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Anderbergia B.NORD., a new genus of everlastings (Compositae-Gnaphalieae) from the Cape Province

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Abstract

The new genus *Anderbergia* B.NORD. comprises six species from the Cape Province, South Africa. Two species are transfers from *Petalacte* D.DON, viz. *A. epaleata* (HILLIARD & BURTT) B.NORD., comb.n. and *A. vlokii* (HILLIARD) B.NORD., comb.n. Four new species are described, viz. *A. rooibergensis* B.NORD. from the Rooiberg in Ladismith Div., *A. fallax* B.NORD. from the Langeberg near Swellendam, and *A. elsiae* B.NORD. and *A. ustulata* B.NORD. from mountains in Worcester Div. The genus *Anderbergia* is endemic to the southwestern Cape Province with a rather narrow range in the southern Cape fold mountain ranges. The new genus is allied to *Petalacte* D.DON, *Langebergia* ANDERB., and especially *Anaxeton* GAERTN., all South African genera belonging to the *Anaphalis* group of the tribe Gnaphalieae ('everlastings') of the Compositae. Keys, distribution maps, illustrations and descriptions are provided.

Key words: Flora of Cape Province; Compositae, Gnaphalieae, *Anderbergia*, *Petalacte*, *Langebergia*, *Anaxeton*; new genus, new species.

Zusammenfassung

Die neue Gattung *Anderbergia* B.NORD. umfasst sechs Arten aus der südafrikanischen Kap-Provinz. Zwei Arten sind Überführungen von der Gattung *Petalacte* D.DON, nämlich *A. epaleata* (HILLIARD & BURTT) B.NORD., comb.n., und *A. vlokii* (HILLIARD) B.NORD., comb.n. Vier neue Arten werden beschrieben: *A. rooibergensis* B.NORD. aus dem Rooiberg in Ladismith Div., *A. fallax* B.NORD. aus dem Langeberg nahe Swellendam, *A. elsiae* B.NORD. und *A. ustulata* B.NORD. aus Gebirgen in Worcester Div. *Anderbergia* ist offenbar auf Gebirgsgegenden im südwestlichen Inland der Kap-Provinz beschränkt. Diese neue Gattung ist mit *Petalacte* D.DON, *Langebergia* ANDERB. und besonders mit *Anaxeton* GAERTN. verwandt. Sie gehören alle zur *Anaphalis*-Gruppe in Tribus Gnaphalieae ("Immortellen") der Familie Compositae. Schlüssel, Beschreibungen, Illustrationen und Verbreitungskarten werden präsentiert.

Introduction

ANDERBERG (1991a), in his generic monograph of the large tribe Gnaphalieae, recognized 11 genera in the '*Anaphalis* group' within a new subtribe Cassiniinae ANDERB. This group of generally less spectacular 'everlastings' is distributed mainly in the southern hemisphere (S and C America, S Africa, Australia and New Zealand), but also represented in the northern hemisphere by many species of *Antennaria* GAERTN. and *Anaphalis* DC. In the Cape Province of South Africa, three smaller endemic genera belong to this group, viz. *Anaxeton* GAERTN., *Petalacte* D.DON and *Langebergia* ANDERB., and a fourth genus is added in this paper.

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The monotypic genus *Langebergia* ANDERB. was established to accomodate the "enigmatic species" *Petalacte canescens* DC. (ANDERBERG 1991a: 93 f.). This species had for some time been acknowledged as anomalous in both *Petalacte* and *Anaxeton* (LUNDGREN 1972, 1974). *Petalacte* remained polyphyletic, however, since ANDERBERG (l.c.) retained the species *P. epaleata* HILLIARD & BURTT, although he pointed out its aberrant position in that genus. More recently a third species of *Petalacte* was described as *P. vlokii* HILLIARD (1993).

In the present paper a new genus is proposed to accomodate the latter two species, which do not fit well in *Petalacte*, as well as four new species. The new genus is named *Anderbergia* to honour my friend and close colleague Dr. Arne Anderberg, the generic monographer of the tribe Gnaphalieae and related tribes of the former Inuleae (ANDERBERG 1991a, b, c, 1994).

Materials and methods

This particular study is based entirely on herbarium material (abbreviations in accordance with HOLMGREN et al. 1990), although the author has extensive field experience with regard to related genera such as *Petalacte* and *Anaxeton*. Floral details and especially micromorphological characters, such as those of ovary wall crystals, were studied on boiled material mounted in Hoyer's solution (cf. ANDERSON 1954). All drawings were made by the present author.

Discussion

The species of *Anderbergia* are tomentose shrubs or shrublets with many small capitula in dense corymbs, in these respects resembling the related South African genera. The leaves have distinctly revolute margins, thereby recalling *Anaxeton*, but differing from *Petalacte* and *Langebergia*, both of which have flat leaves. *Anaxeton*, with ten species in the southwestern Cape Province (LUNDGREN 1972, NORDENSTAM 1988), is obviously the most closely related genus. The species of *Anaxeton* usually have a distinct corymbophore, i.e. the upper part of the flowering branch is subscapose with reduced and very scattered leaves. In *Anderbergia* the flowering branches are evenly leafy to the capitulescence. Furthermore, in *Anaxeton* the upper leaf side is glabrous (or sparsely pilose in one species, *A. hirsutum* (THUNB.) LESS.), not constantly tomentose as in *Anderbergia*.

