to establish the genus *Amphidoxa*. Just as *Amphidoxa gnaphalodes* proves to be no more than a variant of *Gnaphalium declinatum* (see no. 91) so *Trauseld* 749 is no more than a particular variant of *Helichrysum gymnocomum*. Another specimen emphasises this. *Wright* 152 (from Mpendhle distr., near right branch of Loteni R., 2800 m) had 5 out of 11 heads examined without pappus in the female flowers (*Amphidoxa* pattern), but the remaining 6 had female flowers with a weakly developed pappus.

In passing it should, perhaps, be noted that the Tasmanian *Helichrysum semipapposum* (Labill.) DC., a species quite unrelated to either *H. gymnocomum* or *Gnaphalium declinatum*, also has the female flowers epappose, while the much more numerous hermaphrodites are pappose.

Beauverd (in Bull. Soc. Bot. Genève, 2 sér. 3: 136–144, 1912) reports finding a completely epappose specimen of *H. umbraculigerum*. He had previously been impressed on finding that this species always had few caducous pappus bristles, not ciliate at the base, and he doubted its proper placing in *Helichrysum*. The epappose form turned his attention to the monotypic Ethiopian genus *Chiliocephalum* Benth., whose sole species shows a remarkable resemblance to *H. umbraculigerum*. Beauverd reports that the two differ in the composition of the capitula, those of *H. umbraculigerum* having all the flowers hermaphrodite, whereas *Chiliocephalum* has 4-6 female flowers and 1–2 hermaphrodite. This is paralleled in the epappose *H. cymosum* subsp. *calvum* where the proportion of female to hermaphrodite flowers varies thus (giving female figure first): 3/3, 2/4, 1/4, 2/3, 4/3. The claim of *Chiliocephalum* to generic rank disappears and it is reduced to *Helichrysum* (no. 98). At one time Beauverd intended to transfer *H. umbraculigerum* to *Chiliocephalum*, but he changed his mind when he read Moeser's account of African *Helichrysum*, then newly published, and realized the range of pappus-type in the genus. However, Beauverd did unite three of Moeser's groups, (§ *Epapposa*, § *Umbraculoidea*, § *Glomerata*) into a new subgenus *Catapappus*. As the name he chose refers to a caducous pappus and as *H. umbraculigerum* had been at the centre of his studies, this species should be taken as lectotype to which the subgeneric name will be attached if required.

Examination of a wider range of material shows that *H. umbraculigerum* has homogamous heads with 3–7 flowers. The number of pappus bristles generally ranges from 2 to 5, but certain Cape specimens (from about East London to the Transkei-Natal border, including Kentani, Zwart Kei, Bashee river mouth, Dohne, Ntywenka), lack a pappus completely.

Apart from Beauverd, no one seems to have compared these epappose or sparsely pappose species in the above groups with the little known genus *Chiliocephalum*. Spencer Moore, however, described an epappose species from Rhodesia in the Australian genus *Humea* Sm. and added that he saw no reason why the epappose species *Helichrysum epapposum* and *H. infaustum* should not also be placed in *Humea* if that genus was to be maintained. More recently Heine (in Adansonia 7: 128, 137, 1967) has pointed out that *Humea* is shortly antedated by *Calomeria* Vent. The type species is *Calomeria amaranthoides* Vent. (= *Humea elegans* Sm., the type species of *Humea*), and it is a very distinctive species with broad soft leaves and large diffuse panicles of small pendulous capitula. It may deserve the genus to itself! The other Australian species closely resemble some species of *Helichrysum* sect. *Ozothamnus* (which have a well developed pappus) and also *Cassinia aculeata* R. Br. (the type species of *Cassinia*) and its allies (which have both pappus and receptacular paleae). Heine (l.c. 138) has made combinations in *Calomeria* for *Helichrysum epapposum* and *H. infaustum*, but there is no good reason to introduce this generic name into S. African botany. These are simply species of *Helichrysum* that have lost the pappus.

The final point to be examined is the occurrence of species of *Helichrysum* with a paleaceous receptacle. Bolus noted that *H. argyrophyllum* DC. had paleae on the receptacle and made a subgenus *Lysiolepis* Bolus to accommodate it (see Trans. S. Afr. Phil. Soc. 18: 392, 1907). We now add another species with paleaceous receptacle to *Helichrysum* (*H. paleatum*, no. 112), but certainly not to subgen. *Lysiolepis*, for *H. paleatum* has quite other affinities in the genus. In Australia there is little to separate *Cassinia* R. Br. from *Helichrysum* sect. *Ozothamnus* save the paleaceous receptacle. Another plant in this affinity with receptacular paleae is the South African *Rhynea phylicifolia* (no. 135). *Rhynea* was reduced to a section of *Cassinia* by Bentham (in Benth. & Hook. f., Gen. Pl. 2: 313. 1873) and associated by him with the New Zealand species of the genus; these differ from typical *Cassinia* in their shortly oblong, not long linear, leaves and the more conspicuous white tips to the involucral bracts. However they agree with *Cassinia* sens. strict., and differ from *Rhynea*, in the behaviour of the inner bracts, which fall from the heads as the fruits ripen. This is a problem that needs a thorough study; unfortunately we have been unable to see material of the species from Pondoland described by O. Hoffmann as *Cassinia alba*. The affinity of *Rhynea* should be tested with *Helichrysum* (e.g. *H. serpyllifolium*) as well as with *Cassinia*.

To sum up, there are four main points :

1. There is a group of plants with white-tipped inner involucral bracts whose generic position is uncertain and whose homogeneity as a group requires study. It includes certain species of *Gnaphalium* and *Helichrysum* and involves three other generic names, *Amphidoxa*, *Demidium* and *Helichrysopsis*. *Rhynea* also requires study at the same time.

2. There is no problem about the placing of *Helichrysum basalticum* or the variants of *H. cymosum* sens. lat. and *H. odoratissimum* sens. lat. in which the female flowers outnumber the hermaphrodite. These belong in *Helichrysum*.
3. *Helichrysum* includes species that may sometimes lack a pappus on the female or on all the flowers, and species that are always completely epappose. They do not, for this reason, belong to some other genus, such as *Calomeria*.
4. *Helichrysum* includes species with paleaceous receptacles. These species are related to other, epaleate, species of *Helichrysum*, not to one another. They do not, for this reason, belong to *Cassinia* or any other genus.

94. Helichrysum adenocarpum DC. subsp. **ammophilum** Hilliard, **subspecies nova** a subsp. *adenocarpo* habitu semper robusto, foliis glandulosis (haud lanatis), bracteis involucri semper albis, et tempore florendi plerumque praecociore differt.

Type. Natal, Ingwavuma distr., Ilala Flats past Mosi Swamp on road to Maputa, 20 xii 1968, *Pooley* 268 (NU holo, E iso).

NATAL. Ingwavuma distr., Maputa airstrip, 11 iv 1968, *Ward* 6567 (PRE); Lake Sibayi, 20 vii 1971, *Downing* 673 (E, NU). Hlabisa distr., west of Charters Creek, *Ward* 2788 (NH, NU); Dukuduku, *Strey* 6803 (NH, NU, PRE). Mtunzini distr., Amatikulu, *Wylie* comm. *Wood* 8549 (K, NH). Lower Umfolozi distr., coast road north of Tugela river, near Kwabonambi, 13 xii 1965, *Hilliard & Burtt* 3209 (E, NU). Lower Tugela distr., Zinkwazi overflow, *Getliffe* 74 (NU). Eshowe distr., *Gerstner* 1778 (NU).

MOÇAMBIQUE. Delagoa Bay, marshes of Hangwana and Rikatla, white sand, *Junod* 288 (G, Z); Depression de Rikatla, Feb. March 1893, *Junod* 372 (G, Z); *ibidem*, *Junod* 2916 (G); Matalane (Rikatla), *Junod* 565 (G); Inhaca Island, Hlangwini Swamp, in drained grassland, Sept. 1957, *Mogg* 27656 (K).

H. adenocarpum is widespread, from the eastern highlands of Rhodesia to the Zoutpansberg and the mountains of the eastern Transvaal and neighbouring Swaziland, through Natal and nearby parts of the Orange Free State and Lesotho to the Transkei and eastern Cape as far south as the Amatola Mts. It is very variable in stature, leaf size and indumentum, number of heads in the compound inflorescence, and in the colour of the involucral bracts. However, the leaves are generally more or less woolly, and the involucral bracts range from crimson to scarlet to pink or pink and white; very rarely plants have pure white bracts, and even they grow mixed with plants having pink or parti-coloured bracts. The plant singled out here as a subspecies of *H. adenocarpum* is consistently of robust habit, has glandular, very rarely woolly, leaves, a many-headed inflorescence, and involucral bracts invariably pure white. It is confined to the Moçambique-Zululand coastal plain, and grows in sandy, poorly drained grassland, generally flowering from August to December. *H. adenocarpum* generally flowers from January to March, and despite being widespread in Natal from near sea level to the top of the Drakensberg, it is absent from the coastal plain, where it is replaced by subsp. *ammophilum*.

H. adenocarpum subsp. *ammophilum* is sometimes found in herbaria as "*H. elegantissimum* DC.", but that is a plant of very different affinity, easily distinguished by its different habit and epapillose achenes.

95. Helichrysum arenarium (L.) Moench, Meth. 575 (1794).
Type. Probably LINN 989.36!
Syn.: *Gnaphalium arenarium* L., Sp. Pl. 854 (1753).
Gnaphalium adscendens Thunb., Prodr. Pl. Cap. 150 (1800) & Fl. Cap. 654 (1823). Type: "Cape", *Thunberg* (UPS!).
Helichrysum adscendens (Thunb.) Less., Syn. Comp. 274 (1832) quoad syn.; Harv. in Harv. & Sond., Fl. Cap. 3: 235 (1865).

Gnaphalium adscendens was described by Thunberg from a specimen that he clearly thought belonged to his Cape collections. However, examination of the type, kindly sent on loan to us by the authorities at Uppsala, shows that it is the common European species, *Helichrysum arenarium*. The name *H. adscendens* is thus incorrect for any South African species. Harvey (in Harv. & Sond., Fl. Cap. 3: 235, 1865) realised that the plant described by Lessing and De Candolle was distinct and named it *H. psilolepis*. He described *H. adscendens* from Thunberg's specimen alone, but failed to recognize it as a European species, although admitting he knew it only from this one specimen. Subsequently the name *H. adscendens* was incorrectly transferred to *H. cephaloideum* DC. (see no. 97).

96. Helichrysum basalticum Hilliard, **nom. nov.**
Type. Lesotho, Phutha, near Mokhotlong, c. 3050 m, *Compton* 21570 (NBG, holo!).
Syn.: *Gnaphalium alticolum* Compton in Journ. S. Afr. Bot. 19: 113 (1953), non *Helichrysum alticolum* Bolus.
NATAL. Bergville distr., Tugela valley and Mont aux Sources, c. 3000 m, April 1934, *Humbert* 15275 (P); Estcourt distr., Champagne Castle, c. 3200 m, *Nordenstam* 2136 (S).
CAPE. Barkly East distr., summit Doodmans Krans Mt. and Ben Mcdhui, iii 1904, *Galpin* 6676 (PRE); Naude's Nek, 2500 m, 22 ii 1971, *Hilliard & Burtt* 6725 (E, NU); *ibidem*, 9 iv 1966, *Hilliard* 3914 (E, NU).
LESOTHO. Top of Mont aux Sources, *Potts* 2975 (PRE); upper slopes Machaba Peak, 21 iii 1936, *Galpin* 14102 (K); summit Satsanna's Peak, iii 1904, *Galpin* 6670 (K); Mokhotlong, 28 ii 1949, *Guillarmod* 971 (PRE); Motiti river, 5 ii 1954, *Guillarmod* 2084 (PRE).

Compton described this species, with reservations, in *Gnaphalium* because the outer, female, flowers are more numerous than the inner, hermaphrodite, ones. However, the affinity of the plant is with *Helichrysum flanaganii* Bolus. Both species are perennial herbs found on the summit of the Drakensberg from Naude's Nek, between Maclear and Rhodes in the eastern Cape, to Mont aux Sources. *H. basalticum* has a cluster of leaf rosettes at the crown, the leaves obovate and grey-woolly, and spreading, prostrate flowering stems producing dense rounded clusters of heads at the branch tips; *H. flanaganii* produces great tufted mats of closely leafy branchlets, the leaves small, obovate, usually grey-woolly, the flowering stems erect and terminating in dense rounded clusters of heads. The heads of both species are similar: campanulate with tawny-yellow, hyaline, non-radiating involucral bracts about as long as the flowers. They are alike too in floral morphology, including the bright yellow colour of the corolla. They differ in sex distribu-

tion. *H. flanaganii* has 11–15 female, 24–40 hermaphrodite flowers in a head (6 heads from 6 different collections counted); *H. basalticum* has 27:22; 29:24; 29:30; 38:35 female and hermaphrodite flowers respectively in a head (all from one collection.)

The inadequacy of using mere differences in the proportion of female and hermaphrodite flowers to distinguish between the large, heterogeneous genera *Gnaphalium* and *Helichrysum* is discussed elsewhere (p. 339). In this particular instance of a pair of closely allied species falling on either side of that arbitary boundary, it seems expedient to transfer *Gnaphalium alticolum* to *Helichrysum*, the genus where it is most likely to be sought and where its affinity lies.

97. Helichrysum cephaloideum DC., Prodr. 6: 197 (1838); Harvey in Harv. & Sond., Fl. Cap. 3: 242 (1865).

Types. Kaffirland and Albany, *Ecklon* 1887 and 1890 (G–DC!); Umzimkulu, *Drège* 5023 (G–DC!).

Syn.: *H. cephaloideum* var. *polycephalum* DC., Prodr. 6: 197 (1838). Type: Albany, *Ecklon* 1862 (G–DC!).

[*H. adscendens* auctt., non (Thunb.) Less.; Moeser in Bot. Jahrb. 44: 319 (1910); Brenan in Mem. N.Y. Bot. Gard. 8: 468 (1954)].

H. araneosum Klatt in Bull. Herb. Boiss. 4: 834 (1896). Types: Natal, between Howick and Pinetown, *Junod* 186 (Z!) and Richmond, *Schlechter* 6722 (Z!).

The true *H. adscendens* proves to be the European *H. arenarium* (see no. 95 above). At least since Moeser's revision of the African species of *Helichrysum* (in Bot. Jahrb. 44, 1910), the name "*adscendens*" has been applied to the south-east African plant that is properly *H. cephaloideum*. Harvey (above), having seen Thunberg's specimen, quite rightly kept *H. adscendens* and *H. cephaloideum* separate.

98. Helichrysum chiliocephalum Hilliard & Burtt, **nom. nov.**

Type. Ethiopia, Semien, *Schimper* 890 (K, holo! E, iso!).

Syn.: *Chiliocephalum schimperi* Benth. in Hook., Ic. Pl. t. 1137 (1873); Cufodontis in Bull. Jard. Bot. Brux. 36: suppl. 1104 (1966), non *Helichrysum schimperi* (A. Rich.) Moeser.

The reasons for reducing the genus *Chiliocephalum* Benth. are detailed in the discussion under the generic heading above (p. 341). We are not aware of any collections other than the type.

99. Helichrysum crassifolium (L.) D. Don in Loudon, Hort. Brit. 341 (1830).

Type. Cult. in horto upsaliensi (LINN 989: 27!).

Syn.: *Gnaphalium crassifolium* L., Mant. 112 (1767); Lam., Encycl. Méth. 2: 746 (1788).

G. ambiguum Pers., Syn. 2: 417 (1805). Type: Spec. *G. crassifolium* (sec. Lam.) cult. Paris.

Helichrysum ambiguum (Pers.) Presl, Fl. Sic. p. xxix (1826).

H. lamarckii Cambess. in Mém. Mus. Paris, 14: 269, t. 7 (1827); Knoche, Fl. Balear. 2: 461 (1922). Type: as for *G. ambiguum*.

Distribution. Balearic Islands.

Lamarck said that he was somewhat doubtful whether the plant he was describing was the true *Gnaphalium crassifolium* L., but that he did not dare to separate them. Persoon was less cautious and established *G. ambiguum* for *G. crassifolium* sens. Lam. non Linn. Cambessedes considered the epithet *ambiguum* inappropriate on transfer to *Helichrysum* and re-christened the plant *H. lamarckii*. Examination of Linnaeus's type shows that Lamarck's doubts were groundless and *H. crassifolium* is the correct name for this well known plant, endemic to the Balearic Islands. It seems, from Cambessedes' remarks, that although it had long been in cultivation the wild provenance was unknown until he wrote about it.

The South African plant known as *H. crassifolium* is the true *H. crispum* (see no. 100 below).

100. Helichrysum crispum (L.) D. Don in Loudon, Hort. Brit. 341 (1830); Less., Syn. Comp. 310 (1832).

Type. Not found.

Syn.: [*Gnaphalium aureum aethiopicum flore roseo pleno* Plukenet, Phytogr. tab. 298, fig. 3 (1694), Almagest. 171 (1696). Type: Herb. Sloane, vol. 100, fol. 104, top left (BM!)]
Gnaphalium crispum L., Sp. Pl. ed. 2, 1197 (1762), Mantissa 91 (1767).
[*Helichrysum leucophyllum* DC., Prodr. 6: 175 (1838). Type: Cape, Worcester, *Ecklon* (G–DC!).
[*H. crassifolium* auctt. non (L.) D. Don; Harv. in Harv. & Sond., Fl. Cap. 3: 224 (1865); Moeser in Bot. Jahrb. 44: 309 (1910)].

The type specimen that Linnaeus used for the description of *Gnaphalium crispum* is not in his herbarium at the Linnean Society of London. However, there is there a specimen (989.38) determined as *G. crispum* by Linnaeus. It cannot be the type, as it was sent to Linnaeus by Tulbagh in 1769, but it matches well with the description. The same plant is depicted in the Plukenet figure quoted by Linnaeus; the corresponding specimen closely matches Linnaeus's description, and as he can only have seen the very inadequate figure this is no small tribute to his eye. Both the Tulbagh and Plukenet specimens belong to the South African species that is currently but wrongly known as *Helichrysum crassifolium*: wrongly, because Linnaeus's type of *Gnaphalium crassifolium* is a quite different shrubby species from the Balearic Islands, currently called *Helichrysum lamarckii* (see no. 99 above).

For the South African plant commonly known as *H. crispum* see under *H. patulum* (no. 114).

101. Helichrysum cymosum (L.) D. Don subsp. **calvum** Hilliard, **subsp. nov.** a subsp. *cymoso* foliis plerumque magis congestis et saepe angustioribus, capitulis minoribus 4–7-floris (nec 6–10-floris), fimbrillis receptaculi plerumque brevioribus ovario aequalibus (nec plusquam duplo longioribus) et pappo carente differt.

Type. Natal-Lesotho border, summit of Drakensberg in vicinity of Bushman's River Pass, c. 3050 m, *Wright* 447 (E holo, NU iso).

Syn.: *H. infaustum* Wood & Evans var. *discolor* Moeser in Bot. Jahrb. 44: 246 (1910). Types: Natal, *Cooper* 2592; Greytown, *Wood* 1013 (E!) and 4323 (K!). Transvaal, Sandspruit, *Rehmann* 6872 (K!).

CAPE. Barkly East distr., Naude's Nek, 2500 m, *Hilliard & Burtt* 6600 (E, NU); Rhodes to Naude's Nek, 2380 m, *Hilliard & Burtt* 6678 (E, NU). Maclear distr., ascent to Naude's Nek, c. 2440 m, *Hilliard & Burtt* 6594 (E, NU).
NATAL. Alfred distr., Mt. Ngeli, c. 1700 m, *Hilliard & Burtt* 5817 (E, NU). Estcourt distr., Giants Castle, 2660 m, *Bruyns-Haylett* 100 (E, NU); *ibidem*, gully behind Rest Hut, c. 2620 m, *Wright* 431 (E, NU). Bergville distr., Cathedral Peak, *Killick* 1475 (K, NU).
NATAL-O.F.S. border, Sentinel path to Mont aux Sources, c. 2650 m, *Hilliard* 5006 (NU; E mixed with *H. infaustum*).
NATAL-LESOTHO border, top of Drakensberg in vicinity of Bushman's River Pass, 3050 m, *Wright* 446 (E, NU); *ibidem*, 3170 m, *Wright* 500 (E, NU); *ibidem*, *Wright* 327 (E, NU).

