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

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ABSTRACT. Thirty two species are annotated. Seven are new: *Wahlenbergia* (1), *Felicia* (1), *Helichrysum* (3), *Senecio* (1), *Basutica* (1). *Petalactella* is reduced to *Ifloga* and there are notes on the nomenclature of other species in this genus and in *Conyza*, *Gnaphalium*, *Senecio* and *Vellozia*. Difficult taxonomic situations are analysed in *Brachylaena*, *Gymnopentzia* and *Haplocarpha*. Interesting records concern *Crepis*, *Kalanchoë* and *Barberetta* and under the last of these D. Geerinck (Brussels) contributes morphological notes and a revised key to the genera of Haemodoridae—Haemodoreae.

SPRING FLOWERS IN AUTUMN

Bews wrote "In the spring many grass-veld plants commence growth, even before the first rains, as soon as the temperature rises slightly, a fact which demonstrates that it is not in all cases the winter drought which causes the resting period in South African plants" (J. W. Bews, *Plant Forms*: 128, 1925). Forty five years later we are still largely ignorant of the factors governing flowering cycles in grassland plants. It may therefore be of interest to record the autumn appearance of some typical spring flowers.

In the first week of March 1970, a grassy hill-slope at Everton (12 km NW of Durban) was burnt bare. Only 116 mm of rain had fallen here during the exceptionally hot dry months of January and February 1970, instead of the 240 mm average. After the burning, typical spring flowers quickly appeared, showing that removal of the grass cover is significant in inducing flowering in many grassland species. *Eriosema kraussianum* Meisn., *Aster bakerianus* Burtt Davy ex C.A. Smith and *Euryops laxus* (Harv.) Burtt Davy were in bloom at the end of March, during which 19.8 mm (average 88.5 mm) of rain fell, and by mid-April the following were flowering: *Eriospermum mackenii* Bak., *Indigofera hiliaris* Eckl. & Zeyh., *Eriosema cordatum* E. Mey., *E. salignum* E. Mey., *Convolvulus natalensis* Bernh., *Chaetacanthus glandulosus* Nees, *Pentanisia prunelloides* (Eckl. & Zeyh.) Walp., *Vernonia natalensis* Sch. Bip., *V. oligocephala* (DC.) Sch. Bip., *Helichrysum latifolium* (Thunb.) Less., *H. undatum* Less., *Callilepis laureola* DC., *Pentzia pinnatifida* Oliv., *Senecio bupleuroides* DC., and

* Continued from *Notes R.B.G. Edinb.* 30: 128 (1970): arranged alphabetically by families then by genera.

Berkheya speciosa (DC.) O. Hoffm. Our herbarium records show that these common plants usually flower not earlier than August, that is, when the grass is burnt off at the end of the dry winter months.

In the first week of August, only *Hyparrhenia filipendula* (Hochst.) Stapf (spring- to autumn-flowering), *Helichrysum nudifolium* Less. var. *quinquenerve* (Less.) Moes. (usually November to June) and *Selago woodii* (usually January to March) were in flower on the slope that was burnt in March. But on part of the same slope that was burnt in July, *Aster bakerianus*, *Euryops laxus*, *Pentania prunelloides*, *Vernonia oligocephala*, *Pentzia pinnatifida* and *Senecio bupleuroides* were in flower in early August and *Berkheya speciosa* was budding, which is the beginning of their more usual flowering time. The other species that flowered in March and April are not present here. Nothing flowered on unburnt slopes.

CAMPANULACEAE

33. *Wahlenbergia pulvillus-gigantis* Hilliard & Burt, *species nova* habitu pulvilliformi e speciebus omnibus austro-africanis eximia.

Herba perennis multiceps pulvillos compactos usque ad 15 cm diam. et 6 cm altos formans, omnino glabra. *Caules* numerosi, basi ramosi et radicantes, superne iterum ramosi; ramuli 2.5 cm usque longi, 1.5 mm diam., inferne foliis delapsis cicatrosi, superne densissime foliati. *Folia* alterna, congesta, patentia, crassiuscula, carinata, oblongo-lanceolata, ad basin amplexantem minute glandulosum leviter dilatata, usque ad 9×2 mm, apice uncinata, margine integra vel dentibus 1-2 apicem versus instructa; costa supra immersa, subtus prominens. *Inflorescentiae* terminales 12 cm usque altae, 1-4-florae; pedunculus 8 cm usque, bracteis 2-3 minutis instructus, simplex vel superne semel vel bis ramosus, ramulis (pedicellis) 4.5 cm usque, bracteolis 1-2 minutis vel ebracteolatis. *Calyx* 5-partitus; segmenta linearia, 2.5×1 mm, viridia medio dorso purpureo-zonata, apices versus minute glandulosa. *Corolla* tubo albo purpureo-lineato infundibuliformi 4-5 mm longo ore 3-4 mm diam.; lobi 5 albi, lanceolati, 8 mm longi, superne recurvi. *Stamina* filamentis 2 mm longis applanatis, basin versus gradatim ampliatis; antherae anguste oblongae, 1.25 mm longae. *Ovarium* turbinatum, trilobulare; stylus in corolla inclusus, teres, inferne glaber, superne glandulosus; stigmatibus lobi 3, demum recurvi, extra glandulosi. *Capsula* (matura?) parte inferiore 3 mm longa summo 1 mm diam., parte superiore libera conica 1 mm alta valde 3-costata. *Semina*, vix matura, oblonga 1 mm longa. NATAL. Estcourt distr., Highmoor Forest Reserve, spur running SE from Giants Castle, c. 2440 m, 26 xii 1968, Hilliard & Burt 5683 (E, holo; K, NH, NU, PRE, iso); *ibidem*, 19 i 1970, Wright 954 (E, K, NH, NU).

W. pulvillus-gigantis forms rich green cushions on bare cliff or on grassy ledges facing south. It was in full flower at Christmas and Mr F. B. Wright kindly revisited the site the following season some 3 weeks later for fruit. Several local species of *Helichrysum* form cushions, but plants with this habit are not very numerous in the Drakensberg and the new species is a notable addition to this ecological group.

In 1915 W. von Brehmer published an extensive revision of African *Wahlenbergia* (*Bot. Jahrb.* 53: 9-143) and in this he recognised no less than

30 "Artengruppen" (which we refer to henceforth as 'series'). Within this elaborate taxonomic structure it is impossible to find a place for *W. pulvillus-gigantis*, and it is clear from von Brehmer's diagram of growth-forms that he did not know any cushion-forming species. His key is divided primarily into three sections with leaves alternate, opposite or rosulate. The 'rosulate' heading sounds attractive, but proves to include only a single series of herbs with a basal rosette of flat petiolate leaves. Despite their close congestion the leaves of the new species are spirally arranged, not opposite. The only dwarf plants are the very different procumbent forms with sessile flowers: we can only seek a distant affinity for *W. pulvillus-gigantis* amongst caulescent species and here we are led to the series *Squamifoliae*. There are only two species placed here, *W. epacridea* Harv. and *W. squamifolia* v. Brehm. Both have the erect stem closely invested with small hard leaves. No fundamental differences have been observed in flower or fruit and we can only suggest that *W. pulvillus-gigantis* may possibly represent a very distant alpine cousin of these species.

34. *Brachylaena discolor* DC., Prodr. 5: 430 (1836); Harv., Fl. Cap. 3: 117 (1865)

Syntypes: Cape, Uitenhage, *Burchell* 3751, *Ecklon*; Omsamculo to Omtendo, *Drège*; Algoa Bay, *Forbes*.

COMPOSITAE (see also p. 33)

35. *Brachylaena uniflora* Harv., Fl. Cap. 3: 117 (1865).

Type: Natal, "on mountain ranges 2000-3500 ft. from 30-60 miles from the sea", *Sutherland*.

Phillips & Schweickerdt in their revision of the South African species of *Brachylaena* (*Bothalia* 3: 205-221, 1937) list, among others, *B. discolor* DC., *B. uniflora* Harv. and *B. transvaalensis* Phill. & Schweick. as occurring in Natal. The number of flowers in the head in each species according to these authors is as follows:

	male heads	female heads
<i>B. discolor</i>	11-50	11-26
<i>B. uniflora</i>	1-3	4
<i>B. transvaalensis</i>	11-16	8

It may be said at once that the capitula with few flowers have short involucre and much branched inflorescences, while the larger capitula have longer involucre and a tendency towards less branched inflorescences. For instance, single-flowered female heads have involucre about 2.5-4 mm, 10-flowered 5-10 mm and 20-flowered 10-18 mm; single-flowered male heads have involucre 2-4 mm, 20-flowered 5-7 mm, 30-50-flowered 6-10 mm. There is no precise correlation but the general linkage is clear; an exact study would need to take into consideration the age of the capitula, which is not possible in the herbarium. Flower number provides the simplest measure of this variation and is here used alone. All three species are large shrubs or trees and vegetative differences have not been detected.

The material available has been 21 male specimens and 32 female specimens, in NH and NU: at least three heads have been counted on each. The data are listed in full at the end of this note. There is no discontinuity in the number of flowers in either male or female heads

and the gap between 3 male flowers in *B. uniflora* and 11 in *B. transvaalensis* (suggested in Phillips & Schweickerdt's descriptions), or between 4, 8 and 11 flowers in female heads of the three species, does not exist. In one specimen, Strey 8804, additional counts considerably increased the observed variation in a single collection, suggesting that the range is by no means fully expressed by a count of three heads.

There is a strong tendency for the largest number of flowers in the head to occur in specimens growing on coast dunes: of those specimens (12 in all) with 10 or more female flowers in the head, 8 are from beaches and only one (Hluhluwe Game Reserve) is more than three miles from the sea. Of 13 male specimens with 10 or more flowers per head, 9 are from beaches, 4 from within 2 miles of the sea. But 1- or few-flowered heads can occur close to the sea: Burman Bush and Stella Bush, for example, are forest remnants on the Berea ridge in Durban, only about a mile from the sea.

It is instructive to look at specimens from definite areas and Mr R. G. Strey's collections are particularly helpful in enabling us to do this.

For instance:

	Female	Male
Amanzimtoti, Durban distr.	5, 5, 5 8, 8, 9 10, 12, 14 20, 22, 25	24, 24, 25 23, 24, 27 21 26, 34, 35
Uvongo, Port Shepstone distr.	1, 3, 4 8, 8, 10	28, 30, 33
Burman Bush, Durban distr.	1, 2, 3 6, 6, 7 13, 14, 16	5, 6, 7, 8 14, 16, 22 17, 17, 22

These figures might be interpreted in terms of the taxonomy of Phillips & Schweickerdt as suggesting that at Amanzimtoti all three species are present as females, but only *B. discolor* as male: at Uvongo females of *B. uniflora* and *B. transvaalensis*, but male of *B. discolor*. At Burman Bush both sexes of all three species might seem to be present, but *B. discolor*, the large-headed species, in a somewhat small-headed form only.

That interpretation should satisfy nobody. The figures clearly show that three independent species are not present in Natal. Whatever *B. transvaalensis* may be in its type locality (Zoutpansberg, N Transvaal), the name has been applied by Phillips & Schweickerdt to Natal plants that are simply intermediate between the extremes recognized as *B. uniflora* and *B. discolor*.

Two interpretations of the present data are possible: there may be a single species showing clinal variation in numbers of flowers in the head (and associated characters), loosely linked to an ecological cline from coastal dunes to inland forest: or there may be two species which have met and are now hybridizing. Much more field study is required to elucidate this part of the problem.

There is, however, another aspect of wider interest than this particular species-problem. We have here certain plants, which have single-flowered heads and much branched inflorescences, apparently existing within the same breeding unit as others with capitula containing many more flowers in a less-branched inflorescence. Surely there must be here an opportunity to learn something about that curious phenomenon, the single-flowered

capitulum. There is one more point. If further study confirms the sort of figures given above for Amanzimtoti, then it looks as though the variation in flower number may, in certain places, show some degree of sex-linkage. This again is a very interesting possibility and emphasises that this *Brachylaena* problem deserves really critical investigation.