A group of four *Anderbergia* species, viz. *A. elsiae, vlokii, fallax* and *ustulata*, are similar in habit, being diffuse and small-leaved shrublets with dense terminal clusters of small flowerheads. They are separated mainly by characters of involucre and florets requiring close examination. It is noteworthy that the species of *Anderbergia* are all allopatric and each of them is known only from a single locality, so that little is known about infraspecific variation. However, the morphological differences are many, and even if some of them are hard to observe, the local populations appear to merit taxonomic recognition on the specific level.

The involucral bracts in *Anderbergia* are dimorphic as in *Anaxeton* and *Langebergia*, but unlike *Petalacte*, which has homomorphic phyllaries all tipped by a white petaloid portion. In *Anderbergia* the outer involucral bracts are narrow, brown and membranous,

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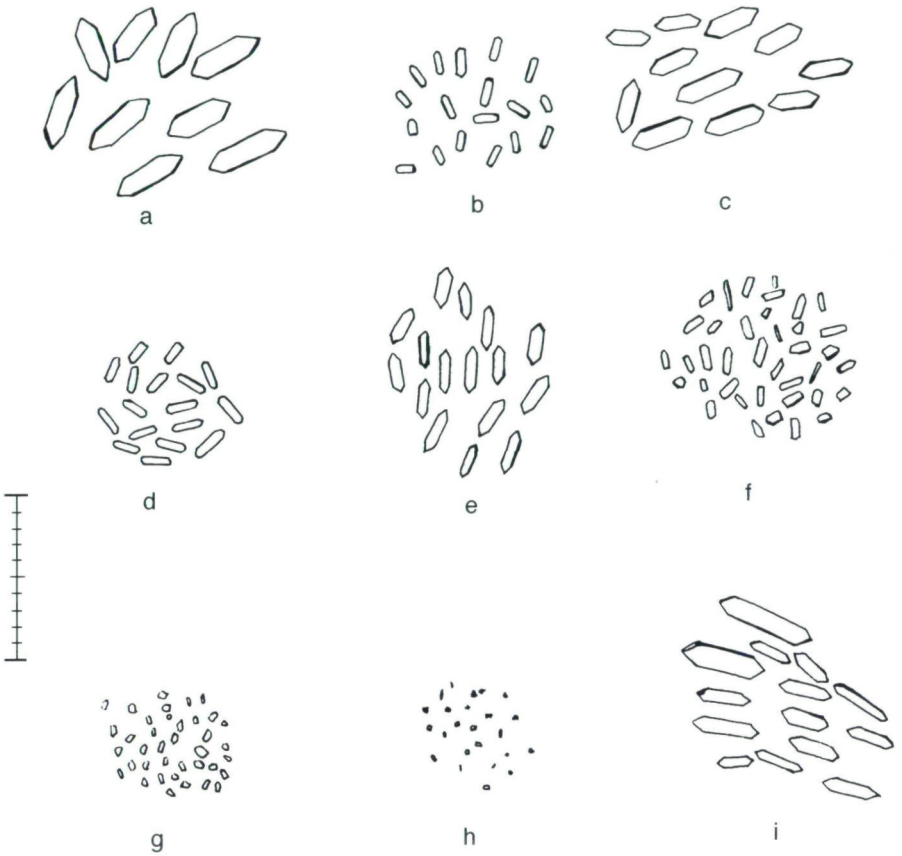

Fig. 1: Ovary wall crystals in *Anderbergia* and related genera: (a) *A. rooibergensis* B.NORD., (b) *A. epaleata* (HILLIARD & BURTT) B.NORD., (c) *A. elsiae* B.NORD., (d) *A. fallax* B.NORD., (e) *A. vlokii* (HILLIARD) B.NORD., (f) *A. ustulata* B.NORD., (g) *Langebergia canescens* (DC.) ANDERB., (h) *Petalacte coronata* (L.) D.DON, (i) *Anaxeton virgatum* DC. - The scale is 0.1 mm. [a: Vlok 2039 in S, b: Esterhuysen 13938 in BOL, c: Esterhuysen 31139 in S, d: Esterhuysen 24503 in BOL, e: Vlok 2416 in BOL, f: Esterhuysen 31150 in S, g: Esterhuysen 24455 in S, h: Wall s.n., 15. IX. 1938, in S, i: Nordenstam 1539 in S].

at least distally, while the inner ones are unguiculate with a distinct white petaloid apical portion. Involucral structure is thus very similar to that of *Anaxeton*, whereas *Langebergia* differs by the non-unguiculate involucral bracts.

The receptacle of *Anderbergia* is constantly epaleate, whereas the only species remaining in *Petalacte* has a paleate receptacle with large paleae resembling and apparently homologous to the inner involucral bracts.

The capitula in *Anderbergia* are few-flowered with one or two female florets and usually only four to five functionally male disc-florets. Occasional capitula (as observed in *A. fallax*) may lack female florets, thus functioning as entirely male.

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The functionally male disc-florets have a simple style without stigmatic papillae. Usually it is apically somewhat clavate, truncate and provided with obtuse sweeping-hairs, and its sole function is to push the pollen through the anther tube. In these respects *Anderbergia* is no different from *Petalacte* and *Anaxeton*, although a slight bifurcation is sometimes visible (fig. 3h). *Langebergia*, however, differs by having a distinctly bifurcate style in the disc-florets, and at least some of them have stigmatic bands and are perfectly fertile, even producing mature cypselas. The occurrence of perfect, bisexual disc-florets in *Langebergia* is interesting and has not been noted by its author (ANDERBERG 1991a) or any other authors.

The corolla is yellow or white, not purple as in related genera (*Petalacte, Langebergia, Anaxeton*). Although it is not easy to ascertain the floret colour on herbarium material, this difference appears to be real. Apparently the female floret corolla in *Anderbergia* is always whitish, or at most pale yellowish, whereas the corolla of the male florets is either distinctly white (*A. rooibergensis* only) or yellow (all other species). The constancy of this latter distinction needs confirmation on fresh material, preferably on entire populations in the field (cf. observation by HILLIARD 1993).