Moeser placed this plant as a variety of *H. infaustum*, doubtless because the pappus is wanting in both. However, *H. infaustum* differs in its homogamous heads and strongly papillose ovaries and can be further distinguished by its differently shaped leaves with different indumentum. The affinity of subsp. *calvum* lies with *H. cymosum*, which it strongly resembles in general facies (a fact remarked upon by Moeser) but from which it is marked off not only by its lack of pappus, but also by its smaller heads (4–7 against 6–10 flowers), fimbrils about as long as the ovary, not at least twice as long, and generally by its more crowded and often narrower leaves. This latter feature is especially true of specimens from high, exposed situations.

H. cymosum subsp. *calvum* ranges along the Drakensberg from about Naude's Nek, between Maclear and Rhodes in the eastern Cape, along the Natal-Lesotho border to the low Berg near Volksrust and Wakkerstroom in the SE Transvaal. It is also on the Lesotho mountains, Ngeli Mt. on the Cape-Natal border, and the spurs of the Drakensberg running out to Greytown and Nkandla in central Natal. It forms low spreading clumps on stony grass slopes and flowers between December and March. A plant of mountain slopes and tops, it has not been recorded below 1200 m, while *H. cymosum* subsp. *cymosum* in Natal and the Transkei is coastal in its distribution, and is always found below about 600 m.

102. Helichrysum dasymallum Hilliard, **nom. nov.**
Type. Transvaal, Magaliesberg, Sand River, *Burke* 67 (K!); sine loc., *Zeyher* 878 (E! K!).
Syn.: *H. lanatum* Harv. in Harv. & Sond., Fl. Cap. 3: 233 (1865), non Schrank (1824).

Although *H. dasymallum* has been collected most often between Irene and Pretoria, there are two records from Houtbosch in the NE Transvaal (*Rehmann* 6097, K, Z; *Swierstra* 3746, PRE), two from northern Natal (Nqutu dist., Nondweni, Frieslands, *Gerstner* s.n. NH 23033, and Utrecht distr., Klipspruit, *Breyer*, TM 16998, PRE) and one from Swaziland (*Stewart* 98, K). This last is an addition to Compton's Swaziland check list (Journ. S. Afr. Bot. Suppl. 6, 1966).

Harvey's choice of *lanatum* as a specific epithet so aptly draws attention to the thick woolly indumentum clothing most parts of the plant that it is here replaced by a Greek equivalent.

103. Helichrysum felinum Less., Syn. Comp. 287 (1832).
Type: Cape, *Thunberg* (UPS—as *Gnaphalium felinum*).
Syn.: [*Gnaphalium frutescens, tomentosum, folio oblongo, floribus comosis* Burm., Pl. Afr. Rar. 224, tab. 79 fig. 4 (1739)].
Gnaphalium elongatum Lam., Encycl. Méth. 2: 741 (1788); Bot. Reg. 3: t. 243 (1813); Bot. Mag. t. 2328 (1822)—non *Helichrysum elongatum* Moench (1794).
G. congestum Lam., Encycl. Méth. 2: 741 (1788)—non *Helichrysum congestum* Moench (1802).
G. felinum Thunb., Prodr., Pl. Cap. 140 (1800) et Fl. Cap. 648 (1823) (nom. illegit.) quoad spec. excl. syn.
[*G. serratum* auct. non Linn.; Thunb., Prodr. Pl. Cap. 149 (1800) et Fl. Cap. 659 (1823).]

Investigation of the nomenclature of this well-known species fortunately results in its retaining the epithet *felinum*, with the minor change that this is now taken to date from Lessing (1832) instead of carrying priority from Thunberg's use under *Gnaphalium* in 1800. Thunberg's epithet *felinum* is illegitimate because he cited *Gnaphalium crispum* Linn. as a synonym and there was no valid reason not to use that name if he thought the plants were the same. An invalid reason, and perhaps Thunberg's reason, was that there was also a *Gnaphalium crispum* Linn. fil., and Thunberg may have intended to use the epithet for that plant, or to drop it altogether because of the confusion that had been caused.

As the synonymy quoted above shows, in 1832 no other epithet had been published that was available for use in *Helichrysum*; therefore Lessing's *Helichrysum felinum* ranks as a legitimate new name (Art. 72).

One other name, not cited above, requires discussion. This is *Gnaphalium discolorum* L. (Sp. Pl. ed. 2, 1191, 1763). The description (especially the phrase *floribus subquinis*) and the specimen in the Linnaean herbarium show that the true plant is not *H. felinum* but a species of *Anaxeton*, *A. arborescens* (L.) Less. (c.f. Lundgren in Op. Bot. 31: 28, 1972). However, later on, Linnaeus himself introduced confusion by citing under this species (Mantissa altera 465, 1771) Burmann's plate (Pl. Rar. Afr. t. 79, f. 4) which is *H. felinum*. The name *Helichrysum discolorum* was first used by D. Don in Sweet's Hortus Britannicus (ed. 1: 222, 1827). This work is a columnar catalogue and the right hand column contains references to illustrations. Against *Helichrysum discolorum* Don, there is a reference to Burmann's illustration which had been quoted by Linnaeus as just mentioned. It is reasonable nomenclature to hold that the use of the same epithet, *discolorum*, and the citation of this plate sufficiently links *Helichrysum discolorum* D. Don with *Gnaphalium discolorum* L. for the name to be written *Helichrysum discolorum* (L.) D. Don. The fact that Burmann's plate is not the true *G. discolorum* is a taxonomic, not a nomenclatural, complication: Linnaeus had made a misidentification in citing this plate and Don followed him. The typification of *Helichrysum discolorum* (L.) D. Don is not affected: the name belongs to *Anaxeton arborescens*.

104. Helichrysum glaciale Hilliard, **species nova** nulli arcte affinis sed fortasse ob folia similia prope *H. pagophilum* M.D. Henderson ponenda, sed habitu diverso et capitulis haud luteis recedens.

Fruticulus nanus, multiramosus, rotundatus, 20 cm usque altus et 30 cm usque diametro; caulis primarius perbrevis nodosus lignosus, ramulis tenuibus (1 mm diametro) inferne nudis et radicantibus superne foliatis. *Folia* dense imbricata; lamina suborbicularis, 5 × 5 mm usque, crassa, dense griseo-albo-lanata, patens, parte basali oblongo lamina paulo breviore et angustiore membranacea fere glabra amplexicauli. *Capitula* in pedunculis laxe foliatis ramulos terminantibus solitaria, campanulata, c. 12 mm longa, bracteis radiantibus 20 mm diametro. *Involucri* bracteae plus minusve 6-seriatae, laxe imbricatae, infimae saepe in pedunculum dispersae, ovatae vel ellipticae, subacutae, interiores exterioribus multo longiores et discum c. 6 mm superantes, nitidae, exteriores pallide brunneae, interiores albae, omnes ad basin interne kermesinae. *Flores* c. 85, omnes hermaphroditi. *Corolla* (juvenilis) 2 mm longa, lutea. *Ovarium* 1 mm longum, pilis ascendentibus ad 0·5 mm longis villosum. *Pappus* 2·5 mm longus. e setis c. 15 scabridis ad apices subplumosis compositus. *Achaenia* 1·25 mm longa, pilis ascendentibus villosa.

Type. Cape, Maclear-Barkly East distr. boundary, Naude's Nek, c. 2500 m, 27 xi 1971, *Hilliard* 5186 (NU holo; E, K, MO, NH, PRE, S iso).

CAPE. Maclear distr., between Maclear and Naude's Nek, 19 xi 1958, *Werdemann & Oberdieck* 1107 (K, PRE); Naude's Nek, stony mountain slopes above the pass, E aspect, c. 2580 m, 31 i 1963, *Nordenstam* 2053 (S).

LESOTHO. Quthing distr., summit Satsanna's Peak, 3210 m, 17 iii 1904, *Galpin* 6672 (K, PRE); Butha Buthe distr., Mota's Pass, *Guillarmod* 2003 (PRE); Sani Pass, c. 2700 m, 18 ii 1973, *Hilliard* 5322 (NU, E, K).

H. glaciale is a very pretty little plant with masses of delicately tinted heads set against the grey foliage. The peculiar "ice-cream" colouring of these heads, the outer bracts pale brown, the inner white, all tinged with crimson at the base inside, giving a rosy cast to the whole head, suggested the specific name. It grows in rounded clumps in the crevices of dolerite and basalt cliffs, often where there is oozing water, or in soil cushions on the cliffs. Dr Nordenstam found it forming dense mats on stony mountain slopes. It flowers from November to January.

It is a plant of the high Drakensberg, seemingly without close affinity, but perhaps allied to another high altitude species, *H. pagophilum*, a very compact, rounded dwarf shrub forming hard cushions on rock faces over 3000 m above sea level. Both have suborbicular leaves, but the indumentum of *H. pagophilum* is more silky than that of *H. glaciale*, similar flowers and pappus, and the villous ovaries of *H. glaciale*, scarcely matched elsewhere in the genus, are echoed in those of *H. pagophilum*, which may be clothed in short upward-pointing hairs, sometimes sparse or wanting. *H. pagophilum*, with its bright lemon-yellow involucral bracts, is itself without affinity among yellow-headed species.

105. Helichrysum griseolanatum Hilliard, **nom. et stat. nov.**

Type: Cape, summit Drakensbergen, near Luhana Pass, alt. 2590 m., 25 v 1897, *Galpin* 2325 (BOL holo! PRE iso!).

Syn.: *H. epapposum* Bolus var. *robustum* Bolus in Trans. Roy. Soc. S. Afr. 1: 155 (1909). Types: lecto as above; syntypes East Griqualand, Tsitsa footpath, *Galpin* 6681 (BOL! K! PRE!); Gatberg, *Baur* 236 (K!).

H. inerme Moeser var. *brachycladum* Moeser in Bot. Jahrb. 44: 246 (1910). Types: Cape, East Griqualand, Mt. Currie, *Tyson* 1255 (Z! K!); Gatberg, *Baur* 236 (K!).

NATAL. Alfred distr., Weza, Mpetyne Forest, 1310 m, *Hilliard* 2510 (NU); Ngeli slopes, 1525 m, *Hilliard* 1765 (NU); *ibidem*, c. 1700 m, 4 i 1969, *Hilliard & Burtt* 5845 (E, NU). Estcourt distr., summit Drakensberg in vicinity of entrance to Bushman's river pass, c. 3050 m, 31 i 1968, *Wright* 448 (E, NU).

CAPE. Mt. Currie distr., Mt. Currie, 1830 m, *Tyson* 1255 (K). Maclear distr., Little Pot river en route Naude's Nek, *Hilliard* 3901 (BOL, E, K, NU); summit Naude's Nek, 2440 m, 9 iv 1966, *Hilliard* 3911 (BOL, E, K, NU); Pot River Pass, 1890 m, 18 ii 1971, *Hilliard & Burtt* 6587 (E, NU); 5·6 miles NE of Maclear, c. 1400 m, *Acocks* 20425 (K). Barkly East distr., Naude's Nek, 2500 m, 19 ii 1971, *Hilliard & Burtt* 6622 (E, K, NU, MO, PRE, S). Mt. Ayliff distr., Insizwa Mt., c. 1615 m, 17 ii 1971, *Hilliard & Burtt* 6529 (E, NU). Matatiele distr., Qachas Nek Pass, 2590 m, 21 i 1970, *Schofield* s.n. (E, NU). Kingwilliamstown distr., Mt. Coke, *Sim* (NU). Keiskammahoek distr., Cata, near Sonntag's plot, c. 1525 m, *Acocks* 15726 (K). Victoria East distr., Great Winterberg, 8 iii 1900, *Galpin* 2659 (PRE); Hogsback, *Rattray* 220 (PRE). Faku's territory [Pondoland], *Sutherland* (K).

The relationship of *H. griseolanatum* lies more with *H. gymnocomum* DC. and *H. infaustum* Wood & Evans than with *H. epapposum* (= *H. inerme*) of which it was originally described as a variety. The three allied species all have similarly shaped heads, involucral bracts and corollas, and papillose ovaries. The heads of *H. griseolanatum* and *H. infaustum* are homogamous, with 3–4 or occasionally 5 flowers without a pappus; those of *H. gymnocomum* are homogamous or heterogamous, with 4–6 flowers (in Natal and Cape specimens), pappus copious or the bristles few or sometimes wanting. The three species can be distinguished on leaf characters, the leaves of *H. griseolanatum* being oblong, elliptic or lanceolate-elliptic, broadest in the middle or below, not decurrent; those of *H. infaustum* linear, not decurrent, while in *H. gymnocomum* the leaves are generally broadest in the upper half and decurrent in broad or narrow stem wings.

H. griseolanatum is a bushy subshrub, forming rounded clumps up to about 25 cm high, but as much as 1 m across. Both stems and leaves are greyish-white woolly, the leaves not more than 15 × 6 mm, often smaller, and more distant on the flowering branches, which terminate in dense flattish clusters of tiny, bright yellow, cylindric heads, felted together at the base. Whole mountainsides can be yellowed in late summer and autumn by this species.

106. Helichrysum helianthemifolium (L.) D. Don in Sweet, Hort. Brit. 223 (1827) et in Loudon, Hort. Brit. 342 (1830).

Type: *Gnaphalium africanum floribus minimis albicantibus* Volckamer, Fl. Noribergensis, 194 cum tab. (1700).

Syn.: *Gnaphalium helianthemifolium* L., Sp. Pl. 868 (1753), ed. 2, 1218 (1763) excl. descr. add.

G. capitellatum Thunb., Prodr. Pl. Cap. 150 (1800), Fl. Cap. 653 (1823). Type: Cape, French Hoek, *Thunberg* (herb. Thunb. 19110, UPS).

Helichrysum capitellatum (Thunb.) Less., Syn. Comp. 305 (1832); DC. Prodr. 6: 206 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 250 (1865); Levyns in Adamson & Salter, Fl. Cape Penins. 784 (1950).

Helichrysum helianthemifolium is a name that has never been in general usage. In *Index Kewensis* it is given as a synonym of *H. serpyllifolium* (Berg.) Pers. This, however, represents one of several misuses of the name.

In the first edition of *Species Plantarum*, Linnaeus published *Gnaphalium helianthemifolium* with a reference to Volckamer's *Flora Noribergensis*. Linnaeus's definition fits Volckamer's plate well and was, we judge, based solely on this. In the Linnaean herbarium there is a sheet written up as *helianthemifolium* by Linnaeus himself and this matches the extended description that he gave in the second edition of *Species Plantarum*. It is not the plant figured by Volckamer, but is *Helichrysum serpyllifolium* (Berg.) Pers. It cannot be the type of *H. helianthemifolium*. (Other sheets labelled *Gnaphalium helianthemifolium* in the Linnaean herbarium have nothing to do with the name as published in either edition of *Species Plantarum* and can be ignored here.)

Volckamer's plate was prepared from cultivated plants raised from seed collected on the Cape Peninsula and sent to him by the widow of Hermann. It is a fair representation of the plant currently known as *Helichrysum capitellatum* (Thunb.) Less. This must accordingly be now known as *Helichrysum helianthemifolium* (L.) D. Don.

107. Helichrysum herbaceum (Andr.) Sweet, Hort. Brit. 223 (1827).

Type: cult. George Hibbert.

Syn.: *Xeranthemum herbaceum* Andr., Bot. Rep. 7: t. 487 (1807).
Helichrysum splendens Sims in Bot. Mag. t. 1773 (1816). Type: cult. George Hibbert, from the Cape.
[*H. squamosum* auctt. non (Jacq.) Thunb.; Thunb., Fl. Cap. 661 (1823) excl. syn.; Less., Syn. Comp. 226 (1832) p.p.; DC., Prodr. 6: 183 (1838) p.p.; Harvey in Harv. & Sond., Fl. Cap. 3: 233 (1865); Moeser in Bot. Jahrb. 44: 332 (1910)].
H. monocephalum Bak. in Kew Bull. 1898: 149 (1898). Type: Malawi, S. Nyika Mts., *Whyte* (K!); between Kondowe and Karonga, *Whyte*.

H. herbaceum is widespread in the eastern part of southern Africa, from about Humansdorp in the southern Cape through Natal and neighbouring parts of Lesotho and the Orange Free State to the eastern Transvaal, Inyanga in Rhodesia, the Nyika plateau in Malawi and Lupembe distr. in Tanzania.

It has long been passing as "*H. squamosum* (Thunb.) Less.". Thunberg's herbarium shows that the *Xeranthemum squamosum* of his *Prodromus Plantae Capensium* and *Flora Capensis* is indeed this plant; but it is no more than a misidentification of *Xeranthemum squamosum* Jacq., which is *Helichrysum pinifolium* (see no. 117).

The plant so long known as *H. squamosum* was introduced into cultivation at the beginning of the last century and was twice illustrated in colour. *Xeranthemum herbaceum* Andrews provides the earliest epithet.

108. Helichrysum hyphocephalum Hilliard, **species nova** nulli arcte affinis, fortasse ex affinitate generali *H. sutherlandii* Harv. (fruticis foliis ellipticis et capitulis corymboso-paniculatis interdum compactis sed nunquam basi velamine circumcinctis).

Herba perennis prostrata, multiramosa, tapetiformis, ramis tenuibus veterioribus aut nudis aut foliatis radicantibus, junioribus dense argenteo-sericeis foliatis plerumque abbreviatis itaque foliis subrosulatis. *Folia* usque ad 20 × 4 mm, lanceolato-elliptica, leviter falcata, apice acuta, basi paulo angustata, amplectentia, utrinque indumento argenteo-griseo papyraceo praedita. *Capitula* 10 usque, aggregata; pedunculi communes distanter foliati, 6 cm longi, ramulos terminantes; pedunculis et basis glomeruli capitulorum uti folia indumento papyraceo vestita, capitula ipsa basi indumento sericeo-lanato cincta. *Involucri* bracteae c. 4-seriatae, vix imbricatae, exteriores interioribus majores, spatulatae, 6 × 3 mm usque, interiores breviores angustioresque, omnes petaloideae, limbo lacticolore, basi viridi. *Flores* c. 17–18, omnes hermaphroditi. *Corolla* 2·5 mm longa, lutea. *Ovarium* c. 0·5 mm longum, pilis brevibus obtusis ascendentibus strigosum. *Pappus* 2·5 mm longus, e setis 5–6 scabridis ad apices subplumosis compositus, mox deciduus. *Achaenia* matura haud visa.

Type. Natal, Estcourt distr., Kamberg Nature Reserve, "Gladstone's Nose", c. 2060, 29 xii 1967, *Wright* 363 (NU holo; E, K, PRE iso).

NATAL. Estcourt distr., Kamberg Nature Reserve, "Gladstone's Nose", c. 1830 m, 18 xii 1966, *Wright* 158 (E, NU); ibidem, 4 i 1968, *Wright* 373 (E, NU); ibidem, 27 xii 1968, *Hilliard & Burtt* 5712 (E, NU).

H. hyphocephalum is a most distinctive creeping perennial herb with silvery, falcate leaves and small heads webbed together at the base to form compact pseudoheads at the tips of the bracteate peduncles. The relatively large, spathulate outer involucral bracts resemble the petals of a miniature "double" anemone or similar flower, and add to the illusion of a solitary, snowy-white head.

As yet, *H. hyphocephalum* ("webbed head") is known only from the spur of the "Little Berg" opposite Kamberg Nature Reserve camp, at about 2000 m above sea level. It forms small mats on the stony ridges descending from the summit cliffs, and in the fissures of the south-facing cliffs themselves, the stems often running along a horizontal crack; it flowers in December and January.

109. Helichrysum lingulatum Hilliard, **species nova** *H. argentissimo* J. M. Wood affinis, sed foliis lingulatis (haud linearibus) et indumento lanato (haud sericeo-lanato) differt.