<i>Specimen</i>	<i>Female capitula</i> <i>Locality</i>	<i>No. of</i> <i>flowers</i>
Coleman 335	Hillary, Durban distr.	1, 1, 1
Mills 342	Seaton Park, Durban North	1, 1, 1
Strey 8819	Mgongongo, Port Shepstone distr., 3 miles inland	1, 1, 1
Strey 8841	Umzinyati Falls, Inanda	1, 1, 1
Strey 8752	Burman Bush, Durban	1, 2, 3
Strey 8784	Stella Bush, Durban	1, 2, 3
Strey 8824	Uvongo, Port Shepstone distr., 2 miles inland	1, 3, 4
Lawn 643	Mpusheni Falls, Eshowe	2, 3, 3
Edwards 1529	Nkandla Forest, Nkandla distr.	2, 3, 3
Ward 2630	Hluhluwe Game Reserve, Hlabisa distr.	3, 4, 4
Pegel NH59807	Stella Bush, Durban	3, 4, 3
Davis 82	Qudeni Forest, Nkandla distr.	4, 4, 4
Tyrell NH21310	Stella Bush, Durban	4, 3, 4
Forbes 766	Nkandla Forest, Nkandla distr.	3, 4, 4
Strey 8805	Doonside } female and Durban distr. } hermaphrodite } on same twig	3, 4, 5
Strey 8805	3 miles inland	4, 5, 5
Gerstner NH22079	Amanzimtoti, Durban distr.	5, 5, 5
Lawn 803	Umhlatuzi Valley, Lower Umfolozi- Mtunzini distr. boundary	7, 7, 6
Strey 8804	Doonside, Durban distr., 3 miles inland	5, 6, 8, 9, 10, 12, 15
Strey 8751	Burman Bush, Durban	6, 7, 6
Wood 4907	Durban	10, 9, 9
Strey 8791	Amanzimtoti, Durban distr.	8, 8, 9
Strey 8823	Uvongo, Port Shepstone distr., 2 miles inland	8, 8, 10
Ward 5810	Isipingo, Durban distr.	10, 12, 10
Tosh s.n.	St. Lucia, Hlabisa distr.	10, 11, 13
Strey 8790	Amanzimtoti, Durban distr.	10, 12, 14
Strey 8782	Tonga Beach, Lower Tugela distr.	14, 15, 15
Strey 8753	Burman Bush, Durban	13, 14, 16
Ward 2687	Hluhluwe Game Reserve, Hlabisa distr.	16, 17, 17
Strey 8859	Port Edward, Port Shepstone distr.	18, 19, 22
Strey 7658	Shelley Beach, Port Shepstone distr.	20, 22, 23
Strey 8789	Amanzimtoti, Durban distr.	20, 22, 25
<i>Male capitula</i>		
Wood 585	Inanda	1, 1, 1
Strey 8820	Mgongongo, Port Shepstone distr., 3 miles inland	1, 1, 1
Strey 8787	Stella Bush, Durban	1, 2, 3
Gerrard & M'Ken 1866	no locality	2, 2, 3
Gerstner 3013	Eshowe Distr.	4, 4, 4
Forest Officer	Mpusheni Falls, Eshowe	7, 7, 7
Bourquin 46	Burman Bush, Durban	5, 6, 7, 8

Specimen	Locality	No. of flowers
Schweickerdt 1368	Berea Bush, Durban	6, 7, 8, 9
Hillary 392	Tongaat Beach, Lower Tugela distr.	10, 10, 12
Wood 4907	Durban	15, 15, 15
Strey 8754	Burman Bush, Durban	14, 16, 22
Bourquin 150	Burman Bush, Durban	17, 17, 22
Strey 8788	Amanzimtoti, Durban distr.	24, 24, 25
Strey 8798	Amanzimtoti, Durban distr.	23, 24, 37
Strey 8797	Amanzimtoti, Durban distr.	21
Strey 8783	Tongaat Beach, Lower Tugela distr.	25, 26, 30
Strey 8822	Uvongo, Port Shepstone distr. 2 miles inland	28, 30, 33
Strey 8793	Amanzimtoti, Durban distr.	26, 34, 35
Ward 5806	Richards Bay, Lower Umfolozi distr.	35, 37, 44
Gordon-Gray 596	Bashee river mouth, E. Cape	35, 44, 47
Moll 1816	Umhlanga Rocks, Inanda distr.	35, 40, 50

36. *Conyza pinnata* (Linn. f.) O. Kuntze, Rev. Gen. 3, 2: 142 (1898).

Type: Cape, *Thunberg*.

Syn.: *Erigeron pinnatus* Linn. f., Suppl. (1781).

Conyza pinnatilobata DC., Prodr. 5: 387 (1836); Harv., Fl. Cap. 3: 112 (1865).

SOUTH AFRICA. From the Paarl Mountains eastward along the high ground and then northwards to the central Transvaal. Usually a plant of damp grasslands.

The purpose of this note is chiefly to deal with the synonym *Baccharis leucanthemifolia* Burm. which is quoted in *Flora Capensis*. This name apparently first appeared in print under *Conyza pinnatilobata*; De Candolle remarked that the plant in Burman's herbarium labelled *Baccharis leucanthemifolia* belonged to his species and added the note that this might be *Xeranthemum leucanthemifolium* Burm. fil. (*Prodr. Fl. Cap.* 26, 1768), of which he could otherwise find no specimen. This sheet of *Baccharis leucanthemifolia* has been kindly sent on loan from Geneva, and Dr W. Greuter tells me that the handwriting on the sheet is that of the elder Burman. On the left we find "Senecio foliis oblongis profunde dentatis simplicibus caulinis sessilibus" and on the right "*Baccharis leucanthemifolia*". The descriptive phrase for *Xeranthemum leucanthemifolium* Burm. fil. is quite different from that on the sheet: it is "fruticosum, foliis sessilibus pinnatifidis serratis". There is thus no direct link between the published name in *Xeranthemum* and the herbarium sheet.

There are four reasons for supposing that the sheet labelled *Baccharis* does in fact represent the plant published as *Xeranthemum*. First, there is the coincidence of the specific epithet; secondly there is the fact that *Baccharis* follows immediately after *Xeranthemum* in *Prodromus Florae Capensis*; thirdly, no sheet labelled *Xeranthemum leucanthemifolium* has been found; fourthly the description "foliis pinnatifidis serratis" is alien to *Xeranthemum* the species of which otherwise have entire leaves, and this suggests that an error may have been made.

There are two points, however, in the younger Burman's diagnosis that may raise a doubt: one is the word "fruticosum". The plant is a herb and

the specimen on the sheet does not look woody. The other is "foliis sessilibus", the elder Burman has correctly written on the sheet "... caulinis sessilibus" and there is a long attenuate basal leaf present.

The arguments for and against accepting this sheet of *Baccharis leucanthemifolia* as the type of *Xeranthemum leucanthemifolium* have to be balanced. The verdict we have reached is that it is very probably the type sheet and publication under *Xeranthemum* was due to an error, but one cannot be certain, and in the absence of certainty the adoption of the name would not be justified.

Descriptions of this plant do not give a clear picture of its habit. The characteristic feature is the prostrate branches, from whose leaf-axils arise the tall flowering stems; the prostrate branches also root at the nodes, though apparently somewhat tardily, and thus a focal point for the origin of further flowering branches is formed. It is not clear whether all inflorescences arise from these prostrate shoots or whether they also arise directly from the seedling. This cannot be decided from herbarium sheets, the life-history of the plants must be studied. A similar growth habit is seen in *C. podocephala* DC., also widespread in S Africa, and *C. mildbraedii* (Muschl.) Robyns from Tropical Africa.

37. *Crepis capillaris* (L.) Wallr.

Described from Switzerland and Italy.

Syn.: *Lapsana capillaris* L., Sp. Pl. 812 (1753)

NATAL. Underberg distr., Castle Gardens, xi 1969, Solomon s.n. (E, NU, NH)

A native of Europe, naturalized in North America and adventive on the west coast of S America and in Australia, now recorded in Natal for the first time, in the foothills of the Drakensberg as a garden weed. The only other species of *Crepis* in the province is the native *C. hypochaeridea* (DC.) Thell. unless one includes *Youngia japonica* (L.) DC., an introduced weed of Asian origin.

38. *Felicia wrightii* Hilliard & Burt*, species nova ex affinitate *Feliciae rosulatae* Yeo† sed facile distinguenda foliis integris, haud dentatis, in marginibus et costa, nec ubique, pilosis.

Herba perennis, stolonifera. *Folia* rosulata, prostrata, usque ad 4.5×1.2 cm, elliptica, apice subacuta, basi attenuata, margine incrassata pilis validis basi bulbosis, trinervia nervis lateralibus inconspicuis costa subtus prominente, utrinque glabra pilis validis in costa et interdum apicem versus exceptis. *Caulis* floriferus monocephalus, erectus, usque ad 22 dm longus, pilis longis gracilibus acutis et aliis brevioribus validis glandulosis parce indutus, bracteatus; bractae oblongae, 8×2 mm, internodiis breviores, supra glabrae, subtus dense glandulosae, marginibus et glandulosis et ciliatis. *Capitula* solitaria, heterogama, radiata. *Involucri bractae* biseriatae, exteriores virides, oblongae, 6.5×1.5 mm, subacutae, intus glabrae, extra pilis

* We are indebted to Dr J. Grau, Munich, for advice on the generic position of this plant.

† See Taxon 19: 946 (1970); based on *Agathaea natalensis* Sch. Bip. = *Aster natalensis* (Sch. Bip.) Harv. = *Felicia natalensis* (Sch. Bip.) Schlechter (1897) — non Sch. Bip. (1843).

glandulis purpureo-capitatis indutae in marginibus ad apices versus ciliatae, interiores similes sed latiores et minus glandulosae. *Flores radiati* c. 16, feminei; corolla tubo 3 mm longo ciliato, limbo elliptico 7×2.5 mm plerumque pallide-violaceo interdum albo; ovarium ambitu ellipticum, 1.5 mm longum, ciliatum; pappus uniseriatus, e setis c. 20 barbellatis 4.5 mm longis. *Flores disci* c. 60, hermaphroditi; corolla flava, tubo anguste infundibuliformi c. 3.5 mm longo medio ciliato, lobis minus quam 1 mm longis extra apices versus glandulosis; ovarium pappusque ut in flore radii. *Achaenia* ambitu elliptica, leviter complanata, 2 mm longa, parce pilosa, eglandulosa.

NATAL. Estcourt distr., Kamberg Nature Reserve, "Gladstone's Nose", c. 1675 m, 17 ix 1967, herb growing on bank of stream flowing into Mooi River, Wright 209 (NU holo; E, NH iso).

It is strange that so attractive a plant should hitherto have escaped notice and we know it from only this one locality. It spreads rapidly by means of stolons and forms colonies sometimes several square metres in extent on the banks of streams on "Gladstone's Nose" and the adjoining farm "Game Pass", at an elevation of about 1675 m. The species it most resembles, *Felicia rosulata*, grows in grassland and on scree at much higher altitudes, 2320 m to 4270 m; this species also produces stolons but apparently much less freely than *F. wrightii*.

We take pleasure in naming this species after Mr F. B. Wright of Kamberg who has supplied us with a wealth of information on Drakensberg plants and is ever ready to seek material we particularly need.

39. *Gnaphalium septentrionale* (Vatke) Hilliard, **comb. nov.**

Type: Moçambique, Inhambane, in dry sandy fields, *Peters*.

Syn.: *Anaxeton septentrionalis* Vatke in Oest. Bot. Zeitschr. 27: 194 (1877).

Type as above.

Gnaphalium stenophyllum Oliv. & Hiern in Oliver, Fl. Trop. Afr. 3: 344 (1877). Type as above.

MOÇAMBIQUE. Lourenço Marques, in humidis, *Schlechter* 11589 (E, K); Delagoa Bay, Rikatla, *Junod* 300 (K); Inhaca, Estação de Biologia Marítima, pelas dunas, a caminho de Cabo Mponduine, *Grandvaux Barbosa* 7035 (K); Inhaca Island, basic sandy soil, marsh at Punta Rosa, *Mogg* 26840 (K). Sul do Save, c. 5 miles W of Inhassoro, \pm 30 m, vlei, 7 x 1963, *Leach & Bayliss* 11867 (M, SRGH); Inharrime, Nhacoongu banks of the Logoa Dongan, light sandy soils, *Pedro* 263 (K).

NATAL. Ingwavuma distr., Maputa airstrip, c. 460 m alt., *C. J. Ward* 6575 (E, NU); Ilala Flats past Mosi on road to Maputa, *E. S. Pooley* 269 (E, K, NH, NU, S, COI).

Although the two synonyms were published in the same year, Vatke's name is clearly earlier as it was actually cited by Oliver & Hiern. These authors presumably changed the epithet because it is inappropriate in *Gnaphalium*.

G. septentrionale appears to be a plant of the Moçambique coastal plain and is at the southern limit of its range in northernmost Zululand. It is a

small, prostrate, many stemmed, ashy-grey herb, distinctive among locally-occurring species by its narrow linear leaves, silky-grey with strongly revolute, white-cottony margins, giving a striped effect. Such a restricted distribution, and distinctive appearance, is unusual amongst African *Gnaphalium* which tend to be widespread weeds.