The pappus bristles are barbellate throughout, not basally minutely denticulate and apically subplumose as in *Petalacte*. The apical pappus teeth are variously shaped in *Anderbergia*, however, either rather long and more or less acute (approaching the 'subplumose' condition), or short and obtuse to rounded, but not as thickish-clavate and strongly opaque as in *Langebergia*.

According to ANDERBERG (1991a, 1994) the pappus bristles in *Langebergia* are basally free and provided with patent cilia, and in *Petalacte* likewise free, but without such cilia. HILLIARD & BURTT (1982: 270) also, at least in their discussion, describe the pappus bristles as basally free in *Petalacte coronata* and *P. epaleata* (now *Anderbergia epaleata*). These observations could not be confirmed on the material studied by me, however, since the pappus bristles appeared to be basally connate in *Petalacte* and *Langebergia*, and no patent cilia were found in either genus. In these respects *Anderbergia* is not materially different, having pappus bristles basally more or less distinctly connate (or sometimes discrete), and clearly not provided with patent cilia.

A special characteristic of *Anaxeton* is the much reduced pappus of the female florets. Also in the male florets the pappus is always much shorter than the corolla.

Cypsela hairs are not very useful for generic distinction within this group of genera. Presence versus absence of cypsela pubescence is of little taxonomic value, except on the specific level. The cypselas of *Petalacte* are glabrous, but those of *Langebergia* are shortly hirsute with clavate hairs. Cypsela pubescence in *Anaxeton* is quite varied, e.g. densely long tomentose in some species, sericeous or shortly hirsute in others, and only puberulous or minutely glandular in some (cf. LUNDGREN 1972). In *Anderbergia*, long cypsela hairs (setae) are found only very sparsely in *A. vlokii* and together with short clavate hairs. The other species of *Anderbergia* either have only short papilliform cypsela hairs or glabrous cypselas.

A feature not previously studied in this group of genera is the presence and structure of oxalate crystals in the ovary wall of the female floret. Such crystals are present in all species of *Anderbergia* (fig. 1a - f). They are prismatic flat bodies, varying in size and

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shape, but generally more or less hexagonal, octagonal or rectangular in outline. In *Anaxeton* quite similar crystals occur, as exemplified by *A. virgatum* DC. (fig. 1i). *Petalacte* and *Langebergia* both lack distinct large crystals. At most they have small bodies of irregular shape (square, rounded, star-shaped or needle-like), perhaps better characterized as crystal sand (fig. 1g - h).

Key to South African genera of the *Anaphalis* group

1 Leaves flat; all or no involucral bracts unguiculate 2

1* Leaves with revolute margins; inner involucral bracts unguiculate with broader petaloid portion, outer ones partly membranous, not clawed 3

2 All involucral bracts unguiculate with short and broad petaloid portion; receptacle paleate; pappus bristles apically subplumose; disc-floret style simple ..... *Petalacte*

2* Involucral bracts not unguiculate; outer ones without petaloid portion, inner ones with elongate petaloid portion; receptacle epaleate; pappus bristles with apical teeth short, subclavate, opaque; disc-floret style bifurcate ..... *Langebergia*

3 Leaves glabrous above (or sparsely pilose); flowering branches apically usually with reduced leaves (= corymbophore present); corolla purplish; pappus reduced especially in female florets ..... *Anaxeton*

3* Leaves tomentose on both sides (though sometimes glabrescent above with age); flowering branches evenly leafy to the top (= corymbophore absent); corolla white or yellow; pappus bristles well developed in all florets ..... *Anderbergia*

Taxonomy

Anderbergia B.NORD., gen.n.

Type: *A. epaleata* (HILLIARD & BURTT) B.NORD.

Frutices vel fruticuli tomentosi erecti vel diffusi. Folia alterna sessilia integra eglandulosa tomentosa, margine revoluto. Capitula heterogama disciformia dense corymbosa. Involucri bracteae dimorphae, exteriores angustae lineares - oblanceolatae vel spathulatae tomentosae apice membranaceae brunneae - fuscae; interiores unguiculatae apice petaloideae albae opacae. Receptaculum epaleatum. Flosculi feminei (0 -) 1 - 2; corolla anguste tubulosa apice glandulosa minute lobata, stylo bifurcato. Cypsela glabra vel breviter hirsuta. Pappi setae uniseriatae basi connatae vel liberae barbellatae. Flosculi disci pauci masculi; corolla alba vel flava basi tubulosa apice ampliata campanulata quinquelobata glandulosa. Antherae basi longe caudatae, appendice apicale plana ovata; endothecio polarato. Stylus simplex sterilis apice subclavato vel truncato interdum minute bifido. Ovarium abortivum glabrum bivenosum. Pappi setae uniseriatae basi breviter connatae vel liberae barbellatae.

Erect or diffuse shrublets without stolons, with greyish-whitish tomentum. Leaves alternate, sessile, simple, entire, tomentose, eglandular, with revolute margins. Capitula heterogamous, small, disciform, in terminal dense corymbs. Involucral bracts dimorphic, ± tomentose, with undivided stereome; outer involucral bracts narrowly linear to oblong or spatulate with membranous brown distal portion; inner involucral bracts unguiculate with a linear-oblong, ± tomentose claw and a white opaque glabrous petaloid apical portion.

