NOTES FROM THE
ROYAL BOTANIC GARDEN
EDINBURGH
VOLUME XXXIV · NO. 3 · 1976

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

O. M. HILLIARD** & B. L. BURTT

ABSTRACT. Thirty species are annotated. Twenty-two belong to Compositae and include new species or names in *Aster*, *Gnaphalium*, *Helichrysum*, *Macowania*, *Nidorella* and *Senecio*, all additions to the Natal flora. *Anaglypha* is reduced to *Gibbaria*. A hybrid swarm is recorded in *Senecio*. *Macowania* is fully revised and two keys are given to the eleven species recognised; one is based on external morphology, the other on the anatomy of the ericoid leaves. In other families *Burmannia madagascariensis*, *Tetraria macowaniana* (a new name for the illegitimate *T. macowanii*), *Monsonia brevirostrata* and the aliens *Hyptis mutabilis* var. *spicata* and *Linum bienne* are also additions to the flora of Natal. *Dioscorea brownii* is fully described for the first time; additional distributional records are given for *Chironia peglerae*. The country of origin of *Burmannia capensis* is discussed.

BURMANNIACEAE

191. Burmannia capensis Mart., Nov. Gen. & Sp. Pl. 1:12 (1823); Jonker in Med. Bot. Mus. Herb. Utrecht 51:12, 22, 98 (1938).
Type: "Cap de Bon Espérance", *Bruguières* in herb. Juss. (P—n.v.)

In identifying the plant recorded below as *B. madagascariensis*, *B. capensis* had also to be taken into consideration. The accuracy of the country of origin marked on the type specimen in Jussieu's herbarium (Cap de Bon Espérance) was questioned by Schlechter (in Fedde, Rep. Sp. Nov. 11:81,1912) who thought it was more probably Asiatic in origin. However, we have recently reported (Notes R.B.G. Edinb. 32:308, 1973), that two of Bruguières' specimens to which a S African origin had been attributed are South American plants: these were *Curculigo luzulifolia* DC. and *Pachyrhynchus* DC. It is thus not improbable that the type specimen of *B. capensis*, which certainly did not come from anywhere near Cape Town, is also S American. Careful comparison with *Burmannia bicolor* Mart. from S America is clearly needed.

192. Burmannia madagascariensis Mart., Nov. Gen. & Sp. Pl. 1:12 (1823); Jonker in Med. Bot. Mus. Herb. Utrecht 51:96 (1938); Perrier de la Bâthie in Humbert, Fl. Madag., fam. 48:2 (1946); Obermeyer in Fl. Pl. Africa 36:tab. 1427 (1964).

* Continued from Notes R.B.G. Edinb. 34:100 (1975).

** Dept. of Botany, University of Natal. Financial assistance from C.S.I.R. is acknowledged.

NATAL. Zululand, St. Lucia estuary, marsh below new houses in game park, next to game fence, scattered amongst marsh sedges in very damp black soil, 25 iii 1975, *E. S. Pooley* 1702 (E, NU).

This is apparently the first record of the family from Natal. *B. madagascariensis* has been found in the Transvaal (Magaliesberg) and illustrated in *Flowering Plants of Africa* (36:tab. 1427, 1964). In the accompanying article, A. A. Obermeyer (Mrs Mauve) summarises the taxonomic difficulties and quotes a report made by Mr W. Marais after examining a wide range of African material at Kew, at that time including several species as recognised by Jonker. Marais concluded that this material sorted into two main groups, though even these were linked by a few intermediates. One group, which includes typical *B. madagascariensis*, has the upper staminal appendages broad and fan-shaped; the other, including *B. welwitschii* Schlechter, has horn-like upper appendages: there are other minor differences. Obermeyer took a broad view of the species and included the Transvaal plant, which has appendages like *B. welwitschii*, in *B. madagascariensis*.

The interesting point about Mrs Pooley's plant from Natal is that this has the broad appendages of typical *B. madagascariensis*. Thus the plants at the only two South African localities for the genus belong to different parts of this aggregate.

COMPOSITAE

193. Aster ananthocladus Hilliard & Burtt, **species nova** ex affinitate *A. harveyani* O. Kuntze sed habitu multo graciliore (etiam quam in subsp. *gracili* Lippert), capitulis semper solitariis, caule ramulos 2–3 plerumque steriles gerente, foliis caulinis uninerviis differt.

Herba perennis; rhizoma tenue (1 mm diam.) breve subterraneum reptans radices breves tenuiter tuberosas et caules paucos erectos glabros tenues c. 30 cm altos et 1 mm diametro emittens; caulis princeps capitulo solitario terminatus, ramulos 2–3 laterales pergraciles ad apices subflexuosos steriles (raro capitulo parvo terminatos) emittens; caules ramulique virides, subaphylli. *Folia radicalia* tempus florendi emarcida, 2–3, usque ad 22 mm longa (petiolo laminae aequali incluso), oblanceolata, lamina ad 5 mm lata, apice apiculato, utrinque pilis basi bulbosis vestita. *Folia caulina* usque ad 33 × 2 mm, sursum decrescentia, inter se distantia, lineari-lanceolata, summa linearia, appressa, marginibus incrassatis scabridis cetero glabra, uninervia. *Capitula* solitaria, heterogama, radiata. *Involucri* bracteae biseriatae, ad 5 × 1·5 mm, carina fusca resinosa viridi-marginata excepta membranaceae ad apices pallide purpureae, glabrae, marginibus fimbriatis. *Flores* radii c. 13, feminei; corollae tubo 2 mm longo, parce ciliato, limbo anguste elliptico 7 × 2 mm pallidissime lilacino; ovarium 1·25 mm longum, pilis longis et glandulis brevibus vestitum; pappus biseriatus, serie exteriore e squamis brevibus, interiore e setis barbellatis corollae limbo paulo longioribus composita. *Flores disci* c. 33, hermaphroditi; corolla lutea, anguste infundibuliformis, 3 mm longa, parce et minute ciliata; ovarium et pappus ut in flore radii. *Achaenia* haud visa.

NATAL. Underberg distr., Garden Castle Nature Reserve, S-facing grass slope with *Senecio mauricei*, c. 1890 m, 28 i 1975, *Hilliard & Burtt* 7772 (holo.E; iso. NU).

The African species of *Aster* have recently been revised by Lippert (in Mitt. Bot. Staats. München 11:153–258, 1973). The new species comes closest to *A. harveyanus* O. Kuntze, but differs in its much more slender habit, reduced single-nerved cauline leaves and in bearing 1–3 lateral branches which seem to have a purely photosynthetic function, the terminal capitulum being usually aborted or entirely absent. A very similar habit is found in certain species of *Wahlenbergia* (Campanulaceae), such as *W. virgata* Engl. and *W. paucidentata* Schinz; in Compositae much more robust spinous sterile branches are found in a number of Lactuceae [e.g. the N African *Launaea acanthoclada* Maire and *L. arborescens* (Batt.) Maire].

We collected *A. ananthocladus* in late January on a slope where the grass was about a foot high after burning. The plants were embedded in the grass tufts. One only had two withered radical leaves present on a dead side shoot: they are quite different from the cauline leaves being more or less obovate and hirsute. A similar type of radical leaf has once been found in *A. harveyanus*, but the radical leaves of these asters are generally not present at flowering time and are therefore rarely collected.

A. ananthocladus also recalls *A. bowiei* Harv., but that species is more woody at the base and has more numerous and longer leaves aggregated towards the base of the peduncle and, apparently, tufted on short sterile axillary branches. The leaves of *A. bowiei* also decrease in size downwards to the scales clothing the rootstock. There appears to be no developed radical leaves.

194. Gibbaria scabra (Thunb.) T. Norlindh, Stud. Calend. 360 (1943).
Type: Cape, *Thunberg* (UPS).
Syn.: *Osteospermum scabrum* Thunb., Prodr. Pl. Cap. 166 (1800).
Gibbaria bicolor Cass. in Bull. Soc. Philom. 1817, 139.
Xerothamnus ecklonianus DC., Prodr. 5:311 (1836). Type: Cape. Uitenhage, *Ecklon* 1851 (G—DC!).
Anaglypha aspera DC., Prodr. 5:311 (1836). Type: Cape, Albany, *Drège* 5842 (G—DC!).

T. Norlindh has dealt fully with this species except in regard to the final synonym above, which is new here. Harvey (Fl. Cap. 3:68, 1865) had suspected that *Anaglypha aspera* was no more than *Osteospermum scabrum*, but he did not see De Candolle's original specimen. We have been able to examine this and there remains no doubt. It is a remarkable fact that De Candolle established two new monotypic genera on the same page of his *Prodromus* and both turn out to be the same species. De Candolle described the disc flowers of *Anaglypha* as fertile, those of *Xerothamnus* as sterile. However *Anaglypha* was re-examined in 1903 by the French botanist G. Dutailly and his letter is now preserved with the type specimen. He reported that the disc flowers were female sterile, as in *Xerothamnus* and, of course, as in *Gibbaria scabra*. The material is scarcely adequate for a confirmatory examination, but none is needed for the general morphology of the plants is so alike that it is unthinkable that they represent distinct species, let alone genera.

Since *Anaglypha aspera* (the type of the genus) is a synonym of *Gibbaria scabra*, we must consider the fate of the two other species that have been referred

to the genus. *Anaglypha acicularis* Benth. (in Hook., Ic. Pl. 12:t.1109, 1872) was collected in George district by W. J. Burchell and has never been found again. The plant has white rays flushed pink underneath and is probably an epappose relative of *Athrixia*. Its repositioning must await the advent of fresh material.

The third species, *A. latifolia* S. Moore (Journ. Bot. 55:105, 1917) comes from the eastern Transvaal. This is the species which was examined by P. Leins and which led him to the conclusion, based on pollen and stigma morphology, that *Anaglypha* should be placed near *Anisopappus* (Bot. Jahrb. 91:122, 1971). In fact *A. latifolia* looks very like an *Anisopappus*, but it differs in having an epaleate receptacle. *Anisoppapus* is already a difficult genus to characterise, but its species (Wild in Kirkia 4:45–73, 1964) are consistent in having paleaceous receptacles. Another difference is perhaps associated with the presence of paleae: in *Anisopappus* the paleae tend to embrace the base of the flower, which sits on a very short peg-like pedicel; when the palea falls independently (which does not always happen) the receptacle appears scrobiculate. In *Anaglypha latifolia* it is shallowly alveolate.

Anaglypha latifolia is a rare plant, collected only twice in the Sabie (*Rogers* 14319—type) and Lydenburg (*Codd* 8304) areas. This permits time for reflection and further study before a transfer so drastically affecting the characterisation of *Anisopappus* is made.

195. Gnaphalium oligandrum (DC.) Hilliard & Burtt, **comb. nov.**

Type: Madagascar, Emirne Province, in cultivated places, *Bojer* 13 (G—DC!).

Syn.: *Anaphalis oligandra* DC., Prodr. 6:275 (1838).

Helichrysum steudelii [Sch. Bip. ex] A. Rich., Tent. Fl. Abyss. 1:421 (1848). Type: Ethiopia, Adoua, *Schimper* I:231 (G! K!).

Gnaphalium steudelii (A. Rich) Oliv. & Hiern in Oliv., Fl. Trop. Afr. 3:343 (1877).

? H. montosicolum Gandoger in Bull. Soc. Bot. France 65:44 (1918). Type: Natal, Camperdown, *Schlechter* 3282 (PRE! Z!).

[*Gnaphalium undulatum* auctt., non. L.; Humbert, Fl. Mad., Fam. 189 Comp. 385 fig. LXXII, 25–33 (1962); Henderson & Anderson, Common Weeds in South Africa 376 fig. 187 (1966)].

There are two points to be considered in the adoption of this name. First, the identity of *Anaphalis oligandra*, and secondly, the confusion between this plant and *Gnaphalium undulatum*.

Anaphalis oligandra was described by De Candolle from Madagascar and the name has never been taken into general use. Examination of the type at Geneva shows clearly that it is conspecific with *Gnaphalium steudelii* and provides an earlier epithet for this plant. All the material examined appears to have fully fertile hermaphrodite flowers and the species is clearly congeneric with *G. undulatum* L. In the present state of the genera of this group (cf. Drury in New Zealand Journ. Bot. 8:222–248, 1970), it seems best to transfer it to *Gnaphalium*.

The difference between *G. oligandrum* and the true Cape *G. undulatum* lies partly in the number of flowers in a head. This difference is reinforced by a

distinction in habit and general facies that usually permits material to be sorted at sight.

G. undulatum is a bushy spreading herb with somewhat flexuous branches while *G. oligandrum* has stiffly erect stems, either simple or branching from the base and then branching above into the compound inflorescence. An occasional specimen of *G. oligandrum* from tropical Africa may show the more delicately branched habit of *G. undulatum*.

In Natal, *G. undulatum* is a montane plant favouring damp scree, stony stream-beds or other damp stony places between 1300 and 3200 m above sea level, while *G. oligandrum* ranges from sea level to c. 1800 m, largely as a roadside weed. It appears to be increasing rapidly and isolated plants were seen at the sides of trails as high as 1800 m (Garden Castle Nature Reserve). Field-work during January-February 1975 resulted in our finding both species in the same area on five occasions: on Mawahqua Mt. (Bulwer distr.), on the Zuurberg (Alfred distr.), in the Garden Castle Nature Reserve at Drakensberg Garden and at Bushman's Nek (Underberg distr.), and in Umzimkulu district. In each of these areas, except the last, *G. undulatum* occurred only as scattered plants in moist habitats, whereas *G. oligandrum* was common as a roadside or pathside weed. The habitat in Umzimkulu district was damp gritty weedy ground at the roadside and here the species were growing cheek by jowl: *G. undulatum* had 38 female and 3 hermaphrodite flowers; *G. oligandrum* 220 female and 9 hermaphrodite.

Natal is the main area of overlap of these two plants. *G. undulatum* ranges from the Cape Peninsula to Natal and the Orange Free State (there is one record from the Transvaal, Magaliesberg, coll. *Mogg*), while *G. oligandrum* has a distribution from Ethiopia to northern Cape Province. Both have been collected in Madagascar. *G. undulatum* is naturalised in the Channel Islands and neighbouring parts of the French coast, and occurs as a wool alien in Britain.