40. *Gymnopentzia bifurcata* Benth. in Benth. & Hook., Gen. Pl. 2: 537 (1873) et in Hook., Ic. Pl. 12: t. 1155 (1876).

Type: Cape, Somerset East div., damp rocks to the west of Mount Boschberg, MacOwan (K).

Syn.: *G. pilifera* N.E. Br. in Kew Bull. 1895: 26 (1895); Wood, Natal Plants 4, 3: t. 362 (1905). Type: Natal, on the Drakensberg, near Bushman's river, Evans 51 (K; NH).

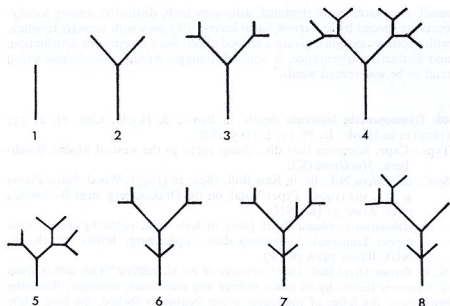
Athanasia turbinata Burtt Davy in Kew Bull. 1936: 84 (1936). Syn-types: Transvaal, Lydenburg distr., Lydenburg, Wilms 792 (K; E, NU), Wilms 792A (K; E)

N. E. Brown (*Kew Bull.* 1895: 27) says of his *G. pilifera* "This differs from *G. bifurcata* Benth. by its much shorter and racemously decussate flowering branchlets, the lobes of the leaves being frequently forked, the long white silky hairs which laxly clothe the young shoots and leaves, the much shorter pedicels, more acute bracts of the involucre, and the corolla has a longer and more slender tube, and is much more abruptly dilated in the upper part than it is in *G. bifurcata*."

In an examination of 27 specimens, ranging from Lydenburg in the eastern Transvaal to Somerset East, there was found to be continuous variation, without geographical patterning, in peduncle length (10–38 mm), and shape of involucre bracts. Nor is there any difference in corolla form except for very slight variations in length.

Indumentum is variable, but there is a strong tendency in even the hairiest specimens for it to be largely confined to the tufts of leaves of the axillary shoots. In other words, the primary leaves, those on the main stems which terminate in inflorescences, will be glabrous or nearly so even when those of the axillary shoots are pilose. This is a not infrequent condition amongst this group of plants (cf. *Senecio seminevea*, *Pentzia pinnatifida* and *P. woodii*). The degree of forking in the leaves shows considerable variation and the types found are shown in fig. 1: the geographical details of the specimens, and the leaf types are shown by number against each specimen in the list at the end of the note. Frequently the primary leaves, that is those on the main stems which terminate in inflorescences, are more forked than those on the short side shoots that develop in their axils. It will be observed that leaf types other than the 3 simplest (1, 2, 3) are confined to the Natal Drakensberg.

The last column in the table shows the number of flowers in a head. Where material has permitted the investigation of several heads a rather wide range of variation is shown in each specimen. Among these specimens only one from the Natal Drakensberg (*Wright* 849 from Loteni) has heads with less than 50 flowers; on the other hand only one outside Natal (*Hilliard* 3963 from Barkly Pass) has no heads with less than 50 flowers. It is not suggested that reliable conclusions can be drawn from these incomplete figures

FIG. 1. Diagrammatic representations of leaf-type in *Gymnopentzia bifurcata* Benth.

but they do give a general indication that the plants of the Natal Drakensberg may on the whole have rather larger capitula.

None of these characters, however, yields information suggesting that there is more than one species in the material examined.

Locality (N to S)	Collector	Leaf Form	No. of Flowers per head
TRANSVAAL			
Lydenburg	Wilms 792	1, 2	20, 20, 20, 25, 29
Lydenburg	Wilms 792A	1, 2	20, 25, 28, 29, 31
Johannesburg	Moss 18392	1, 2	27, 24, 40
Volksrust	Mogg 7516	1, 2, 3	52
NATAL (all Drakensberg, near Lesotho border)			
Tugela Gorge	Hilliard 2860	2, 3, 4	98
Ndumeni Dome	Killick 1933	1, 2	70, 72, 100, 103, 114
Cathedral Peak	Schelte 710	3, 6	71, 82
Rockeries— Saddle area	Edwards 2153	3, 4	69
Champagne Castle	West 810	2, 3	52
Cathkin	Edwards 2015	2, 3, 4	67
Cathkin	West 789	2, 3, 8	76, 77
Injasuti	Evans 640	3, 4	90
Gladstone's Nose	Wright 167	3, 4	81, 82, 102
Highmoor F.R.	Skead 98	2, 3, 5	82, 104, 120
Bushman's river	Evans 51	2, 3	57
Bushman's river	Johnston 663	2, 3	48, 63, 77, 94
Giants Castle G.R.	Gordon 56	1, 2, 3, 7	62, 67, 77
Loteni catchment	Wright 849	1, 2, 3	40, 40, 46
CAPE			
Naude's Nek	Hilliard 3948	1, 2	45, 52, 62
Barkly East			

Locality (N to S)	Collector	Leaf Form	No. of Flowers per head
Barkly Pass	Hilliard 3963	1, 2	62, 63, 73, 84,
Barkly East			84, 87
prob. Baziya, Transkei	Baur s.n.	1, 2, 3	58
Andriesberg,	Galpin 2105	1, 2	36, 43, 44, 52
Queenstown			
Finchams Nek,	Galpin 1828	1, 2	36, 49, 71
Queenstown			
Rockford Bridge,	Johnson 1189	1, 2	38, 51
Cathcart			
Katberg	Story 2811	1, 2	69
Besters Hoek	MacOwan 1877	1, 2, 3	72
Somerset East			
Boschberg,	MacOwan (infor-	1, 2	—
Somerset East	mation from Hook. Ic.)		

41. *Haplocarpha nervosa* (Thunb.) Beauverd in Bull. Soc. Bot. Genève, sér. 2, 7: 51 (1915).

Type: Cape, summit of mountains between Outeniquas and Langekloof, Thunberg (UPS).

Syn.: *Perdicium nervosum* Thunb., Fl. Cap. ed. 2: 689 (1823).

Leria nervosa (Thunb.) Spreng., Syst. 3: 501 (1826).

Landtia nervosa (Thunb.) Less., Syn. Comp.: 38 (1832); Harv. in Harv. & Sond., Fl. Cap. 3: 466 (1865).

Landtia hirsuta Less., Syn. Comp. 37 (1832); Harv. in Harv. & Sond., Fl. Cap. 3: 466 (1865). Type: Cape, Thunberg (UPS).

Haplocarpha hirsuta (Less.) Beauverd in Bull. Soc. Bot. Genève, sér. 2, 7: 51 (1915).

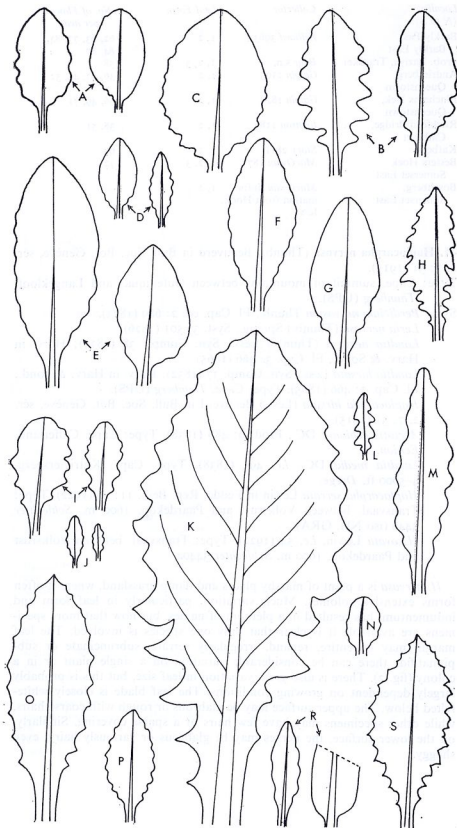
Arctotis echinata DC., Prod. 6: 486 (1838). Type: Cape, Cafferland, Ecklon.

Landtia media DC., l.c. 495 (1838). Type: Cape, Katriviersberg, 4–5000 ft, Drège.

Haplocarpha serrata Lewin in Fedde, Rep. Beih. 11: 53 (1922). Type: Transvaal, between Volksrust and Paardekop, 1600 m, Schlechter 3440 (iso NH, GRA).

H. ovata Lewin, l.c. 54 (1922). Type: Transvaal, between Volksrust and Paardekop, 1600 m, Schlechter 3440a.

H. nervosa is a plant of marshy places and damp grassland, where it often forms extensive colonies. Much variation, particularly in leaf form and indumentum, has resulted in a plethora of names, but now that more specimens are available it is clear that only one species is involved. The leaf margin may be entire, repand, irregularly serrate, subbruncinate or sub-pinnatifid; there can be considerable variation on a single plant or in a colony (fig. 2). There is also great variation in leaf size, but this is probably largely dependent on growing conditions. The leaf blade is closely white-felted below. The upper surface may be glabrous or rough with coarse hairs, while other specimens may have few hairs or a sparse covering. Similarly, on the lower surface, the nerves may be glabrous or variously hairy, even shaggy.



De Candolle, in describing his species *Landtia media*, intermediate between *L. nervosa* and *L. hirsuta* in leaf characters, suggested that only one variable species might be involved. Harvey (in Harvey & Sonder, *Fl. Cap.* 3: 466, 1865) also expressed his doubt that *L. nervosa* and *L. hirsuta* are distinct. Lewin (*Fedde, Rep. Beih.* 11, 1922) reduced *L. nervosa* to synonymy under *Haplocarpha hirsuta* (however, the epithet *nervosa* antedates *hirsuta*). Nevertheless, he singled out a specimen with deeply cut leaves to bear a new name, *H. serrata*.

H. ovata Lewin is supposedly marked off from *H. serrata* by the sulcate, not ribbed, achenes, and the less well-developed pappus. The ovary was ribbed in all the material examined: the ribs may be poorly to well developed and are transversely rugose, though the wrinkling may be slight and evident only at base or apex, or, at the other extreme, so pronounced that the ribs are muricate. The pappus scales range from rudiments to c. 1.5 mm long: all may be rudimentary, or all well-developed, or they may vary on a single achene.

H. nervosa ranges widely in South Africa, from the Outeniqua Mts., near Knysna in the SE Cape, eastwards along the Langekloof Mts., the Amatolas and neighbouring elevated areas and the mountains around Barkly East to the Witteberg, Lesotho, the Natal Drakensberg and its foothills and so to northern Natal and the Transvaal border at Volksrust. There are no records from the eastern Transvaal, but I have seen a single specimen from Mt. Inyangani in the Eastern Highlands of Rhodesia (*Wild* 4597, PRE). Finally there is *H. schimperi* (Sch. Bip.) Beauverd in Ethiopia. This is evidently closely allied to *H. nervosa* but adequate material for a critical comparison is not immediately available to me. A discontinuous distribution from South Africa to Ethiopia is by no means unknown (cf. *Ursinia nana* DC).

H. nervosa and *H. schimperi* belong to *Haplocarpha* sect. *Landtia* (Less.) Beauverd of which the other species are *H. rueppellii* (Sch. Bip.) Beauverd and *H. hastata* Lewin. *H. rueppellii* is found in East Africa and in Ethiopia, and has been carefully studied by Hedberg (*Afro-Alpine Vasc. Pl. in Symb. Bot. Ups.* 15: 367, 1957), who attributes to it a pattern of variation similar to that of *H. nervosa*. *H. hastata*, proposed for another Ethiopian specimen, must be very close to *H. rueppellii* as Hedberg understands the species.