Herba prostrata tapetiformis, rosulas foliorum numerosas e caulibus subterraneis lignosis 1 cm usque diametro multiramosis emittens. *Folia rosularum* usque ad 35 × 8 mm, lingulata, apice plus minusve obtusa, basi lata amplectentia, utrinque dense griseo-lanata. *Caulis florifer* solitarius, terminalis, usque ad 18 cm altus, foliatus. *Folia caulina* appressa, elliptico-oblonga, usque ad 20 × 3 mm, sursum decrescentia, omnia (infimis exceptis) apice membranaceo bracteae involucri simili praedita. *Capitula* solitaria, campanulata, c. 2 cm longa et bracteis radiantibus 4 cm diametro. *Involucri* bracteae plus minusve 5-seriatae, laxe imbricatae, lanceolatae, acutae, exteriores

interioribus discum 15 mm superantibus multo breviores, nitide albae interdum roseo-tinctae et saepe intus ad basin kermesinae. *Flores* c. 180, plurimi hermaphroditi, pauci (c. 12) marginales feminei. *Corolla* 4·5 mm longa, lutea. *Ovarium* c. 1.5 mm longum, papillosum. *Achaenia* ellipsoidea, 1·75 mm longa, brunnea, albo-papillosa, cellulis myxogenis praedita. *Pappus* 4 mm longus, e setis numerosis scabridis ad apicem subplumosis basi pilis patentibus inter se leviter cohaerentibus compositus, mox deciduus.

Type. Cape, Maclear distr., summit Pot River Pass, c. 1950 m, 26 xi 1971, *Hilliard* 5173 (NU holo; E, K, MO, S, PRE iso).

NATAL. Underberg distr., Underberg, *Shirley* s.n., NU 30473.

CAPE. Engcobo distr., hills near Engcobo, *Esterhuysen* 29166 (BOL). Maclear distr., road between Maclear and Naude's Nek, 19 xi 1958, *Werdermann & Oberdieck* 1116 (K); 15 miles from Mt. Fletcher on road to Maclear, 1525 m, 10 xi 1953, *Killick & Marais* 2080 (K, PRE).

LESOTHO. Ramatseliso Gate, *Coleman* 640 (NU, NH).

H. lingulatum will form large mats over extensive areas of poor stony grassland or bare earth, and flowers in early spring. It is closely allied to *H. argentissimum* from which it is distinguished by its differently shaped leaves with a more woolly indumentum. The achenes of *H. lingulatum* become mucilaginous when wet, while those of *H. argentissimum*, though similar in appearance, do not.

H. argentissimum is widely distributed in Natal from about 900 to 2300 m above sea level, and extends as far south as Underberg district and the Zuurberg on the Cape-Natal border near Weza. *H. lingulatum* grows with *H. argentissimum* at Underberg, but seems to replace that species further south.

110. Helichrysum odoratissimum (L.) Sweet, Hort. Brit. 223 (1826); Less., Syn. Comp. 301 (1832); DC., Prodr. 6: 202 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 245 (1865).

Type: Probably 989; 48, 49 or 50 (LINN!).

Syn.: *Gnaphalium odoratissimum* L., Sp. Pl. 855 (1753), ed. 2, 1196 (1763).
Gnaphalium pedunculare L., Mantissa 284 (1767). Type: Cape of Good Hope (LINN 989. 47!).
Helichrysum pedunculare (L.) DC., Prodr. 6: 198 (1838), quoad syn. excl. descr.

The specimen of *Gnaphalium pedunculare* in the Linnaean herbarium is quite clearly the one he had in front of him when he wrote the description of the species. It is, however, referable to the earlier *Gnaphalium odoratissimum*, and the name, currently applied to a quite different species (no. 115), lapses into synonymy. The synonymy given above for this widespread and variable species is not complete.

111. Helichrysum oxyphyllum DC., Prodr., 6: 199 (1838); Harv. in Harv. & Sond. Fl. Cap. 3: 241 (1865).

Type: Cape, Gauritz River, *Burchell* 4733 (G–DC., K).

Syn.: *Gnaphalium crispum* L. f., Suppl. 363 (1781), non L. (1763).
G. elatum Lam., Encycl. 2: 742 (1788)—non *Helichrysum elatum* DC. (1838).

G. undatum J. F. Gmelin, Syst. Veg. 2: 1213 (1792) nom. illegit.; Thunb., Fl. Cap. 655 (1823).
Helichrysum undatum Less., Syn. Comp. 298 (1832) nom. illegit.; Harv. in Harv. & Sond., Fl. Cap. 3: 238 (1865).

This plant has usually been known in recent years as "*H. undatum* (Thunb.) Less.", but Thunberg's *Gnaphalium undatum* was taken over from J. F. Gmelin and Thunberg played no original part in this particular muddle. The trouble arises now because Gmelin renamed *Gnaphalium crispum* L. f. non L. as *G. undatum* without apparently being aware that Lamarck had already named it *G. elatum*. Gmelin's epithet was therefore illegitimate and Lessing's retention of *undatum* when he transferred the species to *Helichrysum* was also illegitimate: he quoted *G. elatum* Lam. as a synonym. Lamarck's epithet was available for use in *Helichrysum* until 1838, when De Candolle took up A. Cunningham's manuscript name *H. elatum* for an Australian species. It is therefore necessary to turn to the next earliest legitimate name, which is *H. oxyphyllum* DC.

See also *H. pallidum* (no. 113).

112. Helichrysum paleatum Hilliard, **species nova** ex affinitate *H. albirosulati* Killick et *H. subfalcati* Hilliard, ab ambobus habitu, foliis glabris vel subglabris, receptaculo paleato valde differt.

Herba perennis, tubere parvo ovali lignoso rosula foliorum coronata. *Folia* radicalia 7 × 1·5 cm usque, elliptica, venis 5 parallelis, apice acuta, mucronata, basi lata amplectentia, marginibus incrassata, subcoriacea, glabra vel pilis parcis asperis praedita, venis et marginibus aut glabris aut lanatis. *Caules floriferi* 1–4, foliis rosulae axillares, basi paulo decumbentes, ad 30 cm usque erecti, simplices, laxe albo-lanati, foliati. *Folia caulina* 7·5 × 1 cm usque, sursum decrescentia, suprema bracteiformia plus minusve disticha, amplectentia, lineari-lanceolata, inferiora secus costa complanata et leviter falcata, superiora erecta haud curvata, ceterum uti radicalia. *Capitula* cylindrica c. 5 × 5 mm, numerosa, aggregata et basi lano albo in capitulo composito terminali 2–3 cm diametro conexa. *Involucri* bracteae plus minusve 4-seriatae, subaequales vel exteriores paulo breviores, haud radiantes, flores aequantes, c. 5 mm longae, subspatulatae, subacutae, apicibus plicatis translucentibus aureis leviter brunneo-suffusis. *Receptaculum* paleatum, interdum etiam fimbrilliferum; paleae 4·75 mm longae, oblongae, subacutae, apicibus plicatis, deciduae; fimbrillae 1 mm longae, persistentes. *Flores* c. 55, omnes hermaphroditi. *Corolla* inferne cylindrica, superne campanulata, lutea. *Ovarium* 0·75 mm longum, papillosum. *Achaenia* ellipsoidea, 1 mm longa, papillosa. *Pappi* setae c. 4–8, 4 mm longae, scabridulae, apicem versus subplumosae, basi haud cohaerentes, mox deciduae.

Type. Natal, Estcourt distr., Giant's Castle Game Reserve, Bannerman Pass, c. 2440 m, 28 iv 1968, *Hilliard* 4828 (NU holo, E iso).

NATAL. Estcourt distr., Giant's Castle Game Reserve, Giant's Castle Rest Hut, c. 2315 m, 30 i 1968, *Wright* 429 (E, NU); Highmoor Forest Reserve, spur running E. from Giant's Castle, c. 2440 m, 18 ii 1968, *Hilliard* 4810 (E, NU); "Stillerust", c. 1980 m, 19 ii 1968, *Wright* 459 (E, NU). Underberg distr., Bamboo Mt., March 1938, *McClean* 701 (NH, PRE); 9 miles NNE of Underberg, 22 iii 1962, *Acocks* 22144 (PRE).

H. paleatum is a rather undistinguished plant found growing in colonies on grassy mountain slopes in a small area of the Natal Drakensberg. Its interest lies in its paleate receptacle. There is only one other African species of *Helichrysum* with a paleate receptacle, *H. argyrophyllum* DC., segregated on this account in subgenus *Lysiolepis* Bolus. But the presence or absence of receptacular paleae can be of scant taxonomic significance (see p. 342), and the relationship of *H. paleatum* lies not with *H. argyrophyllum* but with *H. albirosulatum* and *H. subfalcatum*, in both of which the pit margins are at most slightly produced.

In *H. paleatum*, each flower is subtended by a single, half-clasping palea as long as the corolla or slightly longer, and this falls as the achene matures. These paleae resemble the involucral bracts, merely being slightly narrower. In some specimens there may be two or three fimbrils about 1 mm long in addition to the palea, and these persist on the receptacle. They appear to be upward extensions of the pit margins but are membranous like the paleae, not thick and fleshy as, for example, in many members of the § Plantaginea.

Bolus (in Trans. S. Afr. Phil. Soc. 18: 393, 1907) suggested that the paleae in *H. argyrophyllum* do not resemble the involucral bracts. This is true only up to a point: what they *do* resemble is the stereome of the involucral bract, and indeed, they are just the length of the stereome.

113. Helichrysum pallidum DC., Prodr. 6: 199 (1838).

Type: Cape, between Umzimkulu and Umtentu, *Drège* 5008 (G-DC!—*H. pallidum* α *ellipticum* DC.).

Syn.: *H. undatum* var. *pallidum* (DC.) Harv. in Harv. & Sond., Fl. Cap. 3: 238 (1865).

De Candolle distinguished his *H. pallidum* from "*H. undatum* Less." (see *H. oxyphyllum* DC., no. 111 above) by the pale yellow involucral bracts. The two are indeed very close, but in most specimens of *H. pallidum* the pale yellow bracts are associated with leaves having 5–7 main veins linked by side veins raised on the lower surface. In *H. oxyphyllum* the outer bracts are tinged pink or purplish and the leaves have 3, rarely 5, main veins, the side veins being either invisible or not raised. De Candolle divided *H. pallidum* into three varieties: α, *ellipticum*, β, *intermedium* and γ, *longifolium*. These are trivial variations not meriting recognition.

H. pallidum provides the earliest name in a variable and difficult group: other names that are either synonyms or represent closely related species are *H. agrostophilum* Klatt, *H. rhodolepis* Baker, *H. amoenum* Moeser, as well as *H. oxyphyllum* DC. (no. 111).

114. Helichrysum patulum (L.) D. Don in Loudon, Hort. Brit. 341 (1830).

Type: *Gnaphalium* No. 15 (Herb. Cliff.—BM).

Syn.: [*Gnaphalium foliis amplexicaulibus lateribus codrctatis, ramis patentibus, corymbis terminatricibus*, Linn., Hort. Cliff. 402 (1737)].
G. patulum L., Sp. Pl. 855 (1753).
G. divaricatum Berg., Pl. Cap. 250 (1767). Type: Cape, *Grubb* (STB—n.v.)
G. auriculatum Lam., Encycl. Méth. 2: 754 (1788)—non *Helichrysum auriculatum* Less. Type: Cape (P-LAM!).

[*Helichrysum crispum* auctt. plur. non (L.) D. Don; Less., Syn. Comp. 310 (1832); DC., Prodr. 6: 208 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 253 (1865); Levyns in Adamson & Salter, Fl. Cape Penins. 784 (1950).]

H. crispum var. *subrufescens* DC., Prodr. 6: 208 (1838). Types: ex herb. De La Roche (G–DC!), spec. labelled Gnaphalium spatulatum Breyn. (G–DC!). [These excluded from IDC microfiche.]

The type specimen of *Gnaphalium patulum* (*H. patulum*) in the Clifford herbarium is an excellent one and there is no question about its identity. In the Linnean Society's herbarium sheet 989.25, labelled *G. patulum*, is clearly from the Clifford herbarium: it almost certainly represents the same species, but it seems to be the upper part of a specimen grown under greenhouse conditions. Sheet 989.26, labelled *patulum*?, is a non-flowering specimen, but has the characteristic leaves. Two other sheets are unnamed but belong to the same species: 989.99 (coll. Sparrman) and 989.106.

H. patulum has long been known as *H. crispum*. It seems likely that this name was adopted because it aptly described the crisped leaf-margins of the plant. Linnaeus's use of the epithet *crispum*, however, applied not to leaves but to involucral bracts; Linnaeus described these as "*plicato-undulatis*" and said that they were not, as in *G. patulum*, ovate-lanceolate. *H. crispum* is a distinct species (see no. 100 above).

115. Helichrysum pedunculatum Hilliard & Burtt, **species nova** ad huc pro *H. pedunculari* (L.) DC. habita sed species omnino diversa. *H. pilosello* (L.f.) Less. (*H. latifolio* (Thunb.) Less.) valde affinis, sed foliis angustioribus subtus indumento sericeo-pannoso venas occultante praeditis distinguitur.

Type. Cape, Beaufort distr., Kat River valley, 1860, *Cooper* 415 (holo E! iso K! NH! Z!).

Syn: [*Helichrysum pilosellum* auct. non (L.f.) Less., Syn. Comp. 297 (1832) quoad descr. excl. syn.]

[*Helichrysum pedunculare* auct. non (L) DC.; DC., Prodr. 6: 198 (1838) quoad descr. excl. syn.; Harv. in Harv. & Sond., Fl. Cap. 3: 238 (1865), excl. syn. et var.; Moeser in Bot. Jahrb. 44: 262 (1910); Batten & Bokelmann, Wild Flow. E. Cape 154 pl. 123 fig. 1 (1966).)]

Herba erecta ad 45 cm alta; caulis e radice lignoso simplex, dense lanuginoso-tomentosus, dimidio superiore subnudus. *Folia basalia* subrosulata, parte petiolari c. 1–3 cm longa tandem subfibrosa; lamina elliptica, c. 7–10 × 3 cm, apice acuta vel subobtusa, basi in petiolo alato angustata, supra subglabra, subtus dense sericeo-pannosa, nervis lateralibus utrinsecus c. 3 prope basin laminae orientibus ascendentibus. *Folia caulina* pauca, sursum mox decrescentia, subsessilia, basalibus similia sed minora et apice acutiora, summa valde redacta linearia 2 cm longa. *Inflorescentia* terminalis, valde congesta, glomerulam sphaericam 3–7 cm diametro e capitulis numerosis formans; rami inflorescentiae et bases capitulorum tomentosi. *Capitulum* campanulatum, c. 7 × 6 mm, homogamum, floribus c. 55. *Involucri* bracteae c. 5-seriatae laxe imbricatae, oblongo-lanceolatae, basi lanuginosae, apice brunneae scariosae crispatae haud radiantes, exteriores interioribus flores aequantibus paullo breviores. *Receptaculi* fimbrillae dimidio ovarii aequales.

Corolla 5 mm longa, inferne tubulosa, superne campanulata. *Ovarium* 1 mm longum, epapillosum. *Pappus* e setis numerosis corollam aequantibus scabridis apice subplumosis basi pectinatis et valde cohaerentibus deciduis compositus.

CAPE. Somerset East, Boschberg, *Macowan* 688 (Z). Uitenhage, *Burchell* 4456 (K). Riversdale, Spiegel River, *Burchell* 7201 (K). Graaff Reinet, in summo monte 'Cave', *Bolus* 245 (Z). Stutterheim, *Rogers* 12826 (Z). Aliwal North, Witteberg, *Drège* (E). Transkei, Baziya, *Baur* 485 (Z), 806 (K).

H. pedunculatum has had an unfortunate history. It was misidentified by Lessing as *H. pilosellum* (no. 117) and by De Candolle as *H. pedunculare*, which proves to be a synonym of *H. odoratissimum* (no. 110). It appears here as '*species nova*' simply because it seems desirable to give it a full description based on a good type specimen. It has long been known as *H. pedunculare*; since the epithet *pedunculare* disappears into synonymy, the like-sounding *pedunculatum* has been chosen.

This species is well-represented in herbaria, and the specimens cited above are only a selection of those available. It is found in an area roughly bounded by a line joining Riversdale, Graaff Reinet, the Witteberg near Lady Grey and Baziya in the central Transkei.

116. Helichrysum petiolare Hilliard & Burtt, **nomen novum.**

Type: Zuurberg, *Drège* 264 (G–DC!).

Syn.: [*Gnaphalium tomentosum, foliis orbiculatis subtus incanis*, Burm., Rar. Afr. Pl. 214, tab. 76, f. 2 (1739).]
[*H. petiolatum* auct. non (L.) DC.; DC., Prodr. 6: 208 (1838) quoad descr. et spec., excl. syn.; Harv. in Harv. & Sond., Fl. Cap. 3: 252 (1865); Moeser in Bot. Jahrb. 44: 312 (1910)].

Distribution. Cape, from Swellendam eastwards through the eastern Cape to Mt. Tabankulu and Mt. Insizwa in Pondoland (N Transkei).

It is well known that some cases of confusion in Linnaeus's work resulted from his not having access to Clifford's Herbarium after he left Holland. *Gnaphalium petiolatum* provides an example of this. There is no doubt whatever that *Gnaphalium* 16 of Hortus Cliffortianus was based on the specimen now preserved in the Clifford Herbarium (BM) and not on the synonyms cited. The six-line description fits exactly. It was to this plant that Linnaeus subsequently gave the name *Gnaphalium petiolatum*, appending an asterisk to the Hortus Cliffortianus citation to show that it was well described therein. Unfortunately he added a synonym in Species Plantarum; this was taken from Burmann's work published in 1739 (quoted above) and Linnaeus thus never compared the synonym with the specimen in Clifford's Herbarium. They are not the same. The plant of the Hortus Cliffortianus is a Cretan *Staehelina* (see no. 147 below); it is to Burmann's plant that the name *Gnaphalium* (now *Helichrysum*) *petiolatum* has subsequently been applied. This discrepancy has long been known, but the lack of a type method in nomenclature enabled the current use to be retained. Under the present Code this is clearly inadmissible. The epithet *petiolatum* must go with the plant with which Linnaeus clearly linked it in 1753: this becomes *Staehelina petiolata* (no. 147). The South African *Helichrysum* appears to

have no valid synonyms and must therefore be re-named. As the epithet *petiolatum* will no longer be in use in *Helichrysum*, it is replaced by *petiolare*.

Although widely distributed in the Cape and long cultivated in Europe, the splendid illustration given by Burmann in 1739 remains the only one published.

117. Helichrysum pilosellum (L. fil.) Less., Syn. Comp. 297 (1832), quoad syn. excl. descr.

Type: Cape, '*Bäck*' [i.e. *Forster*, fide Exell] (LINN 989. 79).

Syn.: *Gnaphalium pilosellum* Linn. fil., Suppl. 364 (1781).
G. latifolium Thunb., Prodr. Pl. Cap. 152 (1800) et Fl. Cap. 660 (1823). Type: Cape, Galgebosch, *Thunberg* (UPS).
Helichrysum latifolium (Thunb.) Less., Syn. Comp. 297 (1832); DC., Prodr. 6: 198 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 237 (1865).
H. pedunculare (L.) DC. var. *pilosellum* (L. fil.) Harv. in Harv. & Sond., Fl. Cap. 3: 238 (1865) quoad syn. excl. spec.

Thunberg apparently overlooked the name *Gnaphalium pilosellum*, for it appears neither in his herbarium nor in his Flora Capensis. He redescribed the plant as *G. latifolium*. Lessing transferred both these names to *Helichrysum*, but the plant he described as *H. pilosellum* is not that species; it is one subsequently misidentifield by De Candolle as *H. pedunculare* (L.) DC. (see no. 114).

The type specimen of *Gnaphalium pilosellum* is a characteristic specimen of the plant currently known as *Helichrysum latifolium* and the epithet *pilosellum* must be re-adopted.

118. Helichrysum pinifolium (Lam.) Schrank in Denkschr. Akad. Münch. 1821–22, 8: 168 (1824); Levyns in Adamson & Salter, Fl. Cape Penins. 785 (1950).

Type. Cape of Good Hope (P–LAM, n.v.).