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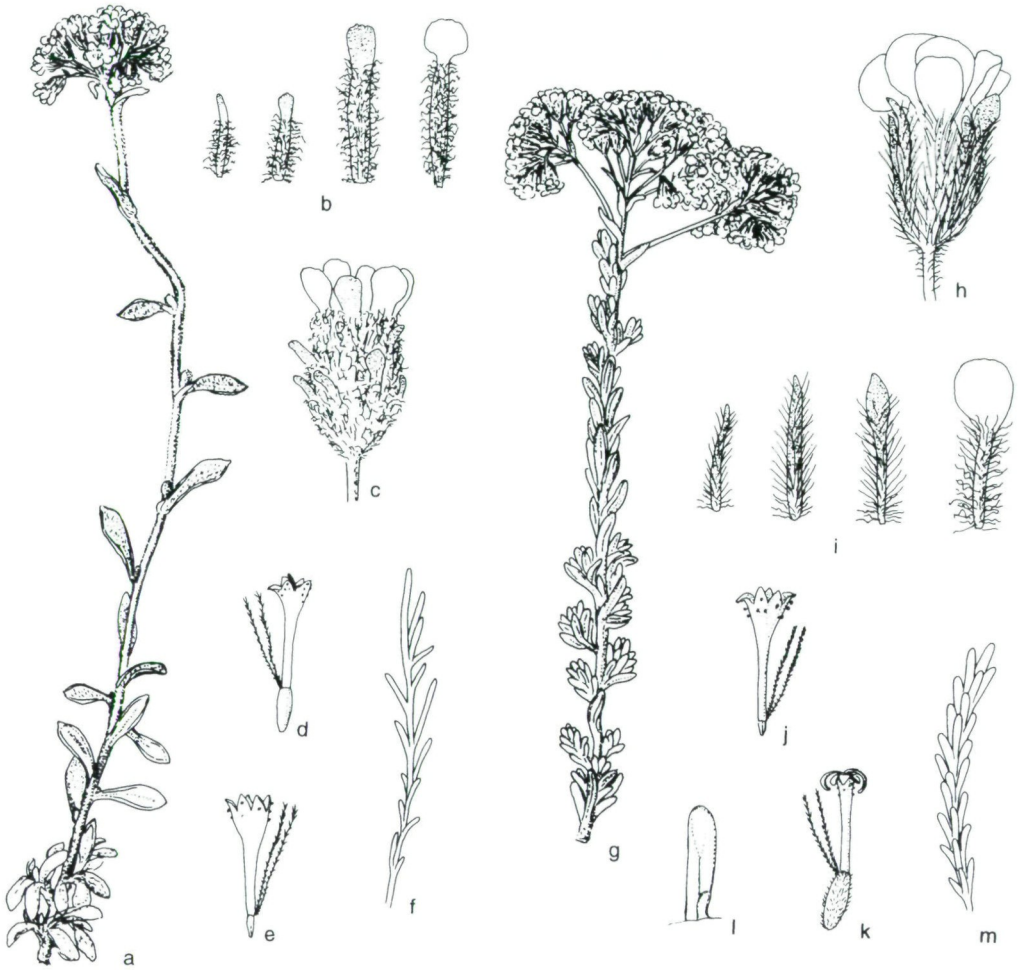

Fig. 2: *Anderbergia epaleata* (HILLIARD & BURTT) B.NORD. (a - f) and *A. rooibergensis* B.NORD. (g - m): (a, g) habit, x 1, (b, i) involucral bracts, x5.5, (c, h) capitulum, x 5.5, (d, k) female floret, x 5.5, (e, j) male floret, x 5.5, (f, m) tip of pappus bristle, x 35, (l) cypsela hair, x 85. [a - f: Esterhuysen 13938 in BOL, g - m: Vlok 2039 in S].

Receptacle epaleate. Female florets (0 -) 1 - 2; corolla white or yellowish, shortly lobed; style bifurcate. Cypsela ellipsoid-oblong, glabrous or shortly hirsute with papilliform non-myxogenic twin hairs, rarely also sparsely setose with longer narrower hairs. Ovary wall crystals prismatic (rectangular, hexa- or octagonal), homomorphic or heteromorphic. Pappus bristles uniseriate, basally shortly connate or nearly discrete, without patent cilia, barbellate throughout with usually short acute to obtuse teeth. Functionally male florets few (3 - 6); corolla white or yellow, tubular below, with a campanulate five-lobed limb; lobes erect to spreading, with marginal veins reaching the lobe apex. Anthers with basal tails and apical flat ± ovate-triangular appendage; endothecium

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polarized; filament collar elongate, straight. Style sterile, simple with subclavate or truncate tip, sometimes minutely bifid, with obtuse, short sweeping-hairs; stylophore distinct, broader than style. Ovary aborted, glabrous, 2-veined. Pappus bristles uniseriate, basally shortly connate or almost discrete, without patent cilia, barbellate throughout with acute teeth, apical teeth acute to obtuse or subclavate.