It seems wise to append a full description of *H. nervosa*: Perennial mat-forming herb with a flat rosette of leaves crowning a short, thick stock and spreading by means of leafy, rooting runners; roots thick, thong-like. Leaves radical, crowded, 0.7–1.5 × 0.4–0.8 cm, oblong-elliptic, elliptic or ovate in outline, gradually or abruptly narrowed into a broad, membranous petiole 1–6 cm long, dilated below and half-clasping, apex subacute to rounded, margin entire, repand, irregularly toothed, subuncinate or subpinnatifid, often entire in the upper half, variously cut in the lower, very young leaves with a loose, cobwebby indumentum, at maturity the upper surface glabrous or thinly hairy to hirsute with coarse, jointed hairs, lower surface closely white-felted, the nerves glabrous or with few to many coarse hairs. Peduncles

FIG. 2. Leaf shape in *Haplocarpha nervosa* (Thunb.) Beauverd: A, B, *Strey* 9077, different plants; C, *Galpin* 6744; D, *Thode* A.358; E, *Thode* A. 198; F, *Sparks* NH. 36127; G, *Sparks* NH. 36126; H, *Wild* 4597; I, *Acocks* 20185; J, *Coetzee* 807; K, *Acocks* 9174; L, *Schlechter* 3446; M, *Thode* 282; N, *Killick* 1953; O, *Galpin* 7382; P, *Acocks* 9149; R, *Thode* 16480; S, *Guillarmod* 3638.

several from the crown, up to c. 8 cm long or nearly wanting, shorter than the leaves, white-cobwebby, erect at anthesis, bent over in fruit. Heads solitary, up to c. 5 cm across the expanded rays. Involucre campanulate, up to c. 1×1 cm, bracts in 2-3 series, loosely imbricated, outer cuneate, long acuminate, cobwebby or glabrous, inner oblong, apex rounded, membranous. Receptacle flattish, pit margins sometimes produced. Ray flowers 8-10, female, fertile, disc flowers numerous, hermaphrodite, fertile or perhaps sometimes functionally male (evidenced by there sometimes being 8 or 9 achenes in the outer series, inner ovaries undeveloped). Corolla of ray flowers oblong, up to 2×0.5 cm, pale yellow, sometimes tinged greenish outside, of disc flowers narrowly tubular below, sometimes with a few hairs outside, campanulate above with 5 lanceolate lobes, pale yellow. Anthers with an ovate apical appendage, base minutely produced. Style branches of the ray flowers lanceolate, style of the disc flowers abruptly thickened above the middle, shortly bifid. Achenes 2 mm long, 2 mm across the top, turbinate, sometimes angled by pressure, 5-8-ribbed, ribs usually transversely rugose but variably so, sometimes nearly smooth or faintly wrinkled at base or apex, sometimes almost muricate, glabrous or ciliate, with a circlet of delicate hairs at the base, sometimes nearly wanting. Pappus of many delicate diaphanous scales, obtuse to acuminate, rudimentary or up to 1.5 mm long, varying sometimes on a single ovary. Flowers from September to April.

CAPE. Knysna distr., near Forest Hall, 10 miles E of Keurboom's river, 9 xi 1928, *Hutchinson* 1381 (PRE). Kingwilliamstown distr., Kingwilliamstown, Ghulu Kop, x 1926, *Dyer* 654 (PRE). Stockenström distr., Katberg, 1828 m, xi-xii 1926, *Dyer* 786 (PRE). Victoria East distr., Hogsback, *Jacot-Guillarmod* 3638 (RUH). Stutterheim distr., Kabaku Hills, c. 1035 m, 10 x 1942, *Acocks* 9174 (PRE); near Toise River, Quacu Forest, 30 ix 1906, *Galpin* 7382 (PRE); Stutterheim Commonage, c. 790 m, 6 x 1942, *Acocks* 9149 (PRE). Barkly East distr., Saalboom Nek, 13.4 miles SSE Clifford P.O., c. 2195 m, 15 i 1959, *Acocks* 20, 185 (PRE); Ben Mcdhui, 2590-2740 m, 12 iii 1904, *Galpin* 6744 (NH).

NATAL. Lions River distr., Nottingham Rd., 14 xi 1945, *Sparks* s.n. (NH 36127); *ibidem*, 9 xi 1945, *Sparks* s.n. (NH 36126). Bergville distr., Sentinel, Mont-aux-Sources, c. 3050 m, 3 xii 1953, *Killick & Marais* 2194 (PRE); *ibidem*, *Killick & Marais* 2193 (PRE). Utrecht distr., Tweekloof, Altemooi, *Thode* A 198 (NH); Altemooi, 1828 m, x 1920, *Thode* s.n. (NH 16480); Kafir Drift-Tweekloof, *Thode* A282 (NH); Kafir Drift, viii-ix 1924, *Thode* A358 (NH); Groenvlei, 9 x 1969, *Strey* 9077 (NH, NU).

LESOTHO. Maseru distr., 30 miles E of Maseru on road to Bushman's Pass, 1980 m, *Cooley & Kofler* 10891 (PRE). Lehaha-la-Sekhonyana, $29^{\circ} 23' S$, $28^{\circ} 19' E$, 2834 m, 29 xii 1946, *Jacot-Guillarmod* 184 (PRE). Maluti Mts., E border area, 2133 m, *Staples* 78 (PRE). Between Sani Pass and Black Mts., c. 3048 m, 7 iv 1958, *Killick* 2353. Makhapung Valley, 3200 m, i 1955, *Jacot-Guillarmod* 1879 (PRE). Cleft Peak area, c. 2990 m, 1 xii 1953, *Killick & Marais* 2178 (PRE). Butha Buthe distr., Pone Valley, Mothae Mts., 2956 m, 8 i 1958, *Coetzee* 807 (PRE). Between Indumeni Dome and Castle Buttress, 2956 m, *Killick* 1935 (PRE).

RHODESIA. Inyanga distr., Mt. Inyangani, 2438 m, 5 ix 1954, *Wild* 4597 (PRE).

42. *Helichrysum bellum* Hilliard, species nova ex affinitate *H. marginati* DC., sed rosulis solitariis vel binis (haud tapetiformibus), foliis utrinque glanduloso-pilosis (haud glanduloso-punctatis), achaeniis 5-7-costatis levibus (haud papillosis) distincta.

Herba perennis, caudice verticali c. 5 mm diam. radicibus 0.5 mm diam. *Caules* simplices 2-3 foliis radicalibus axillares, 30 cm usque alti, basi decumbentes deinde erecti, laxo albo-lanosi et pilis glandulosis saepe purpurascentibus praediti. *Folia* radicalia rosulata, 6×1.5 cm usque, lanceolato-spatulata, tripli- vel quintuplinervia, apiculata, marginibus inconspicue albo-lanosis, utrinque viridia, dense vel parce pilis validis glandulosis inter se inaequilongis glandulis saepe aureis vel aurantiaco-rubris; caulina oblongo-lanceolata, radicalibus minora et sursum descrescentia, marginibus et nervis primariis et pilis glandulosis infra saepe purpurascentibus. *Capitula* plerumque solitaria, rarissime 2-3, campanulata, heterogama, c. 1.5-1.7 cm longa, et 2.5-3 cm diametro (in siccitate). *Bractee involucri* multiseriatae, imbricatae, radiantes, lanceolatae, exteriores quam interiores multo breviores, intimae iterum breviores, parte scariosa 10 mm usque longa albo-nitente glabra, parte basali viridiuscula extra laxissime et parce albo-lanosa. *Receptaculum* alveolatum. *Flores marginales* feminei, c. 35. *Flores disci* hermaphroditi, c. 220; corolla tubulosa c. 3 mm longa, flava, lobis glandulis conspicuis extra praeditis. *Pappus* e setis numerosis delicatulis scabris mox caducis. *Achaenia* c. 1.5 mm longa, ambitu elliptica, 5-7-costata, epapillosa.

NATAL-LESOTHO border, top of Bushman's River pass, c. 3050 m, 31 i 1968, *Wright* 436 (NU holo, E, K, NH, PRE, S, iso).

NATAL. Estcourt distr., Giants Castle Game Reserve, Upper Injasuti, 3355 m, 12 i 1968, *Trauseld* 926; Highmoor Forest Reserve, spur running SE from Giants Castle, c. 2438 m, 17 i 1968, *Wright* 400 (E, NU); Bergville distr., Mont-aux-Sources, 3108 m, ii 1964, *Trauseld* 215 (NU), *ibidem*, near hut, 3017 m, 19 iii 1946, *Schelpke* 1349 (NU), *ibidem*, 17 iii 1955, *Edwards* 612 (NU).

CAPE. Barkly East distr., summit Ben Mcdhui and Doodmans Krans Mts., 11 iii 1904, 2895-3017 m, *Galpin* 6677 (NH).

LESOTHO. Cleft Peak, Cathedral Peak area, c. 3048 m, 21 i 1956, *Edwards* 1161 (NU). Butha Buthe distr., Khatibe C camp, 2743 m, 10 ii 1961 *Jacot-Guillarmod* 4131 (PRE). Matshaleng valley, 2286 m, 25 ii 1960, *Ruch* 1612 (PRE), Ntibokho valley, $28^{\circ} 18' E$ $29^{\circ} 20' S$, 2682 m, 1 i 1947, *Jacot-Guillarmod* 259 (PRE), Little Bokong—as 99, $28^{\circ} 8' E$, $29^{\circ} 14' S$, 2590 m, 22 xii 1946, *Jacot-Guillarmod* 109 (PRE), near Qachas Nek, Masepa, summit Kranskop, 17 iii 1936, *Galpin* 14103 (NH), near Pela Tseon river, 3657 m, 5 ii 1954, *Jacot-Guillarmod* 2077 (PRE).

H. bellum has been confused in herbaria with *H. marginatum* but seen growing together in their native mountains they look very different: *H. bellum* with one or perhaps two leaf rosettes, the plants scattered in colonies in the short stony turf, *H. marginatum* forming multi-rosulate mats on the edges of rock flushes or on steep, broken turf slopes. Galpin collected both species growing together on Ben Mcdhui (*Galpin* 6675, *H. marginatum*), so did Edwards on Cleft Peak (*Edwards* 1162, *H. marginatum*) and Wright on the flank of Giants Castle (*Wright* 397, *H. marginatum*).

There is a marked similarity in leaf size and shape between the two species, but the leathery green leaves of *H. marginatum* with their striking white-woolly margins, which must have suggested the specific epithet, are glandular-punctate and either glabrous at maturity (apart from the woolly margins) or sometimes with stalked glands as well. The leaves of *H. bellum*, however, are membranous, the woolly margins are rather inconspicuous except in very young leaves and both surfaces are glandular-hairy but lack the conspicuous sessile glands of *H. marginatum*. The heads of the two species are very much alike, but whereas the achenes of *H. bellum* are 5-7-ribbed and epapillose, those of *H. marginatum* are ecostate and papillose.

Neither species has been recorded below 2280 m in altitude: they are montane endemics seemingly confined to the Witteberg near Barkly East, the high Lesotho plateau and the face of the Drakensberg overlooking East Griqualand and Natal. They flower in January, February and March.

43. *Helichrysum monticola* Hilliard, species nova *H. adenocarpum* DC. affinis sed caule florifero terminali et bracteis involucri semper albis recedit.

Herba perennis, caudice crasso lignoso rosulis foliosis pluribus emittente, radicibus fibrosis. *Caulis* solitarius, in rosula terminalis, erectus usque ad 30 cm, ad apicem dense foliatus, glandulosus, laxe lanatus vel elanatus, summo in corymbo oligocephalo ramosus vel capitulis raro solitariis binisve. *Folia* radicalia 9×1.5 cm usque, anguste vel late lanceolata, in basi petioloideo amplectente angustata, tripli- vel quintupli-nervia, apiculata, utrinque glandulis et stipitatis et sessilibus praedita, subtus etiam saepe persistenter laxe griseo-albido-lanata interdum glabra, supra plerumque glabrescentia et in sicco brunnescentia, itaque folia discoloria; caulina radicalibus similia sed minora, sursum decrescentia, sessilia, semi-amplectentia. *Capitula* heterogama, campanulata, 2 cm usque longa, 2 cm diametro (in siccitate). *Bractae involucri* multiseriatae, imbricatae, radiantes, lanceolatae, interiores exterioribus multo longiores et floribus quater longiores, omnes albonitentes, glabrae. *Receptaculum* fimbriiferum. *Flores marginales* feminei, c. 20. *Flores disci* hermaphroditi c. 200; corolla tubulosa, c. 3 mm longa, flava, lobis externe glandulis magnis aurantiaco-rubris praeditis. *Pappus* e setis paucis corollae plus minusve aequilongis inferne scabris superne subplumosis mox caducis. *Achaenia* ambitu ovalia, c. 1.5 mm longa, papillosa. Type: Natal, Vryheid district, Zungwini Mt. 8 miles NE of Vryheid, lower slopes, c. 1350 m, 2 i 1969, *Hilliard & Burt* 5856 (NU holo; E, K, NH iso). Selected additional material:

TRANSVAAL. Barberton district (?), sine loc. *Rogers* 30179 (K---written up *H. monticola* Hutch. by J. Hutchinson; sheet two of this number is localised Barberton district and named *H. monticola* Hutch. by Rev. F. A. Rogers, but is *H. appendiculatum*). Belfast distr., hills near Belfast, *van der Merwe* 1223 (NH). Wakkerstroom distr., Oshoek, 2000 m, *Devenish* 798 (NH).