Syn.: *Xeranthemum pinifolium* Lam., Encycl. Méth. 3: 240 (Oct. 1789).
X. squamosum Jacq., Collectanea 3: 279, tab. 20, fig. 2 ("1789", but late 1791 fide Stafleu). Type: from Cape of Good Hope (no spec. cited).
Helichrysum squamosum (Jacq.) Thunb., Fl. Cap. 661 (1823) quoad syn.
Xeranthemum humile Andr., Bot. Rep. 10: t. 652 (1812). Type: Cult. spec. intro. from Cape of Good Hope by Niven (lost?).
Helichrysum humile (Andr.) Less., Syn. Comp. 322 (1832); Harv. in Harv. & Sond., Fl. Cap. 3: 255 (1865); Moeser in Bot. Jahrb. 44: 340 (1910).
Gnaphalium squamosum (Jacq.) Sch. Bip. in Bot. Zeit. 3: 171 (1845).

The name *Helichrysum squamosum*, so long misapplied (see no. 107 above) now falls into synonymy under *H. pinifolium*. Jacquin's description and figure are quite unequivocal. The species would be a splendid one for experimental studies on the change from foliage leaves to scale leaves and from scale leaves to involucral bracts.

119. Helichrysum praecurrens Hilliard, **species nova** *H. sessilioidei* Hilliard affinis sed habitu tapetiformi (haud lignoso-pulvinato), indumento foliorum magis sericeo et achaeniis epapillosis differt.

Herba perennis, tapetiformis; caules diffusi, prostrati, nudi, radicantes, ramulos numerosos erectos dense foliatos ad 2 cm altos inferne foliis siccis emortuis vestitos emittentes. *Folia* superiora dense imbricata, ut videtur rosulata, usque ad 7 × 2 mm, linearia vel anguste lineari-lanceolata, indumento sericeo papyraceo, viridia argenteo-nitentia, siccitate argenteo-griseo. *Capitula* sessilia, apicibus ramulorum solitaria, anguste campanulata, c. 10 mm longa, bracteis radiantibus 20 mm diametro. *Involucri* bracteae plus minusve 6-seriatae, dense imbricatae, exteriores ovatae, interiores lanceolatae vel ellipticae, omnes acutae, exteriores interioribus discum 6–7 mm superantibus multo breviores, albo-nitidae, exteriores pallide brunneo-suffusae, interiores plerumque ad apices roseo-tinctae. *Flores* c. 30–40, omnes hermaphroditi, vel interdum pauci marginales feminei. *Corolla* 5·5 mm longa, lutea, rubro-apiculata. *Ovarium* 1 mm longum, epapillosum. *Pappus* 6 mm longus, e setis numerosis scabridis apicibus subplumosis basi pilis patentibus leviter cohaerentibus, mox deciduus. *Achaenia* haud visa.

Type. Natal, Estcourt distr., summit of Drakensberg in vicinity of Giant's Castle Pass, c. 3170 m, 19 xi 1970, *Wright* 1044 (NU holo; E, K, PRE, iso).

NATAL. Bergville distr., Mont aux Sources, 3110 m, 17 xi 1954, *Edwards* 349 (NU).

LESOTHO. 1 mile W. of summit of Bushman's River Pass, c. 3170 m, 3 xi 1967, *Wright* 275 (E, NU); 1 mile S.W. of exit Bushman's River Pass. c. 3170 m, 2 xii 1968, *Wright* 749 (NU); ibidem, *Wright* 748 (E, NU); Fanana Valley, Oxbow, 3200 m, 16 xii 1969, *Williamson* 374 (K); Oxbow Agricultural area, 3050 m, 11 xi 1970, *Williamson* 862 (K); Thaba Ntlenyana, 18 i 1955, *Guillarmod* 2331 (PRE); Butha Buthe distr., Pone Valley, Mothae Mts., *Coetzee* 805 (PRE); Mokhotlong, Temrock Peak, *Liebenberg* 5699 (PRE).

H. praecurrens is found on the summit of the Drakensberg along the Natal-Lesotho border and on the high Lesotho plateau, always more than 3000 m above sea level, and flowering in November and early December. It forms dense and extensive mats and is a colonizer of bare or sparsely grassed areas, whence the specific epithet.

120. Helichrysum serpyllifolium (Berg.) Pers., Syn. 2: 416 (1807); Less., Syn. Comp. 277 (1832); Harv. in Harv. & Sond., Fl. Cap. 3: 218 (1865); Moeser in Bot. Jahrb. 44: 307 (1910).

Type: Spec. cult. Paris (SBT, n.v.).

Syn.: *Gnaphalium serpyllifolium* Berg., Descr. Cap. 250 (1767); Lam., Encycl. Méth. 2: 743 (1783), excl. syn. Volck.

G. orbiculare Thunb., Prodr. Pl. Cap. 152 (1800), Fl. Cap. 659 (1823). Type: Cape, hills below Table Mt., *Thunberg* (UPS—sheet 19222!).

Helichrysum serpyllifolium var. *orbiculare* (Thunb.) DC., Prodr. 6: 173 (1838).

Helichrysum orbiculare (Thunb.) Druce in Rep. Bot. Exch. Brit. Isles. 1916: 626 (1917).

This species ranges from the Cape Peninsula north-eastwards to Natal. It has long been in cultivation in Europe.

G. C. Druce proposed the name *Helichrysum orbiculare* to replace "*H. serpyllifolium* Less.", the name used by Harvey in Flora Capensis. His decision was evidently based merely on inspection of the incomplete synonymy given by Harvey. *H. serpyllifolium* Less. is based on *Gnaphalium serpyllifolium* Berg., which long antedates Thunberg's *G. orbiculare*. At first, a rather cursory investigation seemed to uphold Druce's action, as *H. serpyllifolium* Less. is antedated by *H. serpyllifolium* Pers. based on "*G. serpyllifolium* Lam.". However reference to Lamarck's Encyclopédie shows that his *G. serpyllifolium* is just Bergius' species of the same name. Indeed Lamarck says the species had long been cultivated at Paris, and Bergius tells us that it was just such a specimen that he described. Clearly a nomenclatural reference to "*G. serpyllifolium* Lam." must be read as an indirect reference to Bergius, and Persoon's name under *Helichrysum* may be taken as *H. serpyllifolium* (Berg.) Pers. It is the correct name for the species.

Lamarck, it may be noted, added to Bergius' species the doubtful synonym *G. helianthemifolium* L. and, without any expression of doubt, a reference to Volckamer, Flora Noribergensis (194, cum tab.) which is actually the basis of Linnaeus's species. *G. helianthemifolium* is distinct from *G. serpyllifolium* and has been dealt with above (no. 106). See also *G. polifolium* (no. 93).

121. Helichrysum sessilioides Hilliard, **nom. nov.**

Type: Lesotho, Qacha's Nek distr., Mt. Sauer, *Jacottet & Jacottet* (Z!).

Syn.: *H. aretioides* Thellung in Viertelj. Nat. Ges. Zürich 66: 241 (1921), non Turcz. (1851).

[*H. sessile* auctt., non DC.; Killick, Bot. Surv. S. Afr. Mem. no. 34: 140 (1963); Trauseld, Wild Flowers of Natal Drakensberg: 200 & 201 (1969).]

CAPE. Griqualand East, Mt. Currie, 1950 m, July, *Tyson* 1496 (K). Barkly East distr., Naude's Nek, 2440–2620 m, 27 xi 1971, *Hilliard* 5193 (E, NU). NATAL. Alfred distr., summit Ngeli Mt., c. 2250 m, *Lennox* s.n. (NU); Estcourt distr., Kamberg Nature Reserve, "Gladstone's Nose", 2060 m, 13 xi 1966, *Wright* s.n. (E, NU); ridge extending east from Giant's Castle, c. 2440 m, 12 viii 1967, *Wright* 187 (E, NU); summit of Drakensberg, vicinity of Giant's Castle Pass, c. 3200 m, 19 xi 1970, *Wright* 1046 (E, NU). Bergville distr., Mont aux Sources, *Sidey* 2017 (PRE); Cathedral Peak Forestry Station, spur leading to Organ Pipes Pass, *Killick* 1753 (PRE). LESOTHO. Likolobeng, *Guillarmod* 708 (PRE).

H. sessilioides is a very attractive early spring-flowering dwarf shrub, forming compact rounded cushions on basalt and dolerite cliffs along the high Drakensberg from Lundean's Nek and Naude's Nek, between Maclear and Barkly East in the Cape, to Mont aux Sources in Bergville district, Natal. It is also on the high mountains near Kokstad and on nearby Mt. Ngeli on the Cape-Natal border.

It bears some resemblance to *H. sessile* DC., but is distinguished from that species by differences in leaf and involucre. In *H. sessilioides*, the upper leaf surface has a thin, silky indumentum that will strip off like a skin and dries silvery-grey, while the lower surface is closely white-felted: in *H. sessile*, both leaf surfaces are enveloped in a thick, close indumentum that dries like crumpled white tissue paper and breaks down with age to felt. *H. sessilioides*

has 9–12 series of involucral bracts, the radiating tips of the inner ones being lanceolate or oblong and more or less obtuse; the bracts of *H. sessile* are in 4–5 series and have short, broadly ovate, acute, radiating tips. *H. sessile* was described from a specimen with empty heads (this specimen, *Drège* 5738 G–DC, now lacks even those heads). However, *Esterhuysen* 19704 (BOL) from the Compassberg (which is the highest point in the Sneeuwberg whence came the type collection of *H. sessile*)—has homogamous heads with c. 28 flowers, corollas 3·5 mm long, ovaries 1 mm long, strongly papillose, and copious pappus bristles about equalling the corolla. *H. sessilioides* does not differ in floral detail, but has larger heads (c. 50-100 flowers).

122. Helichrysum silvaticum Hilliard, **species nova** *H. tricostato* (Thunb.) Less. affinis, sed ob involucri bracteas acutas, haud obtusas, et folia sessilia haud breviter petiolata, distincta.

Herba perennis (?), parce ramosa, 40 cm usque alta; caules inferne plerumque simplex et nudi vel foliis emortuis vestiti, superne furcati, juniores griseo-albo-lanati et foliati. *Folia* 15–40 × 1·5–6 mm, lineari-lanceolata vel lanceolata, apice acuta mucronata, basi angustata semi-amplexicaulia, marginibus planis, utrinque griseo-lanata costa tantum subtus conspicua. *Capitula* numerosa in paniculas corymbosas terminales disposita, campanulata, c. 4 mm longa. *Involucri* bracteae plus minusve 5-seriatae, laxe imbricatae haud radiantes, lanceolato-ellipticae, acutae vel subacutae, exteriores interioribus multo breviores, c. 2–3·75 × 0·75–1 mm, interiores flores aequantes, albae opacae. *Receptaculum* fimbrillatum, fimbrillis ovaria aequantibus. *Flores* c. 20–30, omnes hermaphroditi. *Corolla* 3.5 mm longa, lutea. *Ovarium* 0·4 mm longum, epapillosum. *Achaenia* 0·5 mm longa, ellipsoidea, laete brunnea, epapillosa. *Pappus* e setis gracilibus scabridis numerosis basi pilis patentibus leviter cohaerentibus, mox deciduus.

Type. Natal, Ubombo distr., Makatini Flats, 28 vi 1964, *Strey* 5287 (NU holo, PRE iso).

NATAL. Ubombo distr., Manaba, 17 vi 1939, *Gerstner* 3467 (K); Maputaland, vi 1914, *Transv. Mus. Maputaland Exped.* TM 14229 (PRE).

MOÇAMBIQUE. Inhambane-Velho, 24 m eastward, very common, sandy and cultivated soils, vii 1937, *Gomes e Sousa* 1964 (K); Ile de Bazaruto, dans les peuplements de Brachystegia, vii 1936, *Gomes e Sousa* 1779 (K); Maria Gaza, *Junod* 382 (PRE).

Apparently common in places on the sandy soils of the coastal plain in Moçambique and northernmost Zululand, growing socially in light open woodland or grassland. Not related to other species in this area, but having its allies in the Western Cape and SW Africa.

123. Helichrysum subfalcatum Hilliard, **species nova** *H. albirosulato* Killick affinis sed foliis linearibus vel lanceolatis discoloris (haud spatulatis concoloris) et capitulis heterogamis differt.

Herba perennis, tapetiformis, caulibus primariis ramosis radicantibus rosulas foliorum numerosas congestas emittentibus. *Folia* 30–60 × 2–7 mm, plerumque lanceolata raro linearia, saepe secus costam plicata et leviter falcata, apice acuta, basi lata amplectentia, indumento sericeo papyraceo,

supra viridia (siccitate grisea), subtus albo-argentea. *Capitula* cylindrica c. 4 × 3 mm, numerosa, dense aggregata, inter se tela conjuncta, capitulum planum secundarium 15–20 mm diametro caulem floriferum foliosum c. 15 cm altum terminans formantia. *Involucri* bracteae plus minusve 3-seriatae, subaequales, haud radiantes, flores aequantes, c. 4 × 1·5 mm, oblongae, acutae vel subacutae, paulo convexae, translucentes, exteriores brunnescentes, omnes luteo-apiculatae. *Flores* 12–16, 2–3 feminei, ceteri hermaphroditi. *Corolla* 3 mm longa, lutea. *Ovarium* 0·8 mm longum, papillosum. *Pappus* e setis 3–5 scabridis 3·5 mm longis ad apices subplumosis luteis compositus, mox caducus. *Achaenia* matura haud visa.
Type. Natal, Estcourt distr., Highmoor Forest Reserve, spur running E from Giant's Castle, c. 2440 m, 18 ii 1968, *Hilliard* 4809 (NU holo, E iso).
NATAL. Estcourt distr., Highmoor Forest Reserve, spur running E from Giant's Castle, c. 2130 m, 18 ii 1968, *Hilliard* 4815 (E, NU); *ibidem*, 2300 m, 15 ii 1967, *Wright* s.n. (NU 38184). Mpendhle distr., "Whiterocks", c. 2140 m, 9 i 1968, *Wright* 383 (E, NU). Bergville distr., Mont aux Sources, 3050 m. 25 iii 1946, *Schelpe* 1387 (NU); Sentinel Path to Mont aux Sources, c, 2600 m, 24 ii 1970, *Hilliard* 5000 (E, NU); Tugela valley and Mont aux Sources, c. 2500 m, iv 1934, *Humbert* 15156 (P); *ibidem*, 3–3200 m, *Humbert* 15239 (P). Underberg distr., Sani Pass, 2440–2740 m, i 1972, *Grice* s.n. (NU); *ibidem*, *Killick & Varhmeijer* 3733 (PRE).
LESOTHO. Mokhotlong distr., Sani Pass, *Ruch* 2402 (PRE).

H. subfalcatum is a plant of steep, stony mountain slopes and tops, its big mats of tightly congested leaf rosettes often dominant over large areas; in very rough terrain it may grow rooted in the humus collected between boulders and in rock crevices. It flowers from January to March.

Its nearest ally is *H. albirosulatum*, a plant of similar habit found on the Cave Sandstone platforms crowning the spurs of the Natal Drakensberg. *H. albirosulatum* has silvery-white spathulate leaves, the tips of which are often infolded and slightly recurved. In *H. subfalcatum*, however, the leaves are generally more or less lanceolate, often folded along the midrib and slightly falcate in outline, which suggested the specific epithet; occasionally they are linear with revolute margins. The leaves, stems and bases of the compound heads are enveloped in that peculiar "tissue paper" indumentum so often seen in S African members of the genus. It is thinnest on the upper leaf surfaces, which are dark green in life, silvery-grey when dry, contrasting with the silvery-white undersurface.

124. Helichrysum subglomeratum Less. var. **imbricatum** DC., Prodr. 6: 186 (1838).
Lectotype: Cape, Albany, between Riebeck East and Grahamstown, *Burchell* 3534 (G–DC! K! PRE!).

De Candolle included under this variety two different plants. Of the eight specimens cited, two (*Drège* 3570 and *Ecklon* 1892) belong to the species later described as *H. glomeratum* Klatt. The other six represent a distinct entity, which may be a variety of *H. subglomeratum* or of *H. glomeratum* or an independent related species. It is this plant that requires a name, and it is best to retain that given by De Candolle until its status can be settled. The

choice of *Burchell* 3534 as lectotype permits this and is also indicated by the fact that De Candolle cited it first, separated from the other specimens in print by a dash.

Beauverd (in Bull. Soc. Bot. Genève 2 sér., 3: 142, 1911) regarded all De Candolle's specimens as falling within *H. glomeratum* Klatt. However, *H. glomeratum* Klatt has lanceolate leaves with acute or very acute tips, and is found mainly in Natal and the Transkei, while *H. subglomeratum* var. *imbricatum* (as defined here) has elliptic leaves with subobtuse tips, and is in the eastern Cape from Uitenhage and Albany districts to Kingwilliamstown and Queenstown.

125. Helichrysum vernum Hilliard, **species nova** *H. lamprocephalo* Bolus (*H. scapiformi* Moeser) proxime accedit sed habitu tapetiformi et venis lateralibus foliorum coriaceorum occultis differt.

Herba perennis tapetiformis, rosulas numerosas aggregatas e caule robusto subterraneo ramoso emittens. *Folia rosularum* elliptico-obovata vel raro lanceolato-oblonga, usque ad 5 × 1·5 cm, patentia, apice obtusa vel subacuta, apiculata, basi lato vaginantia, crassa, coriacea plerumque costa tantum conspicua, primo laxe lanata, mox marginibus laxe lanatis exceptis glabrata. *Caulis florifer* terminalis, solitarius, usque ad 25 cm altus, laxe lanatus, foliatus. *Folia caulina* appressa, plus minusve oblonga, usque ad 25 × 3 mm, sursum decrescentia, laxe lanata, glabrescentia, superiora apice colorato membranaceo bracteae involucri simili praedita. *Capitula* solitaria campanulata, 2·5–3 cm longa, bracteis radiantibus c. 4 cm diametro. *Involucri* bracteae plus minusve 6 seriatae, laxe imbricatae, lanceolatae, acutae vel acutissimae, exteriores interioribus discum 15 mm superantibus multo breviores, nitide roseae vel kermesinae. *Flores* plus minusve 250, omnes hermaphroditi. *Corolla* 4·5 mm longa, lutea. *Ovarium* 1·5 mm longum, papillosum. *Achaenia* (immatura) 1·5 mm longa, brunnea, albo-papillosa. *Pappus* 5 mm longus e setis numerosis gracilibus scabridis ad apicem subplumosis basi pilis patentibus leviter inter se cohaerentibus compositus, mox deciduus.

Type. Natal, Mpendhle distr., "Storm Heights", c. 2100 m, 14 x 1967, *Wright* 229 (NU holo, E, PRE iso).

NATAL. Bergville distr., Cathedral Area, Cleft Peak, 2135 m, Oct. 1944, *Schelpe* 899 (NU); Witzieshoek, Sentinel path to Mont aux Sources, 2315 m, 17 xi 1954, *Edwards* 340 (NU). Estcourt distr., contour path between Giant's Castle Hut and Bushman's River Pass, c. 2255 m, 25 x 1968, *Wright* 683 (E, NU); Giant's Castle Game Reserve, summit Little Berg near Injasuti house, c. 1920 m, 8 x 1966, *Hilliard* 4003 (E, NU); SE end of Gladstone's Nose, c. 2560 m, 22 xi 1967, *Wright* 310 (E, NU); "Stillerust", 1830 m, 11 xi 1967, *Wright* 1 (NU); Lions River distr., Umgeni Poort, 1675 m, 6 ix 1965, *Moll* 1931 (NU). Underberg distr., Sani Pass, Nov. 1964, *Gillies* 31 (E, NU); Castle Gardens, *Solomon* 24 (NU).

This species is common in the Natal Drakensberg and its foothills from Oliviershoek Pass in the north to Sani Pass in the south. It is one of the first plants to flower in spring when the grass is burnt, and forms big, tight mats, often on steep slopes, and over large areas, the bright rose pink or crimson

heads with a yellow disc contrasting vividly with the fresh green of the leaf rosettes and the blackened turf. The heads often appear to be sessile in the centre of the rosettes, and the peduncles elongate only when growing conditions are good.