Key to the species of *Anderbergia*

1 Capitulescence somewhat loose with at least some distinct branches, 1.5 - 5 cm wide; capitula 5 - 5.5 mm long; erect or ascending, compactly branching shrubs with brachyblasts 2

1* Capitulescence compact, 1 - 1.8 cm wide; capitula 2.5 - 4.5 mm long; diffusely branching slender shrublets 3

2 Leaves spatulate to narrowly obovate-oblanceolate, c. 1 cm long and mostly 3 - 4 mm wide; involucre brownish woolly with entangled hairs; apical pappus teeth narrow, subacute, longer than bristle diameter ..... 1. *A. epaleata*

2* Leaves mostly oblong, c. 0.5 cm long and 1.5 - 2 mm wide; outer involucral bracts white-sericeous with long, rather straight, glossy hairs; pappus apically barbellate with short teeth ..... 2. *A. rooibergensis*

3 Outermost involucral bracts short, 1.5 - 2 mm long, less than 1/2 of involucre length; cypsela hirsute ..... 5. *A. fallax*

3* Outermost involucral bracts 2 - 3.5 mm long, about 1/2 of involucre length or longer; cypsela glabrous or subglabrous 4

4 Petaloid involucral bracts basally glabrous; outer involucral bracts about 1/2 of involucre length; female florets usually two ..... 4. *A. vlokii*

4* Claw of petaloid involucral bracts tomentose from the base; outer involucral bracts longer than 1/2 the involucre length; female floret normally one 5

5 Petaloid tip of inner involucral bracts 1.2 - 1.5 mm long and wide; male florets 6 - 7; cypsela glabrous; apical pappus teeth in female florets short, sparse, acute, in male florets thickened, dense, obtuse-rounded, spreading ..... 3. *A. elsiae*

5* Petaloid tip of inner involucral bracts c. 1 mm long and wide; male florets 4; cypsela with a few papilliform hairs; apical pappus teeth in female florets slender, acute, in male florets erecto-patent, obtuse ..... 6. *A. ustulata*

1. *A. epaleata* (HILLIARD & BURTT) B.NORD., comb.n.

≡ Basionym: *Petalacte epaleata* HILLIARD & BURTT, Notes Royal Bot. Gard. Edinburgh 40: 270 (1982).

Type: Cape Prov., Ladismith Div., S slopes of Swartbergen near Ladismith, 6. IX. 1947, Esterhuysen 13938 [holo BOL!].

Figs. 1b, 2a - f, 5.

A much-branched suberect to ascending shrublet up to c. 0.5 m tall, closely leafy and with some brachyblasts; flowering branches more laxly leafy. Leaves erecto-patent to spreading, spatulate to narrowly oblong-obovate, 7 - 13 mm long, (2.5 -) 3 - 4 mm wide, flat with narrowly revolute margins, distinctly midribbed on the lower side, half-

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clasping, greyish-tomentose but glabrescent with age on upper side, apically obtuse to rounded and apiculate. Capitulescence somewhat loosely branched with corymbiform clusters of heads (some branches clearly visible), 1.5 - 3 cm wide. Capitulum c. 5 mm long and 2 - 3 mm wide. Outer involucral bracts 7 - 9, linear-lanceolate to narrowly oblong, 2 - 4 mm long, light brownish-greyish woolly with glabrous, brown, membranous, obtuse to truncate tips; inner involucral bracts 7 - 8, unguiculate, 4 - 4.5 mm long, claw linear to oblong, whitish-tomentose, apical petaloid portion broadly ovate to rounded, 1 - 1.2 mm long and wide. Female floret 1; corolla tubular, c. 2.5 mm long, yellow, shortly 5-lobed, apically glandular; ovary glabrous. Pappus as in male florets. Male florets 4 - 5; corolla yellow, 2.5 - 3 mm long, tubular below, narrowly campanulate above, 5-lobed, apically glandular. Anthers c. 1 mm long incl. narrowly ovate-triangular obtuse apical appendage. Style simple, apically truncate or minutely bifid; stylophore distinct, broader than style. Pappus bristles basally connate, barbellate throughout with slender ± acute teeth; apical teeth elongated, distinctly longer than bristle width.

A. epaleata has larger leaves than any of its congeners, usually around 1 cm long and distinctly spatulate with a narrow revolute margin. This species is so far known only from the southern slopes of Swartbergen near Ladismith. Specimens from the Rooiberg (also in Ladismith Div.) were referred to *P. epaleata* in HILLIARD (1993), but are here regarded as specifically distinct (*A. rooibergensis*, below).

2. *A. rooibergensis* B.NORD., sp.n.

Type: Cape Prov., Ladismith Div., Rooiberg mountain, above Boskloof, 4200 ft., 2. XI. 1988, Vlok 2039 [holo S!, iso E].
Figs. 1a, 2g - m, 5.

Frutex erectus ramosus brachyblastis numerosis instructus. Folia densa suberecta ad erecto-patentia oblonga cinereo-tomentosa c. 5 mm longa margine valde revoluta apice obtusa apiculata. Capitula numerosa sat dense corymbosa c. 5 mm longa. Involucri bracteae exteriores filiformes ad anguste oblongo-oblanceolatae albo- vel cinereo-sericeae membranaceae fuscae, interiores unguiculatae tomentosae lamina petaloidea nivea glabra late oblonga ad elliptico-oblonga vel subquadrata. Flosculus femineus 1, corolla alba, styli ramuli valde exserti, cypsela breviter hirsuta, pappi setae acute barbellatae basi subdiscretae. Flosculi masculi 4 - 5, corolla alba, pappi setae barbellatae dentibus apicalibus brevibus obtusis.