ORANGE FREE STATE: Harrismith distr., Swinburne, Manjanets Mt. next to Rensburg's Kop, c. 1980 m, *Hilliard* 4961 (E, NU).

NATAL. Utrecht distr., summit of escarpment on road from Utrecht to Wakkerstroom, 1950 m, *Hilliard* 2241 (NU). Newcastle distr., Amajuba Mt., *Wood* 4798 (NH); below summit Normandien Pass, 2010 m, *Hilliard* 2412 (NH, NU). Klipriver distr., Van Reenen, *Wood* 4530 (NH). Bergville distr., Cathedral Peak area, Cathedral path, 2712 m, *Schelpé* 184 (NU). Nkandla

distr., Nkandla forest, 1280 m, *Hilliard* 1194 (E, NU). Umvoti distr., Ahrens, "Mowbray", c. 1524 m, *Fisher* 958 (NU, NH). Lions River distr., Karkloof, Mt. Gilboa, 1767 m, *Schofield* (NU 44581). Estcourt distr., Giants Castle Game Reserve, 1737 m, *Trauseld* 335 (NU). New Hanover distr., Noodsberg, Broadmoore, c. 1000 m, *Rudatis* 1604 (STE).

CAPE. Tsolo-Maclear distr. boundary, Ntywenka, c. 1370 m, *Hilliard & Burt* 3753 (E, NU). Engcobo distr., Manina Forest Station, Gulandoda Mt., 1590 m, *Marais* 1403 (NH). Matatiele distr., New Amalfi, *Forbes* 1083 (NH).

SWAZILAND. Mbabane distr., hill behind Mbabane, 1340 m, *Gordon-Gray* 6022 (NU). Piggs Peak distr., near Havelock, Emlembe Mt., Devil's Bridge, *Hilliard & Burt* 3580 (E, NU).

S. monticola is typically a plant of steep stony grass slopes, often forming large colonies, and is frequently found growing with *H. adenocarpum* though that species may then favour the damper situations, grassy hollows or even places semi-waterlogged in summer. Both flower in December, January and February.

The two species are frequently confused in herbaria. Dr John Hutchinson at Kew many years ago singled out and labelled a specimen "*H. monticola* Hutch.". The name passed into herbarium use but has never been published nor the plant described. The heads in *H. adenocarpum* are often pink or red or parti-coloured, those of *H. monticola* pure white, though the inner bracts are occasionally tinged red at the base inside. Difficulty arises with white-headed plants of *H. adenocarpum*. However, the point of origin of the flowering stems is diagnostic: central in *H. monticola*, always lateral in *H. adenocarpum*.

44. *Helichrysum palustre* Hilliard, species nova *H. bello* Hilliard peraffinis sed foliis griseis aequabiliter lanatis (haud viridibus glanduloso-hispidis lanato-marginatis) et capitulis minoribus recedit.

Herba perennis, rosulas foliosas plures e capite caudicis 4 mm diametro emittens. *Caules* 20 cm usque, plures e capite, erecti vel basi decumbentes, dense foliati usque ad apicem, griseo-albido-lanati. *Folia* radicalia lanceolato-lingulata, apiculata, 5 × 0.7 cm usque, tripli- vel quintupli-nervia, utrinque indumento persistente appresso sericeo-lanato griseo-albido glandulas stipitatas paucas minutas obtegente induta, raro glabrescentia; caulina lanceolata vel linearia, acuminata, radicalibus minora et sursum decrescentia, uti radicalia lanata, supra interdum glabrescentia. *Capitula* solitaria, campanulata, heterogama, c. 1.1–1.5 cm longa, 1.5–2 cm diametro (in siccitate). *Bractee involucri* multiseriatae, radiantes, imbricatae, lanceolatae, exteriores breves gradatim in interiores longiores transeuntes, intimae iterum breves, parte scariosa 9 mm usque longa albo-nitente basi rubescente glabra, parte basali c. 2 mm longa in exterioribus parcissime lanata in ceteris glabra. *Receptaculum* alveolatum. *Flores marginales* feminei, c. 15. *Flores disci* hermaphroditi c. 130; corolla tubulosa, c. 3 mm longa, flava, lobis extra glandulosis. *Pappus* e setis multis delicatulis scabris mox caducis. *Achaenia* ambitu elliptica, 5–7 costata, epapillosa.

LESOTHO. Basutoland [Lesotho] plateau at headwaters of Loteni river c. 400 yards from exit of Bushman's River Pass, c. 3050 m, 2 xii 1968, *Wright* 753

(NU, holo, E, K, NH, iso); *ibidem*, c. $\frac{1}{2}$ mile E of entrance to Bushman's River Pass, c. 2988 m, 5 xii 1967, Wright 332 (E, K, NH, NU); Thaba Ntlenyana, 5486 m, 19 i 1955, Jacot-Guillarmod 2343 (PRE); Butha-Buthe distr., Pone valley, Mothae Mts., 2956 m, 8 i 1958, J. A. Coetzee 815 (PRE).

Mr F. B. Wright brought in this remarkable little plant in December 1967 and went back the following year to collect more material. He tells me that it grows actually in water in the marsh or on small earth hummocks raised above the surface of the water. He noted particularly that *H. bellum* grows in neighbouring grassland and that there is no gradation in form from plants in grassland to plants in the marsh. I have therefore described *H. palustre* as distinct from *H. bellum* though the distinction given in the diagnosis seems so trivial, especially in *Helichrysum* where type of indumentum can be an unreliable character. The heads of *H. palustre* seem consistently smaller than those of *H. bellum*. This is reflected in the maximum length of the involucre bracts as well as the number of flowers in the head. Again, these are characters that I would usually consider unreliable in *Helichrysum*. A real difference may lie in habit: *H. palustre* may well consistently have many more leaf rosettes on the crown than *H. bellum*. This needs checking in the field. They certainly have different ecological preferences and *H. palustre* begins to flower a month earlier than *H. bellum*.

45-56. *Ifloga* Cass. in Bull. Soc. Philom. 1819, 142 et in Dict. Sc. Nat. 23: 13 (1822)

Syn.: *Trichogyne* Less. in Linnaea 6: 231 (1831) et Syn. Comp. 359 (1832); DC., Prodr. 6: 264 (1838); Harv., Fl. Cap. 3: 285 (1865).

Petalactella N.E. Br. in Kew Bull. 1894, 100; Oliver in Hook., Ic. Pl. 24: t. 2352 (1895); Phillips, Gen. S. Afr. Fl. Pl. 640 (1926), ed. 2, 793 (1951).

The re-collection of *Petalactella woodii* N.E. Br., in what is probably its type locality (Orange Free State, Harrismith, Queen's Hill summit, c. 1650 m, 20 ii 1970, O. M. Hilliard 4952), led to a reinvestigation of the affinity of this monotypic genus and the discovery that it cannot be distinguished from *Ifloga*. There has been some confusion in the history of the South African species of *Ifloga* and it has therefore seemed desirable to summarise the position, especially as the genus proves to have great phytogeographical and perhaps phylogenetic interest.

Ifloga spicata is the one northern species; a small annual that ranges from the Canary Islands to north-west India. It is, under its synonym *I. fontanesii*, the type and only original species of the genus.

The genus *Trichogyne* was established by Lessing in 1831, being based on the South African subshrub previously known as *Seriphium loricifolium*. Right from the beginning, however, he associated with this species not only other perennials but also the annual *Gnaphalium verticillatum*. Lessing compared his genus with *Filago* or *Gifola*: he did not mention *Ifloga* and in the following year, in his *Synopsis Compositarum*, he kept *Trichogyne* and *Ifloga* as distinct genera.

The union of these two genera was effected by De Candolle in 1838, but he used the later name *Trichogyne*.

Shortly afterward Fenzl (*Flora* 22: 737-750, 1839) made a more detailed study of these plants than previous authors and decided that *Trichogyne* should be retained as a genus independent from *Ifloga*. He based his decision on the fact that the *Trichogyne* species which he examined had the outermost bracts sterile (i.e. forming an involucre), while *Ifloga* had them all fertile (i.e. was without an involucre); on the female flowers of *Trichogyne* being less numerous, in *Ifloga* more numerous, than the male; and in the receptacle of *Trichogyne* being rounded, in *Ifloga* more or less elongate. The relative number of female and male flowers is a distinguishing trend in the two groups, but its repeated breakdown as a distinguishing character between *Gnaphalium* and *Helichrysum* gives little confidence to its use here: the shape of the receptacle seems to be correlated with the number of male flowers, and indeed Fenzl's remarks only apply to that part bearing the male flowers. The differences he finds are far less impressive than the resemblances between the two groups and it would seem to be a mistake to divorce them at the generic level. The current practice of including *Trichogyne* in *Ifloga* is therefore maintained. Fenzl's paper does, however, give some interesting information on variability in the heads of *Filagineae* and this is a matter that deserves closer attention.

Bentham (*Genera Plantarum* 2: 299, 1873) was the first to establish the use of the name *Ifloga* for the combined genus. Even so the necessary specific transfers were mostly not made until Schlechter described a new species in 1899. Then, owing to their being disguised in the text, they were not taken up in *Index Kewensis*. Some, indeed, had already been made, others were made again by later authors. All Schlechter's combinations were based only on the corresponding names in *Trichogyne*, though some of the ultimate basionyms were in *Gnaphalium*, *Seriphium* and *Stoebe*. Some early epithets were also taken up by Druce (1914, 1917) but have not been generally adopted and even the *Flora Capensis* synonymy was not complete. It has thus seemed useful to enumerate the species with their full synonymy and correct authorities.

The capitula of *Petalactella* were described as having female flowers with filiform corollas in the axils of the outer involucre bracts; these were said to be separated from the central, functionally male, flowers by sterile bracts. This condition was believed by both N. E. Brown and Oliver to be unique in Compositae. This was not so: the situation had long been well known in the subtribe *Filagineae*, where the capitula were described as having the receptacle paleaceous towards the margin but naked centrally. Despite the verbal differences the two conditions are exactly the same. In particular *Petalactella woodii*, a dwarf gnarled subshrub on the dry hills of the Free State-Natal border, clearly belongs to the same group as the perennial species of *Ifloga* found at the Cape, and it is indeed a very interesting extension of the range of that group.

Dissection of *Petalactella* led to some additional observations of interest. The inflorescence is indeed a remarkable structure. The filiform flowers are borne in the axils of cymbiform bracts arranged on a slender erect axis. If these bracts and female flowers are removed there remains a small terminal capitulum of functionally male flowers surrounded by an involucre of flat bracts. This is the natural way to describe what is seen: the male flowers are in a capitulum. How then are the female flowers arranged? There is

only one obvious explanation. Each female flower represents a single-flowered capitulum which has completely lost its involucre and is protected only by the subtending bract. As a parallel it may be mentioned that in the compound head of some species of *Sphaeranthus* the individual capitula are reduced to two involucre bracts and 4-5 flowers, and the whole is subtended by a well developed concave bract (see Ross-Craig in Hook., *Ic. Pl.* 36: 69, tab. 3517A, 78, t. 3521B, 1954).

This notion that the capitulum of some *Filagineae* is a compound structure proves not to be an original one. Professor G. Wagenitz, who has recently revised the Old World species of *Filago* sens. lat. (*Willdenowia* 5: 395-444, 1969), tells me that he has already entertained just the same idea. A critical study is needed, and this must include the examination of an underlying assumption. It is, that the flowers of Compositae are necessarily borne in a capitulum, and if they seem not to be so borne there must have been evolutionary reduction of the capitulum to a solitary flower. The suggestion made above, that the female flowers of *Ifloga* represent capitula reduced to a single flower, naked except for its subtending bract, is an act of homage to this assumption. All I can see is a terminal capitulum of functionally male flowers and below it a contracted raceme of a few solitary female flowers each subtended by a boat-shaped bract. Whatever the result of a critical study, it is clear that these shrubby South African species provide material that will be much easier to handle than the annuals.

The affinity of these shrubby species demands further attention. The annuals were understandably at first confused with *Gnaphalium*. The perennials, however, were partly extracted from the genus *Stoebe* and in *Flora Capensis*, Harvey placed *Trichogyne* alongside *Stoebe* and its allies. These are also ericoid subshrubs and in this group of genera there is a strong tendency towards single-flowered capitula. In *Metalasia*, capitula range from many-flowered to 3-flowered; in *Stoebe* there is always a single hermaphrodite flower; *Disparago* has two arrangements: either the capitula are two-flowered, one flower being female the other hermaphrodite, or they are one-flowered but aggregated together, the individual heads containing either a single shortly radiate female flower or a single hermaphrodite flower. Against the background a group of genera showing such diverse capitular structure and a tendency towards the aggregation of reduced capitula, the evolution of the curious compound structure of *Ifloga* is not too difficult to imagine.