H. vernum will be found in herbaria mixed with *H. lamprocephalum* (= *H. scapiforme* Moeser) because, in the dried state, the two can be exceedingly difficult to distinguish, though the rather leathery leaves of *H. vernum* with side veins not or scarcely visible are usually diagnostic. *H. lamprocephalum* has a much wider distribution and can grow at much lower altitudes than *H. vernum*, but the two species are sometimes found together in the Drakensberg and then the difference in habit is very striking: *H. vernum* with numerous rosettes pressed close to the ground in tight mats, *H. lamprocephalum* with more erect leaves and only a few rosettes tufted together. The leaves of *H. vernum* are leathery in texture, glabrous at maturity, with a waxy bloom on the upper surface when fresh; the leaves of *H. lamprocephalum* are more membranous, usually woolly, though often glabrescent, and the two main side veins show up clearly. In the Giant's Castle-Kamberg area at least, *H. vernum* flowers earlier than *H. lamprocephalum*, which here always has white bracts, though elsewhere the bracts vary from white to pink to crimson.

126–127. Heteromma Benth.

We have already reported (in Notes Roy. Bot. Gard. Edinb. 31: 33, 1971) that our earlier reduction of *Pentheriella krookii* to *Heteromma simplicifolium* was an error, and the necessary combination has been made. The three species of *Heteromma* now recognized may be distinguished as follows : —

1a. Tips of at least the outer involucral bracts very obtuse . *H. krookii*
1b. Tips of involucral bracts acute 2
2a. Leaves (other than the uppermost passing into the inflorescence bracts) pinnatisect or lyrate . . . . . *H. decurrens*
2b. Leaves simple . . . . . *H. simplicifolium*

126. Heteromma krookii (O. Hoffm. & Muschler) Hilliard & Burtt in Notes Roy. Bot. Gard. Edinb. 31: 33 (1971).

Type: Natal, Van Reenen's Pass, *Krook* in *Plantae Pentherianae* no. 1447 (W!).

Syn.: *Pentheriella krookii* O. Hoffm. & Muschl. in Ann. Nat. Hofmus. Wien 24: 316, t. 7 (1910).

A subshrub up to c. 1 m tall, the stout stem simple and nude below, much branched above, shoots leafy. *Leaves* crowded at the tips of the branches, up to 13 × 3 cm, elliptic, tapering into a petiole-like base, base expanded, semiamplexicaul, shortly decurrent, the upper leaves sessile, passing into inflorescence bracts, young stems, leaves and particularly petiolar region softly pilose, mature leaves sparsely hairy except on the veins. *Heads* in compact corymbose panicles terminating some of the branches.

NATAL. Newcastle distr., Normandien Pass, 1950 m, 16 xii 1962, frequent on forest margin, c. 4 ft., *Hilliard* 1008 (NH, NU). Klipriver distr., Van Reenen, i 1914, *Bews* s.n. (2 sheets, NU 2978, 2979); ibidem, *Wood* 10765 (NH). Bergville distr., Oliviershoek Pass, 1830 m, 18 ii 1970, *Hilliard* 4912 (E, K,

NH, S, M, NBG, PRE); Hlolela, "The Cavern", 1525 m, xi 1962, *L'Ange* 13 (NU).

ORANGE FREE STATE. Harrismith distr., Swinburne, Rensburg's Kop, c. 2225 m, ii 1970, *Hilliard* 4984 (E, K, NH, NU, M); *ibidem*, Manjanet's Mt. next to Rensburg's Kop, c. 1980 m, 21 ii 1970, *Hilliard* 4962 (E, K, NH, NU, PRE, SRGH, COI); near Harrismith, *Sankey* 109 (K); Platberg, *Kotze* 886 (PRE); ibidem, 1980 m, *Puttrell* s.n. (PRE).

H. krookii forms dense stands in damp hollows on mountain slopes, along rocky watercourses and on the rocky margins of forest patches and *Leucosidea* scrub between 1525 and 2225 m above sea level. In its type locality at Van Reenen it can be seen in quantity in the deep gorge running through the village. Its known distribution is along the Drakensberg from Normandien Pass near Newcastle in northern Natal to Hlolela just north of Tugela gorge, and neighbouring mountains in the Orange Free State.

127. Heteromma simplicifolium Wood & Evans in Journ. Bot. (London) 35: 488 (1897); Hilliard & Burtt in Notes Roy. Bot. Gard. Edinb. 30: 121 (1970), excl. syn. *Pentheriella krookii* and all specs. except type.

Type: Natal, Drakensberg Mts. near Polela R., 6–7000 ft., *Evans* 648 (K).

An herbaceous perennial producing one or a few leaf rosettes from a somewhat stoloniferous stock, the non-flowering leaf rosettes (probably biennial) appearing lateral to the flowering stems and dissociated from them. *Basal leaves* long-petioled, blade oblong, up to 20 × 4 cm, apex blunt, base somewhat cordate or rounded, margin irregularly crenulate-serrulate or nearly entire, often with minute peg-like glands, both surfaces pubescent, petiole up to 15 cm long, base expanded, semiamplexicaul, pilose, cauline leaves often smaller and passing into the inflorescence bracts, sessile or with a poorly defined petiolar region the tissue of which may be dissected, shortly decurrent. *Heads* in a very open corymbose panicle terminating the simple 1 m tall, flowering stem.

NATAL. Impendhle distr., Hlatimba Pass, c. 2430 m, 2 iii 1971, north-facing slope, locally frequent, *Wright* 1145 (E, K, NU, NH, M). Underberg distr. headwaters of the Umzimkulu river, c. 2135 m, *Hilliard* (NU).

CAPE. Maclear distr., Naude's Nek, c. 2440 m, 19 ii 1971, on damp grassy-rocky slope, *Hilliard & Burtt* 6610 (E, K, NU, PRE, MO).

H. simplicifolium grows on steep, open mountain slopes or flats beside streams, forming large colonies. It is known from only a limited area of the Drakensberg in southern Natal and nearby East Griqualand, and appears therefore to have a more southerly distribution than *H. krookii*. A plant collected in the Cathedral Peak Forest Reserve, Bergville district (Tutumi river valley, 1950 m, 15 iv 1953, erect herb, 3–4 ft., frequent in *Protea rhodantha* veld, heads yellow, *Killick* 1948, PRE) is problematical. It agrees with *H. simplicifolium* in inflorescence branching, head size and involucral bracts, but has much larger stem leaves and slightly harsher indumentum. The material is fruiting and there are no basal leaves.. Until younger, leafy material is collected, its placing remains doubtful.

128. Nidorella anomala Steetz in Peters, Reise Mossamb. Bot. 2: 400 (1864).
Type: Wittberg, *Drège* ("*N. solidaginea* DC. *a* in herb. Sonder and Lehmann").
Syn.: *N. depauperata* Harv. in Harv. & Sond., Fl. Cap. 3: 90 (1865). Type: Transvaal, *Zeyher* 803 (K! BM! G! PRE!).
N. angustifolia O. Hoffm. in Ann. Nat. Hofmus. Wien 20: 53 (1905). Types: Griqualand East, Nalogha—Tsitsa river, *Krook* in herb. Penther 1067 (W! BM!) and Newmarket, *Krook* in herb. Penther 1237 (W!).
N. solidaginea auct. non DC.; Wild in Bol. Soc. Brot. 43: 233 (1969).

There is only a single sheet of *Nidorella solidaginea* DC., namely *Drège* 5722, zwischen Wittbergen und Stormbergen, in the De Candolle herbarium. This specimen, with its large heads, clearly fits De Candolle's description (Prodr. 5: 322, 1836), the phrase "capitula in genere majora nempe 3–4 lin diam" being particularly significant. It is therefore the holotype of *N. solidaginea*.

There is, however, a later complication in that the Drège distributed specimens of "*N. solidaginea*" included two species: "*N. solidaginea* b" from the Stormberg is the same as *Drège* 5722 G–DC; "*N. solidaginea* a" from the Witteberg is the plant later described as *N. anomala* Steetz. There is no specimen of this latter species under any name in De Candolle's herbarium, nor a Drège collection of it in the general herbarium in Geneva.

Wild, who recently revised the genus (in Bol. Soc. Brot. ser. 2, 43: 209–240, 1969) did not have the advantage of actually seeing the Prodromus herbarium, and was under the impression that it contained both "a" and "b" specimens of "*N. solidaginea*". He thus wrongly typified *N. solidaginea* by Drège "a", which led to his placing *N. anomala* and *N. depauperata* in synonymy under that name. Examination of the type sheet shows that *N. solidaginea* is to be placed under *N. resedifolia* DC. (see below), and Steetz's action in proposing *N. anomala* for the small-headed plant is upheld.

129. Nidorella resedifolia DC., Prodr. 5: 322 (1836); Wild in Bol. Soc. Brot. 43: 233 (1969), which see for further synonymy.
Syn.: *N. solidaginea* DC., Prodr. 5: 322 (1836). Type: Zwischen Wittbergen und Stormbergen, *Drège* 5722 (G–DC).
N. krookii O. Hoffm. in Ann. Hofmus. Wien 20: 54 (1905). Type: Natal, Umkomaas, *Krook* in herb. Penther 1383 (W).

The type of *N. solidaginea* is exactly matched by that of *N. krookii*. These plants are the large-headed form of *N. resedifolia*, also represented by: distr. of Albert, *Cooper* 644 (K), between Greytown and Newcastle, *Wilms* 2047 (K), Dundee distr., Wesselsnek, *Schlechter* 3398 (G, K); Dundee, *Shirley* (NU), the last three localities all in northern Natal. The specimens "*N. solidaginea* b" of Drège's distribution are this plant: "*N. solidaginea* a" are *N. anomala* Steetz (see above).

130. Nidorella tongensis Hilliard, **species nova** ex affinitate *N. undulatae* (Thunb.) Harv. sed habitu, et floribus disci omnino fertilibus (nec masculis tantum) differt.

Herba perennis e basi praecipue ramosa; caules basi lignosi, nudi, decumbentes et radicantes, superne erecti herbacei foliati ad c. 55 cm usque, striati, glabri vel subglabri. *Folia* ad 9 × 2 (–3) cm sursum decrescentia, ambitu variabilia, plerumque spatulata vel elliptica ad basin petioliformem angustata, superiora oblanceolata vel anguste oblonga, apice acuta vel obtusa, mucronata, basi plerumque plus minusve auriculata, semi-amplectentia, interdum vix vel haud auriculata, inferiora marginibus grosse et irregulariter dentata, superiora integra vel subintegra, crassa, glabra vel parce pilosa. *Capitula* numerosa ad apices ramulorum in glomerulos corymbose disposita, subglobosa, c. 3 × 4 mm, heterogama. *Involucri* bracteae plus minusve biseriatae, floribus breviores. *Flores marginales* feminei, biseriati, fertiles; corolla inferne cylindrica superne minute radiata, 1·75 mm longa, lutea; ovarium 1 mm longum, compressum, pilosum; pappus e setis numerosis scabridulis compositus, corolla paulo brevior. *Flores disci* hermaphroditi, fertiles; corolla infundibuliformis, c. 2·5 mm longa, lutea; ovarium 1 mm longum, plus minusve compressum, pilosum et interdum etiam glandulosum; pappus e setis numerosis scabridulis compositus, corolla paulo brevior. *Achaenia* haud visa.

Type. Natal, Mtunzini distr., c. 1 km N of Port Durnford, Driftsands, *Venter* 6443 (NU holo, E iso).

NATAL. Mtunzini distr., c. 1 km N of Port Durnford Lighthouse, Driftsands, *Venter* 3230 (PRE); Umhlatuzi Lake Bluff, *Venter* 4786 (PRE); Port Durnford, *Ward* 3474 (K, PRE). Ingwavuma distr., Muzi Swamp, *Moll & Nel* 5584 (NH, NU).

N. tongensis more closely resembles *N. undulata* than any other species, but they differ in habit: the simple flowering stem of *N. undulata* is probably biennial, arising from a leaf rosette in the second year of growth, while slender spreading underground runners ensure perennation; *N. tongensis* seems to send up annual stems, simple or forking once or twice at the base, from spreading woody underground runners, without the formation of leaf rosettes. Moreover, *N. undulata* is peculiar in the genus in having the ovaries of the disc flowers generally abortive. The disc flowers of *N. tongensis* are fully fertile.

N. tongensis is known only from NE Natal, having been collected several times near Port Durnford on damp dune cliffs overlooking the beach, and away from the sea in seasonally wet land around Mosi (Muzi) Swamp, not far from Ndumu. Much of the low-lying plain between the Lebombo Mts. and the sea is the home of the Tonga people, whence the specific epithet. The plant flowers in October.

N. undulata is a plant of mountain grasslands from the eastern highlands of Rhodesia south to the eastern Cape and flowers from January to April.

I am indebted to Dr J. Venter, of the University College of Zululand, who kindly made a special journey to Port Durnford to collect material for me.

131. Nolletia ruderalis Hilliard, **species nova** *N. rarifoliae* (Turcz.) Steetz affinis sed foliis linearibus (haud filiformibus) differt; etiam involucri bracteae punctis glandulosis pallidis superificalibus praeditae sed saccis oleosis aurantiacis immersis *N. rarifoliae* carentes.

Herba perennis. *Caules* ad 40 cm alti e caudice lignoso subterraneo horizontali, inferne simplices superne in inflorescentiam foliatam ramosi. *Folia* erecta, imbricata, linearia, 15–45 × 1–3 mm, sursum decrescentia et in bracteas transeuntia, apice acuta, basi amplexicaulia, crassa, uninervia. *Capitula* heterogama, raro homogama, disciformia, hemisphaerica, c. 7 × 10–12 mm, ramulos inflorescentiae terminantia. *Involucri* bracteae floribus paullo breviores, plus minusve 3-seriatae, lanceolatae, usque ad 4·5 × 1 mm, seriebus duobus interioribus subaequalibus exterioribus brevioribus, apice acutae, marginibus membranaceae, leviter fimbriatae, glabrae vel pilis paucis medianis praeditae, minute glanduloso-punctatae. *Flores feminei* pauci, raro nulli; corolla c. 2–2·5 mm longa, stylo brevior, tubularis, apice irregulariter dentata; achaenium et pappus ut in flore hermaphrodito. *Flores hermaphroditi*: corolla 3–4 mm longa, inferne tubularis, superne ampliata; ovarium c. 1·75 mm longum. *Achaenium* c. 3 mm longum, anguste obovatum, compressum, parce pilosa, coma basali erecta praeditum. *Pappus* uniseriatus, e setis numerosis barbellatis corollae paullo brevioribus basi cohaerentibus.
Type. Natal, Hlabisa distr., Hluhluwe Game Reserve, 140 m, 27 x 1953, *Ward* 1623 (NU holo, E, PRE, iso).
NATAL. Hlabisa distr., Hluhluwe Game Reserve, 145 m, 4 xi 1954, *Ward* 2431 (K, PRE). Zululand, N'Tondweni, *Wood* 9434 (PRE); Hlaza/Mbemkedwini Corridor, *Hitchins* 715 (PRE).
TRANSVAAL. Kruger National Park, Nambi Gate, 600 m, 15 xii 1952, *van der Schijff* 2041 (K, PRE); Pretoriuskop, *van der Schijff* 2055 (PRE).
SWAZILAND. Mbabane distr., Malkerns, c. 760 m, 19 xii 1957, *Compton* 27385 (K).

This species has passed as *N. rarifolia*, but differs in its linear, not filiform, leaves and its lack of the large, elongated, orange-coloured oil sacs,embedded down the midline of the involucral bracts, that are so conspicuous a feature of *N. rarifolia*. Although *N. rarifolia* too produces tufts of stems from a woody stock, this does not creep horizontally in the same fashion as that of *N. ruderalis*. This creeping stock undoubtedly contributes to the success of *N. ruderalis* as a colonizer of bare areas. Its natural habitat is grassland or open woodland over shallow or sandy soils in the Transvaal and Swaziland "Lowveld" and the more coastal parts of Zululand. *N. rarifolia* is a plant of moist grasslands in the Natal Midlands and on the Transvaal "Highveld".

A specimen collected on the eastern face of the Lebombo Mountains near the Natal-Moçambique border (Nkonjane-Abercorn Drift, c. 300 m, 31 x 1969, *Moll & Pooley* 4190, E, NU, PRE) is indistinguishable in general facies from *N. ruderalis* but it lacks filiform female flowers.

132–134. Printzia Cass. in Dict. Sc. Nat. 37: 488 (1825) nom. cons.; Harv. in Harv. & Sond., Fl. Cap. 3: 513 (1865).

Two Natal species of *Printzia* present a biological situation that is of great potential interest because it suggests the development of sympatric isolation by separation of flowering seasons.

These species are *P. laxa* (no. 133) and *P. pyrifolia* (no. 134). They are both perennial herbs, sending up strong and decidedly woody annual stems from a perennial rhizomatous stock (see fig. 9). Characteristically *P. pyrifolia* has an unbranched stem, thick ovate-cordate exauriculate leaves, more or less

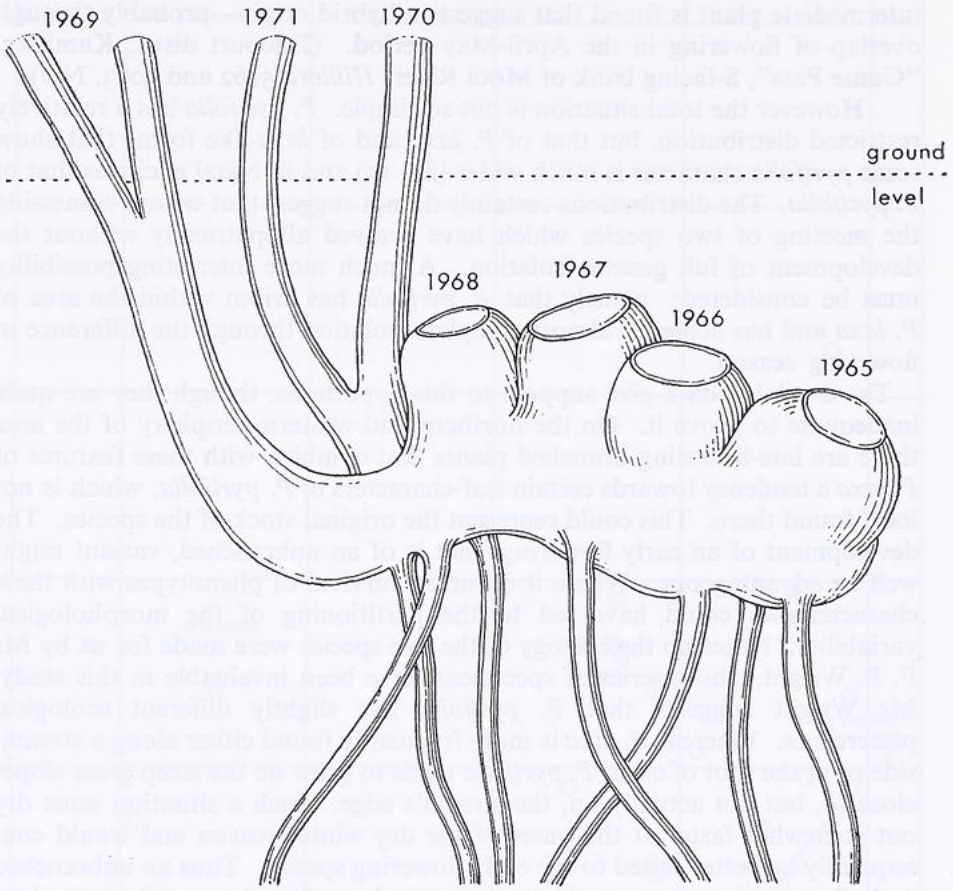

FIG. 9. Rootstock of *Printzia pyrifolia* showing successive scars of annual shoots.

glabrous above but densely white tomentose below and hence strongly discolorous, and the leaf margins are closely, shallowly and regularly denticulate; the capitulum has 18 or more ray flowers. *P. laxa*, in contrast, has bushy branched stems, thinner ovate-elliptic leaves that eventually develop auricles at the base, are less strongly tomentose below and less markedly discolorous, the margins have fewer, coarser, more irregular teeth; the capitulum has fewer (often only up to 12) rays.