A rather compact, much-branched, erect shrub up to 0.8 m tall, with numerous densely leafy brachyblasts and closely leafy flowering branches. Leaves suberect to erecto-patent, oblong, c. 5 mm long and 1.5 - 2 mm wide, greyish-tomentose, with distinctly revolute margins and an elevated midrib on lower side, apically obtuse and apiculate. Capitulescence rather loose with distinct branches, 2 - 5 cm in diam., consisting of several corymbiform capitula clusters. Capitulum 5 - 5.5 mm long, 2 - 3 mm wide. Outer involucral bracts 6 - 9, filiform-linear to narrowly oblong-oblanceolate, 2.5 - 4 mm long, greyish-white sericeous with long glossy hairs, membranous, brown or dark brown throughout or partially (distally), acute to obtuse (often 1 - 2 spatulate to subunguiculate, intermediary to inner bracts). Inner involucral bracts (8 -)9, unguiculate; claw narrow, linear to narrowly oblong, white-tomentose; apical petaloid portion broadly oblong to elliptic-oblong or subsquare, 1.5 mm long, 1.2 - 1.5 mm wide, rounded-truncate or slightly emarginate. Female floret 1; corolla tubular, somewhat widening above, c. 2.5 mm

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long, white, apically glandular and shortly 5-lobed. Style branches up to 1 mm long, much exserted. Cypsela ellipsoid-oblong, 1.6 - 1.8 mm long, 0.6 - 0.7 mm wide, terete but faintly ribbed, brownish, shortly hirsute with obtuse duplex hairs and a few longer thinner setae. Ovary wall crystals largely homomorphic, acutely hexagonal, flat. Pappus bristles finely and acutely barbellate, basally barely connate or discrete, apical teeth more white and opaque. Male florets 4 - 5. Corolla white, 3 - 3.5 mm long, tubular below, narrowly campanulate above, apically 5-lobed and glandular. Anthers c. 1 mm long incl. triangular-ovate obtuse apical appendage; filament collar long and narrow; anther tails long (at least equalling collar), branching. Style base swollen, placed on a distinct stylophore, simple with subclavate truncate tip; sweeping-hairs papilliform, rounded-obtuse. Pappus bristles finely barbellate throughout with apical teeth short, densely set, obtuse and opaque.

This collection was misidentified as *Petalacte epaleata* (now *Anderbergia epaleata*) by HILLIARD (1993). It differs in a number of characters, however, and certainly represents a separate species. The leaves are distinctly smaller and more closely set, often crowded on brachyblasts. The leaves are oblong rather than spatulate, and their margins are more distinctly revolute than in *A. epaleata*. Furthermore, the capitulescence is more lax and broad with a different type of indumentum. Thus, the outer involucral bracts of *A. rooibergensis* are glossy and whitish sericeous, as compared to the greyish-brownish, thin and araneose tomentum in *A. epaleata*. Other distinctive features of *A. rooibergensis* are the larger petaloid tips of the inner involucral bracts, the pubescent cypselas, and the very different pappus with short and obtuse apical teeth (cf. fig. 2m).

Another collection from the Rooiberg was cited as *Petalacte epaleata* by HILLIARD & BURTT (1989: 207), viz. Oliver 5396 [E, NU, STE]. I have not seen this collection, which very likely belongs to *A. rooibergensis*.

3. *A. elsiae* B.NORD., sp.n.

Type: Cape Prov., Worcester Div., Keeromsberg, slopes on NE side, S aspect, 3000 ft., 5. IX. 1965, Esterhuysen 31139 [holo BOL!, iso S!].
Figs. 1c, 3a - j, 5.

Fruticulus erectus diffuse ramosus. Folia lanceolata ad anguste oblonga 5 - 10 mm longa tomentosa margine revoluta apice obtusa vel rotundata apiculata. Capitula dense aggregata 4 - 4.5 mm longa. Involucri bracteae praeter apices tomentosae, exteriores filiformes ad lineares apice fuscae membranaceae, interiores unguiculatae lamina petaloidea nivea rotundato-quadrata. Flosculus femineus 1; corolla flava; cypsela glabra; pappi setae barbellatae dentibus apicalibus brevibus rotundato-obtusis. Flosculi masculi 6 - 7; corolla flava glandulosa; pappi setae barbellatae dentibus apicalibus brevibus rotundato-obtusis.

Diffusely branching slender shrublet 0.3 - 0.5 m high, greyish-tomentose throughout, older stems and branches glabrescent. Leaves lanceolate to narrowly oblong, 0.5 - 1 cm long, 1.5 - 2 mm wide, margins revolute, apex obtuse to rounded and dark-apiculate. Capitula 15 - 20, in dense, terminal, corymbiform, 1.2 - 1.8 cm wide synflorescence. Involucre cup-shaped, 4 - 4.5 mm high, 2 - 3 mm wide. Involucral bracts 18 - 19; outer 9 - 11, filiform-linear, 2.5 - 3 mm long, 0.2 - 0.5 mm wide, woolly, with dark brown, membranous, glabrous tip; inner c. 8, unguiculate, c. 4 mm long, with a linear, subcoriaceous, yellowish-greenish, woolly claw (c. 2.5 mm long); white petaloid portion