Investigation of the composition of the flower heads yielded the following results. Forty-four specimens of *G. undulatum* ranging from Oliviershoek Pass in NW Natal to the Cape Peninsula showed a range of 36–74 flowers in a head, 33–69 female, 3–9 hermaphrodite.

A single specimen (*Humbert & Swingle* 5575, K) from Madagascar had 48, 64 and 75 flowers in the three heads examined (46–72 female, 2–4 hermaphrodite).

Forty-six specimens of *G. oligandrum* from South Africa showed a range of 148–304 flowers in a head, 137–285 female, 9–30 hermaphrodite. Five counts (based on 3 specimens, including an isotype of *Anaphalis oligandra*, K) from Madagascar yielded 177–216 flowers in a head, 162–206 female, 11–18 hermaphrodite; thirty-seven counts from tropical Africa (based on 20 specimens from Kenya, Uganda, Tanzania, Congo, Malawi, Rhodesia and Angola) ranged from 91–167 flowers, 84–247 female, 5–15 hermaphrodite, while one count from Buha district, Tanzania, had 364 flowers, 336 female, 28 hermaphrodite, and five from Barotseland, Caprivi Strip, Ngamiland and Kubango-Kunene yielded 350–441 flowers, 331–421 female, 17–23 hermaphrodite.

Many herbarium species are too old for satisfactory counting and it is clear that the position in tropical Africa needs further study. The pocket of high counts in Barotseland and neighbouring regions contrasts with the much lower

figures usual in central and east African material, where 10 out of 12 specimens gave counts about or below the lower limit of the 148–304 range recorded in S Africa.

In general, however, the overall picture remains. *G. undulatum* is small-headed and southern, *G. oligandrum* larger-headed and with a more northerly centre. In Natal, the two overlap without merging and it seems right to recognise them as independent species whose relationships and variability require further study.

The plant described as *Helichrysum montosicolum* by Gandoger presents something of a problem. It was based on a single specimen collected by Schlechter at Camperdown, Natal, and no later material precisely matches it. The three heads counted contained 90, 91 and 97 flowers respectively (82–88 female, 8–9 hermaphrodite); figures that are high for *G. undulatum*, low for *G. oligandrum*. In habit the plant resembles *G. oligandrum*, being branched only towards the top, but the leaves are decidedly decurrent as in *G. undulatum*. It is noteworthy that this specimen was collected in flower in September. Search in the Camperdown area in October failed to reveal any *Gnaphalium* of this group, but by December typical *G. oligandrum* was common along the roadsides.

Three other South African specimens deserve comparison with *H. montosicolum*. *Ecklon & Zeyher s.n.* from mountains near Caledon and Genadendal, collected in October, had up to 81 flowers in a head (55, 59, 69 female, 4, 7, 12 hermaphrodite); *Hilliard* 1736 from Oribi Gorge, S Natal, has heads with 75–107 flowers (66–95 female, 9–12 hermaphrodite); *Thode* A. 2680, from Enon, Uitenhage, has 96 flowers (87 female, 9 hermaphrodite) in the single head counted. These last two were collected in September. All three differ from the type of *H. montosicolum* in having notably more obtuse involucral bracts. In *H. montosicolum* they are acute, as they are frequently in *G. undulatum* and usually in *G. oligandrum*, but specimens with blunter bracts are common in *G. undulatum* and occur more rarely in *G. oligandrum*. The strongly decurrent leaves of these specimens are usually a feature of *G. undulatum*, but are also found in at least some of the plants with large heads from the Barotseland region and these are certainly *G. oligandrum*. This feature is most reliable on the lower part of the stem, but the early withering of the leaves often makes observation difficult in the herbarium.

At present it seems best to regard *H. montosicolum* as a probable synonym of *G. oligandrum*, but to recognise that early flowering specimens of this group deserve more careful study.

196. Helichrysum auriceps Hilliard, **nom. nov.**

Lectotype: Natal, Richmond, *Schlechter* 6722 (Z, BOL).

Syn.: *H. araneosum* Klatt in Bull. Herb. Boiss. 4:834 (1896), non Baker (1887).

Selected citations:—

NATAL. Mtunzini distr., Ngoye forest reserve, *Huntley* 206 (NU); New Hanover distr., Noodsberg, 1060 m, *Hilliard* 1224 (NU); Durban distr., Wentworth, 90 m, *Ward* 6143 (NU); Camperdown distr., Shongweni, hills overlooking Shongweni dam, *Ross* 2099 (NU); Richmond distr., Hela-Hela, *Strey* 10870 (E, NU); Alfred distr., Weza, Ngeli slopes, *Hilliard* 1278 (E, NU).

In an earlier note (in Notes R.B.G. Edinb. 32:345, 1973), *H. cephaloideum* DC. was established as the correct name for the group commonly called *H. adscendens* Thunb. At that time *H. araneosum* Klatt [non Baker] was left as a synonym of *H. cephaloideum*. However, its usually larger capitula with all the bracts acute, and usually longer, narrower and more acute radical leaves justify its retention as a component of a group of species that badly needs critical study. The necessary new name is therefore supplied here. *H. auriceps* is found from about Eshowe and Ngoye in Zululand south to Bizana in the Transkei and inland to c. 2000 m above sea level. One specimen cited by De Candolle under *H. cephaloideum* (*Drège* 5023) belongs to *H. auriceps*; it was collected on heights above the Umzimkulu River.

197. Helichrysum citricephalum Hilliard & Burtt, **species nova** *H. petersii* Oliv. & Hiern affinis sed frutex effusus foliis et caulibus indumento griseo-albo-lanato indutis, capitulis 15 mm longis, involucri bracteis citrinis acuminatis. *H. petersii* Oliv. & Hiern herba perennis caulibus simplicibus glanduloso-pubescentibus foliis supra glandulosis subtus griseo-albo-lanatis capitulis 10 mm longis bracteis aureis acutis.

Frutex usque ad 1 m altus et diametro, ramis primariis nudis basibus persistentibus foliorum asperis, ramulis floriferis griseo-coacto-glandulosis, crebre foliatis. *Folia* plerumque 30–50 × 7–18 mm, oblongo-lanceolata, summa lanceolata, apice acuta vel acuminata, apiculata, ad basi angustata rotundata sessilia, utrinque argenteo-griseo-coacta etiam glandulosa, triplinervia. *Capitula* heterogama, campanulata c. 15 mm longa, 25 mm diametro (bracteis radiantibus inclusis), 4–20 solitaria in pedunculis foliates 5–12 cm longis corymbose disposita. *Involucri* bracteae 6–12-seriatae, gradatim longiores, lanceolatae, acutae vel acuminatae, flores multo superantes, nitentes, pallide citrinae. *Receptaculum* alveolatum. *Flores* 465–484, 16–19 feminei, 446–468 hermaphroditi. *Corolla* 3–5 mm, flava. *Ovarium* 0·75 mm longum, epapillosum. *Achaenia* haud visa. *Pappi* setae numerosae, corollam plus minusve aequantes, infra leves haud cohaerentes, apicibus barbellatae, mox caducae.

NATAL. Ixopo distr., Ixopo to Umzimkulu road, straggling shrub in forest-margin type vegetation on steep banks at roadside, 26 ii 1975, *Hilliard & Burtt* 8045 (holo. NU; iso. E).

H. citricephalum, with its large pale lemon-yellow heads and grey leaves, is a handsome plant, and was a surprising discovery at the side of the main road near Ixopo. There are numerous specimens on either bank of a roadside cutting clothed in scrubby vegetation. The natural habitat of the species would seem to be forest-margin scrub, and it should be sought around the numerous forest patches on the hillsides of southern Natal.

H. citricephalum is unlike any South African species and is allied to *H. petersii* Oliv. & Hiern from tropical Africa (Moçambique, Malawi, Angola and southern Tanzania). In indumentum it resembles *H. buchananii* Engl. from Malawi but the leaves of *H. buchananii* are oblong, not lanceolate, and that species has a dwarf bushy spreading habit and smaller heads with golden yellow and pale brown involucral bracts.

198–208. Macowania Oliv. in Hook., Ic. Pl. 11:49, t.1062 (1870). Benth. in Benth. & Hook. fil., Gen. Pl. 2:327 (1873); O. Hoffm. in Engl. & Prantl, Natürl. Pflanzenfam. 4(5):199 (1894); Phillips, Gen. S Afr. Fl. Pl. 647 (1926); C. A. Smith in Bothalia 2:347–350 (1927); Phillips in Journ. S Afr. Bot. 16:21 (1950) et Gen. S Afr. Fl. Pl. ed. 2, 802 (1950); M. D. Henderson in Kirkia 1:114–118 (1961).

Type species: *M. revoluta* Oliv.

Syn.: *Klenzea* Sch. Bip. in Walp., Rep. 2:973 (1843), p.p. min. excl. lecto.
Homochaete Benth. in Hook., Ic. Pl. 12:9, t.1110 (1872) et in Benth. & Hook. fil., Gen. Pl. 2:331 (1873); O. Hoffm. in Engl. & Prantl, Natürl. Pflanzenfam. 4(5):203 (1894); Phillips, Gen. S Afr. Fl. Pl. 649 (1926). Type species: *H. conferta* Benth.
Antithrixia auctt. non DC.; Benth. in Benth. & Hook. fil., Gen. Pl. 2:329 (1873) p.p.; Oliv. & Hiern, Fl. Trop. Afr. 3:356 (1877); O. Hoffm. in Engl. & Prantl, Natürl. Pflanzenfam. 4(5):200 (1894), p.p.

Heads heterogamous, radiate. *Involucre* campanulate or turbinate, bracts in several series, becoming progressively longer inwards, at least the margins scarious, brown or hyaline, generally lightly woolly outside, sometimes glabrous, often glandular. *Receptacle* flat, smooth or honeycombed, epaleate. *Ray flowers* uniseriate, generally female, fertile, rarely sterile; corolla tubular below, glabrous or hairy, limb narrowly elliptic, 3-toothed; style branches linear, apex subacute; stigmatic papillae confined to marginal bands on the inner faces and confluent at the branch tips; ovary ribbed, generally pubescent, rarely glabrous, pappus of scabrid bristles, caducous or persistent. *Disc flowers* hermaphrodite, generally fully fertile, rarely functionally male; corolla narrowly cylindric below, glabrous or hairy, abruptly campanulate or more gradually widened above, 5-lobed; anthers with a deltoid or oblong-obtuse apical appendage, bases tailed, tails free or adjacent ones cohering, smooth or fimbriate; style branches (when fertile) oblong, slightly broadened at the obtuse tips, minute pollen-sweeping papillae on outer faces; stigmatic bands marginal on the inner surfaces, not meeting at tip; ovary ± 10-ribbed, generally pubescent, rarely glabrous; pappus of acute scabrid bristles (neither subplumose nor obtuse as illustrated in Bothalia 2:349, 1927), caducous or persistent. *Achenes* cylindric or fusiform, ribbed, glabrous or hairy, pappose or epappose.

Shrubs, erect or dwarf, and then often intricately branched, often glandular. *Leaves* alternate, crowded, linear or linear-lanceolate, sessile, apex mucronate, margins revolute or thickened, midrib usually prominent below. *Heads* solitary, rarely clustered, terminal, sessile or pedunculate. *Flowers* deep yellow (South Africa), or at least the rays whitish or pale yellow (Ethiopia, etc.).

Eleven species: 9 in South Africa, from the eastern Cape to the eastern Transvaal; 2 in Ethiopia (incl. Eritrea) and Arabia (Yemen).

In 1870 Oliver established the genus *Macowania* (Inuleae-Athrixineae) based on the single species *M. revoluta*; important features of this plant were its fertile ray flowers, functionally male disc and caducous pappus. Two years later Bentham described another monotypic genus, *Homochaete* (Inuleae-Inulineae), based on *H. conferta*; in this both ray and disc flowers produce achenes and the pappus is persistent. *Macowania* remained monotypic until

1901, when N. E. Brown added two further species, *M. glandulosa* and *M. pulvinaris*. The situation was unchanged when C. A. Smith revised the genus in 1927. Neither Brown nor Smith realised that both *M. glandulosa* and *M. pulvinaris* were at that time wrongly placed in *Macowania*, for the possession of fully fertile disc flowers and persistent pappus were characters of *Homochaete*. In 1950, E. P. Phillips reduced *Homochaete* to *Macowania*.

Since 1950, three new species have been described: *M. sororis* by R. H. Compton in 1953, *M. corymbosa* and *M. tenuifolia* by M. D. Henderson in 1961. Henderson pointed out that on technical grounds (particularly the sterile rays) *M. corymbosa* might have been made a distinct genus, and that *Homochaete* could also be distinguished from *Macowania* sens. strict. On consideration, however, she favoured the broader concept of *Macowania*, so that all these similar looking shrubs were retained in the same genus. We fully concur. Finally, two northern species, *M. ericifolia*, from Yemen and Ethiopia, and *M. abyssinica* from Ethiopia and Eritrea have been transferred from *Antithrixia* to *Macowania* (Burtt & Grau in Notes R.B.G. Edinb. 31:373–376, 1972).

As soon as the Ethiopian species of *Antithrixia* were recognised as belonging to *Macowania* it became necessary to consider the generic name *Klenzea* under which *A. abyssinica* was originally described. In *Index Kewensis* this appears as "*Klenzea* Sch. Bip. ex Steudel, Nomencl. ed. 2,1:847 (1840) et ex Hochst. in Flora 24 (1841), 1: Intell. 26.=*Athrixia* Ker Gawl. (Compos.) partim". However, neither Steudel nor Hochstetter supplied descriptions and the valid publication of the genus dates from Walpers (Repertorium 2:973, 1843) who published full descriptions direct from manuscripts supplied by Schultz: this justifies the citation as 'in' rather than 'ex' Walpers. There were three species, *K. abyssinica*, *K. rosmarinifolia* and *K. lycopodioides*; the last was South African and is now *Bryomorphe lycopodioides* (Sch. Bip.) Levyns. In his generic description Schultz drew particular attention to the reddish or purplish ray-flowers: this character is italicized and is noted as differentiating the genus from *Inula*. It can only have been taken from *K. rosmarinifolia*, the species that is now referred to *Athrixia*. The *Index Kewensis* citation equating *Klenzea* with *Athrixia* is thus in line with the choice of *K. rosmarinifolia* as the lectotype of *Klenzea*; the generic name passes into synonymy and need not concern us further.