These characters are usually adequate to distinguish typical examples of the two species even in the herbarium, where uncertainty whether a small unbranched specimen is a lateral or main shoot may cause confusion. In the field, observation of the whole plant makes recognition much easier, as does the fact that *P. pyrifolia* flowers in (December–) March (–May), while *P. laxa* flowers in (April–) July (–October). As annual growth of the new shoots will usually start in October (the southern spring), there is clearly a link between the simple unbranched habit and early flowering in *P. pyrifolia*, and between branched habit and late flowering in *P. laxa*.

P. pyrifolia and *P. laxa* grow in close proximity in a number of localities and the differences in growth, flowering time, and morphology are so striking as to leave little doubt that they are specifically distinct. Just occasionally an

intermediate plant is found that suggests a hybrid origin—probably through overlap of flowering in the April-May period. (Estcourt distr., Kamberg, "Game Pass", S-facing bank of Mooi River, *Hilliard* 5062 and 5063, NU).

However the total situation is not so simple. *P. pyrifolia* has a relatively restricted distribution, but that of *P. laxa* and of *laxa*-like forms that show some *pyrifolia* character is much wider (fig. 10) and in Natal encircles that of *P. pyrifolia*. The distributions certainly do not suggest that we are witnessing the meeting of two species which have evolved allopatrically without the development of full genetic isolation. A much more interesting possibility must be considered: namely that *P. pyrifolia* has arisen within the area of *P. laxa* and has achieved almost complete isolation through the difference in flowering season.

The available data give support to this hypothesis, though they are quite inadequate to prove it. On the northern and western periphery of the area there are late-flowering branched plants that combine with these features of *P. laxa* a tendency towards certain leaf-characters of *P. pyrifolia*, which is not itself found there. This could represent the original stock of the species. The development of an early flowering, that is of an unbranched, variant might well be advantageous. Where it occurred survival of phenotypes with these characteristics could have led to the partitioning of the morphological variability. Notes on the ecology of the two species were made for us by Mr F. B. Wright, whose series of specimens have been invaluable in this study. Mr Wright suggests that *P. pyrifolia* has slightly different ecological preferences. Whereas *P. laxa* is more frequently found either along a stream-side or at the foot of cliffs, *P. pyrifolia* tends to grow on the steep grass slopes close to, but not actually on, the stream's edge. Such a situation must dry out somewhat faster at the onset of the dry winter season and would consequently be better suited to the early flowering species. Thus an unbranched early-flowering variant would immediately have found an ecological niche where it was not in full competition with the bushy late-flowering species.

The partitioning of variability in the area where both species occur, in correlation with their seasonal diversification, is in line with J. L. Crosby's theoretical studies (Crosby in Heredity 25: 253-298, 1970). In committing this highly speculative interpretation to print we have the deliberate objective of inviting critical studies that will prove it true or false. It should be remarked here that the seasonal differentiation of *P. laxa* and *P. pyrifolia* is not an isolated example. On an earlier page in this paper, there is a description of *Athanasia villosa* (no. 84), which differs from the allied *A. pinnatifida* (no. 83) in its later flowering, with which is associated a tendency to flower on the lateral shoots: in *A. pinnatifida* these normally remain as axillary leaf tufts and do not elongate.

To aid any who may take up the challenge, we now give a more detailed discussion of the main characters that seem of value in dealing with these plants.

The habit and the gross leaf differences between the two species are straightforward, but they are not absolutely decisive. In an attempt to find a more precise difference, the toothing of the leaf margins was examined in some detail. It was found that the most useful measurement was the ratio given by dividing the length of the midrib (in mm) by the number of teeth along one margin. This gives a good discrimination for leaves above 30 mm in length.

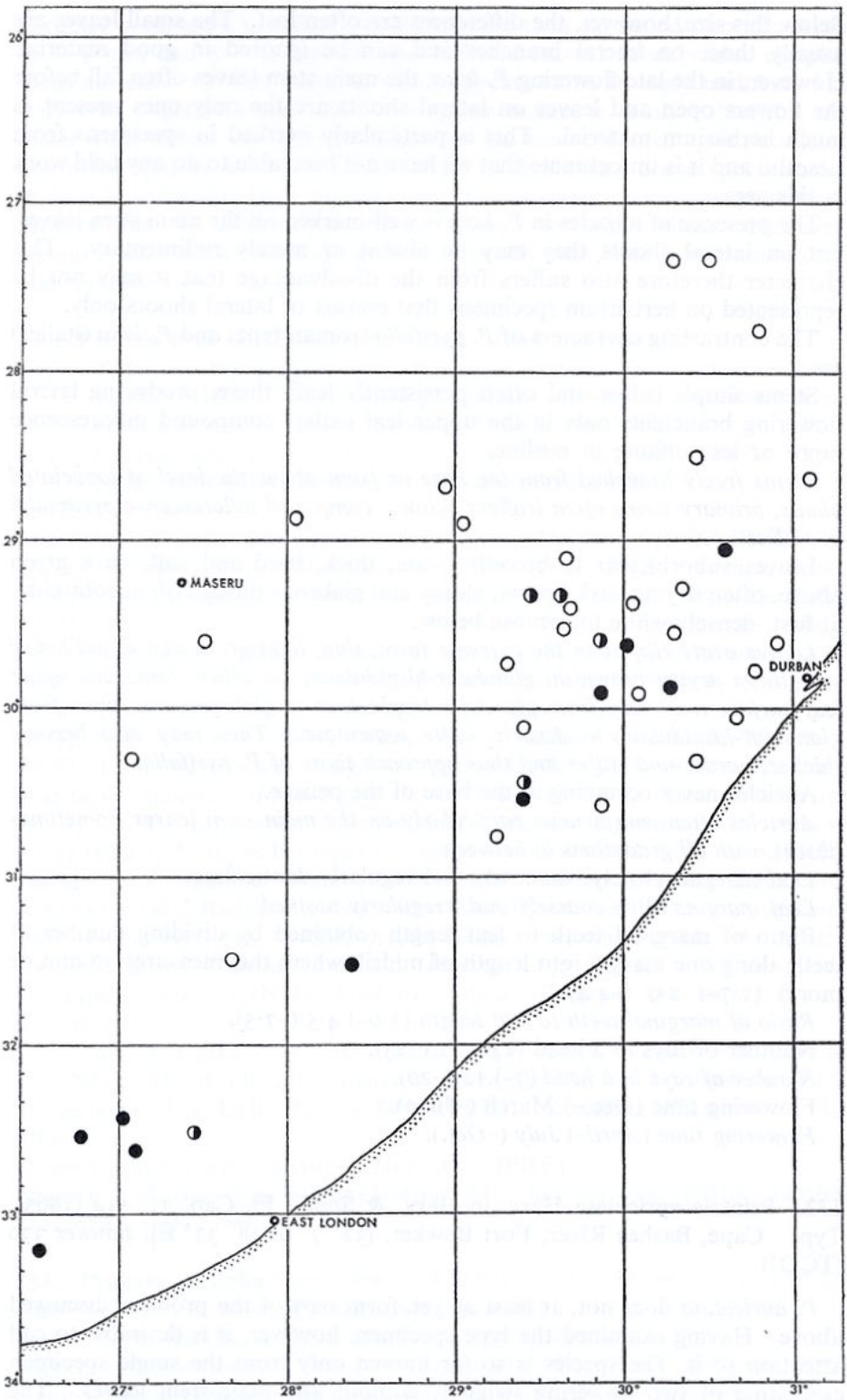

FIG. 10. Map of south-east Africa showing distribution of *Printzia laxa* (open circles), and *P. pyrifolia* (filled circles); the half-filled circles indicate occurrence of both species.

Below this size, however, the differences are often lost. The small leaves are usually those on lateral branches and can be ignored in good material. However, in the late-flowering *P. laxa*, the main stem leaves often fall before the flowers open and leaves on lateral shoots are the only ones present in much herbarium material. This is particularly marked in specimens from Lesotho and it is unfortunate that we have not been able to do any field work in this area.

The presence of auricles in *P. laxa* is well-marked on the main stem leaves, but on lateral shoots they may be absent or merely rudimentary. This character therefore also suffers from the disadvantage that it may not be represented on herbarium specimens that consist of lateral shoots only.

The contrasting characters of *P. pyrifolia* (roman type) and *P. laxa* (italics) are :—

Stems simple below and often persistently leafy there, producing lateral flowering branchlets only in the upper leaf axils; compound inflorescence more or less oblong in outline.

Stems freely branched from the base or from above the level of associated plants, primary stems often leafless below; compound inflorescence pyramidal in outline.

Leaves suborbicular to broadly ovate, thick, hard and stiff, dark green above, often drying dark brown, glossy and glabrous though often cobwebby at first, densely white tomentose below.

Leaves ovate elliptic in the extreme form, thin, light green above and below sometimes drying brownish, glandular-hispidulous; in other forms, the upper leaf surface may vary from glandular-hispidulous to glabrous, the lower from glandular-hispidulous to densely white tomentose. They may also become thicker, harder and stiffer and thus approach those of P. pyrifolia.

Auricles never occurring at the base of the petiole.

Auricles often conspicuous particularly on the main stem leaves, sometimes absent, with all gradations in between.

Leaf margins closely, shallowly and regularly denticulate.

Leaf margins often coarsely and irregularly toothed.

Ratio of marginal teeth to leaf length (obtained by dividing number of teeth along one margin into length of midrib where this measures 30 mm or more) (1·7–) 2·9 (–4·4).

Ratio of marginal teeth to leaf length (3·0–) 4·5 (–7·5).

Number of rays in a head (17–) 21 (–23).

Number of rays in a head (7–) 12 (–20).

Flowering time (Dec.–) March (–June).

Flowering time (April–) July (–Oct.).

132. Printzia auriculata Harv. in Harv. & Sond., Fl. Cap. 3: 514 (1865). Type. Cape, Bashee River, Fort Bowkei, [32° 7′ S, 28° 33′ E], *Bowker* 370 (TCD!).

P. auriculata does not, at least as yet, form part of the problem discussed above. Having examined the type specimen, however, it is desirable to call attention to it. The species is so far known only from the single specimen consisting of two flowering twiglets, without any main-stem leaves. The heads are similar to those of *P. laxa*, and the elliptic leaves (15 × 7 mm) are

abruptly contracted to a flat petiole-like base then expanded into two large (9 × 8 mm and 5 × 4 mm on two different leaves) suborbicular clasping basal auricles: the leaf margin, which appears to be strongly undulate, has only 2 to 3 teeth on each side: the upper surface is thinly cobwebby, the lower white-felted. Nothing quite like this has been collected again, nor have any other species of *Printzia* been found in that area. Some specimens of *P. laxa* have similar large auricles, but the leaf-margins are always several-toothed and the indumentum is cobwebby, not white-felted. However, should *P. auriculata* eventually prove conspecific with *P. laxa*, its name would take precedence.

133. Printzia laxa N. E. Br. in Kew Bull. 1895: 26 (1895).

Type: Natal, on the Drakensberg, Bushman's river, 6,000–7,000 ft., *Evans* 53 (K! NH!). The isotypes in NH are labelled "near New Caves, Drakensberg, 6–7,000 ft.", one in Evan's own hand.

Syn.: *P. densifolia* Wood & Evans in Journ. Bot. 35: 488 (1897). Type: Natal, near York, Blinkwater, *Wood* 4331 (K! NH!).

Selected citations :—

TRANSVAAL. Wakkerstroom distr., "Oshoek", *Devenish* 677 (K, PRE).

NATAL. Utrecht distr., "Donkerhoek", *Devenish* 10 (PRE). Vryheid distr., Vryheid, at the old water reservoir, *Gerstner* 3519 (NH). Bergville distr., Tugela native location near Natal National Park, upper Sinyati valley, *Edwards* 845 (NU, PRE); Cathedral Peak Forest Reserve Station, Catchment 2, *Killick* 1718 (K, NH, PRE). Estcourt distr., Tabamhlope police post, *Pentz* 320 (K, NH, PRE); Kamberg area, "Gladstone's Nose", *Wright* 181 (E, K, NH, NU, M); *ibidem*, "Game Pass", *Hilliard* 5061 (E, K, NH, NU, PRE). Lions River distr., Balgowan, *Bayer* 883 (E, NU); Blinkwater Bush near farm "Benvie", *Hilliard* 5059 (E, K, NH, NU, PRE); Cedara, *Marriott* s.n. (K, NH). Impendhle distr., middle S slopes Impendhle Mt., *Acocks* 13771 (PRE); E slopes Inzinga river valley, wooded kloof, *Story* 1236 (PRE). Inanda distr., Inanda, *Wood* 562 (K, NH). Pinetown distr., Emberton, *Wood* 5762 (K). Richmond distr., SE of Mid Illovo, farm "Ismont", *Hilliard* 5065 (E, K, NH, NU, PRE); Hella-Hella, *Strey* 7640 (NH, NU, PRE). Umzinto distr., Dumisa, Fairfield, *Rudatis* 1040 (E, K). Alfred distr., Harding, *Oliver* 141 (NH). Underberg distr., Bamboo Mt., *Hilliard* 5104 (E, NU).

CAPE. Mount Currie distr., Mt. Currie, *Tyson* 527 (K); Zwartberg, *Comins* 579 (NU). Mt. Ayliff distr., Insizwa, *Kotze* 617 (PRE). Stutterheim distr., Stutterheim, The Dell, *Acocks* 8933 (PRE); Komgha, *Flanagan* 60 (K, PRE, Z).

ORANGE FREE STATE. Zastron, *Heydorn* 1 (PRE).

LESOTHO. Morija, slope of Makhoarane Mt., *Jacottet* 1049 (PRE); Leribe, *Dieterlen* 13 (K, NH).

134. Printzia pyrifolia Less., Syn. 108 (1832); DC., Prodr. 7: 13 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 514 (1865).

Type. Cape, Kaffraria, *Krebs* 160 (iso G and G–DC!).

NATAL. Umvoti distr., Greytown, *Storey* s.n., NH 17612. Estcourt distr., Giant's Castle Game Reserve, *Nicholson* 4 (NH, PRE); Kamberg, "Game Pass", *Wright* 1160 (NU). Richmond distr., Byrne, upper mountain slopes

among rocks, *Galpin* 11903 (K, PRE). Polela distr., Donnybrook, Indian coll. comm. *Wood* 13083 (NH, PRE). Impendhle distr., near Boston, *Wood* 11129 (E, PRE); middle S slopes Impendhle Mt., *Acocks* 13769 (PRE).
CAPE. Mt. Currie distr., nr. Kokstad, *Haygarth* (E). Keiskammahoek distr., Cata, upper S slopes near Sonntag's Plot, *Acocks* 15745 (K, PRE); Dohne, *Acocks* 15745 (K); Katberg, *MacOwan* 815 (K, PRE). Victoria East distr., Hogsback, plateau above Kettlespont Falls, *Johnson* 1169 (K, PRE). Albany distr., Grahamstown, *Atherstone* 483 (K). Engcobo distr., Baziya, *Baur* 207 (K).

The specimen of *Krebs* 160 actually described by Lessing was presumably in the Berlin herbarium. We have seen isotypes in the De Candolle and general herbaria in Geneva. They both have leaves less than 3 cm long and, indeed, Lessing so described them. Leaf shape, texture, indumentum and toothing leave no doubt, however, that the name *P. pyrifolia* is here correctly applied.

135. Rhynea phylicifolia DC., Prodr. 6: 154 (1838) et in Deless., Ic. Sel. 4, t. 52 (1840); Harv. in Harv. & Sond., Fl. Cap. 3: 205 (1865).
Type. Cape, between Umsikaba and Umzimvubu rivers, *Drège* 5013 (G–DC! E! K!).
Syn.: *Cassinia phylicifolia* (DC.) Wood, Natal Pl. 4 (3): t. 355 (1905).

Distribution: from the Zoutpansberg and the mountains of the eastern Transvaal and Swaziland, through Natal to East Griqualand and the Transkei.

In the present uncertain state of the generic classification of this group, it seems preferable to retain *Rhynea* as an independent genus rather than submerge it in the Australasian *Cassinia* (see discussion p. 342).

136. Senecio brevilorus Hilliard, **species nova** nulli arcte affinis; *S. tugelensi* Wood & Evans modice similis, sed caulibus robustioribus altioribus magis foliosis, inflorescentia pluricapitata, bracteis involucri conspicue 3–5-venosis, radiis perbrevibus flores disci aequantibus, facile distinguitur.

Herba perennis, stolonifera, laxe caespitosa, ad 60 cm diametro. *Caules* floriferi 75 cm usque alti, simplices, basi lignosi, superne herbacei, in inflorescentiam corymboso-paniculatam ramosi, dense foliosi, superne bracteati. *Folia inferiora* 7·5 cm usque longa; lamina 4 cm usque, elliptica, apice subacuta, margine incrassata calloso-denticulata, basi in parte lata (ad 4 mm) plana petioloidea attenuata, crassa, glabra paulo glauca. *Folia superiora* minus distincte petiolata, suprema lanceolata, inter se distantia, in bracteas transeuntia. *Capitula* heterogama, perbreviter radiata, plus minusve nutantia, pauca vel multa in paniculam aperte corymbosam disposita. *Involucrum* campanulatum, basi calyculo e bracteis paucis in pedunculum descendentibus praeditum; bracteae 12–14, oblongae, 8–10 mm longae, apice subacutae, marginibus membranaceae, glandulis apicalibus exceptis glabrae, venis 3–5 conspicuae percursae. *Flores radii* c. 13, feminei, fertiles; corolla 8 mm longa, limbo c. 5 mm longo 3–dentato, pallide luteo. *Flores disci* c. 65; corolla 7–8 mm longa, infundibuliformis, e basi sursum sensim ampliata, pallide lutea 5-lobata, lobis nervis medianis aurantiacis ad basin corollae percurrentibus praeditis. *Antherae* apice lanceolato-appendiculatae, basi

breviter et late caudata. *Styli* rami truncati penicellatique appendice conico caudato breviter superati. *Ovaria* florum radii et disci cylindrica, 3 mm longa, 8–costata. *Achaenia* 3·5–4 mm longa, glabra. *Pappus* uniseriatus, copiosus, scabridus, c. 5 mm longus.

Type. Natal, Mpendhle distr., right bank of right branch of Loteni river looking upstream, 7 iv 1967, *Wright* 189 (E holo, NU iso).

NATAL. Estcourt distr., Giant's Castle Game Reserve, Gable stream, 18 iii 1969, *Trauseld* 1072 (E, NU); Underberg distr., tributary of Umzimkulu river above Drakensberg Gardens Hotel, c. 2140 m, 20 vi 1971, *Hilliard* 5116 (E, NU).

S. brevilorus is a very odd plant, decidedly anomalous at least among the summer-rainfall-area species of *Senecio*. In the first place, it has extraordinarily short rays, only the length of the disc flowers. Then the involucral bracts each have 3 to 5 yellow or orange-coloured parallel nerves, there are 5 similar nerves median to the corolla lobes of the disc flowers and running to the base of the corolla tube, 3 in each ray, and 8 such nerves in the ovary and of course the achene. The nerves appear to be impregnated with an orange-coloured resin. This type of nerve occurs sporadically in *Senecio* and is also found in *Mesogramma* (often included in *Senecio*) and in many species of *Cineraria* and *Euryops*. These are casual observations: no exhaustive search has been made. The interesting thing is that these resin sacs seem to be correlated with median nerves in the corolla-lobes, a relatively uncommon occurrence in Compositae. There is strong similarity in both corolla and involucral bracts between *S. brevilorus* and *Cineraria atriplicifolia* DC., *C. lyrata* DC. and *C. aspera* Thunb. for example. *S. brevilorus* also has the cone-tipped style branches characteristic of *Cineraria*. But the achenes of *S. brevilorus* are all cylindric, whereas at least the outer ones are generally compressed in *Cineraria* and provide the strongest argument for keeping the South African species of *Cineraria* separate from *Senecio*.

The distribution of resin-marked nerves in the involucral bracts and corollas of *Senecio* and its allies might prove to be a valuable taxonomic character, but it is one about which very little information is at present available. They are present for instance in *S. harveianus* MacOwan and *S. madagascariensis* Poir., but in the corollas of these two species (which are certainly not allied to *S. brevilorus*) they run from the tips of the corolla lobes to only a short distance below the sinuses, not to the base of the corolla tube as in *S. brevilorus*.