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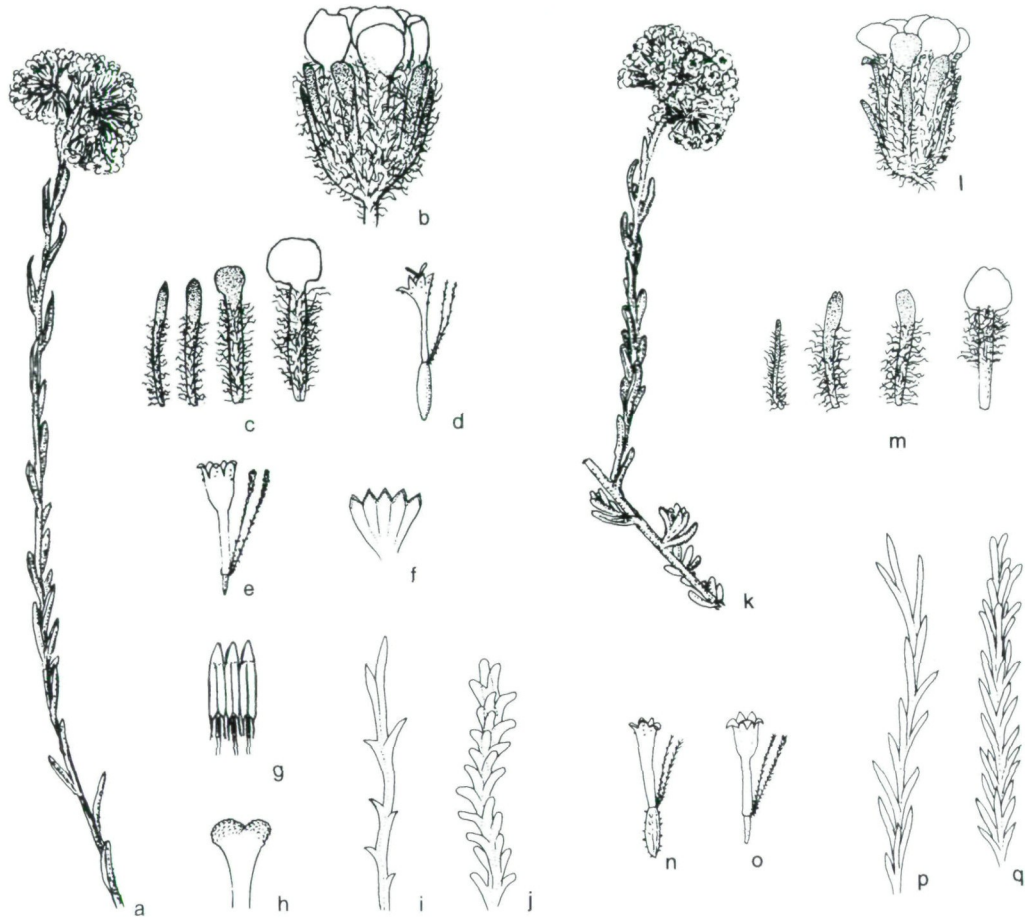

Fig. 3: *Anderbergia elsiae* B.NORD. (a - j) and *A. vlokii* (HILLIARD) B.NORD. (k - q): (a, k) habit, x1, (b, l) capitulum, x 5.5, (c, m) involucral bracts, x 5.5, (d, n) female floret, x 5.5, (e, o) male floret, x 5.5, (f) corolla of male floret laid out, x 5.5, (g) anthers, x 12, (h) style tip from male floret, x 35, (i, p) tip of pappus bristle from female floret, x 35, (j, q) tip of pappus bristle from male floret, x 35. [a - j: Esterhuysen 31139 in S, k - q: Vlok 2416 in BOL].

rounded-square, 1.2 - 1.5 mm long and wide, sometimes truncate or emarginate, snow-white. Female floret 1; corolla shortly 5 - 6-lobed, 2.3 mm long; style branches c. 1 mm long, linear-filiform; cypsela (immature) elliptic-oblong, ribbed, glabrous; pappus bristles basally shortly connate, barbellate throughout with acute teeth, apical teeth short, sparse. Functionally male florets 6 - 7; corolla 5-lobed, yellow, glandular on the limb with shortly stalked or sessile, golden yellow, rounded glands. Anthers c. 1 mm long incl. narrowly ovate-triangular obtuse appendage. Style simple, filiform, with somewhat dilated, shortly bilobed tip; ovary aborted, narrow, glabrous, with two vascular strands. Pappus bristles c. 8 - 10, slender and flexuous, basally shortly connate, barbellate with spreading acute teeth from the base, apically thickened and more opaque with spreading short and thickened rounded to obtuse teeth.

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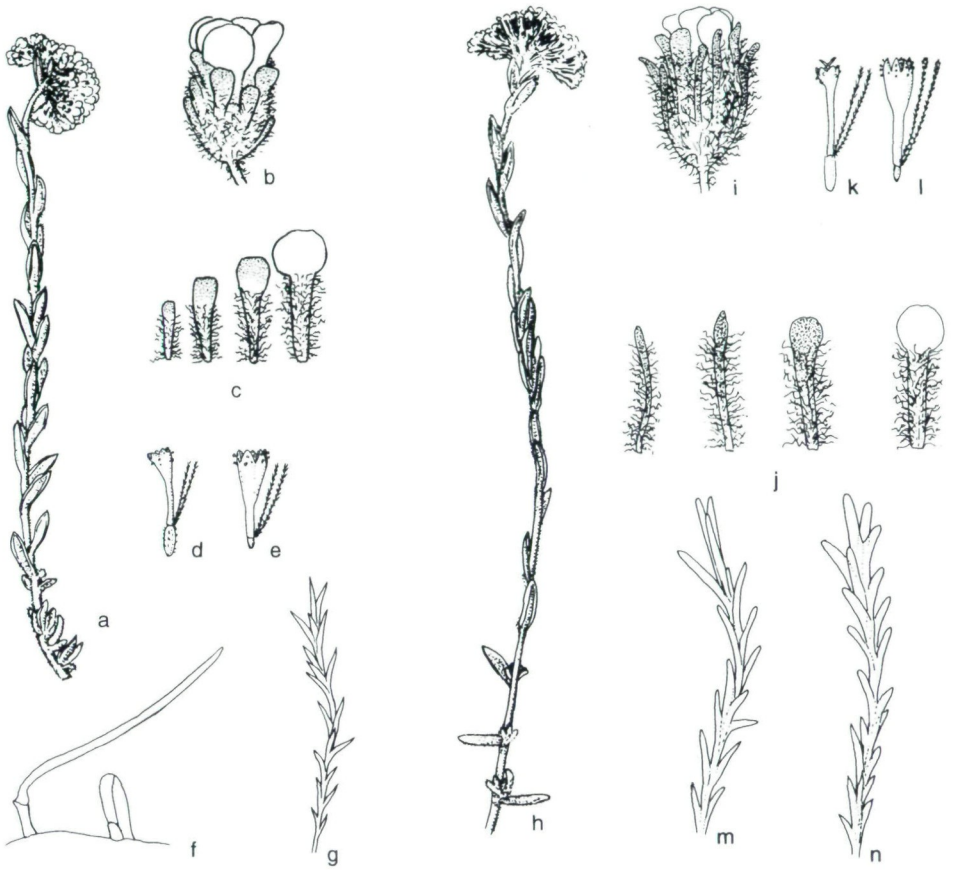