It was Bentham (in Benth. & Hook. fil., Gen. Pl. 2:329, 1873) who indicated that *Klenzea abyssinica* and another unnamed Ethiopian species belonged to *Antithrixia* DC. Where Bentham led, others (Vatke, Oliver & Hiern, O. Hoffman etc.) followed: no critical comparison with the Namaqualand *Antithrixia flavicoma* DC., the type of the genus, was made. In fact, Bentham may have been relying on the Ethiopian species in placing *Antithrixia* in Athrixieae, for *A. flavicoma* clearly has the leaves channelled and woolly above, convex below, characters that he emphasised as being diagnostic of Relhanieae. *Antithrixia* DC. is monotypic and should be placed near *Relhania;* it is not closely related to *Macowania*.

We have recently found a further species of *Macowania*, described here as *M. hamata*, in southern Natal, and have been able to recognise yet another from a specimen collected by J. W. Bews in the Tugela gorge, Royal Natal National Park, as long ago as 1915. Unfortunately no other specimen of this Tugela plant has come to light, and, although it is clearly distinct from any

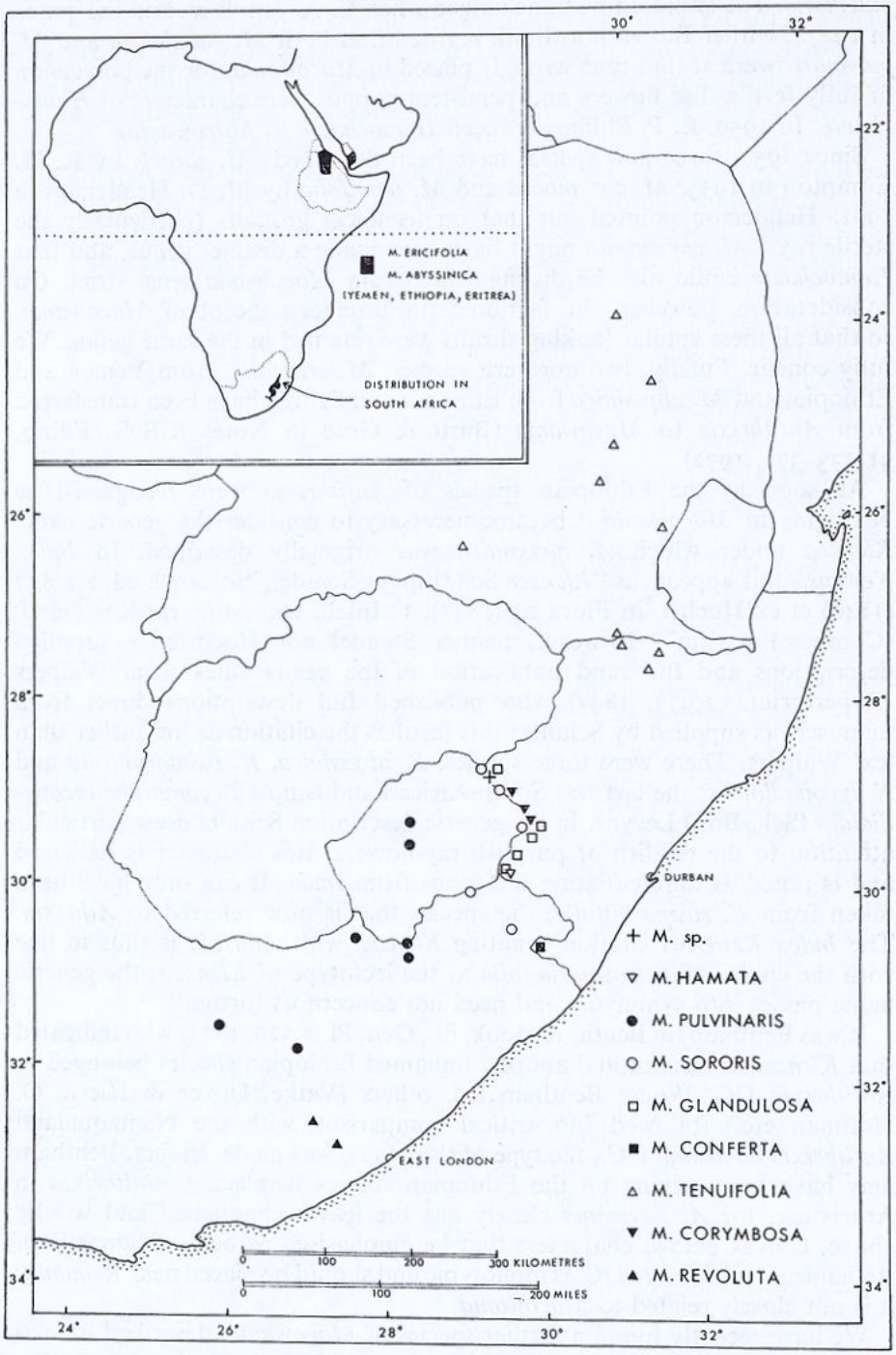

FIG. 1. Map to show the distribution of the species of *Macowania* in southern Africa, and (inset) the complete range of the genus.

other, it seems best to defer giving it a name until better material is available for use as the type, for Bews's specimen is in young bud only.

Thus *Macowania* now includes eleven species, and both its geographical and morphological range have been extended. The map (fig. 1) shows that most species are rather restricted in their distributions, as far as these are at present known. The ranges of *M. pulvinaris* and its close ally *M. tenuifolia* are more extended. *M. pulvinaris* is on the mountains of the eastern Cape from Maraisburg, northwest of Queenstown, to the Witteberg and Cape Drakensberg between Herschel and Maclear, and so to the Lesotho mountains. There is a gap between *M. pulvinaris* and *M. tenuifolia*, which is found on the mountains in northern Natal and across the Transvaal border, west to Nigel and north as far as The Downs near Tzaneen.

The gap of some 300 km between the areas of *M. pulvinaris* and *M. tenuifolia* is negligible compared with the giant step across half the continent to the mountains of Ethiopia and Eritrea, and beyond to the Yemen. Yet the two northern species, *M. abyssinica* and *M. ericifolia*, despite being the only ones with whitish or pale yellow rays, are not isolated in the genus, but are quite closely allied to *M. tenuifolia*, the northernmost of the South African species.

We accept the reduction of *Homochaete* to *Macowania*, and the extended morphological range of *Macowania* is reflected in the revised generic description given above. Until the discovery of *M. hamata* (after the first draft of this revision was written) it seemed that the enlarged genus still fell into two groups centred on the type species of the two generic names. Thus *M. revoluta* and its only close ally *M. corymbosa* were characterised by brown-margined involucral bracts, by some flowers in the head failing to produce achenes (the functionally male disc flowers in *M. revoluta*, the neuter rays in *M. corymbosa*), by deltoid apical anther-appendages, by short caducous pappus bristles and glabrous or subglabrous achenes. In the other species of the genus the involucral bracts had hyaline margins, all flowers produced achenes, the anther-appendages were oblong, the pappus bristles longer and persistent, and the achenes pilose.

M. hamata breaks down this distinction in having the hyaline bract-margins and oblong anther-appendage of the second group but the short caducous pappus and glabrous achenes of *M. revoluta* and *M. corymbosa*. A genus of only eleven species does not demand any formal subdivision and the discovery of *M. hamata* has therefore led us to abandon our original intention of recognising two sections.

It is time to turn outward from *Macowania*. The main difference given by Bentham between the subtribes Athrixineae and Inulineae is that the style-arms are truncate in the former, rounded, and often slightly expanded towards the tip, in the latter. The style-arms of *Macowania* do not fit quite precisely into either group, and this no doubt accounts for *Macowania* having been placed in Athrixineae, *Homochaete* in Inulineae. It is clear that despite the slight rounding the tips are closer to the truncate pattern, and it would therefore be proper to place the genus in Athrixineae. This view is strengthened by a consideration of the stigmatic surfaces. P. Leins has shown (in Bot. Jahrb. 91:91–146, 1971) that in Inulineae the stigmatic bands meet at the tip of the style arms: in *Macowania* they remain distinct, and so they do in *Athrixia* itself.

The yellow rays of *Macowania*, compared with the mauve or white ones of *Athrixia*, make any confusion between the two genera unlikely; and there are technical characters in achenes and pappus which are quite adequate to separate them. *Macowania* is much more likely to be confused with the two Drakensberg species of *Nestlera*, *N. acerosa* (DC.) Harv. and *N. virgata* N.E. Br., which are rather similar in general appearance. However these plants have very long narrowly cylindric achenes and a pappus of short scales.

Leaf anatomy. The firm linear leaves of *Macowania* invite anatomical study, and from the rather cursory investigation that has been done it is clear that there are simple anatomical features visible in the transverse section of the leaf that will enable sterile material to be named with reasonable confidence (see fig. 2). An anatomical key to the species is therefore given; it must be read with the warning that the quantity of material examined does not justify any dogmatic statement about the constancy of any individual character.

In all leaves the midrib is strongly developed. Usually 3–5 main side veins are seen in a transverse section and these are continuous throughout the length of the leaf. There are interconnecting veins, at various angles, between them and from these interconnecting veins there are short arms that end blindly in the mesophyll. These veinlet-endings may be accompanied by terminal sclereids.

The general pattern throughout the genus is that the leaf margins are "revolute" and there are two grooves on the lower surface, one on each side between margin and midrib. The groove always contains raised stomata and small glandular hairs. With one exception there are also slender white curly hairs in the groove. These are lacking in *M. conferta*, but this species alone has massive glandular hairs in the groove, in others they are restricted to the midrib and upper surface. The size and shape of the groove may be distinctive of different species and the nature of the leaf margin is also characteristic and would repay developmental study.

The most distinctive internal character is the presence in two species, *M. hamata* and *M. sororis*, of palisade tissue above the midrib: in other words the palisade is continuous across the leaf. In all other species it is interrupted above the midrib either by sclerenchyma fibres or by parenchyma associated with the bundle sheath. Whether the fibres do abut directly on to the epidermis also provides a useful key character.

There is apparently some correlation of leaf-structure with habit. The leaves of *M. ericifolia*, *M. abyssinica*, *M. tenuifolia* and, perhaps, *M. pulvinaris* are held longer in the suberect position than in the other species. Especially in the two northern species (*M. ericifolia* and *M. abyssinica*) this is linked with presence of stomata on the upper leaf surface and a lower mesophyll which is palisade-like in character. These anatomical features are less noticeable in *M. tenuifolia* and *M. pulvinaris*, but the tendency is there.

The distribution of this rather ericoid type of leaf in Compositae is not known to us, but it is worth drawing attention to its occurrence in the South American *Hinterhubera* Sch. Bip. (tribe Astereae), where it has been investigated by Dr Ingrid Roth (see Acta Bot. Venezuela 9:381–398, 1974).

We are indebted to Dr M. H. Bokhari and Messrs Douglas McKean and Michael Ram for help with the preparation of leaf sections.

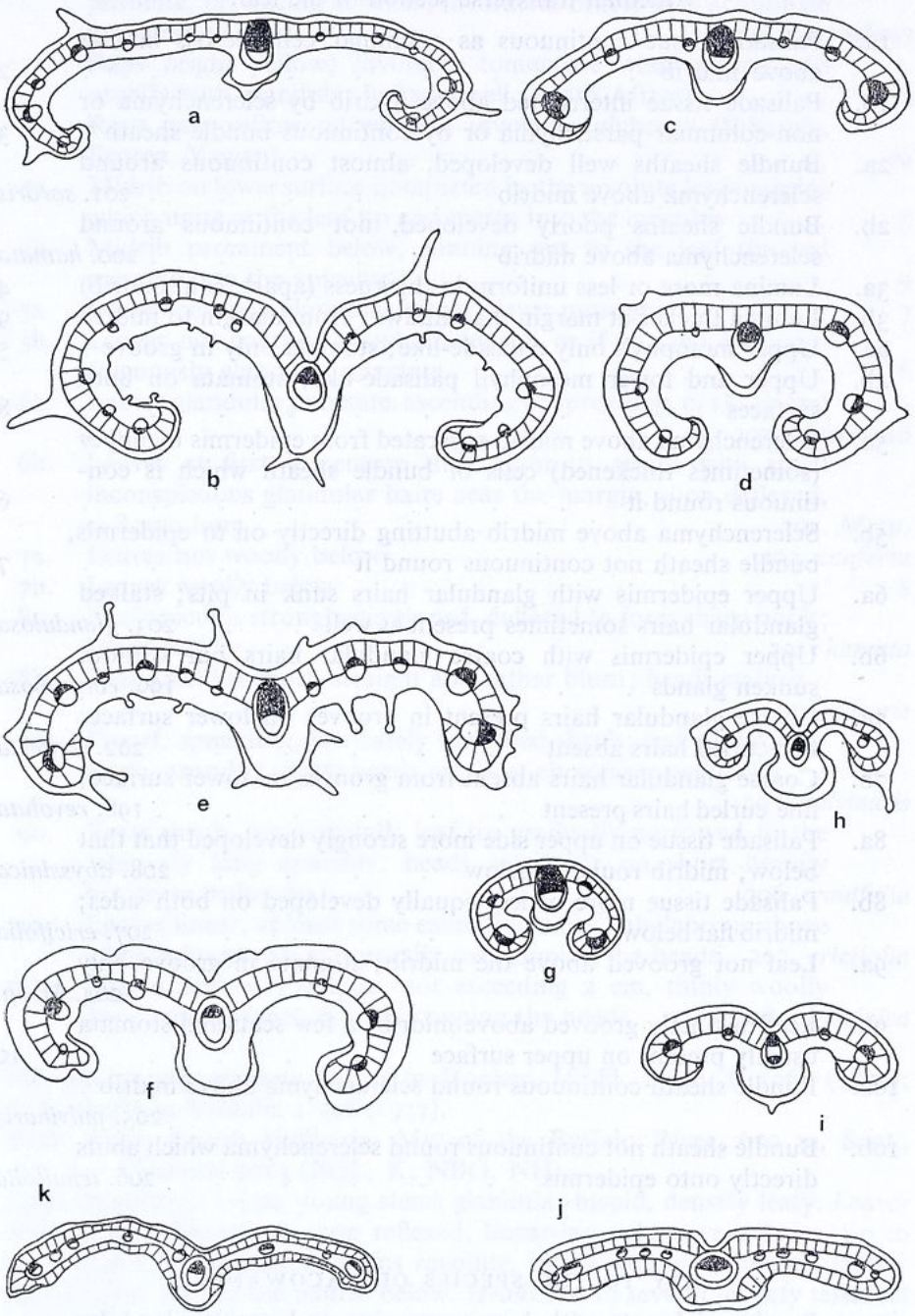

FIG. 2. Diagrammatic median transverse sections of the leaves of *Macowania*: a, *M. revoluta*; b, *M. corymbosa*; c, *M. hamata*; d, *M. sororis*; e, *M. conferta*; f, *M. glandulosa*; g, *M. sp.* no. 204; h, *M. pulvinaris*; i, *M. tenuifolia*; j, *M. ericifolia*; h, *M. abyssinica*. All × 30.