S. brevilorus is known only from the southern part of the Natal Drakensberg where it grows at about 2140 m above sea level, along the edges of rocky streambeds, forming large mats between the boulders. It flowers in March and April: in June some late fruiting heads were still hanging on the dry but still standing flowering stems, with new green leafy shoots already a few centimetres high from the bases of the old stems, despite frost on the ground.

The leaves of *S. brevilorus* are very like those of *S. tugelensis*, but here the resemblance really ends. *S. tugelensis* is a much more delicate plant found on damp grassy cliffs on the mountain flanks, its solitary stems usually bearing a single, prominently rayed head. The orange nerves, so conspicuous in the involucral bracts, corollas and ovaries of *S. brevilorus*, are wanting in *S. tugelensis*.

137. Senecio chrysocoma Meerburgh, Afbeeld. Gew. t. 39 (31 Dec. 1777), Pl. Rar. t. 39 (1789).

Type. Cult. Leiden, from South Africa (n.v.).

Syn.: *S. reclinatus* Linn. f., Suppl. 369 (July–Dec. 1781). Type: cult. hort. Ups. from Cape of Good Hope (996. 6 LINN!).

S. graminifolius Jacq., Misc. Aust. 2: 322 (late 1781—early 1782) and Ic. Rar. 1, t. 174 (1781–87). Type: cult Vienna, from Cape of Good Hope (n.v.).

Jacobaea reclinata (Linn. f.) Thunb., Prodr. Cap. 156 (1800), Fl. Cap. 675 (1823).

Senecio paniculatus Berg. var. *reclinatus* (Linn. f.) Harv. in Harv. & Sond., Fl. Cap. 3: 397 (1865).

S. paniculatus auct., non Berg.; Wood, Natal Plants 6, t. 502 (1912).

It is only in recent years that the dating of some early publications has been precisely ascertained and summarized in Stafleu, Taxonomic Literature. It is now clear that *S. chrysocoma* takes precedence over the other two names. The closeness of their dates of publication suggest that all three were from the same introduction.

S. chrysocoma is a weedy species widespread from Uniondale district in the Southern Cape eastwards through the coastal areas to Natal. *S. paniculatus* Berg. is a different plant with smaller heads (c. 6–8 mm long, opposed to 9–11 mm) found from Uniondale district westwards.

138. Senecio cissampelinus (DC.) Sch. Bip. in Flora 28: 499 (1845).

Type. Cape, ceded territory, *Ecklon* 1367 (G–DC, n.v.; I.D.C. microfiche)

Syn.: *Cacalia* ? *cissampelina* DC., Prodr. 6: 331 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 315 (1865).

RHODESIA. Umtali, Vumba, "Cloudlands", *Fisher* 1576 (NU, PRE).

TRANSVAAL. Zoutpansberg distr., Louis Trichardt, *Galpin* 14003 (K, PRE). Pietersburg distr., Woodbush, *Acocks* 12903 (PRE); ibidem, *Taylor* 696 (PRE); Magoebaskloof, *Codd* 1686 (PRE). Pilgrimsrest distr., Mariepskop, *van der Schijff* 5114 (PRE).

NATAL. Umzinto distr., Hlokozi, *Rudatis* 2369 (STE); Dumisa, Hlutankungu *Rudatis* 1530 (STE).

CAPE. Umzimkulu distr., Zuurberg, *Wood* 3049 (K, NH). Mt. Ayliff distr., Tonti Forest, *Kotze* 657 (K, PRE). Stutterheim distr., Dohne, *Sim* 19749 (PRE); Kentani, *Pegler* 481 (PRE); Kat River, *Zeyher* (SAM 39600).

When De Candolle described Ecklon's plant from the eastern Cape as a species of *Cacalia*, he indicated his doubt as to its correct generic placing, and concluded with the words "*An novi generis pignus*?". De Candolle associated with *C. cissampelina* another doubtful species of *Cacalia*, *C. volubilis* Bl. from Java, and created for these two species the section *Cacalia* sect. *Cissampelopsis*. The similarity of the names *Cissampelopsis* and *cissampelina*, as well as the descriptions, suggests very strongly that *C. cissampelina* is the proper lectotype of sect. *Cissampelopsis*.

In 1858 Miquel (Fl. Ned. Ind. 2: 102) raised *Cacalia* sect. *Cissampelopsis* DC. to generic rank. He clearly states that his genus is based on De Candolle's section and that it includes both African and Indian species. Thus the type

of De Candolle's section must become the type of Miquel's genus. Because he was writing a flora of the Netherlands Indies, Miquel actually named only *Cissampelopsis volubilis* (Bl.) Miq. His failure to transfer *C. cissampelina* does not mean that it cannot be taken as the type of *Cissampelosis*. Miquel also added a note that the Indian *Senecio araneosus* DC., *S. corymbosus* DC. and *S. walkeri* Arn. belong to the same genus.

It should perhaps be noted that in the Flora of Java (2: 427, 1965), Backer & Bakhuizen use the name *Senecio walkeri* Arn., giving *S. araneosus* DC. and *Cissampelopsis volubilis* (Bl.) Miq. as synonyms. (The epithet *volubilis* is not available for this plant if it is placed in *Senecio*). More recently Mr A. J. C. Grierson has studied the Ceylon material of the group and proposes to reduce *S. walkeri* to a variety of *S. corymbosus*. It is perfectly clear that all these plants are very closely related and may be regarded as a single aggregate species when considering the generic problem.

Some hundred years after Miquel, Milne-Redhead (in Exell, Suppl. Cat. Vasc. Pl. S. Tomé 27: 1956) erected the genus *Mikaniopsis* to include 5 species with a range from West Africa to Ethiopia and south to Uganda, Zambia, Tanzania, the Congo and Angola. Milne-Redhead noted that there existed at Kew further specimens from places as far apart as the Gold Coast and Natal which might represent undescribed species. Despite the transfer of De Candolle's name, *Cacalia cissampelina*, for the South African plant to *Senecio*, despite the species being reasonably well represented in herbaria, and despite its being a most distinctive plant, it has gone unrecognized except by Harvey in Flora Capensis; he quoted a specimen collected at Katberg as well as the type. It was a specimen from the Kat River, now housed at Kirstenbosch, that enabled one of us (O.M.H.) to identify the material quoted above. It seemed that the transfer of *S. cissampelinus* to *Mikaniopsis* would be in order, despite the fact that it has homogamous capitula whereas those of the other species of *Mikaniopsis* are heterogamous. Such variation is not unusual in genera of Compositae and the heterogamy described in *Mikaniopsis* is apparently of a minor type: it does not involve any dimorphism of the corolla, but merely the abortion of the stamens of the outer flowers.

Meanwhile, however, the second author (B.L.B.) had encountered *Senecio corymbosus* DC. in Ceylon, and had been struck by its resemblance to the African *Mikaniopsis*. It was in following up this lead that the existence of Miquel's genus *Cissampelopsis* came to light.

The Indian, Ceylon and Javan species in this group are, like *S. cissampelinus*, plants with homogamous capitula. They do not, however, appear to show any differences from *Mikaniopsis* that can be judged, at present, as justifying generic separation. On the other hand, with the loss of heterogamy as a distinctive character, the question must arise whether this group of species can be rightly separated from *Senecio* itself.

The petioles are characteristic of the group and a feature to which Milne-Redhead drew particular attention: "*Mikaniopsis* possesses a character which I have not noticed in other climbing members of the Senecioneae, namely the lower part of the petiole becomes thickened and curved to form a hook to assist the climbing of the plant. The leaves are eventually cut off by the formation of an abscission layer at the apex of the curved thickened portion, leaving the hook firmly attached to the branch. This character is

difficult to discern in young leaves." It is clearly visible in the microfiche photograph of De Candolle's specimen of *S. cissampelinus*. The Asiatic species also show the same feature, although the persistent part of the petiole may be merely a stump rather than a hook. In the Ceylon plant examined, *S. corymbosus* DC., the leaf blades are rather leathery and apparently long-lived: therefore the petiolar stumps, formed when the blade and upper part of the petiole abscind, were not much in evidence. The mechanism was, however, present.

S. cissampelinus is a vigorous herbaceous forest climber with something of the aspect of a *Mikania*. It flowers mainly in July and August. The leaves are alternate, rather thick-textured, rhomboid-deltoid, bluntly 3–5-angled, digitately nerved, very lightly cobwebby at first, particularly on the lower surface, glabrescent. The axillary inflorescences are shorter than the leaves, the heads small (c. 10 × 6 mm, c. 10-flowered), several arranged corymbose-paniculately, the involucral bracts few (5–7), reaching to the top of the cylindric part of the corolla tube with the campanulate and deeply lobed upper part, and the pappus of bristles, exserted. The flowers are whitish or pale yellow. The involucral bracts are swollen at the base, with a few small calyculus bracts a little longer than the swellings. The anther bases are tailed, the tips of the style branches furnished with a short cone, the achene cylindric, glabrous and closely ribbed.

The essential characters are shared with other members of the group and make its recognition easy. It is the status of the group that is in doubt. Any reliable segregates from such a vast genus as *Senecio* are welcome, but before adopting *Cissampelopsis* as the generic name for the group it is desirable to investigate its relationships rather more closely, especially with the other non-climbing species of sect. *Synotis* (Hook. fil., Fl .Brit. Ind. 3: 351, 1881), which also have tailed anthers. It therefore seems best to continue to use the existing name in *Senecio* for the time being.

139. Senecio hastatus L., Sp. Pl. 868 (1753), Syst. Nat. ed. 10, 1215 (1759); Hill, Syst. Veg. 2: 118, t. 84 f. 8 (1761), ed. 2 (1774); L., Syst. Nat. ed. 12, 2: 551 (1767), ed. 13 (Murray), 630 (1774), Syst. Veg. ed. 14 (Murray), 757 (1784), Syst. Veg. (Gmelin) 1228 (1796); Willd., Sp. Pl. 3: 1987 (1803); Klinsmann, Clavis Dillen. Hort. Elth. 14 (1856); Druce & Vines, Dill. Herb. 69 (1907).

Type. *Senecio* 10, herb. van Royen (L!).

Syn.: [*Jacobaea afra perennis viscosa lutea Asplenii foliis* Vaill., Act. Paris. 298 (1720); Dillen., Hort. Eltham. 183, t. 152 (1732)].
[*Senecio petiolis amplexicaulibus, pedunculis folio triplo longioribus, foliis pinnato-sinuatis, floribus radiatis* van Royen, Fl. Leyd. Prodr. 164 (1740)].
Senecio hastulatus [sphalm.?] L., Sp. Pl. ed. 2, 1218 (1762); Dill., Hort. Elth. pl. icon. et nomina, t. 152 (1774); DC., Prodr. 6: 383 (1838); Harv. in Harv. & Sond., Fl. Cap. 3: 367 (1865); Levyns in Adamson & Salter, Fl. Cape Penins. 812 (1950).

As the above citations show, this plant is at present most often known by the name *S. hastulatus* L. It seems likely, however, that the spelling *hastulatus* was simply a mistake in the second edition of Species Plantarum. Throughout

Linnaeus's other publications *hastatus* was consistently used. De Candolle, who always cited ed. 2, gave currency to *hastulatus*. We must now return to the original spelling.

The specimen in Linnaeus's own herbarium (996.27 LINN!) does not belong to this species, but it is probably the upper part of a (cultivated?) specimen of *S. litoreus* Thunb. It is not, however, the type of the species. Linnaeus took his definition verbatim from van Royen and quoted the Vaillant synonym given above. The Director of the Rijksherbarium, Leiden, has kindly sent van Royen's specimen on loan and we have seen Vaillant's specimen in the Muséum National d'Histoire Naturelle, Paris. In the second edition of *Species Plantarum* Linnaeus quoted the Dillenius plate and the corresponding specimen is still in the Dillenian herbarium at Oxford, though we have not seen it. Vaillant's specimen, van Royen's specimen and the Dillenian illustration all represent exactly the same species. In the Edinburgh herbarium they are well matched by specimens collected in the vicinity of Cape Town by W. H. Harvey (nos. 35, 69). The application of the name is therefore not in doubt.

Although the specimen 996.27 in Linnaeus's herbarium is wrongly named *S. hastatus*, the species is represented there by sheet 996.85, unnamed and annotated "484" [in Thunberg's herbarium].

140. Senecio helminthioides (Sch. Bip.) Hilliard **stat. nov.**

Type. Natal Bay, *Krauss* 285 (G! K!).

Syn.: *S. quinquelobus* var. *helminthioides* Sch. Bip. in Flora 27: 700 (1844).

Leaves ovate-deltoid in outline, shallowly lobed, the sinuses more or less remotely denticulate. *Peduncles* sometimes 1–headed, more usually 2–6 heads in a very open corymb. *Heads* discoid, calyculus bracts broad, foliaceous. *Achenes* hispid.

CAPE. Port Alfred, *Tyson* s.n. (PRE); Bathurst, Belton Hills road, *Johnson* 936 (PRE). East London, Queen's Park, *Munro* P885 (PRE); Kowie West, *Tyson* s.n. (PRE). Kentani, *Pegler* 464 (PRE). Somerset, *Bowker* (K). Komgha, near Kei River, *Flanagan* 1881 (K).

NATAL. Estcourt distr., Dalton Bridge, *West* 1020 (PRE). Kranskop distr., Ntunjambili Mt., *Codd & Dyer* 2808 (PRE). Port Shepstone distr., Umzimkulu gorge, *McLean* 410 (PRE). Lower Tugela distr., near Insuzi, *Acocks* 10316 (PRE). Umzinto distr., Dumisa, Friedenau, *Rudatis* 381 (K). Durban distr., Isipingo Beach, *Ward* 106 (E, NU); Springfield, *Wood* 13251 (K). Inanda distr., Inanda, *Wood* 506 (K). Weenen distr., Muden, Nocife Hill, *Edwards* 2767 (K). Ubombo distr., summit Lebombo, en route Jozini Dam, *Hilliard* 1548 (NU); Lebombo Mts., *Strey* 8152 (K); Sordwana Bay, *Vahrmeijer & Tolken* 858 (K). Ingwavuma distr., Ndumu Game Reserve, *Pooley* 531 (E, NU); near Maputa and Big Kosi Lake, *Rodin* 4686 (K). Without precise locality, *Gerrard* 1007 (K), *Cooper* 2541 (K).

TRANSVAAL. Barberton distr., Rimer's Creek, *Galpin* 915 (K). Pietersburg distr., Blaauwberg, farm "Bulbul", *Codd* 7955 (K); Magoebaskloof, *Gerstner* 5411 (PRE).

SWAZILAND. Mbabane distr., Palwane Hills, *Compton* 25903 (K). Stegi distr., 14 miles S of Stegi, *Compton* 30064 (K). Hlatikulu distr., near Hlatikulu, *Compton* 28765 (K).

MOÇAMBIQUE. Delagoa Bay, *Monteiro* 22 (K). Lourenço Marques, *Borle* 127 (BM).
RHODESIA. Salisbury distr., Wedza Mts., *Wild* 6522 (BM).
MADAGASCAR. District de Fort Dauphin, *Decary* 10221 (PRE).

Schultz described his plant as a variety of *S. quinquelobus* on the basis of its having hispid, not glabrous, achenes. The plant is amply distinct from *S. quinquelobus*, as well as the allied *S. macroglossus* and *S. macroglossoides*, not only in this character, but also in its broad, foliaceous calyculus bracts and in having the sinuses of the leaf lobes denticulate, not smooth. It is more tropical in its distribution too, ranging from about Port Alfred in the eastern Cape through coastal Natal to Barberton in the SE Transvaal and on to the Blaauwberg at the NW extremity of the Zoutpansberg, Swaziland, Delagoa Bay in Moçambique and the Wedza Mts., 30 miles S of Marandellas in Rhodesia. It is also in Madagascar.

141. Senecio macroglossoides Hilliard **species nova** a *S. macroglosso* DC. foliis ambitu deltoideo-ovatis utrinque lobis 3–5 brevibus acutis instructis (haud hastatis lobis acuminatis), calyculi bracteis dimidium involucri tantum aequantibus saepissime basi ciliatis (haud plus minusve involucrum aequantibus eciliatis), et a *S. quinquelobo* DC. lobis foliorum rectis vel leviter concavis, calyculi bracteis ciliatis, floribus disci longioribus et capitulis saepissime radiatis differt.

Planta perennis scandens nectensque subcarnosa glabra. *Folia* ambitu deltoideo-ovata utrinque lobis 3–5 brevibus acutis instructa, marginibus loborum rectis vel leviter concavis. *Capitula* ramos breves foliosos terminantia, interdum solitaria, saepe 12 usque corymbum laxum formantia, saepissime radiata, rarissime discoidea. *Involucrum* e bracteis circa 12, lanceolato-oblongis 10–13 mm longis compositum, calyculo bracteis dimidio brevioribus marginibus plerumque ciliatis patulis vel reflexis instructum. *Flores radii* circa 7, limbo 15–20 mm longo flavo. *Flores disci* corolla (10·5–) 11–12·5 mm longa flava. *Ovarium* 4·5–5·5 mm longum, cylindricum, strictum, glabrum, margine pallida membranacea coronatum. *Pappus* copiosus, e pilis albis scabridis, mox caducus.
Type. Natal, Umzinto distr., Dumisa, Umgaye Flat, 600 m, *Rudatis* 1419 (E holo, K iso).
CAPE. Between the Umsikaba and Umzimvubu rivers, *Drège* 5027 (G–DC).
NATAL. Inanda distr., Inanda, *Wood* 573 β (K). Kranskop distr., Kranskop-Middledrift road, 1000 m, *Edwards* 2096 (K). Lions River distr., near York, 900–1200 m, *Wood* 4310 (K); ibidem, *Wood* 997 (E). Nkandla distr., Nkandla forest, *Codd* 1375 (K). Vryheid distr., Nhlazatshe Mt., c. 1220 m, *Hilliard & Burtt* 3364 (NU). Zululand, 1525 m, *Gerstner* 6717 (K). Durban distr., Isipingo Beach, *Ward* 407 (PRE). Pinetown distr., Kloof Nature Reserve, *Moll* 3261 (PRE).
TRANSVAAL. Pilgrimsrest distr., Mariepskop, c. 1675 m, *v. d. Schijff* 4453 (K).

The Drège specimen cited above is one of De Candolle's syntypes of his species *S. macroglossus* (see no. 142 below), but the plant proves distinct from that species, and is easily distinguished by a number of characters. The

leaves of *S. macroglossoides* are deltoid-ovate in outline, with 3–5 sharply acute, shallow lobes on either side, the margins of the lobes straight or slightly concave; those of *S. macroglossus* are deltoid in outline, generally hastate, with acuminate lobes, the margins of the lobes convex. The calyculus bracts of *S. macroglossoides* are approximately half the length of the involucral bracts, nearly always have ciliate margins, and are spreading or reflexed; those of *S. macroglossus* nearly or quite equal the involucral bracts and, in the dried state at least, are appressed. Furthermore, the heads of *S. macroglossoides* are nearly always corymbosely arranged, those of *S. macroglossus* nearly always solitary, at most 3 in a very open corymb.

Harvey (Fl. Cap. 3: 403, 1865) as well as De Candolle, both of whom were working with a very limited number of specimens and therefore failed to detect that two species were involved, suggested a close relationship between "*S. macroglossus*" and *S. quinquelobus* (no. 145). It is, however, *S. macroglossoides* that closely resembles *S. quinquelobus*, the most obvious, and least trustworthy, difference being the presence of rays in *S. macroglossoides*, their absence in *S. quinquelobus*. However, there are a number of other differences, which, when considered singly, are none of them absolute (nor indeed is the presence or absence of rays), but collectively they justify the separation.

S. macroglossoides	*S. quinquelobus*
Margins of leaf lobes straight or slightly concave.	Margins of leaf lobes slightly convex.
Margins of at least some of the calyculus bracts nearly always ciliate, though cilia sometimes very sparse.	Margins of calyculus bracts without cilia.
Heads nearly always radiate (discoid state recorded only from Mariepskop)	Heads discoid
Corolla of disc flowers (10.5–) 11–12 mm long.	Corolla of disc flowers 9·5–11 mm long.