The most conspicuous feature of the head of *Ifloga woodii* is not flower, nor involucre bract: it is pappus! This pappus plays no part in fruit dispersal, for it is found only on the male flowers. The individual setae are simple below but plumose in the upper part; what makes it particularly conspicuous, however, is that the cells of the plumes have spiral thickenings of cellulose on the walls and appear white and glistening.

Now in these features of the pappus *Ifloga* shows a unique combination of characters. A pappus plumose in the upper part is not very remarkable and is found in this general affinity in such genera as *Elytropappus*, *Disparago*, *Comptonanthus*. Strongly thickened pappus cells are found in at least one other genus, *Metalasia*; a weak spiral banding on the cells walls is probably rather widespread however. Nevertheless the pappus of *Ifloga* must be held to strengthen the affinity between this genus and the other ericoid subshrubs

like *Stoebe*, *Disparago* and *Metalasia*. There is also a remarkable parallelism in geographical distribution. All these genera are centred on the Cape and have their concentration of species there; but they all have outliers to the north-east. *Stoebe* reaches the mountains of East Africa, though outside the Cape there is probably no more than a single species in any area; *Disparago* reaches to southern Natal and is there exceptional in being coastal rather than montane in distribution; *Metalasia* reaches the Drakensberg and recurs on the Zoutpansberg in the northern Transvaal; and now the addition of *Petalactella woodii* to *Ifloga* gives the shrubby section of that genus an outlier in the Drakensberg.

The real link of *Ifloga* to the north is, however, through the annual species; it is indeed by no means certain that *I. aristulata* in south-west Africa is specifically distinct from the northern *I. spicata*. These links between plants of arid habitats in the north and south have been briefly touched on elsewhere (Burt in *Plant Life of SW Asia*, ed. Davis, Harper & Hedge, in press). and the matter will not be pursued further here. One conclusion, however, will bear restatement. The northern *Filagineae* (Central Asia, Mediterranean, California) are a very isolated group when studied in that area alone. It is through *Ifloga* that they are linked to the flora of southern Africa and it is through the shrubby species of this genus that they are linked to other genera like *Disparago* and *Metalasia* which are currently placed in *Relbunium* but are also undoubtedly allied to the *Helichryseae* which are so richly developed in the south.

In enumerating the following species of *Ifloga* no critical investigation of their validity is implied: in particular the annual species may prove to be less numerous when a detailed study has been made. One species is to be excluded: *Ifloga setulosa* Hutch. has proved to be *Elytropappus hispidus* (L. f.) Druce (see Nordenstam in *Journ. S. Afr. Bot.* 30: 46, 1964).

It seems useful to recognize the marked difference between annual and perennial species at sectional level. The name for the shrubby section requires comment. Under Art. 21 para. 3 of the *International Code* (1966) "The epithet of a subgenus or section must not be formed from the name of the genus to which it belongs by adding the ending *-oides* or *-opsis* or the prefix *Eu-*". Thus *Trichogyne* sect. *Eutrichogyne* DC. is inadmissible. However when Bentham subsequently used the name *Eutrichogyne* under the genus *Ifloga* he was, apart from the wrong attribution to De Candolle, in accord with the modern Code and this name must stand.

In the following enumeration the annual section is placed first and the species alphabetical in each section.

Sect. *Ifloga*

Syn.: *Trichogyne* sect. *Ifloga* (Cass.) DC., Prodr. 6: 265 (1838).

45. *Ifloga ambigua* Thellung in Vierteljahrsschr. Nat. Ges. Zürich, 61: 444 (1916)—non (L.) Druce (1914).

Type: Cape Province: Malmesbury, in collibus, Schlechter 1618.

This species is unknown to me. Clearly the name cannot stand, being antedated by *I. ambigua* (L.) Druce; it would, however, be unwise to re-name it without a critical revision of the annual species, which all seem to be very closely related.

46. *Ifloga aristulata* Thellung in Vierteljahrsschr. Nat. Ges. Zürich, 61: 443 (1916); Merxm., Prodr. Fl. SWA 139: 104 (1967).
Type: South West Africa: Otjihua, Dinter 560 (iso E).

47. *Ifloga glomerata* (Harv.) Schlechter in Bot. Jahrb. 27: 204 (1899).
Type: "Cape, Eckl. & Zeyh. (Herb. Sond)".
Syn.: *Trichogyne glomerata* Harv., Fl. Cap. 3: 287 (1865).
Unknown to me.

48. *Ifloga paronychioides* (DC.) Fenzl in Flora 22: 749 (1839); Schlechter in Bot. Jahrb. 27: 204 (1899); Merxm., Prodr. Fl. SWA 139: 104 (1967).
Type: Little Namaqualand, Zilverfontein, Drège (iso E).
Syn.: *Trichogyne paronychioides* DC., Prodr. 6: 266 (1838); Harv., Fl. Cap. 3: 287 (1865).

49. *Ifloga spicata* (Forsk.) Sch. Bip. in Webb & Berth., Phyt. Canar. 2: 310 (1845).
Type: Egypt, desert near Cairo, Forsk.
Syn.: *Chrysocoma spicata* Forsk. Fl. Aeg.-Arab. lxxiii (1775).
Ifloga fontanesii Cass. in Dict. Sc. Nat. 23: 14 (1822).

Distributed, if all one species, from the Canary Islands to NW India. For details of synonymy etc. see Floras of these regions. This is the type species of the genus *Ifloga*.

50. *Ifloga verticillata* (Linn. fil.) Fenzl in Flora 22: 748 (1839); Schlechter in Bot. Jahrb. 27: 204 (1899); Levyns in Adamson & Salter, Fl. Cap. Penins. 774 (1950).
Type: Cape, "Bäck" (Forster: cf. Exell in Journ. Bot. 69: 227, 1931).
Syn.: *Gnaphalium verticillatum* Linn. fil., Suppl. 364 (1781).
Trichogyne verticillata (Linn. fil.) Less., Syn. Comp. 361 (1832); DC., Prodr. 6: 265 (1838); Harv., Fl. Cap. 3: 287 (1865).
Ifloga polycnemoides Fenzl in Flora 22: 749 (1839).

I have thought it correct to accept this combination in the form given above. Fenzl actually cited the basioym with a query; he seemed confident only in asserting that his plant was the same as that described by De Candolle. Nevertheless it would be incorrect to cite *I. verticillata* Fenzl as an independent name: had that been intended he would no doubt have given a full description (as he does for his new *I. polycnemoides*) as well as the diagnosis. It is safe to say that he was deliberately retaining the epithet currently in use, but expressing some doubt as to whether it was being correctly applied.

Sect. *Eutrichogyne* Benth. in Benth. & Hook. f., Gen. Pl. 2: 299 (1876).
Syn.: *Trichogyne* sect. *Eutrichogyne* DC., Prodr. 6: 265 (1838).
Type: *Seriphium laricifolium* Lam. = *Ifloga disticha* (Linn. f.) Druce.

51. *Ifloga ambigua* (L.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 3: 419 (1913).
Type: S. Africa: probably sheet 988: 55 labelled *Artemisia dubia* by Linnaeus (LINN).

Syn.: *Artemisia ambigua* L., Sp. Pl. ed. 2, 1190 (1763), excl. syn. Commelin.
Gnaphalium seriphioides Berg., Descr. Pl. Cap. 267 (1767).

Seriphium ambiguum (L.) Murr., Syst. Veg. ed. 13, 665 (1774).

Metalasia seriphioides (Berg.) D. Don in Mem. Wern. Soc. 5: 558 (1826).

Trichogyne seriphioides (Berg.) Less. in Linnaea 6: 231 (1831) et Syn. Comp. 360 (1832); DC., Prodr. 6: 265 (1838); Harv. in Fl. Cap. 3: 286 (1865).

Ifloga seriphioides (Berg.) Schlechter in Bot. Jahrb. 27: 204 (1899); Levyns in Adamson & Salter, Fl. Cap. Penins. 775 (1950).

When Druce proposed this combination he said that it should replace *I. laricifolia*. The species however is clearly based on the sheet in the Linnean herbarium written up by Linnaeus himself as *Artemisia dubia*: this is the non-spiny plant known currently as *Ifloga seriphioides*. Linnaeus evidently changed the epithet from *dubia* to *ambigua*, perhaps only in proof. It is remarkable that Bergius actually quotes *Artemisia dubia* as the first synonym of his *Gnaphalium seriphioides*, and he gives the correct diagnostic phrase and page reference for *Artemisia ambigua*!

I have omitted from the synonymy *Stoebe fasciculata* Thunb. (1794) and names based on it; these would probably be correctly placed here, but confirmation by examination of the type specimen is desirable.

52. *Ifloga decumbens* (Thunb.) Schlechter in Bot. Jahrb. 27: 204 (1899).

Type: Cape, Thunberg.

Syn.: *Gnaphalium decumbens* Thunb., Prodr. Fl. Cap. 148 (1794).

Trichogyne decumbens (Thunb.) Less., Syn. Comp. 359 (1832); DC., Prodr. 6: 265 (1838); Harv., Fl. Cap. 3: 286 (1865).

53. *Ifloga disticha* (Linn. fil.) Druce in Rep. Bot. Exch. Cl. Brit. Isles, 4: 628 (1917).

Type: S. Africa, probably the sheet 1048: 9 (LINN).

Syn.: *Stoebe disticha* Linn. fil., Suppl. 391 (1781).

Seriphium laricifolium Lam., Encycl. 1: 271 (1783).

Seriphium distichum (Linn. fil.) Lam., Encycl. 1: 271 (1783).

Trichogyne laricifolia (Lam.) Less. in Linnaea 6: 231 (1831) et Syn. Comp. 361 (1832); DC., Prodr. 6: 264 (1838); Harv., Fl. Cap. 3: 287 (1865).

Trichogyne seriphioides var. *disticha* (Linn. fil.) DC., Prodr. 6: 265 (1838).

Ifloga laricifolia (Lam.) Schlechter in Bot. Jahrb. 27: 204 (1899); Levyns in Adamson & Salter, Fl. Cap. Penins. 775 (1950).

There are two sheets in the Linnaean herbarium written up as *disticha* by Linnaeus filius himself (1048: 9, and 1048: 10). The first of these simply has the initials C.B.S. corresponding to the published citation. The other is a Thunberg sheet—and under other species Thunberg's name was usually

cited when appropriate. It may be that 1048: 10 is *Ifloga ambigua*; 1048: 9, however, is an excellent specimen of the spiny plant long known as *I. larici-folia*. The published description is brief to the point of bareness: "S. foliis fasciculatis recurvis, spicis bifariis"; but it fits this sheet perfectly well.

54. *Ifloga pilulifera* Schlechter in Bot. Jahrb. 27: 204 (1899).

Type: Cape Province: Clanwilliam div., Boontjes Rivier, c. 2600 ped., 25 xii 1896, *Schlechter* 8672.

Not known to me.

55. *Ifloga reflexa* (Linn. fil.) Schlechter in Bot. Jahrb. 27: 204 (1899); Levyns in Adamson & Salter, Fl. Cap. Penins. 775 (1950).

Type: Cape, *Thunberg*.

Syn.: *Stoebe reflexum* Linn. fil., Suppl. 391 (1781).

Seriphium reflexum (Linn. fil.) Pers., Syn. Pl. 2: 501 (1805).

Trichogyne reflexa (Linn. fil.) Less., Syn. Comp. 360 (1832); DC.,

Prodr. 6: 265 (1838); Harv., Fl. Cap. 286 (1865).

Trichogyne radicans DC., Prodr. 6: 265 (1838).

56. *Ifloga woodii* (N.E. Br.) B. L. Burtt, comb. nov.

Type: Orange Free State: stony hill near Harrismith, 19 xii 1893, *Wood* 5139 (K; E).

Syn.: *Petalactella woodii* N.E. Br. in Kew Bull. 1894, 100; Oliver in Hook., Ic. Pl. 24: t. 2352 (1895).

Apparently this species was not re-collected until found by Dr O. M. Hilliard in February 1970. Dr Hilliard enquired locally about a "stony hill" and was promptly told that Queen's Hill must have been meant. Here the plant was certainly found in plenty and it seems very probable that this is the type locality. The hill is a flat-topped one and the summit is ringed by cliffs. *Ifloga woodii* was nearly confined to crevices in flat sandstone platforms fringing the cliffs and to the broken parts of the cliffs themselves near the summit. Here it grew in quantity together with a *Helichrysum* (*H. dasycephalum* Moeser?), but was quite absent from the grassland that covered most of the summit.