Key to *Macowania* species based on anatomical features visible in median transverse section of the leaf.

1a. Palisade tissue continuous as columnar cells across lamina above midrib 2
1b. Palisade tissue interrupted above midrib by sclerenchyma or non-columnar parenchyma or by continuous bundle sheath . 3
2a. Bundle sheaths well developed, almost continuous around sclerenchyma above midrib . . . . . 201. *sororis*
2b. Bundle sheaths poorly developed, not continuous around sclerenchyma above midrib . . . . . 200. *hamata*
3a. Lamina more or less uniform in thickness (apart from midrib) 4
3b. Lamina thicker at margin than midway from margin to midrib 9
4a. Upper mesophyll only palisade-like; stomata only in groove . 5
4b. Upper and lower mesophyll palisade-like; stomata on both surfaces 8
5a. Sclerenchyma above midrib separated from epidermis by upper (sometimes thickened) cells of bundle sheath which is continuous round it 6
5b. Sclerenchyma above midrib abutting directly on to epidermis, bundle sheath not continuous round it 7
6a. Upper epidermis with glandular hairs sunk in pits; stalked glandular hairs sometimes present as well . . 203. *glandulosa*
6b. Upper epidermis with coarse glandular hairs but without sunken glands . . . . . 199. *corymbosa*
7a. Coarse glandular hairs present in grooves on lower surface; fine curled hairs absent . . . . . 202. *conferta*
7b. Coarse glandular hairs absent from grooves on lower surface; fine curled hairs present . . . . . 198. *revoluta*
8a. Palisade tissue on upper side more strongly developed that that below; midrib rounded below . . . . . 208. *abyssinica*
8b. Palisade tissue more or less equally developed on both sides; midrib flat below . . . . . 207. *ericifolia*
9a. Leaf not grooved above the midrib; stomata in groove only 204. *M. sp.*
9b. Leaf distinctly grooved above midrib; a few scattered stomata usually present on upper surface 10
10a. Bundle sheath continuous round sclerenchyma above midrib . 205. *pulvinaris*
10b. Bundle sheath not continuous round sclerenchyma which abuts directly onto epidermis . . . . . 206. *tenuifolia*

KEY TO THE SPECIES OF MACOWANIA

1a. Involucral bracts with brown margins and coarse glandular hairs on the back 2
1b. Involucral bracts with hyaline margins, tomentose, at least when young, glandular hairs if present fine, or glands sessile 3
2a. Ray flowers female, fertile; disc flowers functionally male: involucral bracts tipped with decurrent mucro . . 198. *revoluta*

2b. Ray flowers sterile (with or without styles); disc flowers hermaphrodite, producing achenes; involucral bracts with acuminate membranous tips . . . . . 199. *corymbosa*

3a. Rays bright yellow; involucre tomentose when young and usually with glandular hairs as well (South Africa) . . 4

3b. Rays pale yellow or whitish; involucre glabrous (Ethiopia, Eritrea, Yemen) 10

4a. Midrib on lower surface dominated by the revolute leaf-margins which unite at the leaf tip and merge into the apiculus . . 5

4b. Midrib prominent below, running out to the leaf tip and merging into the apiculus 9

5a. Leaves coarsely glandular hispid, never punctate . . . 7

5b. Leaves not coarsely glandular hispid, or if so then also conspicuously glandular punctate 6

6a. Leaves glandular punctate, ascending or spreading, c. 15–20 mm long . . . . . 203. *glandulosa*

6b. Leaves at first tomentose then glabrous above with small inconspicuous glandular hairs near the margin, soon deflexed, c. 8 mm long . . . . . 204. *M. sp.*

7a. Leaves not woolly below . . . . . 202. *conferta*

7b. Leaves woolly below 8

8a. Leaf apiculus strongly developed, deflexed to form sharp hook; heads sessile . . . . . 202. *hamata*

8b. Leaf apiculus short, straight and rather blunt; heads stalked . 210. *sororis*

9a. Dwarf, spreading, intricately branched shrub; leaf tip broadly acute, apiculus short; heads on short ebracteate peduncles . 205. *pulvinaris*

9b. Erect shrub, 0·5–1 m tall; leaf tip gradually narrowed to the relatively long apiculus; heads sessile or on short heavily bracteate peduncles . . . . . 206. *tenuifolia*

10a. Leaves linear, at least some exceeding 2 cm, subglabrous above when fully grown and usually overtopping the heads 207. *ericifolia*

10b. Leaves narrowly elliptic, not exceeding 2 cm, thinly woolly above throughout, not overtopping the heads . 208. *abyssinica*

198. Macowania revoluta Oliver in Hooker, Ic. Pl. 11:49, t. 1062 (1870); C. A. Smith in Bothalia 2:348 (1927).

Type: Cape, British Kaffraria, Mts of the Buffalo River, 670 m, Sept., *Macowan* 2013 (BOL, K, NBG, NH).

Erect shrub to c. 1·5 m, young stems glandular-hispid, densely leafy. *Leaves* (fig. 2a) not imbricated, soon reflexed, linear-lanceolate, very acute, up to 30 × 3 mm at the base, margins revolute, thinly woolly below, glandular-hispid above and on the midrib below. *Heads* few to several in leafy terminal corymbs. *Involucre* campanulate, 12–14 mm long and as broad, bracts margined dark brown, glandular-hispid on the backs. *Flowers* yellow, rays female and fertile, disc functionally male. *Corolla* of disc narrowly cylindrical and hairy below, abruptly campanulate and glabrous above. *Anthers* with apical appendage deltoid barely 0·5 mm long and the same breadth at the base, tails smooth and free. *Ovary* of ray 15-ribbed, 2·3 mm long, pubescence

sparse short and spreading; of disc 10-ribbed. *Achene* narrowly barrel-shaped, closely ribbed, glabrous or nearly so. *Pappus* setae half as long as tube of disc, soon caducous.

CAPE. Kingwilliamstown distr., Pirie Mt, 670 m, *Tyson* 2935 (E, NBG); *ibidem*, 915 m, *Flanagan* 2144 (GRA, NBG); *ibidem*, x 1887, *MacOwan* 2013 (E, GRA); *ibidem*, xi 1886, *Macowan* 2013 (NH); *ibidem*, 1220 m, *Sim* 1029 (E, NU). Keiskammahoek distr., Hogsback, *Rattray* 304 (GRA); Hogsback, Wolf Ridge, 1220 m, *Story* 3119 (GRA); Wolf River plateau, *Stayner* 28 (GRA); Wolf River forest, *R. & D.* 104.

In *M. revoluta* there are about 8 to 10 ray flowers and nearly all the achenes are derived from these. Oliver described the disc flowers as functionally male with very shortly and obtusely bilobulate style arms. We were able to examine seven collections and found that it is rare indeed for an ovule to be present in the ovary of a disc flower. The style varied from shortly bilobulate to quite deeply cleft, but even these branches were shorter and more elliptic than the oblong style branches present in the hermaphrodite flowers of all the other species, and were better provided with pollen-sweeping papillae on their outer faces.

M. revoluta is endemic in the eastern Cape, being known only from forest margins on Pirie Mt and the neighbouring mountains about the sources of the Buffalo river, and nearby Hogsback and Wolf Ridge in the Amatola Mts, between about 650 and 1200 m above sea level. Flowering material has been collected in September, October and November, also January and May. Its closest ally is *M. corymbosa* from the Natal Drakensberg. That species is readily distinguished by its linear, closely imbricated, leaves and crowded heads with sterile rays and fertile disc flowers.

199. Macowania corymbosa M. D. Henderson in Kirkia 1:114 (1961).

Type: Natal, Bergville distr., Umlambonja river, *Marriott* s.n. (PRE 22503).

Erect shrub up to c. 1·5 m tall, the young branches clad in closely imbricated leaves. *Leaves* (fig. 2b) linear, abruptly acute, up to 40 × 3 mm, margins revolute, thinly woolly below, glandular-hispid above and on the midrib below. *Heads* several crowded at the branch tips. *Involucre* turbinate, 12–15 × 8–10 mm, bracts margined dark brown, glandular-hispid on the backs. *Flowers* yellow; rays neuter, with or without styles, disc hermaphrodite. *Corolla* of disc narrowly cylindric and hairy below, abruptly campanulate and glabrous above. *Anthers* with deltoid apical appendage barely 0·5 mm long and about as broad at the base, tails smooth and coherent in pairs. *Ovary* of ray flowers usually abortive, of disc about 10-ribbed, glabrous. *Achene* cylindric, c. 3·5 mm long, glabrous. *Pappus* setae about half as long as corolla of disc, soon caducous.

NATAL. Bergville distr., Cathedral area, Umlambonja river, 1585 m, vii 1944, *Schelpe* 633 (NH, NU); N slopes of Inner Horn, Cathedral Ridge, 2530 m, shrub 4–5 ft, 8 vii 1957, *Edwards* 2135 (K, NU); Cathedral area between Camel and Pyramid, 2133 m, vii 1940, *Schelpe* 688 (NU); Cathedral Peak area, old rocky river bed, 2133 m, vii 1949, *Esterhuysen* 15494 (BOL); *ibidem*, river bank and steep S slope, 2133–2438 m, vii 1944, *Esterhuysen* 10216 (BOL, K, NBG); Lambonja to Cathedral, *Esterhuysen* 12902 (K); Cathedral Peak Forest Stn, upper reaches Indumeni river, 1980 m, shrub c. 3′ 6″, occasional

in boulder bed scrub, 15 ii 1952, *Killick* 1681 (BOL, K, NH); Sinyati valley, 1524 m, *Edwards* 847 (NU). Estcourt distr., Cathkin area, Grey's Pass, 2590 m, 17 v 1969, *Trauseld* 1075 (NU); Giants Castle G.R., gully behind Giants Hut, c. 2255 m, shrub about 2 ft high in boulder bed, 26 viii 1968, *Hilliard* 4845 (E, NU); *ibidem*, 24 x 1968, *Wright* 661 (NU); *ibidem*, *Trauseld* 953 (NU).

M. corymbosa forms part of the shrub communities in boulder-strewn gullies, along streamsides and on steep valley walls in the Natal Drakensberg from about Cathedral Peak to Giant's Castle, 1525 to 2590 m above sea level. It flowers mainly from May to July.

See under *M. revoluta* for its affinity.

200. Macowania hamata Hilliard & Burtt, **species nova** *M. sorori* Compton affinis, sed foliis apice hamatis et capitulis sessilibus facile distinguitur.

Frutex erectus, effusus, ad c. 1 m altus; rami veteres nudi basibus foliorum delapsorum asperi; ramuli juniores appresse albo-lanati, dense foliati. *Folia* patentia c. 10–13 × 1·25 mm, linearia, basi lata, apice acutissimo cartilagineo-hamata, marginibus revolutis (praecipue in siccitate); pagina superior viridis, nitens, pilis paucis albis lanatis et aliis validis glanduloso-capitatis praecipue ad apicem et, supra medium, ad margines; pagina inferior dense albo-tomentosa tomento costam occultante. *Capitula* apice ramulorum solitaria, sessilia. *Involucrum* turbinatum, c. 12 × 10 mm; bracteae stramineae, ad apices brunnescentes, tenuiter lanatae, exteriores lanceolatae acuminatae, interiores in acumen abruptius contractae. *Flores radii* c. 13, limbo 9 mm longo, feminei, fertiles, interdum antheris 1–2 difformibus sed polliniferis praediti; ovarium anguste cylindricum, 10-costatum, glabrum; pappi setae c. 22, scabridae, ad apicem attenuatae, inaequales, longissimae duo trientes corollae tubi aequantes, caducae. *Flores disci* hermaphroditi; corolla inferne cylindrica pilosa, superne anguste campanulata glabra, vivide lutea; antherae appendicibus apicalibus oblongis obtusis minus quam 0·5 mm longis, caudis laevibus vel paulo fimbriatis per paria leviter cohaerentibus; ovarium anguste cylindricum, 10-costatum, glabrum, ovuliferum; pappus uti floris radii, setis longissimis partem cylindricam corollae aequantibus.

NATAL, Underberg distr., Garden Castle Nature Reserve, main stream valley W of forester's house, c. 1800 m, 28 i 1975, *Hilliard & Burtt* 7816 (holo. E; iso NU).

Straggly shrub up to c. 1 m tall, young stems densely leafy. *Leaves* (fig. 2c) patent, linear, c. 10–13 × 1·25 mm, apex very acute, hooked, margins revolute, upper surface green, glossy, with a few white woolly hairs and stout gland-tipped hairs particularly towards the tips and margins in the upper half, lower surface white-woolly, the midrib obscured. *Heads sessile*, solitary at the branch tips. *Involucre* turbinate, c. 12 × 10 mm, bracts straw-coloured, brownish towards the tips, thinly woolly. *Flowers* yellow, rays female, disc hermaphrodite. *Corolla* of disc flowers cylindric below, hairy, narrowly campanulate above, glabrous; anther appendages oblong, obtuse, less than 0·5 mm long, about half as wide at the base, tails smooth or slightly fimbriate, cohering lightly in pairs. *Achenes* not seen, ovary 10-ribbed, glabrous. *Pappus*

bristles c. 22, subequal, longest about equalling cylindric part of corolla tube, caducous.

The affinity of *M. hamata* with *M. sorosis* is confirmed by an anatomical feature: both have the palisade layer of the mesophyll continuous across the leaf. In all other species it is broken by fibres or parenchyma above the midrib.

201. Macowania sororis Compton in Journ. S. Afr. Bot. 19:114 cum fig. (1953).
Type: East Griqualand, Mount Currie, 2133 m, iv 1938, *Sister Mildred* 8 (NBG).