Van der Schijff 4453 (cited above), from Mariepskop in the north-eastern Transvaal, despite its lack of rays, is clearly *S. macroglossoides*, having the typical leaf form and ciliate calyculus bracts of that species. Radiate and discoid plants are relatively commonplace in species of *Senecio*, and the radiate form of *S. macroglossoides* should be sought in the Transvaal.

There is almost complete geographical separation between *S. macroglossoides* and *S. quinquelobus*. *S. macroglossoides* ranges from about Port St. Johns in the Transkei through Natal to Mariepskop in the Transvaal Drakensberg, probably always above 600 m altitude, climbing on forest margins, and flowering mainly in May and June. *S. quinquelobus* is mainly a southern and eastern Cape species, from Swellendam and Mossel Bay districts to Humansdorp and Uitenhage and inland to Albany, Somerset East, Victoria East, Queenstown and Komgha. It is also in southernmost Natal. Like *S. macroglossoides*, it climbs on forest margins and flowers in April and May.

142. Senecio macroglossus DC., Prodr. 6: 404 (1838).
Lectotype: Cape, Albany, *Drège* 5123 (G–DC!).

Leaves more or less deltoid in outline, usually 3-lobed, the larger ones generally hastate, lobes acuminate, the two basal ones sometimes with a smaller tooth on the lower margin. *Peduncles* 1-headed, usually solitary rarely 2–3 heads in a very open corymb, with few or several lanceolate, foliaceous bracts. *Heads* radiate, rays c. 8–12, calyculus bracts more or less equalling the involucral bracts, appressed at least in the dried state. *Achenes* glabrous.

CAPE. Albany, collector not given, 851 (K); without locality, *Zeyher* 2986 (K); bottom of Woest Hill, *Dyer* 2420 (K). Humansdorp distr., Humansdorp, *West* 84 (K). Uitenhage distr., Winterhoek Mts., *Fries, Norlindh & Weimarck* 701 (K); Port Elizabeth, *Bolus* 2672 (K); Uitenhage, *Prior* (K); Addo Bush, *Long* 24 (K). Bathurst div., Port Alfred, *Rogers* 28062 (K). Keiskammahoek distr., Keiskammahoek, *Theron* 2105 (K). Elliotdale distr. [Bashee river mouth], The Haven, *Gordon-Gray* 1320 (E, NU). Transkei, Konap, *Baur* 1038 (K). C.B.S., without precise locality, *Harvey* (K); *Cooper* (K).
NATAL. Durban distr., Palmiet river, *Sanderson* 909 (K) and hort. Kew, Dec. 1874 (K). Inanda distr., near Umzinyati waterfall, *McClean & Ogilvie* 28867 (K). Lower Tugela distr., Umvoti river valley, en route Glendale Mill, *Hilliard* 2108 (NU). Ubombo distr., Lebombo Mts., *Strey* 8148 (K). Ingwavuma distr., Ndumu Hill, *Pooley* 1 (E, NU). Hlabisa distr., Hluhluwe Game Reserve, *Hitchins* 88 (PRE). New Hanover distr., Noodsberg, Appelbosch, *Strey* 6017 (PRE).
TRANSVAAL. Warmbaths, *Burtt Davy* 10708 (PRE).

Two of De Candolle's three syntypes of *S. macroglossus* are preserved in Geneva, and they represent two different plants. The Prodromus description of the leaves covers both specimens but the reference to 1-headed branches with foliaceous bracts swings the balance in favour of the left-hand specimen on the Prodromus Herbarium sheet, *Drège* 5123, which is accordingly nominated lectotype, *Drège* 5027, the right-hand specimen, is the plant described above (no. 141) as *S. macroglossoides*. *S. macroglossus* has long been cultivated in Europe, as a greenhouse plant or a window-climber, a form with variegated leaves being most commonly seen. It is sometimes grown in South Africa, and there is need of confirmation that the isolated record given above for the Transvaal represents a wild plant.

143. Senecio ngoyanus Hilliard, **species nova** ex affinitate *S. variabilis* Sch. Bip. sed foliis glabris, capitulis minoribus, involucri bracteis 4·5–5 mm (haud 7–11 mm) longis et minute capitato-glandulosis (haud pilis magnis multiseriatis glanduloso-capitatis praeditis) et achaeniis glabris (haud hispidis) facile distinguitur.

Herba perennis caudice crasso 1 cm usque diametro. *Caulis* florifer solitarius, ad 60 cm erectus, superne subdichotome ramosus in corymbum laxum paucicapitatum, ramis inflorescentiae parce et breviter glanduloso-pubescentibus exceptis glaber. *Folia* pro maxima parte radicalia, caulina pauca distantia in bracteas parvas inflorescentiae mox transeuntia; radicalium lamina anguste elliptica, usque 7·5 × 1·8 cm, apice subacuta, basi in petiolum aequilongum sensim angustata, utrinque glabra, marginibus plus

minusve integris vel denticulatis. *Capitula* discoidea campanulata, 6–7 × 8 mm, basi bracteis minimis tenuibus 2–3 calyculata. *Involucri* bracteae c. 14, 4·5–5 mm longis, minute et parce glanduloso-pubescentes, saepe purpureo-tinctae. *Flores* c. 30, purpurei, interdum pallidiores vel albidi. *Corolla* inferne cylindrica, superne subito campanulata, c. 4·5 mm longa. *Antherae* apice breviter ovato-appendiculatae, basi obtusae. *Ovarium* c. 2 mm longum, glabrum. *Styli* rami truncati, penicillati. *Pappus* e setis tenuibus scabridis albis corolla paulo brevioribus. *Achaenia* cylindrica, costata, glabra, interdum in costis minute glandulosa.

Type. Natal, Mtunzini distr., Ngoye, 14 xii 1968, *Hilliard & Burtt* 5632 (E holo; K, NH, NU iso).

NATAL. Mtunzini distr., Ngoye, *Hilliard* 3181 (E, NU); ibidem, *Gordon-Gray* 6186 (E, NU); ibidem, *Wylie* in herb. Wood 8632 (NH); Mtunzini, *Thode* A 1533 (NH); ibidem, *Lawn* 1157 (NH); Richards Bay, Zinkwasi overflow, *Getliffe* 64 (NU); west of Charters Creek, *Ward* 2866 (NH, NU); Dukuduku, *Strey* 5484 (NH); Empangeni High School, *Venter* 1973 (NH). Lower Tugela distr., Umhlali, *Wood* 11941 (NH). Ingwavuma distr., E Ingwavuma, *Aitken & Gale* 59 (NU).

MOÇAMBIQUE. Delagoa Bay, *Junod* 69 (G). Inhaca Island, Hlangwini Swamp, *Mogg* 27549 (K).

S. ngoyanus is a plant of the Moçambique-Zululand coastal plain, growing socially in marshy depressions in grassland or in marshy places on the great granite domes that are so conspicuous a feature of Ngoye forest east of Eshowe. It flowers from September to December. Its glabrous, long-petioled radical leaves, nearly nude stems and glabrous achenes mark it off among species with discoid heads and whitish to purple flowers. The glands on the backs of the involucral bracts and on the upper parts of the peduncles have a very short (c. 4–celled) uniseriate stalk and a relatively large, several-celled globose head, very different from the massive, multicellular, multiseriate cone-shaped glandular hairs of *S. variabilis* and the long, many-celled but uniseriate gland-tipped hairs also found in *S. variabilis*, as well as in other species in this general affinity, for example *S. barbatus* DC., *S. sandersonii* Harv., *S. concolor* DC. and *S. erubescens* Ait.

144. Senecio panduriformis Hilliard, **nom. nov.**

Type. Highlands of Natal, *Gerrard & M'Ken* 1043 (TCD! K!).

Syn.: *S. pandurifolius* Harv. in Harv. & Sond., Fl. Cap. 3: 380 (1865), non C. Koch (1843).

The well-known and apt name *S. pandurifolius* Harv. has to be abandoned because it is a later homonym. A similar name has been chosen since there is no likelihood of confusion with the Caucasian *S. pandurifolius* Koch.

Some sheets of the South African plant collected by Rudatis will be found in herbaria bearing the name *S. thomsianus* Muschler. When this name was eventually published, however, it was applied to an East African species collected by Keil in Usambara (Bot. Jahrb. 43: 59, 1909). We have not been able to trace the type, but it is clear from the description that it is not the South African plant.

145. Senecio quinquelobus (Thunb.) DC., Prodr. 6: 404 (1838).
Type. Cape, *Thunberg* (herb. Thunb. 20904—UPS).
Syn.: *Cacalia quinqueloba* Thunb., Fl. Cap. 626 (1823).
CAPE. Mossel Bay distr., Koega waterfall, *Muir* 944 (PRE). Swellendam distr., Grootvadersbosch, *Marloth* 13181 (PRE). Knysna distr., near Knysna, *Burchell* 5471 (K); Groot Rivier, *Fourcade* 1231 (K); ibidem, *Taylor* 7725 (K); beyond East End Garden, *Taylor* 1248 (K). Humansdorp distr., Klipdrift, *Thode* A 2483 (K). Somerset East distr., Boschberg, *Burchell* 3152 and 3237 (K); ibidem, *MacOwan* 274 (K). Komgha distr., near Komgha, *Flanagan* 678 (K). Victoria East distr., Hogsback, *Johnson* 1221 (K); ibidem, *Jacot Guillarmod* 5513 (K). Albany distr., *Cooper* 1514 (K). Alexandria distr., Bushman's River mouth, *Archibald* 4341 (PRE). East London, *Galpin* 1854 (PRE). Queenstown distr., Gwatyn, *Galpin* 8130 (PRE).
NATAL. Without precise locality, *Cooper* 2540 (K). Polela distr., Xumeni Forest, *Moll* 3236 (PRE).

The type specimen is written up 'Othonna' in Thunberg's hand, and Lessing has added 'Cacalia 5 loba Thunb.' (fide Juel, Pl. Thunberg. 340, 1918).

For further discussion, see under *S. macroglossoides* (no. 141, above).

146. Senecio tanacetopsis Hilliard, **nom. nov.**
Types. Cape, Witteberg, *Cooper* 626 (TCD! lecto). Transvaal, Langspruit, *Zeyher* 934; Dornkopf, *Burke* (TCD! K!).
Syn.: *S. tanacetoides* [Sond. ex] Harv. in Harv. & Sond., Fl. Cap. 3: 394 (1865), non Kunth & Bouché (1845).

A careful study of the group of closely allied plants centred on *S. achilleifolius* DC. shows that the entity named *S. tanacetoides* is a distinct one and has no later synonym. It is therefore renamed as above.

147. Staehelina petiolata (L.) Hilliard & Burtt, **comb. nov.**
Type. Gnaphalium 16 (Herb. Clifford—BM!).
Syn.: [*Gnaphalium caule fruticoso, foliis ovatis integerrimis petiolatis, floribus terminatricibus confertis* L., Hort. Cliff. 402 (1737)].
Gnaphalium petiolatum L., Sp. Pl. 854 (1753).
Staehelina arborescens L., Mantissa, 111 (1767); Rech. f., Fl. Aegaea 646 (1943), which see for fuller refs.
Helichrysum petiolatum (L.) DC., Prodr. 6: 208 (1838) quoad syn. excl. descr. et spec.
CRETE. Endemic, numerous collectors (e.g. *Dörfler* 4895, *Davis* 285, 302, *Greuter* 7570, 7858).

It is most unfortunate that the specific epithet of this well known Cretan endemic has to be changed. The circumstances in which the name was transferred to a S African *Helichrysum* have been explained above (see no. 116).

148. Tarchonanthus trilobus DC. var. **galpinii** (Hutch. & Phill.) J. Paiva in Bol. Soc. Brot. 46: 358 (1972).
Type. Transvaal, Barberton distr., Hyslop's Creek, *Galpin* 926 (K! NH! PRE!).
Syn.: *T. galpinii* Hutch. & Phill. in Kew Bull. 1936: 85 (1936).

T. galpinii was distinguished from *T. trilobus* by its entire, not trilobed, leaf apex, but this distinction does not always hold, and we agree with Dr J. A. R. Paiva's reduction to infraspecific rank. *T. trilobus* is found on the edges of Table Mountain Sandstone cliffs from the neighbourhood of Port St. Johns in the Transkei to Natal south of the Tugela, and the leaf apex here is nearly always markedly trilobed. However, *Strey* 6932 (PRE), from the Umtamvuna Forest Reserve on Natal's southern border, has leaves that are only shallowly and obscurely trilobed at the tips, and indeed these closely resemble the leaf tips of *Schlieben & Hartmann* 12023 (PRE) from the farm Rietbok in the Zoutpansberg, northern Transvaal. North of the Tugela, on the granite domes of Ngoye Forest east of Eshowe, there is considerable variation in the degree of leaf lobing on different trees: some may have entire leaf tips, others are shallowly but distinctly trilobed, while yet others show varying degrees of lobing. Herbarium records suggest that much the same situation pertains in Hluhluwe and Umfolozi Game Reserves and on the Lebombo Mountains at least south of Stegi in Swaziland.

Northwards, on the mountains around Barberton, on Mariepskop, the Waterberg, the Granite Mountains near Potgietersrust, the Zoutpansberg, Blaauwberg, at Namaacha on the Lebombos where the Transvaal-Swaziland-Moçambique borders meet, and at Inyanga in the eastern highlands of Rhodesia, leaf tips are mostly obtuse to acute, though some specimens such as *Schlieben & Hartmann* 12033, quoted above, and *Buitendag* 478 (K) from Barberton, Agnes Mine, have a hint of trilobing in some of the leaves. These localities may well all be on granite or other igneous rocks, in contrast to the sandstone favoured by *T. trilobus* sens. strict.

Mr Ian Garland kindly went to Ngoye and confirmed my casual observations on the trees there.

149. Vernonia galpinii Klatt in Bull. Herb. Boiss. 4: 827 (1896).
Type. Transvaal, Barberton, Saddleback Mt., *Galpin* 1030 (K! NH! Z!).
Syn.: *V. monocephala* Harv. in Harv. & Sond., Fl. Cap. 3: 53 (1865), non Gard. (1847). Types: Transvaal, Magaliesberg, *Burke* (K!); Natal, Zululand, *Gerrard & M'Ken* 1011 (NH sheet is *V. sutherlandii*).
Cacalia harveyi O. Kuntze, Rev. Gen. 3(2): 138 (1898). Type as for *V. monocephala*.

This species, common in the grasslands of Natal, the Transvaal and Swaziland, has also been recorded from the eastern highlands of Rhodesia.

150. Vernonia neocorymbosa Hilliard **nom. nov.**
Type. Cape, "*Bäck*" [i.e. Forster, fide Exell] (LINN 981.6!).
Syn.: *Staehelina corymbosa* Linn. f., Suppl. 359 (1781).
Vernonia corymbosa (Linn. f.) Less. in Linnaea 6 (1): 674 (1831), non Schweinitz (1824).

Unfortunately, the trivial name of this common shrub is preoccupied by an American species. *V. neocorymbosa* is widespread in the eastern part of South Africa, from the Zoutpansberg through Swaziland, Natal and the Transkei to about Port Elizabeth in the SE Cape. It has also been recorded from Mt. Mponduine in the Lebombo Mts. near Namaacha, Moçambique.

151. Vernonia stipulacea Klatt in Bull. Herb. Boiss. 4: 457 (1896).
Type. Transvaal (sphalm. Natal), Drakensberg 23° 30′ S, *M'Lea* (sphalm. M'Sea) comm. *Bolus* 3004 (Z! the K sheet is localised Macamac).
Syn.: *V. ampla* O. Hoffm. in Bot. Jahrb. 30: 423 (1901). Type: Tanganyika, Usafua, Ngosi or Poroto-Berg, *Goetze* 1286 (E! localised Kinga-Berg).
V. podocoma Sch. Bip. ex Oliv. & Hiern in Oliv., Fl. Trop. Afr. 3: 296 (1877), non Sch. Bip. ex Vatke in Linnaea 39: 476 (1875).
V. oliveriana Pichi-Sermolli in Webbia 7: 345 (1950).

Pichi-Sermolli (Webbia 7: 342–345, 1950) pointed out that the name *V. podocoma* was not available in the sense used by Olivier & Hiern in the Flora of Tropical Africa, and he re-named the species *V. oliveriana*. Brenan (Mem. N.Y. Bot. Gard. 8: 462, 1954) noted, however, that this plant was almost certainly conspecific with *V. ampla* O. Hoffm. though he had not seen the type of this. An isotype is preserved at Edinburgh and shows that Brenan's determination was correct. However, he was mistaken in thinking that this was the earliest name available as the species had already been described from near its southern limit as *V. stipulacea* Klatt, based on a specimen from the Transvaal Drakensberg. This name must accordingly be adopted. The species is widespread in tropical Africa.

Klatt described the pappus bristles as equal; nevertheless, the outer series is clearly much shorter than the inner.

CRASSULACEAE

152. Kalanchoë figuereidoi Croizat in Bull. Jard. Bot. Brux. 14: 364 (1937); Jacobsen, Handb. Sukk. Pflanzen, 2: 826 (1954) and Handbook Succ. Pl. 2: 647 (1960); Hamet & Marnier in Arch. Mus. Nat. Hist. Nat. Paris, 7 sér., 8: 102 (1964).
Type. Moçambique, Nyassa, Metonia [? Metorica, c. 13° S, 36° 55′ E], leg. *A. Figuereido de Gomes e Sousa*, cult. Jard. Bot. Brux. (BR).
MOÇAMBIQUE. Zambesia, Mt. Mongué, 16° 35′ S, 35° 30′ E, c. 1000 m, in crevices of granite rock, 26 i 1971, *Hilliard & Burtt* 6342 (veg. only), cult. R.B.G. Edinb., June 1971, C.8206.
MALAWI. Mt. Mdima, 15° 50½′ S, 35° 13½′ E, in crevices on granite cliff, 5 ii 1967, *Hilliard & Burtt* 4673 (veg. only), cult. in R.B.G. Edinb. C. 8307.

Kalanchoë figuereidoi is a very distinct species in the genus on account of its insignificant flowers; the corolla is less than 1 cm long and tinged pale pink. The flowers are far less attractive than the glaucous, red-blotched leaves.

In both localities where we found this plant it was growing in rock crevices on hills clad with open *Brachystegia* woodland. As such habitats are plentiful in this region the species may prove much less rare than the present sparse records suggest.

RUBIACEAE

153. Galopina crocyllioides Bär ex Schinz in Viertelj. Nat. Ges. Zürich 78: 437 (1923).
Types. Natal, Howick, *Junod* 238; Umgaye, *Rudatis* 867 (iso BM, E).
NATAL. Durban distr., Isipingo, 23 iv 1949, *de Villiers* 34 (NU). Pietermaritzburg distr., Town Hill, March 1966, *Hilliard* 5275 (NU); Swartkop, April 1948, *Nixon* 14 (NU).
CAPE-NATAL border, Zuurberg, *Tyson* 1176 (K).

Although published fifty years ago, the name *Galopina crocyllioides* has not been taken into use for this distinctive species with white-villous ovaries. Scanty though they are, the herbarium records show that the plant is widely distributed in Natal, from near sea level to about 1200 m, in grassland.

SELAGINACEAE

154. Selago junodii Rolfe in Viertelj. Nat. Ges. Zürich 49: 196 (1904).
Type. Transvaal, Shilouvane, *Junod* 818 (Z!).
Syn.: *S. stewartii* S. Moore in Journ. Bot. 69: 232 (1921). Type: Swaziland, *Stewart* in herb. Rogers 20444 (BM!).
SWAZILAND. King's Forest, near Havelock, grassveld; heads of white flowers; 21 i 1966, *Hilliard & Burtt* 3644 (E, NU).

This is an addition to R. H. Compton's check list of the Swaziland flora (Journ. S. Afr. Bot. Suppl. 6: 68, 1966). Our specimen agrees well with *Junod* 818 (Z) written up by Rolfe himself and with the type of *S. stewartii* also. One plant in the population (H. & B. 3644a-E) was noted that had browner and broader leaves (2 mm against 1 mm) and lacked the axillary tufts of small leaves usually present.