57. *Senecio haygarthii* [M. R. F. Taylor ex] Hilliard, nom. nov.

Syn.: *Cineraria montana* Bolus in Trans. S. Afr. Phil. Soc. 18: 396 (1909).

Type: Natal, summit of the Drakensberg, approx. alt. 15-1800 m, *Haygarth* comm. *Wood* 9925.

The name *S. haygarthii* has been in use for many years but has never been validly published. According to Bolus, the type specimen came from the summit of the Natal Drakensberg, but an isotype in Natal Herbarium records 'Orange River Colony, Albertina' in the hand (his own?) that appears on

many of Haygarth's collections. We have not been able to trace Albertina, but it was probably somewhere near Harrismith.

S. haygarthii is a distinctive species, easily recognized by its white-felted stems, pinnatisect leaves green and glabrous above, often drying dark, white-felted below, and dense corymbs of small heads less than 1 cm across, both rays and disc bright yellow. Bolus described the achenes as 1-nerved, but this is not so: they are 5-nerved and 5-angled, appearing slightly fluted in cross-section with the darker-coloured nerves lying in the hollows. Those of ray and disc flowers are alike, and glabrous.

The plant is a herbaceous perennial consisting of clumps of stout erect stems about 1 m tall, simple below, branching above into the compound inflorescence. It grows gregariously along streamsides, in boulder beds and in the ericoid shrub communities ("fynbos") of the Natal Drakensberg from about Tugela gorge in the north to Sani Pass near the Cape border, between about 1500 and 2400 m in altitude.

58. *Senecio poseidonis* Hilliard & Burt, species nova a *S. concolore* DC. habitu divaricato et foliis lyratis, a *S. purpureo* L. et habitu divaricato et foliis parce tantum pubescentibus et capitulis radiatis differt.

Herba divaricata, verosimiliter annua, 1.3 m usque alta. *Caules* c. 6 mm diam., striati, glanduloso-pubescentes, aequaliter foliati. *Folia* alterna, lyrata vel lyrato-pinnatisecta, margine remote callosio-denticulata, basi valde auriculata, sessilia, semi-amplexicaulia, c. 15 × 6.5 cm usque, membranacea, utrinque viridia (in siccitate fusca), parce pubescentia pilis aliis glandulosis aliis eglandulosis. *Inflorescentia* laxa corymbosa, pedunculis ultimis 5 cm usque longis parce bracteatis glanduloso-pubescentibus. *Capitula* heterogama radiata. *Receptaculum* alveolatum, marginibus alveolarum productis. *Involucrum* turbinatum, bracteis 12-14 oblongo-lanceolatis 6-7 mm longis glanduloso-pubescentibus marginibus membranaceis, calyculo e bracteis 2-3 valde redactis composito. *Flores* radii c. 8, feminei, pallide violacei, corollae tubo 5 mm longo glabro, limbo elliptico 7 mm longo; ovarium ambitu ellipticum, 3 mm longum, pubescens; pappus e setis numerosis tenuibus c. 7 mm longis mox caducis. *Flores disci* c. 45, hermaphroditi; corolla 7 mm longa, pallide violacea, inferne anguste cylindrica, superne campanulata, 5-lobata; antherae et stigma pallide violacea; ovarium pappusque ut in floribus radii. *Achaenia* c. 4 mm longa, teretia, anguste elliptica, utrinque angustata, 11-costata, inter costas minute pubescentia.

NATAL. Alfred distr., Ngeli Mt., c. 1525 m, 4 i 1969, Hilliard & Burt 5850 (NU holo; E, K, NH, S, Z iso); *ibidem*, c. 1220 m, 2 i 1966, Hilliard & Burt 3492 (E, NU); *ibidem*, c. 1310 m, 5 i 1964, Hilliard 2533 (NH, NU); 2 miles W of Weza, 1 i 1966, Strey 6273 (NH, NU). Nkandla distr., Qudeni forest, c. 1615 m, 26 xii 1964, Hilliard 2994 (NU).

CAPE. Pondoland, 4 miles W of Bizana, 900 m, 22 xi 1945, Acocks 12235 (K).

The specific epithet needs a word of explanation. Poseidon was the name of the Greek month covering mid-December to mid-January in our calendar. This is just the season when this species flowers. New epithets are hard to find in *Senecio*!

S. poseidonis favours damp shady situations and is common in places

on Ngeli mountain in southern Natal, where it grows in colonies along stream-sides in kloof forest and on damp slopes in the main Mpetyne forest, and in "subtropical forest margins" (Acocks) near Bizana. It also occurs in Qudeni forest in Zululand, 250 km NE of Ngeli, but there are no records from any of the hundreds of intervening forest patches, well-known though many of these are.

S. poseideonis is distinctive among species occurring in Natal, its growth habit, radiate heads and thin, sparsely pubescent leaves setting it sharply apart. It should not be confused with *S. purpureus* L., as that is a species of open ground with densely glandular foliage and discoid heads; it also lacks the markedly divaricate branching of *S. poseideonis*. *S. concolor* DC. is also very different in habit, and although *S. concolor* has radiate capitula like *S. poseideonis* its undulate-margined, not lyrate, leaves prevent any confusion.

CRASSULACEAE

59. *Kalanchoë elizae* Berger in Monatsschr. Kakteenk. 13: 69 (1903) et in Hortus Mortolensis, 180 (1912), et in Engler & Prantl, Natürl. Pflanzenfam. 2 Aufl. 16C: 405 (1930); Hamet in Bull. Herb. Boiss. 2 ser. 8: 39 (1908) et in Bull. Soc. Bot. France 57: 22 (1910); Jacobsen, Handbuch Sukk. Pflanzen 2: 824 (1954), et Handbook Succ. Pl. 2: 646 (1960).

Type: cultivated material from "Tropical Africa".

Syn.: *Cotyledon insigne* N. E. Br. in Bot. Mag. t. 8036 (1905). Type: grown at Kew from seed coll. 1898 by J. Mahon at 7000 ft. in Nyasaland. MALAWI. Mt. Mlanje, path from Chambe to Luchenyia, wet stony ground in shade of large rocks, vegetative only, 20 i 1967, Hilliard & Burt 4535, cult. R.B.G. Edinb. fl. April 1970, corolla dull orange-red, C. 8027.

Berger does not give the exact origin of his plant, but it seems very likely that he received some of the seed given to Kew by J. Mahon. The link between Hanbury's garden at La Mortola, where Berger was Curator, and Kew was always close. It is not known whether this original introduction has persisted in cultivation; it was not listed in the 1938 edition of *Hortus Mortolensis*, nor is it included in the R.H.S. *Dictionary of Gardening*.

It was Berger himself who first noted that *Cotyledon insigne* N. E. Br. was the plant he had already described in *Kalanchoë*. In a letter to Raymond Hamet he called attention to this, but accepted N. E. Brown's view that the plant should be placed in *Cotyledon*. Hamet himself, however, endorsed Berger's original opinion that the plant was a *Kalanchoë* and its tetramerous flowers certainly entitle it to be placed there. It is somewhat surprising, however, that all authors have included it in the same group as *Kalanchoë crenata* and the other mainland African species. All these have erect flowers with star-shaped regular corolla-limb. *K. elizae* has horizontal flowers with a slightly declinate corolla-tube and a somewhat zygomorphic limb. In these characters and in the rather thick and fleshy consistency of the corolla it seems to be unique in the genus, and certainly stands apart from the other mainland species. On Madagascar, *Kalanchoë* takes on a great diversity of form and whether *K. elizae* has a closer affinity with species from this island remains to be investigated.

HAEMODORACEAE

61. *Barberetta aurea* Harv., Gen. S. Afr. Pl. 2: 377 (1868); Bak. in Dyer, Fl. Cap. 6: 2 (1896).

Type: Cape, "Kaffraria, Isomo R." [= Transkei, Tsomo R.?], *Barber & Bowker*.

CAPE. Pondoland, Mt. Tabankulu, 7 i 1966, *Hilliard & Burt* (not collected). Umzimkulu distr., Insikeni forest, 1600 m, 3 i 1964, *Hilliard* 2487 (NU).

NATAL. Alfred distr., Mt. Ngeli, 1 i 1966, *Hilliard & Burt* 3476 (E, NU), cult. in R.B.G. Edinburgh C.5143 (E); *ibidem*, *Strey* 6314 (NH). Ixopo distr., Donnybrook, Qunu Falls, iii 1947, *Williams* 91 (NU). Pietermaritzburg distr., Winterskloof, "The Knoll", xi 1966, *Ram* (NU 36999). New Hanover distr., on road between Blinkwater and York, 5 xii 1966, *Hilliard* 4066 (NU).

This beautiful species is remarkably little-known. It is typically a plant of kloof forest; on Mt. Ngeli it grows freely on rocky forest floor providing there is plenty of moisture: on Mt. Tabankulu we found it had run riot in a wet soggy forest glade, forming a veritable cloth of gold only splashed here and there with the red of *Cyrtanthus epiphyticus*; wet humus-clad rock ledges and marshy stream-sides in forest are other habitats.

Such populations raise the question of vegetative reproduction, and this seems to be well developed in *Barberetta*. The flowering stem rises from a corm and each corm produces two lateral stolons (fig. 3), clearly associated with the distichous position of the foliage leaves. Each stolon, which bears scale leaves, grows out away from the parent corm and swells up terminally to form a new cormlet. The stolons connecting the parent to its two progeny soon decay, so that the new cormlets are independent from an early stage. One would expect the old corm to renew itself also by another one superimposed on it, formed in the leaf-bases of the old shoot. This does not seem to happen in pot cultivation, but field observations have not been made. Seeds are also produced, though not very freely in cultivation.

Meiotic counts from pollen mother cells were made by Miss C. Milne on material cultivated at Edinburgh (C.5143). They show regular formation of 15 bivalents at first meiotic metaphase. There is a strong tendency for secondary association of bivalents to occur: groups varying in number from 3 to 8 bivalents were observed. As far as we know this is the first chromosome count from the tribe Haemodoreae and the haploid number $n = 15$ has not been recorded in the family.

It was noticed in 1969 that D. Geerinck, in an account of the genera of Haemodoraceae, reported difficulty in ascertaining details of the structure of *Barberetta* owing to the scanty herbarium material available (*Bull. Jard. Bot. Nat. Belg.* 39: 51, 1969). Having the plant in cultivation at Edinburgh, the opportunity was taken to send him living material to grow on for examination. Mr Geerinck has now been able to examine the living plants and we are glad to publish his notes here.

NOTES BY D. GEERINCK (rue Charles Pas 4, Bruxelles—1100).

Examination of the living plant enabled the placing of *Barberetta* in Haemodoraceae to be settled with certainty. The 3 stamens are clearly opposite to the inner tepals, the characteristic position for this family. Both Harvey and Phillips incorrectly described them as being opposite the

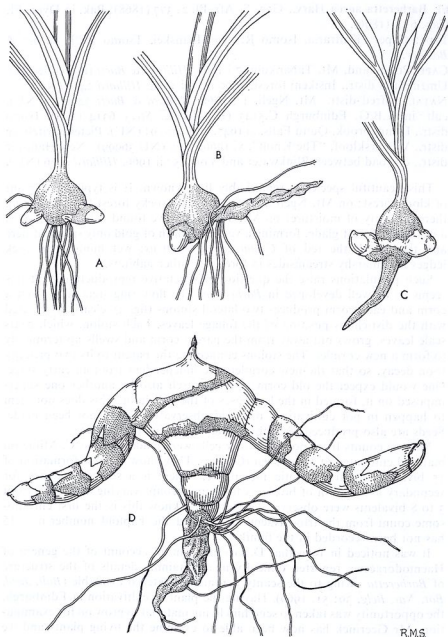


FIG. 3. *Barberetta aurea* Harv.: A, B, different views of one, and C another small corm showing buds of new stolons and withered stolons from which the young corm has developed. D, larger corm with scar of old flowering stem on top and two strongly developed stolons.

outer tepals, the position found in Iridaceae. It was also found, however, that the flowers are zygomorphic because of the abortion of two of the loculi of the ovary and the lateral divergence of the style and one stamen (fig. 4). Revised descriptions and generic key (to be associated with my previous paper in *Bull. Jard. Bot. Nat. Belg.* 39: 47-82, 1969) follow.