Dwarf, much-branched shrub forming low compact cushions, young stems densely leafy. *Leaves* (fig. 2d) imbricated, linear, up to 13 × 2 mm, subacute, margins strongly revolute, lower surface white-woolly, upper viscid, shining, with stout glandular hairs particularly towards the tips and on the rolled margins. *Heads* solitary at the branch tips, shortly pedunculate. *Involucre* turbinate, c. 11 × 10 mm, bracts straw-coloured, pale brown towards the tip, lightly woolly, glandular-pubescent. *Flowers* yellow, rays female, disc hermaphrodite. *Corolla* of disc narrowly cylindric below, widening gradually above, glabrous. *Anther* appendages oblong, obtuse 0·75 mm long, only about half as wide at the base, tails free, more or less fimbriate. *Achenes* 10-ribbed, c. 3 mm long, villous. *Pappus* bristles about 17, subequal, the largest equalling the corolla of disc flowers, persistent.

NATAL. Estcourt distr., summit Bushman's River Pass, 2895 m, 23 i 1940, *West* 1729 (NH, PRE); *ibidem*, 12 ii 1969, *Wright* 918 (E, NH, NU); *ibidem*, *Killick* 3906 (PRE). Bergville distr., Mont aux Sources, *Flanagan* 1879 (BOL); *ibidem*, near chain ladder, 3048 m, 25 iii 1946, *Schelpe* 1417 (NH, NU) Cathedral Peak, Tsana-talana valley, 2990 m, i 1965, *Schelpe* 7208 (BOL, K); Cleft Peak, *Esterhuysen* 12882 (BOL) and 23018 (BOL); Sani Pass, NE facing cliffs, 2820 m, 18 ii 1973, *Hilliard* 5335 (E, NU); *ibidem*, S facing side, c. 2700 m, 31 xii 1973, *Hilliard* 5419 (E, NU).
LESOTHO. Machaba Peak [near Qacha's Nek], 21 iii 36, *Galpin* 14088 (BOL, K, NU, PRE).

Described from the top of Mt Currie near Kokstad at 2133 m, *M. sororis* is otherwise known only from the edge of the Drakensberg escarpment from about Qacha's Nek, near Matatiele in East Griqualand, to Mont aux Sources, always at about 3000 m above sea level, on the basalt and dolerite overlying the Cave Sandstone. It flowers from January to April.

M. sororis is closely allied to *M. conferta*, see discussion under that species.

202. Macowania conferta (Benth.) Phillips in Journ. S. Afr. Bot. 16:21 (1950); Henderson in Kirkia 1:115 (1961); Hilliard & Burtt in Notes R.B.G. Edinb. 30:123 (1970).
Type: [Pondoland] Faku's Territory, *Sutherland* (K; fragment PRE).
Syn.: *Homochaete conferta* Benth. in Hook., Ic. Pl. t.1110 (Aug. 1872).

Dwarf, much-branched shrub forming low, compact cushions, young stems densely leafy. *Leaves* (fig. 2e) closely imbricated, linear, abruptly acute, up to 15 × 2 mm, margins strongly revolute, both surfaces glandular-pilose, midrib strongly raised below. *Heads* sessile, solitary at the branch tips.

Involucre turbinate, c. 12 × 10–12 mm, bracts pale brown or straw-coloured, lightly woolly, minutely glandular. *Flowers* yellow, rays female, disc hermaphrodite. *Corolla* of disc flowers narrowly cylindric below widening gradually above, with a few hairs immediately below the expanded part. *Anther* with apical appendage oblong obtuse 0·75 mm long, only about half as wide at the base, tails free and more or less fimbriate. *Achene* 10-ribbed, c. 3·5 mm long, pilose. *Pappus* bristles about 17, subequal, the longest equalling the corolla of disc flowers, persistent.

NATAL. Alfred distr., Ngeli Mt, c. 1830 m, 1 i 1966, *Hilliard & Burtt* 3472 (E, NU); *ibidem*, c. 1830 m, 4 i 1969, *Hilliard & Burtt* 5807 (E, NH, NU).

M. conferta has been collected on Ngeli Mt at an altitude of about 1830 m, where it forms low rounded masses on rock outcrops on steep grassy mountain slopes, flowering in January. Otherwise it is known only from the type collection in "Faku's territory" which included the western side of Ngeli Mt, now part of Pondoland in the Transkei.

M. conferta strongly resembles *M. sororis* from nearby Mt Currie and the Drakensberg escarpment from Qacha's Nek to Mont aux Sources. However, the leaves of *M. sororis* are woolly below, at least when young, are more viscid and less glandular, and the heads are shortly pedunculate. There are minor floral differences, the corolla of the disc flowers being hairy immediately below the expanded upper part in *M. conferta* whereas it is glabrous in *M. sororis* except for a few stout glands on the backs of the tips of the corolla lobes.

M. glandulosa, a Natal Drakensberg endemic, is also in this affinity, but is easily recognised by its glandular-punctate leaves not found elsewhere in the genus. It differs from both *M. conferta* and *M. sororis* in the completely glabrous corolla of the disc flowers, in the anther tails, adjacent pairs cohering and smooth in *M. glandulosa*, free and fimbriate in both *M. conferta* and *M. sororis*, and in fewer (± 12) pappus bristles, slightly shorter than the corolla, rather than ± 17 bristles equalling the corolla.

203. Macowania glandulosa N.E. Br. in Kew Bull. 1901:124 (1901); C. A. Smith in Bothalia 2:348 (1927).

Type: Natal, on the top of Tabamhlope Mt, 1825–2135 m, Feb., *Evans* 412 (K, NH); Langalibalele's Location, *Fannin* 2013 (K).

Dwarf, much-branched shrub forming low compact cushions, young stems densely leafy. *Leaves* (fig. 2f) imbricated, linear, up to 20 × 2·5 mm, acute, margins strongly revolute, lower surface white woolly, upper glabrous, glandular punctate, very rarely with stalked glands as well. *Heads* sessile, solitary at the branch tips. *Involucre* turbinate, c. 12–14 × 12–15 mm, bracts pale brown or straw-coloured, often with a purple-brown patch on the midline towards the tips, minutely glandular. *Flowers* yellow, rays female, disc hermaphrodite. *Corolla* of disc flowers narrowly cylindric below, widening gradually above, glabrous. *Anthers* with apical appendage oblong obtuse 0·5 mm long, only about half as wide at base, tails smooth and cohering in pairs. *Achenes* c. 3·5 mm long, fusiform, 10-ribbed, the ribs spaced, villous. *Pappus* bristles 12, a little shorter than the disc corolla, persistent.

NATAL. Bergville distr., Hlolela, The Cavern, 1830 m, x 1963, *L'Ange* 74 (NU). Estcourt distr., Tabamhlope, 1980 m, 15 x 1907, *Wylie comm. Wood* 10629

(BOL, NBG, NH, GRA); *ibidem*, c. 1980 m, 26 iv 1945, *Acocks* 11466; *ibidem*, 29 xi 1939, *West* 1394 (NH, PRE); Kamberg, "Gladstone's Nose", c. 1950 m, 1 vi 1970, *Wright* 983 (E, NU); Giant's Castle Game Reserve, Injasuti area, 1920 m, 3 viii 1966, *Trauseld* 628 (NU, PRE); *ibidem*, 8 x 1966, *Hilliard* 4008 (E, NH, NU); between Kamberg Nature Reserve and Giant's Castle Game Reserve, *Wright* s.n. (E, NU). Underberg distr., Cobham Forest Station, Sipongweni Caves, c. 2100 m, 13 iv 1974 (not in flower), *Hilliard* 5507 (E, NU); Garden Castle Nature Reserve, tributary W of Umzimkulu R., c. 1950 m, 4 xi 1973, *Hilliard & Burtt* 7065 (E, NU); Bushman's Nek Forest Reserve, 2080 m, 2 xi 1962, *Hilliard* 912 (E, NU); *ibidem*, path to Thamathu pass, c. 1980–2310 m, 23 xi 1973, *Hilliard & Burtt* 7446 (E, NU).

M. glandulosa appears to be confined to the Cave Sandstone platforms of the Natal Drakensberg from Hlolela near Mont aux Sources to Bushman's Nek on the Cape border, between 1830 and 2080 m above sea level. It flowers mainly in October and November.

Its glandular-punctate leaves make it the most easily recognised species. In the northern part of its range the glandular-hispid hairs so common in *Macowania* are entirely lacking; in its two southernmost stations, in the Garden Castle Nature Reserve above Drakensberg Garden and at Bushman's Nek, the leaves are glandular-hispid as well as punctate. It is worth noting that at present records for *M. glandulosa* show a break between the Giant's Castle area (Estcourt district) and Sipongweni (Underberg district), only a few miles from the Garden Castle station. The Sipongweni plant is, however, like the more northern ones in lacking glandular-hispid hairs on the leaves. The two southernmost plants, which have these hairs, do not seem to differ from typical *M. glandulosa* in any other respect and do not, at present, seem to merit naming, even as a variety.

204. Macowania sp.

Woody subshrub, the branch available 25 cm, lower part bare and rough with old leaf bases, then dead deflexed leaves, then living leaves also deflexed except at tip of new shoots. *Leaves* (fig. 2g) 10 × 1 mm, linear, apex acute, margins revolute, both surfaces at first white tomentose, soon apparently glabrous above but actually with persistent indumentum of minute erect papillae, persistent white tomentose in the groove below. *Heads* sessile, solitary at the branch tips. *Involucre* (young heads only) 6–7 mm, bracts pale brown, shortly scabro-pubescent, margins somewhat lacerate. *Flowers* all in bud, rays female, disc hermaphrodite; anther appendages oblong, obtuse, 0·25 mm long, about half as wide at the base, tails smooth, adjacent pairs cohering lightly. *Ovaries* apparently hairy. *Pappus* bristles c. 25, persistent.
NATAL. Bergville distr., Tugela gorge, 7000 ft, among boulders, ix 1915, *Bews* 327 (E, NU).

This interesting plant seems to have been collected only the once. There is no doubt that it is distinct from any of the other species, but the material is young and it seems desirable to wait for better specimens to make the type of the new name. An outstanding feature is the way in which the leaves soon become deflexed.

205. Macowania pulvinaris N.E. Br. in Kew Bull. 1901:124 (1901); C. A. Smith in Bothalia 2:350 (1927).

Type: Cape, Queenstown div., on the summit of Andriesberg, near Bailey, 2070 m, *Galpin* 2258 (BOL, K, GRA, NBG).

Dwarf, much-branched shrub forming low, compact cushions, young stems densely leafy. *Leaves* (fig. 2h) closely imbricated, linear, acute up to 20 × 1·25 mm, margins strongly revolute, midrib strongly raised below, lower surface white-woolly between margins and midrib, glabrescent, upper surface, particularly the margins, and midrib below glandular-hispid. *Heads* solitary at the branch tips, pedunculate. *Involucre* turbinate, c. 8–10 × 10 mm, bracts straw-coloured, lightly woolly, minutely glandular. *Flowers* yellow, rays female, disc hermaphrodite. *Corolla* of disc flowers narrowly cylindric below, widening gradually above, with a few hairs immediately below the expanded part. *Anthers* with apical appendage oblong obtuse 0·75 mm long, only about half as wide at base, tails smooth, free. *Ovary* 2·5 mm long, 10-ribbed, villous. *Pappus* bristles c. 17, subequal, the longest equalling disc corolla, persistent.

CAPE. Herschel distr., nr Sterkspruit, Majuba Nek, covers the mountains at high altitudes, xii 1915, *Hepburn* 106 (GRA), *ibidem*, 28 xii 1917, *Hepburn* 237 (GRA, Z). Barkly East distr., summit Doodmans Krans Mt, 2940 m, 9 iii 1904, *Galpin* 6694 (K, GRA, NBG. NH); Naude's Nek, c. 2620 m, 28 xi 1971, *Hilliard* 5209 (E, NU); *ibidem*, 2440 m, 19 ii 1971, *Hilliard & Burtt* 6621 (E, NU). Eastern Province. Maraisburg distr., Maraisburg, 1220 m, vi 1946, *Archibald* 2460 (GRA).

LESOTHO. Likolobeng [29° 15′ S, 28° 02′ E], 2900 m, 28 xii 1948, *Compton* 21244 (NBG). Mamalapi [29° 16′, 28° 02′], 2740 m, 28 xii 1948, *Compton* 21319 (NBG). Bitsolebe area [29° 30′, 28° 02′], *Marais* 1324 (K, PRE). Mamalapi slopes, 2590 m, *Jacot Guillarmod* 645 (PRE); Mosalamane Pass [29° 10′, 28° 05′], *Jacot Guillarmod* 339 (K, PRE). Likolobeng [29° 15′, 28° 02′], 2900 m, *Jacot Guillarmod* 788 (PRE). Basutoland, *Staples* 56 (PRE). Blue Mt Pass [approx. 29° 25′, 28°], c. 2135 m, *Williamson* 539 (K).

M. pulvinaris is conspicuous in the ericoid shrub communities ("fynbos") on the mountains about Queenstown, northwest to Maraisburg and so to the Witteberg and Cape Drakensberg, and on the mountains in the western half of Lesotho, mostly between 2000 and 2950 m above sea level, but as low as 1220 m in its westernmost station (and that of the whole genus) at Maraisburg, between Hofmeyer and Tarkastad in the eastern Cape. It flowers mainly in December.

M. pulvinaris is very closely allied to *M. tenuifolia* from which it is distinguished by its dwarf habit, less attenuated leaf tips and ebracteate peduncles. Separately and collectively, the two species have the widest distribution of any in the genus, *M. tenuifolia* getting as far north as The Downs near Tzaneen in the north eastern Transvaal.

206. Macowania tenuifoia M. D. Henderson in Kirkia 1:116 (1961).

Type: Transvaal, Nigel, Vrisgewaag G 337, 8 miles SE of Nigel, *Mogg* 20116 (PRE).

Erect shrub c. 0·6 to 1 m tall, young stems densely leafy. *Leaves* (fig. 2i) imbricated, up to 20 mm long, less than 1 mm broad, linear, tapering gradually

to the acute tip, margins revolute, midrib strongly raised below, lower surface white woolly between margins and midrib, glabrescent, upper surface, margins and midrib below minutely to markedly glandular-hispid. *Heads* solitary at the branch tips, sessile or on short bracteate peduncles. *Involucre* turbinate, 8–10 × 8–10 mm, bracts straw-coloured, often with traces of white wool particularly near the base, minutely glandular. *Flowers* yellow, rays female, disc hermaphrodite. *Corolla* of disc flowers narrowly cylindric below, widening gradually above, with a few hairs immediately below the expanded part. *Anthers* with apical appendage oblong obtuse 0·5 mm long about half as wide at base, tails smooth and free. *Achenes* c. 3 mm long, 10-ribbed, villous. *Pappus* bristles c. 17, subequal, the longest equalling disc corolla, persistent.

TRANSVAAL. Letaba distr., The Downs, *Rogers* 21564 (PRE). Pilgrimsrest distr., Mariepskop, *v.d. Schijff* 5836 (K, PRE); *ibidem*, 2315 m, 24 i 1968, *Hilliard* 4734 (E, NU, PRE); *ibidem*, 18 i 1969, *Hilliard & Burtt* 5992 (E, NU, PRE). Lydenburg distr., 20 miles N of Dullstroom on Lydenburg road, *Hardy* 945 (K, PRE, Z); 9 miles N of Dullstroom, 7 xi 1960, *Strey* 3442 (K, NH, PRE); 8 miles NE of Dullstroom, *Codd* 536 (K, PRE). Middelburg distr., Belfast, *Franks* 9807 (PRE). Carolina distr., Lochiel, *Pole-Evans* s.n. (PRE). Heidelberg distr., Nigel, Vrisgewaag, *Moss* 22557 (PRE); Boschfontein, *Mogg* 25488 (PRE); Suikerboschrand, *Mogg* 25409 (PRE); Sandfontein, *Mogg* 25082 (PRE). Wakkerstroom distr., Tafelkop, 1830 m, 13 xi 1966, *Devenish* 1338 (K, NH, PRE); Wakkerstroom, *Devenish* 700 (K).

NATAL. Utrecht distr., Kaffir Drift to Tweekloof, ix 1923, *Thode* A. 279 (K). Paulpietersburg distr., Dumbe Mt, *Galpin* 10950 (PRE). Vryheid distr., Kambula Mt, c. 1525 m, 15 ix 1945, *Acocks* 11768 (K, PRE, NH).

M. tenuifolia ranges from northernmost Natal west to Nigel on the southern Transvaal highveld and north along the mountains to The Downs near Tzaneen. There is a gap of some 300 km between the northernmost record for *M. pulvinaris* in Lesotho and the southernmost records for *M. tenuifolia* in the Transvaal and Natal. Indeed, there is no record of the genus at all along the low Drakensberg from Oliviershoek to Wakkerstroom, which is remarkable.

M. tenuifolia grows in grassland among rock outcrops, and flowers mainly in September and October, although occasional heads can be found as late as January. The leaves are always white woolly on the lower surface between the midrib and the revolute margins, although the margins may be sufficiently inrolled to obscure this completely. There is a good deal of variation in the glandular pubescence. The leaves were described as "sparsely setose" and this is certainly true of the type specimen (*Mogg* 20116), but *Moss* 22557 from the same locality and *Mogg* 25082 from Sandfontein, part of the same farm, are much more glandular. They are matched by specimens from Mariepskop (*Hilliard & Burtt* 5992 and *Hilliard* 4734), while *van der Schijff* 5836 from Mariepskop is very sparsely glandular. *Pole-Evans* from Lochiel (between Carolina and Oshoek) is very glandular, *Rogers* 21564 from The Downs (the northernmost record for the species) is even more markedly so. All the other material quoted here is minutely glandular. However, all the specimens examined have the characteristic tapered leaf tip of *M. tenuifolia*, and are accepted as being that species.

M. tenuifolia is closely allied to *M. pulvinaris*: see under that species. It is also the species that most closely resembles *M. ericifolia*, one of the Ethiopian outliers of the genus, but it is distinguished by details of leaf structure: the thick leaf margins, not the raised midrib, merge with the apiculus in *M. ericifolia*, which has longer, flatter leaves with the midrib *above* white-woolly, as well as white wool on the lower surface, and lacks the massive glandular hairs of the southern species. *M. ericifolia* also has more obtuse, less glandular, involucral bracts, pale yellow rays, glabrous corollas, c. 12, not c. 17, pappus bristles and fimbriate, not smooth, anther tails.

207. Macowania ericifolia (Forsk.) Burtt & Grau in Notes R.B.G. Edinb. 31:376 (1972).

Type: Yemen, Mt Kurma, *Forskål* (BM, C, M).

Syn.: *Aster ericifolius* Forsk., Fl. Aeg.-Arab. 150 (1775).

Aster ansif Schrank in Denkschr. königl. bayer. Akad. Wiss. 6:196 (1817). Type as for *Macowania ericifolia* (M).

Athrixia ? ericifolia (Forsk.) DC., Prodr, 6:277 (1837).

Antithrixia angustifolia Oliv. & Hiern, Fl. Trop. Afr. 3:356 (1877). Type: Ethiopia; Gerra Abuna Sikla Haimanot, 2440 m, 29 xi 1863, *Schimper* 1443 (BM, E, K, Z).

Detris ericifolia (Forsk.) Hiern, Cat. Welw. Afr. Pl. 1:545 (1898), quoad basionym. tantum.

Felicia ericifolia (Forsk.) Mendonça, Contr. Con. Fl. Angola, 1, Compositae 1:44 (1943), quoad basionym. tantum.

[*Antithrixia abyssinica* auctt.; Vatke in Linnaea 39:493 (1875), quoad spec. excl. syn.; Schwartz in Mitt. Inst. allg. Bot. Hamburg 10:281 (1939)—non (Sch. Bip.) Vatke.]

Erect shrub, young stems densely leafy. *Leaves* (fig. 2j) close-set but not imbricated, linear, tapering to the acute tip, up to 33 × 1 mm, flat, somewhat flexuous, margins of the young leaves revolute, midrib raised below, upper surface thinly white-woolly at first, soon glabrous except for the woolly midline, minutely glandular, viscid, lower surface white woolly but the wool so matted with a viscid exudate that young leaves appear glabrous, only old dry leaves white-woolly below. *Heads* sessile or very shortly pedunculate, overtopped by the upper leaves, solitary at the tips of the branchlets, often several corymbosely arranged. *Involucre* turbinate, c. 10 × 10 mm, bracts straw-coloured, pale brown above, glabrous, minutely glandular. *Flowers* pale yellow or whitish. *Corolla* of disc narrowly cylindric below, gradually widening upwards, glabrous. *Anthers* with apical appendage oblong, obtuse, 0·5 mm long and about half as wide at the base, tails free and more or less fimbriate. *Achenes* 3 mm long, 10-ribbed, villous. *Pappus* setae c. 12, a little shorter than disc corolla, persistent.

YEMEN. Menacha–Kahil, Pass zwischen Djebel Schibam und Djebel Dhulwa, 2400–2800 m, 27 vii 1931, *Wissman* 2080 (HBG); Chamis–Sanaa, 2300–2900 m, i 1928, *Wissman* 156 (HBG); Yasil–Chamis, 2400–2900 m, iii 1928, *Wissman* 157 (HBG); Djebel Dhuran, 1931, *Wissman* 1835 (HBG); Naquil Isla Pass, 2930 m, 8 iii 1938, *Scott & Britton* 567 (BM); Jebel Sumara, 2955 m, 3 i 1938, *Scott & Britton* 400 (BM); Gebel Schibam, Menacha, 2600 m,

28 ii 1889, *Schweinfurth* 1643 (K, Z); head of Sumara Pass, 2900–3000 m, iii 1974, *Lavranos* 11301 (E, NU).
ETHIOPIA. Prov. Wollo, Gipfelplateau der Aischatn Amba, c. 5 km SE Lalibela (c. 12°N, 13°E), 3350 m, 17 vi 1968, *Sebald* 2076 (STU); Lalibella, ii 1973, *Polunin* 11650 (K).

Christensen (in Dansk Bot. Arkiv 4:26, 1922) put a question mark against Forskål's specimen at Copenhagen. The name *Aster ericifolius* does not appear on the sheet, which is labelled "Aster ericoides villosus Wild.?" This, and the fact that at that time Forskål's plant was thought to be the same as *Felicia schimperi*, justified the doubt. But the microfiche of the sheet shows quite clearly that the specimen is *Macowania ericifolia*.

First recorded on Mt Kurma (14° 44′ N, 43° 40′ E) in the Yemen, *M. ericifolia* has since been collected several times in that area and in Ethiopia on the mountains north of Lake Tana, always above 2300 m altitude. It is a plant of dry rocky hillsides and forms a shrublet 30–50 cm high. The ray flowers are recorded as white (Sebald) or pale yellow (Lavranos, Polunin), but unfortunately most collections lack any such information.

The long leaves (up to 2·8 cm) on *Schimper* 1443, may represent a seasonal phase of growth as a few withered shorter leaves (c. 1·3 cm) can be found persisting here and there. Similarly *Polunin* 11650 shows a range of leaf-length of 1–2·5 cm on different shoots. The short leaves approach those of *M. abyssinica* and the differences between the two species require more critical investigation. For the time being the retention of the separate species seems to be justified.

208. Macowania abyssinica (Sch. Bip.) B. L. Burtt in Notes R.B.G. Edinb. 31:376 (1972).
Type: Ethiopia, Mt Scholada near Adua, *Schimper* 227 (BM, K, M).
Syn.: *Klenzea abyssinica* Sch. Bip. apud Walpers, Repert. 2:973 (1843); A. Rich., Tent. Fl. Abyss. 1:398 (1848).
Antithrixia abyssinica (Sch. Bip.) Vatke in Linnaea 39:493 (1875); Oliv. & Hiern, Fl. Trop. Afr. 3:356 (1877).

Diffuse shrub, young stems closely leafy. *Leaves* (fig. 2k) narrowly elliptic, up to 18 × 2·5 mm, flat, margins slightly revolute, midrib raised below, both surfaces white-felted when young with only the long, naked apiculus protruding, upper surface glabrescent, minutely glandular, lower persistently white-woolly except on the midrib. *Heads* sessile, solitary at the tips of the branchlets, not overtopped by the leaves. *Involucre* turbinate, c. 10 × 8 mm, bracts straw-coloured below, pale brown above, glabrous, minutely glandular. *Flowers* pale yellow or whitish. *Corolla* of disc flowers narrowly cylindric below, gradually widening upwards, glabrous. *Anthers* with apical appendage oblong obtuse 0·5 mm long and about half as wide at the base, tails free and more or less fimbriate. *Achenes* 3 mm long 10-ribbed, villous. *Pappus* bristles c. 12, a little shorter than disc corolla, persistent.
ETHIOPIA. Royaume de Choa, *Rochet d'Héricourt* (BM ex P); zwischen Zaha und Memsach, 2440 m, 20 ii 1856, *Pullen* 574 (K). Eritrea; Hamasen, *Pappi* 135 (BM, K) and 4352 (K, M).

Closely allied to *M. ericifolia*—see discussion under that species.

209. Nidorella agria Hilliard, **species nova** a *N. undulata* (Thunb.) Harv. (specie indumento glanduloso-pubescens, praecipue in inflorescentia, notata) pilis longis acutis robustis per totam plantam dispersis recedit.

Herba perennis stolonibus hypogaeis instructa; caulis florifer simplex, raro basi furcatus, ad 60 cm altus, hispidus et glanduloso-puberulus, foliatus. *Folia* radicalia plerumque anthesi emarcida, rosulata, elliptica, usque ad 15 × 4 cm, apice obtuso apiculato, basi in parte petiolari attenuata, marginibus subintegris vel calloso-denticulatis vel crenatis, utrinque pilis longis acutis robustis hispidis, vel pilis ad margines et costas restrictis, etiam minute glandulosa; folia caulina inferiora similia, sursum decrescentia et oblonga vel lanceolata et in bracteas inflorescentiae lanceolatas acutas vel acuminatas transeuntia, omnia cordato-amplectentia. *Capitula* 3·5 × 3·5 mm, numerosa, in corymbum patentem terminalem disposita. *Involucrum* campanulatum; bracteae biseriatae, oblongo-lanceolatae, 2·5 mm longae, glanduloso-puberulae, marginibus fimbriatis. *Receptaculum* marginibus alveolarum elevatis. *Flores* feminei c. 32–45, masculi 9–12; corolla vivide lutea, femineorum minute radiata c. 2·5 mm longa, masculorum infundibuliformis 3·5 mm longa. *Achaenia* (ex *Hilliard* 3924) 1 mm longa, turbinata, leviter compressa, pilosa; ovaria florum masculorum fere aborta. *Pappus* e setis numerosis scabridis c. 2·5 mm longis compositus.

NATAL. Bergville distr., Oliviershoek Pass, 1830 m, 18 ii 1970, *Hilliard* 4928 (E, NU). Underberg distr., valley bottom of Umzimkulu river above Drakensberg Garden Hotel, 1675 m, 21 i 1975, *Hilliard & Burtt* 7756 (holo. E; iso. NU); Sani Pass, 1980 m, 26 i 1966, *Killick & Vahrmeijer* 3789 (K).

ORANGE FREE STATE. Bethlehem distr., Clarens, farm Dunblane 335, 1850 m, 14 iii 1972, *Scheepers* 1869 (K). Witzieshoek, at hut on way to Mont aux Sources, c. 1980 m, 1 iv 1970, *Liebenberg* 8161 (K).

LESOTHO. Leribe, *Mrs Dieterlen* 559 (K); above Buffalo river waterfall, c. 2350 m, 15 iii 1904, *Galpin* 6663 (K); Masepu, at base of Kranskop near Qacha's Nek, 17 iii 1936, *Galpin* 14253 (K).

CAPE. Matatiele distr., Qacha's Nek, c. 1980 m, 27 iii 1962, *Acocks* 22185 (K). Maclear distr., summit Naude's Nek, 2340, 9 iv 1966, *Hilliard* 3924 (E, NU). Barkly East distr., Rhodes to Naude's Nek, 2350 m, 21 ii 1971, *Hilliard & Burtt* 6669 (E, NU); ascent to Naude's Nek, 10 iv 1966, *Hilliard* 3944 (E, NU). Wodehouse distr., Andriesberg, 1525 m, 23 v 1899, *Galpin* 2609 (K).