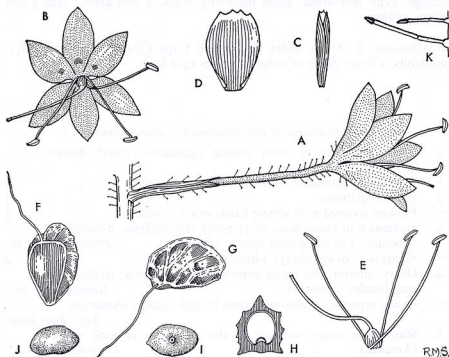


FIG. 4. *Barberetta aurea* Harv.: A, B, flower; C, bract; D, bract, unrolled; E, stamens and gynoecium; F, G, fruit with remains of style; H, fruit in T.S.; J, I seed. (All $\times 4$). K, hairs, $\times 26$.

Generic description:

Herbs with stoloniferous corm. Leaves radical and cauline, sheathing, laterally flattened, narrowly elliptic. Inflorescences racemose, terminal and axillary, beset in the upper part with glandular hairs; bracts membranous, pale green, rolled round the pedicel. Flowers zygomorphic, glabrous; tepals free, subequal; stamens free, subequal, opposite to the three inner tepals, divergent; anthers introrse, basifixed, slightly sagittate at the base; ovary superior, with 1 fertile carpel and 1-2 barren carpels, becoming unilocular, half-ellipsoidal with the upper side curved and the lower side flat; ovule 1; style apical on the lower side of the ovary; stigma 1, minute. Fruit indehiscent, ellipsoid, with a sharp dorsal ridge, verrucose. Only one species.

Specific description:

Herbs up to 30 cm high from a stoloniferous corm. Leaves up to 35 cm long and 6-20 mm broad, glabrous. Inflorescences many-flowered, up to

30 cm long; bracts 5 mm long; pedicels 8-15 mm long. Flowers yellow; tepals 7 mm long, 4 mm broad, the three upper with an orange spot at the base; stamens 7 mm long the two upper ascending and slightly divergent, the lower diverging strongly in the opposite direction to the style; filaments yellow; anthers elliptic, very short, orange; ovary green, 2 mm diam.; ovule 1 mm diam.; style yellow, 6-7 mm long, strongly bent sideways; stigma orange. Fruit half-ovoid, green becoming black, 4 mm diam.; seed 3 mm diam., orange.

Distribution. S. Africa, from the eastern Cape (Transkei) to the Natal midlands, a linear range of some 250 miles (400 km).

Key to genera of Haemodoraceae—Haemodorea

1. Plants glabrous or with simple eglandular hairs; flowers actinomorphic 2
- + Plants with glandular hairs; flowers zygomorphic 6
2. Flowers glabrous 3
- + Flowers covered with simple hairs; ovary 3-locular 5
3. Stamens 6 in two whorls of 3; ovary semi-inferior, 3-locular to 1-locular; 1 ovule in each loculus (Australia) *Phlebocarya* R.Br.
- + Stamens 3; ovary always 3-locular 4
4. Ovary inferior, becoming superior after anthesis; ovules 2 in each loculus (Australia) *Haemodorum* Sm.
- + Ovary superior; ovules numerous in each loculus (America) *Xiphidium* Aubl.
5. Stamens 6; ovary superior; ovules numerous in each loculus (America) *Lophiola* Ker-Gawl.
- + Stamens 3; ovary inferior; ovules 3-6 in each loculus (America) *Lachnanthes* S.Ell.
6. Flowers covered with glandular hairs; ovary 3-locular 7
- + Flowers glabrous (or with a few glandular hairs near base); tepals all free; ovary superior, 1-locular, with upper side curved and the lower side flat; ovule 1; style apical on lower side of ovary (Africa) *Barberetta* Harv.
7. Staminodes 0; stamens 3 8
- + Staminodes 2; ovary superior 9
8. Upper tepals \pm connate at base; stamens subequal; ovary superior; ovules numerous in each loculus (Africa) *Wachendorfia* Burm.
- + Tepals all free; one stamen shorter than the others; ovary inferior; ovule 1 in each loculus (Africa) *Dilatris* Berg.
9. Superior tepals \pm connate at base; fertile stamens 3, those of the outer whorl replaced by 2 staminodes, the adaxial one missing; ovules 2-4 in each loculus (America) *Schieckia* Meisn.
- + Tepals all free; stamen 1, those of the outer whorl missing and 2 of the inner whorl replaced by staminodes; ovules 2 in each loculus (America) *Pyrrorhiza* Mag. & Wurd.

THYMELAEACEAE

61. *Basutica propinqua* Hilliard, species nova a *B. aberrante* (C. H. Wright) Phillips foliis glabris, tubo calycis brevioris, et ambitu calycis loborum et petalorum distinguitur.

Frutex multiramulus, robustus sed vix plus quam 20 cm. altus; rami primum pilosi, mox glabri, cicatricibus foliorum delapsorum asperi, cortice fusco-brunneo. *Folia* alterna, congesta, sessilia, lanceolata, subacuta, usque ad 6×2 mm, concava, crassa, coriacea, glabra pilis 2-3 sub apice juniorum exceptis, marginibus integris nervis lateralibus ascendentibus ut costa immersa. *Flos* sessilis, solitarius in axillo folii ad basin ramuli brevis; ramuli uniflori ad apices ramorum congesti. *Calyx* pallide ochroleucus, extra pilosus; tubus infundibuliformis, basi ampliatus et superne articulatus, 5 mm longus, ore 2 mm diametro; lobi 4, late ovati, 2×2 mm. *Petala* 4, carnosula depresso-ovata, interdum emarginata, 0.75×1 mm. *Stamina* 4, 0.5 mm infra petala orientia, filamentis minutis; antherae anguste oblongae, 1.5 mm longae; staminodia 0. *Ovarium* ellipsoideum, superne pilosum, uniloculare, ovulo uno; stylus filiformis 2 mm longus, stigmatibus capitato papilloso.

LESOTHO. c. 1 mile NNW of entrance to Bushman's River pass, c. 3139 m, 5 xii 1967, Wright 333 (NU, holo; E, iso).

NATAL. Bergville distr., Mont aux Sources, near hut, 2988 m, 2 xii 1951, Schelpe 3040 (NH); *ibidem*, Beacon Buttress, 3200 m, 18 xi 1955, Edwards 363 (NU). Mont aux Sources, 3048 m, iii 1946, Schelpe 1375 (NU), sterile but almost certainly the same.

C. H. Wright (in Thiselton-Dyer, *Fl. Cap.* 5, 2: 584, 1925) described a plant that was aberrant in *Gnidia* in possessing only 4 perfect stamens and no staminodes: he chose the specific epithet, *aberrans*, to reflect this position. In 1944 E. P. Phillips (*Journ. S. Afr. Bot.* 10: 64) erected a new genus *Basutica* to accommodate this plant and as the generic concepts set out by Phillips are in general use in South Africa we follow his treatment. It should be noted, however, that Domke (*Bibl. Bot.* 111, 1934) was satisfied to accept the possession of only 4 stamens as an occasional condition in *Gnidia*. The generic limits in this group are still uncertain.

The first collection of this second species was apparently made by E. Schelpe in 1946 when he described it as "locally subdominant in dry grassland around rocks" on Mont aux Sources, but the material is sterile, which brings a slight element of doubt into the determination. However, he collected flowering material in the same area five years later. D. Edwards collected flowering specimens on nearby Beacon Buttress in 1955 but they slipped without notice into the *Basutica aberrans* cover.

Then Mr F. B. Wright of Kamberg found the plant in December 1967 on the summit plateau near the entrance to Bushman's River pass, which climbs up behind Giants' Castle, type locality of *B. aberrans*. Mr Wright has also collected that species in the pass (Wright 264, NU). Both are gnarled dwarf shrubs found in stony turf near the top of the escarpment and on its summit along the Natal-Lesotho border. *B. propinqua* can be recognised at a glance by its glabrous, not silky-pilose, leaves. However, there are also marked differences in the flowers: the calyx tube of *B. propinqua* is only about half the length of that of *B. aberrans* (5 mm as against 8-10 mm)

and the lobes are broadly ovate and very obtuse, not oblong and subacute. The petals are depressed-ovate, a little broader than long, whereas those of *B. aberrans* are narrowly elliptic and about twice as long as broad.

VELLOZIACEAE

62. *Vellozia elegans* (Balf.) Hook. fil. in Bot. Mag. t. 5803 (1869); Baker in Dyer, Fl. Cap. 7: 245 (1897); Greves in Journ. of Bot. 59: 284 (1921); Ayensu in Kew Bull. 23: 328 (1969).

Syn.: *Vellozia talbotii* Balf. in Trans. Bot. Soc. Edinb. 9: 189 (1867).

Talbotia elegans Balf., l.c. 192 (1867).

Barbacenia elegans (Balf.) Pax in Engl. & Prantl, Nat. Pflanzenfam. 2 Aufl. 15A: 434 (1930).

Xerophyta elegans (Balf.) Baker in Journ. of Bot. 13: 234 (1875).

SOUTH AFRICA. Natal to eastern Transvaal.

Some confusion has surrounded the name of this plant and as the documents may not be easily available in South Africa it will be as well to clear the matter by recapitulating the history of the plant. It was introduced to cultivation in Britain by H. Fox Talbot and this gentleman showed it to Professor J. Hutton Balfour at Edinburgh. Balfour did not recognize the plant and suggested it should be shown to Oliver at Kew. Oliver pronounced it an undescribed *Vellozia* and suggested that it be called *V. elegans*.

Meanwhile part of the living material had been presented to the Royal Botanic Garden, Edinburgh, and Balfour exhibited it at meetings of the Botanical Society of Edinburgh three times in quick succession. In the report of the meeting of 10 January 1867 it is mentioned as a new species *Vellozia elegans*, but no description was given. On 13 June it was shown again and a description of the plant taken from a dried specimen was printed in the report of this meeting. Then followed the comment "Dr Balfour proposed to call it *V. talbotii*. It may turn out to be a new genus. If so the name *Talbotia* will be given to it". Finally flowering plants were exhibited on 13 July 1867 and Dr Balfour "proposed that it be made a new genus" and called it *Talbotia elegans*.

It could well be argued that the name *Vellozia talbotii* was not definitely accepted by Balfour, and therefore was not validly published. It is however, unnecessary to worry about this. The reports of all these meetings were published simultaneously and although *Vellozia talbotii* was given verbally a fortnight before *Talbotia elegans*, it has no priority of publication. The next worker therefore had the right to choose which epithet he would use. This choice was effectively exercised when two years later Sir Joseph Hooker illustrated the plant in Curtis's *Botanical Magazine*. He called it *Vellozia elegans*. So far as he was concerned, he was reverting to Oliver's original name. However we may take the view that Balfour's names were validly published and that Hooker's use of the epithet *elegans* was effectively a transfer from *Talbotia* to *Vellozia*. The citation given at the head of this note therefore seems to be most in accord with the *Code of Nomenclature*.

There is no type specimen dating from Balfour's time in the Edinburgh herbarium. The plant has, however, remained in cultivation and there is no record of a further introduction until quite recently. This old stock is white-

flowered. A plant with pale purple flowers, which is the usual form in the wild, was introduced to Edinburgh from Mariepskop, E. Transvaal in 1964 (Burt 2925).

Unlike most species of *Vellozia*, *V. elegans* has a weak trailing stem and its characteristic habitats are damp cliffs and rocks in forest. Recently Ayensu (*Kew Bull.* 23: 328, 1969) has indicated that *V. elegans* shares characters of leaf-anatomy with South American species of *Barbacenia*, but this is not connected with its general habit of growth. Some other African *Vellozia*, which have the erect branched stems more usual in the genus, are associated with *V. elegans* in these characters of leaf-anatomy. The generic limits in this group have long been subject to debate: Ayensu has shown that anatomical features must be taken into account in a general re-assessment.

V. elegans var. *minor* Bak. (in Dyer, *Fl. Cap.* 7: 245, 1897 = *Xanthophyta minuta* Bak. in *Journ. of Bot.* 13: 234, 1875—non *Vellozia minuta* Bak.) is presumably only a depauperate fragment of *V. elegans* (Natal, Guenzius, K). I do not know of any evidence for a distinct variety or second species in Natal.

ADDENDUM TO COMPOSITAE

63. *Heteromma krookii* (O. Hoffm. & Muschl.) Hilliard & Burt, **comb. nov.**
Syn. *Pentheriella krookii* O. Hoffm. & Muschl. in *Ann. Nat. Hofmus, Wien* 24: 316, t.7 (1910).

Previously (Notes R.B.G. Edinb. 30: 121, 1970) we equated *Pentheriella krookii* with *Heteromma simplicifolium* Wood & Evans. New field collections show this to be incorrect. Details will be published in the next paper in this series.