N. agria is easily distinguished from *N. undulata* by the coarse harsh hairs distributed over most parts of the plant. These hairs are wanting in *N. undulata* which commonly has a short glandular pubescence nearly confined to the inflorescence branches and bracts, or the whole plant may be nearly glabrous. Occasionally there may be a few short pointed crisped hairs in the inflorescence region, but these are quite unlike the coarse hairs of *N. agria*. In both species the leaf margins may be entire or obscurely toothed; however, when the toothing is well developed, as it sometimes is particularly on radical leaves, the margins are crenate in *N. agria*, serrate in *N. undulata*. Radical leaves are often wanting in dried specimens because each flowering shoot is biennial and the lower leaves are usually withered at flowering. Both radical and cauline leaves of *N. undulata* dry brownish, whereas in *N. agria* they are green.

The centre flowers in both species are always male with ovaries often

nearly aborted, a unique condition in *Nidorella* and possibly the main factor contributing to the confusion of the two species. We had long been aware that the glandular plant with glabrous leaves is always found in damp places (marshes, marshy streamsides, rock flushes, damp grassy hollows) while the harshly pubescent plant grows in dry places, but when, for the first time, we saw large colonies growing together in the upper reaches of the Umzimkulu river, Southern Natal, in January 1975, their striking difference in ecological preferences was reinforced by a difference in flowering time: *N. undulata* was in full flower, whereas *N. agria* was only in bud. The herbarium material at our disposal shows that *N. undulata* flowers mainly in December and January, but as early as October and as late as March, *N. agraria* mainly in March and April, but as early as February and as late as May.

Dr Mats Thulin kindly compared specimens of both plants with the type of *Chrysocoma undulata* in Thunberg's herbarium and confirmed that the epithet belongs to the glandular plant. An examination of isotypes of *N. longifolia* DC. and *N. amplexicaulis* DC. at Kew showed them to be synonymous with *N. undulata*. It seems that Harvey did not see a specimen of the hairy plant when he was writing up Compositae for *Flora Capensis*. *N. undulata* is widely distributed from Riversdale distr., southern Cape, through the eastern highlands of South Africa to Inyanga in Rhodesia, while *N. agria* is more restricted, being recorded from Andriesberg near Queenstown thence eastwards to the Cape and Natal Drakensberg, Lesotho, and the mountainous eastern part of the Orange Free State.

210. Senecio citriceps Hilliard & Burtt, **species nova** *S. discodregeano* Hilliard & Burtt similis sed foliis radicalibus lineari-lanceolatis (haud lanceolatis vel late ellipticis), floribus flavis (haud purpureis) et achaeniis pilosis (nec glabris) recedens itaque fortasse *S. anomalochroo* Hilliard artius affinis. Ab hac habitu robustiore, capitulis multo majoribus (bracteis involucri c. 20, 9–12 mm longis, haud c. 12, 6 mm longis) et floribus flavis nec purpureis differt.

Herba perennis, caudice apice e basibus foliorum fibroso; caulis florifer solitarius, 55 cm usque altus, inferne simplex, superne in inflorescentia ramosus, striatus, tenuiter albo-griseo-arachnoideus, glabrescens, crebre foliatus. *Folia* radicalia erecta, 300 × 7 mm usque, dimidio longitudinis petiolari, lamina lineari-lanceolata, apice acuminato, basi angustato deinde iterum ampliato in parte petiolari laminae aequilata, marginibus incrassatis revolutis remote calloso-dentatis, supra glabra vel pilis paucis araneosis induta, infra tenuiter albo-coacta, costa glabra; caulina similia sed superiora sessilia, sursum decrescentia et in bracteas inflorescentiae transeuntia. *Capitula* discoidea, 2–12 in pedunculis 5–20 cm longis subnudis, corymbose disposita. Involucrum campanulatum; bracteae c. 20, 9–12 mm longae, floribus paulo breviores, tenuiter arachnoideae; calyculi bracteae paucae, dimidio involucri plus minusve aequales. *Flores* c. 70, flavi, lobis corollae et parte tubi inflata lineis resinosis notatis. *Achaenia* 6 mm longa, fusiformi-cylindrica, costis 10 latis glabris, in canaliculis dense albo-setosa.

NATAL. Polela distr., Mawahqua Mt, Bulwer–Impendhle road, "Clairmont", c. 1370 m, 4 i 1975, *Hilliard & Burtt* 7618 (holo. NU; iso. E, PRE). Umzinto distr., Umgaye, 600 m, 7 ii 1908, *Rudatis* 454 (E, K). Underberg distr., Garden Castle Nature Reserve, valley of main stream W of forester's house,

c. 1800 m, 28 i 1975, *Hilliard & Burtt* 7811 (E, K, NU); Bushman's Nek, slopes W of hotel, 17 ii 1975, *Hilliard & Burtt* 7975 (E, NU); lower slopes of Bamboo Mt, 16 xii 1974, *M. Grice s.n.* (E, NU).
TRANSKEI. Between Cala and Elliot, 1560 m, i 1896, *Bolus* 10146 (K).

The recognition of this species is clearly long overdue. It has been in herbaria since 1896 and is spread over a range of at least 245 miles. It was unknown to us till we found it in grassland on the eastern side of Mawahqua Mt near Bulwer in January 1975, and then in rapid succession in the Garden Castle Nature Reserve and at Bushman's Nek; in the two latter areas the main flowering period was over by the end of January. It is a very distinctive species and the affinities given in the diagnosis are not, in fact, very close ones.

211. Senecio parentalis Hilliard & Burtt, **species nova** *S. paucicalyculato* Klatt affinis sed habitu minus robusto, cauli basi 2 mm diam. (haud 4–10 mm), foliis in parte inferiore aggregatis (sed haud plurimis radicalibis) marginibus obscure, haud manifeste, denticulatis; etiam capitulis plerumque minoribus, bracteis involucri 5–6 mm, haud 6–7·5 mm, radiis 5, haud plerumque 8.

Herba perennis usque ad 60 cm alta, omnino glabra lana ad nodos infimos et in axillis occulta excepta; caules plerumque solitarii, interdum bini, infra inflorescentiam simplices, basin versus foliati, superne subnudi. *Folia* 4–5, basin caulis versus aggregata; saepe unum redactum in medio partis subnudae et bractea rami inflorescentiae subtendens; usque ad 6(–8) × 2 cm, inferiora elliptica, apice obtusa vel subacuta, basi angustato interdum petiolari, superiora ad basin et apicem acutum plus minusve aequaliter angustata, marginibus leviter incrassatis obscure et remote calloso-denticulatis in siccitate paulo coriacea, obscure penninervia. *Capitula* radiata, 12 usque in pedunculis longis nudis vel subnudis in corymbum patentem disposita. *Involucrum* turbinato-campanulatum; bracteae 8–10, 5–6 mm longae, floribus multo breviores, apice fimbriatae; bracteae calyculi minimae. *Flores* radii plerumque 5, limbo elliptico c. 7–10 × 2·5–3 mm; flores disci 17–21; corolla 5 mm longa; omnes vivide lutei. *Ovarium* 3 mm, glabrum. *Achaenia* non visa.
NATAL. Underberg distr., Garden Castle Nature Reserve, jeep track from Forest Station to Bushman's Nek, c. 1850 m, 2 ii 1975, *Hilliard & Burtt* 7908 (holo. NU; iso. E, K, MO, PRE); *ibidem*, "Sunken Valley", S of Drakensberg Garden Hotel, 4 ii 1975, *Hilliard & Burtt* 7951 (E, NU).

Typical *S. parentalis* has so far been found only in marshes on the Cave Sandstone in the Underberg district of southern Natal. It seems to be most closely allied to *S. paucicalyculatus* Klatt, but, in the herbarium, it can bear a superficial resemblance to the less robust specimens of *S. ruwenzoriensis* S. Moore (see no. 213 below). That species, however, lacks the woolly crown to the rootstock, and has a deep-seated tuber and triplinerved leaves; furthermore it is a plant of dry rocky slopes, not of marshes.

Two further specimens require mention here: Estcourt distr., Kamberg Nature Reserve, Stillerust Vlei, xi 1971, *Wright* 1193 (E, NU); Alfred distr., Ngeli Mt, c. 2100 m, on wet ground by flush, 4 i 1969, *Hilliard & Burtt* 5823

(E, NU). These may be conspecific with *S. parentalis*, but both have somewhat larger solitary or subsolitary heads; further material is needed before final decisions can be taken.

S. parentalis takes its name from the fact that it is apparently the recurrent parent in hybrid swarms (see no. 212) formed between it and *S. submontanus*.

212. Senecio parentalis (supra no. 211) × **S. submontanus** (infra no. 214). NATAL. Underberg distr., Garden Castle Nature Reserve, jeep track from Forest Station to Bushman's Nek, c. 1850 m, 2 ii 1975, *Hilliard & Burtt* 7909 (E, NU); *ibidem*, "Sunken Valley", S of Drakensberg Garden Hotel, 4 ii 1975, *Hilliard & Burtt* 7952–7956 (E, NU).

The most obvious differences between *S. parentalis* and *S. submontanus*, apart from the former being radiate and the latter discoid, lie in the involucral bracts and size of heads: *S. parentalis* has 8–10 bracts, 5 rays and 17–21 disc flowers, while *S. submontanus* has only 4–6 bracts and 7–10 flowers. Also the leaves of *S. submontanus* tend to be longer and less markedly aggregated towards the base of the stem; but this feature seems not to be altogether constant.

The hybrid plants all grew in the marshy areas with *S. parentalis*, and indeed this species was sometimes difficult to find in a pure state. *S. submontanus* was generally restricted to the slightly drier ground around the edge of the marsh, and here no hybrids were found.

At the first locality all the hybrids were collected under a single number (7909), but separate numbers were used for different forms in the second area where the hybrids were found.

The following notes summarise some of the obvious features:—

H. & B. 7952: discoid; involucral bracts 8–10, 4·5–6 mm long; 18–30 flowers all perfectly formed. Shorter in stature than *S. submontanus* and leaves tending to be crowded at base. Occupying considerable area in SE corner of marsh.

H. & B. 7953: bracts 7–10, 4·5–5 mm long; outer flowers bilabiate forming very short rays; leaves crowded at base.

H. & B. 7954: 3–4 rays, otherwise as *S. parentalis*.

H. & B. 7955: 3–5 very narrow rays, otherwise as *S. parentalis*.

H. & B. 7956: short-rayed plants, otherwise as *S. parentalis*.

It is clear that a much more critical study of these hybrid swarms is desirable, but it seems safe to suggest that back-crossing from the primary hybrids to *S. parentalis* has taken place.

213. Senecio ruwenzoriensis S. Moore in Journ. Linn. Soc. 35:355 (1902).

Type: [Uganda–Tanzania–Rwanda border] Mpororo, dry grassy hills, 5000 ft, *Scott Elliot* 8043 (BM, K).

Syn.: *S. paucifolius* DC., Prodr. 6:403 (1838); Harv. in Harv. & Sonder, Fl. Cap. 3:377 (1865)—non S. G. Gmel. (1774). Types: Cape, Uitenhage, *Ecklon* 1253 (G—DC); Tambukiland, *Ecklon* 1408 (G—DC); Zuurbergen, *Drège* 5847 (G—DC).

S. othonniformis Fourcade in Trans. Roy. Soc. S. Afr. 21:89 (1934). Types as for *S. paucifolius*.

S. ruwenzoriensis ranges from Kenya and Uganda south through the highlands of Tanzania, Zambia, Malawi, Moçambique and Rhodesia to the highlands of the eastern Transvaal, Natal, Lesotho, East Griqualand, the eastern Cape, and as far west as Swellendam.

De Candolle recognised the species in 1838, but his epithet had an earlier homonym, and when Fourcade re-named it a hundred years later he overlooked the fact that the plant has a wide range and that Spencer Moore had already named a specimen from the northern part of its area. Spencer Moore's epithet is slightly misleading; the specimen was collected by the 1893–4 Ruwenzori expedition at Mpororo, now on the Uganda–Tanzania–Rwanda border, as Scott Elliot's label on the isotype at Kew shows, and not on Ruwenzori itself.

214. Senecio submontanus Hilliard & Burtt, **species nova** *S. isatideo* DC. affinis sed foliis elliptico-oblongis vel lanceolato-ellipticis acutis vel acutissimis, nec oblongo-obovatis plus minusve obtusis, facile distinguitur. *S. adnato* DC. similis sed caudice apice lanato, capitulis discoideis, foliis brevioribus minus acuminatis basin caulis versus aggregatis differt.

Herba perennis usque ad 75 cm alta, omnino glabra, lana ad nodos infimos et in axillis occulta excepta; caulis solitarius, infra inflorescentiae ramos simplex, inferne foliatus, superne subnudus. *Folia* plerumque 3–5 cauli inferiori restricta (interdum unum in medio partis superioris et saepe folium redactum infra ramum inflorescentiae primum, ramis ulterioribus bracteis suffultis), elliptico-oblonga vel lanceolato-elliptica, usque as 17 × 2–3 cm, ratione longitudinis latetudini folii mediani 6·5–17:1, raro 4·5:1, apice acuta vel acutissima, basi lato amplectente et brevissime decurrente, marginibus leviter incrassatis integris vel obscure et remote calloso-denticulatis, in siccitate plus minusve coriacea, obscure penninervia. *Capitula* discoidea, angusta, numerosa in pedunculis parce bracteatis in paniculam corymbosam disposita. *Involucrum* turbinatum; bracteae 4–6, 4.5–6 mm longae, dimidium florum aequantes, apicibus fimbriatis; bracteae calyculi 1 vel 2, minimae. *Flores* 7–10, corolla 5–5·5 mm longa, vivide lutea. *Ovaria* 2·5–3 mm, glabra. *Achaenia* haud visa.

NATAL. Underberg distr., Garden Castle Nature Reserve, jeep track from Forest Station to Bushman's Nek, c. 1850 m, 2 ii 1975, *Hilliard & Burtt* 7907 (holo. NU; iso. E, K, MO, PRE); *ibidem*, "Sunken Valley", S of Drakensberg Garden Hotel, 4 ii 1975, *Hilliard & Burtt* 7957 (E, NU); *ibidem*, plateau S of Drakensberg Garden Hotel (path to Garden Castle), 30 i 1975, *Hilliard & Burtt* 7871 (E, NU). Bushman's Nek, Ngwanwane river valley towards foot of Bushman's Nek Pass, 21 vi 1973, *Hilliard & Burtt* 7407 (NU).

The small narrow heads of *S. submontanus* (reflected in the few involucral bracts and small number of flowers) distinguish it from similar species except *S. isatideus* DC., *S. isatidioides* Phillips & Smith, *S. adnatus* DC. and *S. hygrophilus* Dyer & Smith. Neither of the last two species has a woolly crown to the rootstock; they both have capitula with one or two ray flowers and may not be very closely allied to *S. submontanus*. S. *isatideus* and *S. isatidioides* are woolly at the crown and have discoid heads, but differ very obviously in their broadly obovate, thinner and more distinctly veined, leaves.

S. submontanus is found on the Cave Sandstone (or its derived soils) in the Drakensberg and takes its name from its occurrence in the Underberg district of southern Natal. It appears to hybridise with *S. parentalis* (see No. 211).

CYPERACEAE

215. Tetraria macowaniana B. L. Burtt, **nom. nov.**

Type: Cape, Somerset East, in summo monte Boschberg, 4500 ft, *Macowan* 1864 (holo. Z; iso. K).

Syn.: *Chaetospora hexandra* Boeckeler in Flora 61:37 (1878)—non *Tetraria hexandra* (Nees) Kuek. Type as above.

Tetraria macowanii C.B.Cl. in Durand & Schinz, Consp. Fl. Afr. 5:661 (1895), et in Thiselton-Dyer, Fl. Cap. 7:290 (1898), et Ill. Cyp. tab. 93, f. 5–8 (1909)—nomen illegit. Type as above.

Tetraria robusta (Kunth) C.B.Cl. var *pauperior* Kuekenth. in Fedde, Rep. Sp. Nov. 29:190 (1929), saltem quoad *Schlechter* 10078.

CAPE. Ceres distr., Koude Bokkeveld, Wagensdrift, 5500 ft., 21 i 1897, *Schlechter* 10078 (E, K). Worcester distr., Brandwacht Mt, iv 1929, *Stokoe* 18933 (K).

NATAL. Underberg distr., Garden Castle Nature Reserve, main stream valley west of forester's house, c. 1800 m, forming tufts on grassy hillside, 28 i 1975, *Hilliard & Burtt* 7792 (E, NU).

Since C. B. Clarke cited *Chaetospora hexandra* as a synonym when publishing *Tetraria macowanii* his name was illegitimate, for at that time there was no impediment to the use of the epithet *hexandra* in *Tetraria*. This, however, is no longer possible as it has since been used for *T. hexandra* (Nees) Kuek. [= *Macrochaetium hexandrum* (Nees) H. Pfeiff.]. The species therefore requires a new epithet and, in this case, there seems no objection to keeping as close as possible to that used by Clarke in *Flora Capensis*.

Boeckler described the style as "breviter trifido", but this was clearly an error. Through the kindness of Prof. C. D. K. Cook his type has been sent on loan from Zurich and re-examined: in the spikelet dissected 5 style arms 5 mm long were found.

Schlechter 10078 is a syntype of *T. robusta* var. *pauperior* Kuek., but does not seem to differ in any way from *T. macowaniana* and indeed C. B. Clarke identified the Kew sheet of this collection with Macowan's plant. It differs from *T. robusta* in having 6 stamens and 6–7 style arms. The two species are remarkably similar in general facies, but re-examination of the type of *T. robusta*, collected by Drège in Humansdorp distr., confirms that there are only 3 stamens and 3 style arms, and it should be kept distinct at present.

The disjunction between the type locality of *T. macowaniana* on the summit of the Boschberg and its new station in Natal amounts to some 300 miles. It is, however, not very remarkable as the two places are in similar climatic areas and much of the intervening country has been very poorly explored botanically. The jump from the Boschberg to the Worcester and Ceres districts is about 400 miles, but is much more surprising as it carries one into the winter rainfall area of the Cape. The distribution of this species, as known to us at present, serves to emphasise just how much fieldwork remains to be done.

DIOSCOREACEAE

216. Dioscorea brownii Schinz in Mém. Herb. Boiss. No. 20:11(1900); Schönl. in Rec. Albany Mus. 1, *in indice* (1903); Knuth, Pflanzenr., Dioscor. 94 (1924); Burkill in Journ. Linn. Soc. Bot. 56:402 (1960) in not.; Teichman, Schijff & Robbertse in Boissiera 24a:222 (1975.) **Plate 9.**

Type: Natal, Zuurberg, 4500 ft, xii 1883, *Tyson* 1829 (holo. Z, n.v.; iso. K).

Syn.: *D. tysonii* Schönl. in Rec. Albany Mus. 1:49 (1903)—non Baker (1899). Type: *Tyson* 1829 (as for *D. brownii*; GRA, n.v.).

Tuber with a conical crown, below which spread 3–5 finger-like processes up to 11 × 2·4 cm; new fingers arising each year from the base of the crown and more or less superimposed on those of previous year (up to 3 superimpositions seen); one stem each year from the apex of the crown with up to three old stem bases still visible. *Stem* solitary, erect, c. 1 m high, 3·8 cm diam. at base, striate, glabrous, with a few squamiform leaves in lowest quarter, densely leafy above, internodes between half and twice as long as petiole, always much shorter than leaf, lower foliage leaves the largest and sterile; female plant unbranched; male plant with lateral axillary branches shorter than the main axis, flowering, these (and occasionally the main axis) often flexuous at the tip and twining, when induced to, sinistrorsely. *Foliage leaves* spirally arranged, petiolate, glabrous, those towards the top of the stem and on the lateral branches decreasing in size (and not included in measurements); petiole 1–2 cm; lamina 10–13 × 2–3·5 mm across widest part, more or less lanceolate, often with basal auricles, shortly acuminate, 5–7 nerved. *Male inflorescence* axillary up to 7 cm long, a raceme of 1–3-fld more or less sessile cymes; bracts 2–3 mm long, lanceolate, acute. *Bracteoles* if present similar but smaller. *Male flower* with 6 green oblong tepals, 2 × 0·75 mm; stamens 6, 1·5 mm, anthers barely 0·5 mm; pistillode 1 mm. *Female inflorescence* axillary, racemose, 4–5 cm long; bracts narrowly lanceolate, acuminate, c. 3 mm long, bracteoles a little shorter. *Female flower* on pedicel 1·5–2 mm long elongating in fruit; including ovary c. 5 mm long; tepals 3 mm, oblong, incurved at tips, lower 2 mm green with hyaline margin very narrow at base widening upwards, upper 1 mm hyaline; staminodes 6, with rudimentary anther 0·5 mm adherent at base of tepal; styles 3, 2 mm long, shortly united at base and forming column for most of their length, out-curved at the tips with bifid stigmas. *Fruit* on pedicel c. 6 mm long, 2–2·5 cm long, tipped by short 3 mm beak and persistent perianth, each wing 6–7 mm broad. *Seeds* 2 in each loculus, attached in lower half of loculus, seed-body c. 4 × 3 mm, wing distal c. 11–12 × 6 mm, continued as very narrow margin at base of seed, the seeds of one loculus often somewhat dissimilar in shape.

NATAL. Alfred distr., Weza, Zuurberg, 4000–4500 ft, in tall grassland, 26 ii 1975, *Hilliard & Burtt* 7701/A, female, 7702/A, male (E, NU).

Dioscorea brownii has been collected at several places in the Natal midlands, but until now only the upper parts of male flowering specimens have been known. We collected female plants in flower and in almost mature fruit and also dug up one or two tubers. It has therefore been possible to give a complete description of the species for the first time.

Knuth, in his account of the genus for *Das Pflanzenreich*, referred *D. brownii* to subgen. *Helmia* sect. *Opsophyton*, which has seeds with downward

directed wings. Burkill (Journ. Linn. Soc. Bot. 56:402, 1960) was more cautious and said the species could not be placed without more complete material. His caution was justified for *D. brownii* proves to have wings on the upper sides of the seeds. The seed character alone restricts the placement of *D. brownii* in Knuth's key to subgen. *Stenophora* or subgen. *Testudinaria*, for whose distinction Knuth indicates an underground tuber in *Stenophora* and an above-ground one in *Testudinaria*. This would result in *D. brownii* being placed amongst the north temperate species of *Stenophora*. Burkill, however, characterises *Stenophora* as having a rhizome, not a tuber, and *D. brownii* clearly has no close affinity there. In fact Knuth's emphasis on the epigeal tuber of sect. *Testudinaria* proves to be unsound, for Archibald (in Journ. S Afr. Bot. 33:12, 1967) notes that the tuber of *D. sylvatica* is subterranean in deep soils, above ground where the soil is shallow.

With one exception all the characters of *D. brownii* point to its affinity with the wholly S African section *Testudinaria*. (We follow Burkill in using sectional rather than subgeneric rank.) The exception lies in the renewal of the tuber. In the other species the tuber grows by an "annual increment within the tuber from a continuous growth zone which increases the size of the tuber without altering its shape" (Burkill). In *D. brownii*, as indicated in the description above, there is an annual renewal of the tuber, the lobes of the new growth being superimposed above those of the old. For the rest there seems no major difference between *D. brownii* and the species of sect. *Testudinaria*. Certainly the flowers are remarkably similar to those of *D. elephantipes*, a comparison having been made with living material cultivated at Edinburgh.

Differences that one would not expect to be of sectional importance are that the stem of *D. brownii* is erect and strongly striate (not smooth as in *D. elephantipes* etc.) and the leaf-blade is much longer. But this is not an essential difference in leaf-form; it is simply brought about by the great elongation of the central lobe, so that the lateral lobes become mere appendages at its base or are almost lost. This difference in leaf-shape is quite possibly associated with the change in habit from a climber with spreading petioles and more or less pendent blades to an erect plant growing in tall grass and having ascending leaf-blades.

Careful study of tuber development from seed and of tuber renewal are obviously needed. Meanwhile, however, it seems reasonable to place the affinity of *D. brownii* with sect. *Testudinaria* and we ourselves would be prepared to include it in that section.

The authority for the sectional name is not immediately clear from Burkill's paper (Journ. S Afr. Bot. 18:177, 1952). In fact *Testudinaria* had previously been known at sectional level only as sect. *Eutestudinaria* (Uline in Engl. Bot. Jahrb. 25:157, 1898), a form of name now rejected. Burkill himself is the effective author at this rank and the full citation is:—

Dioscorea sect. **Testudinaria** (Salisb.) Burkill in Journ. S. Afr. Bot. 18:185 (1952).

Syn.: *Testudinaria* Salisb. in Burchell, Travels 2:147 (1824), reimp. 2:105 (1953).

Dioscorea subgen. *Testudinaria* (Salisb.) Uline in Engl. Bot. Jahrb. 25:157 (1898) excl. sect. *Stenophora*; Knuth in Pflanzenr., Diosc. 321 (1924).

PLATE 9. *Dioscorea brownii* Schinz (*H. & B.* 7702/A): A, fruiting stem; B, tuber.

Type of section: *D. elephantipes* (L' Hérit.) Engl.
Other species: *D. sylvatica* Eckl. & Zeyh.; *D. hemicrypta* Burkill.

GENTIANACEAE

217. Chironia peglerae Prain in Kew Bull. 1908:297 (1908).
NATAL. Underberg distr., valley of Umzimkulu above Drakensberg Garden Hotel, 1675 m, 29 i 1975 *Hilliard & Burtt* 7819 (E, NU); Estcourt distr., Kamberg Nature Reserve, 1952/53, *Wright* s.n. (NU).

The latest account of *Chironia* in South Africa (Marais & Verdoorn in Fl. S Afr. 26, 1963) records a gap in the distribution of *C. peglerae* from Kentani in the southern Transkei and Katberg in the E Cape to Giant's Castle in Estcourt distr., Natal. Our specimen from the Underberg district on southern Natal helps to bridge this gap, and we give a further record of the species from Kamberg, which is not far from Giant's Castle.

GERANIACEAE

218. Monsonia brevirostrata R. Knuth in Engl. Bot. Jahrb. 40:67 (1907) et Pflanzenr., Geran. 306, fig. 37B (1912); Burtt Davy, Fl. Pl. Ferns Transvaal 1:192 (1926).
Type: Cape, East Griqualand, between Elliot and Maclear, 1500 m, *Bolus* 8725 (K).
NATAL. Underberg distr., Bushman's Nek police post, on bare ground, annual, petals white veined purple, fallen by 1 pm, 18 ii 1975, *Hilliard & Burtt* 8005 (E, NU); Bamboo Mt, 3 iii 1974, *M. Grice s.n.* (NU).

In addition to the type Knuth cites "Kaffraria, Zuurberge (*Schlechter* ann. 1895, n. 6573)". The Zuurberg where Schlechter collected this number is not in Kaffraria but in Alfred district, southern Natal. The species is not recorded in J. H. Ross, *Flora of Natal* (1972), but is also known from the south eastern Transvaal (Ermelo, Wakkerstroom) and from the Orange Free State (Golden Gate Park).

LABIATAE

219. Hyptis mutabilis (A. Rich.) Briq. in Bull. Herb. Boiss. 4:788 (1896) var. **spicata** (Poit.) Briq. l.c.; Epling in Fedde, Rep. Sp. Nov., Beih. 85:361 (1936).
NATAL. Lions River distr., Cedara College of Agriculture, iii 1975, *Rhind* s.n. (NU).

A specimen of this plant was brought in to us from Cedara College of Agriculture near Pietermaritzburg, where it is established as a weed. We are indebted to Mr I. C. Hedge for identifying it. Mr Hedge tells us that it is native in the tropical and subtropical regions of the Americas and is now fairly widespread there and in the West Indies as an introduced weed. No record has been traced of it as an introduced species in the Old World. On the other hand, *H. pectinata* (L.) Poit., which was described from Jamaica and is widespread in the warmer parts of America, is a widespread weed in the warm parts of the Old World and has long been established in Natal.

LINACEAE

220. Linum bienne Mill., Gard. Dict. ed 8, no. 8 (1768); Davis, Fl. Turkey 2:447 (1967); Tutin et al., Fl. Eur. 2:209 (1968).
Type: Cult. spec. originating from Istria (BM).
NATAL. Lions River distr., Dargle, Kilgobbin farm, grassy forest clearing, pale blue flowers, 21 i 1975, *Hilliard & Burtt* 7730 (E, NU).

This is a native of western and southern Europe and eastwards to Iran. It seems to be well established where we collected it and has not, to our knowledge, previously been recorded in Natal or elsewhere in S Africa.