Fig. 4: *Anderbergia fallax* B.NORD. (a - g) and *A. ustulata* B.NORD. (h - n): (a, h) habit, x1, (b, i) capitulum, x 5.5, (c, j) involucral bracts, x 5.5, (d, k) female floret, x 5.5, (e, l) male floret, x 5.5, (f) cypsela hairs, x 85, (g, n) tip of pappus bristle from male floret, x 35, (m) tip of pappus bristle from female floret, x 35. [a - g: Esterhuysen 24503 in S, h - n: Esterhuysen 31150 in S].

It is a pleasure to name this species after Miss Elsie Esterhuysen, who found most of the material available of this genus and is indeed one of the most eminent plant collectors of the 20th century.

This species resembles the three following species, but has larger capitula with more florets, longer outer involucral bracts, and glabrous cypselas. It is so far only known from the type locality on the Keeromsberg, which also marks the western limit of the genus.

4. *A. vlokii* (HILLIARD) B.NORD., comb.n.

≡ Basionym: *Petalacte vlokii* HILLIARD, Edinb. J. Bot. 50: 181 (1993).
Type: Cape Prov., Montagu Div., on crest of Waboomsberg, on farm Pypsteelsfontein, S facing slope, 4200 ft., 29. IX. 1990, Vlok 2416 [holo E, iso BOL!, K].
Figs. 1e, 3k - q, 6.

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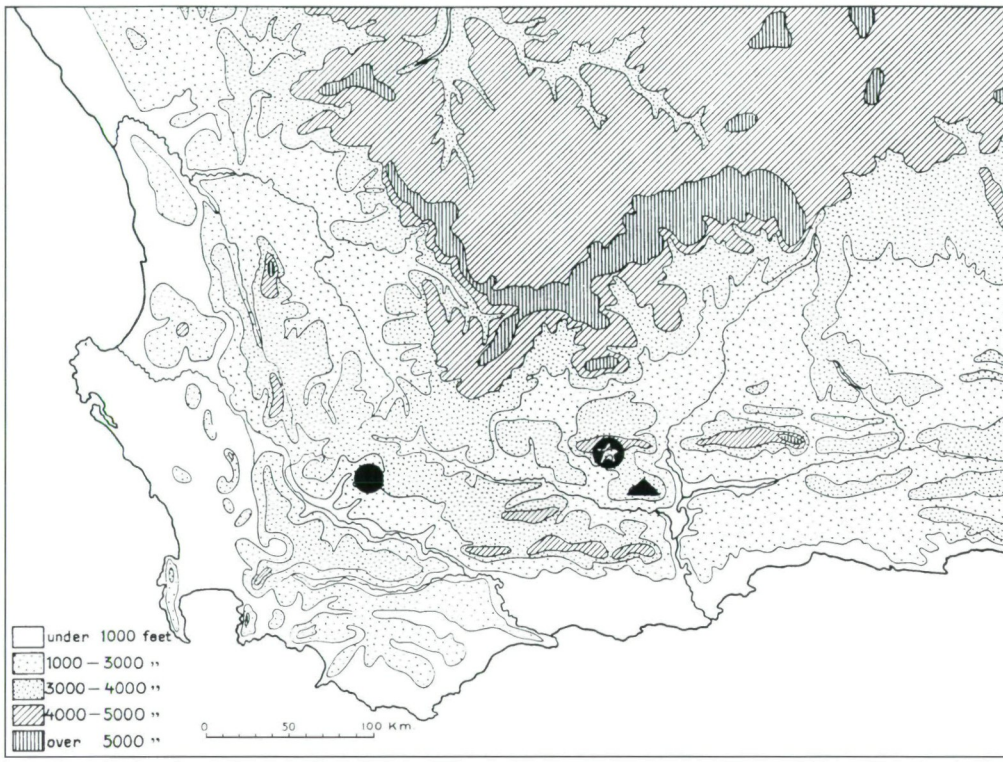

Fig. 5: Distribution of *Anderbergia epaleata* (HILLIARD & BURTT) B.NORD. (star), *A. rooibergensis* B.NORD. (triangle) and *A. elsiae* B.NORD. (dot).

Loosely branched shrublet 0.2 - 0.4 m high, greyish-white-tomentose throughout, though old stems glabrescent. Leaves evenly distributed or closely set on scattered brachyblasts, oblong, 4 - 6 mm long, 0.7 - 1.5 mm wide, upper side loosely cobwebby-tomentose, lower side more densely so, midrib indistinct, margins much revolute, apex obtuse to rounded and minutely apiculate but mostly without a distinct apiculus. Capitula c. 10 - 40 in dense, rounded corymbs 1 - 2 cm in diam. Capitulum 3 - 4 mm long, 2 - 2.5 mm wide. Outer involucral bracts 9 - 11, filiform-linear to oblanceolate, 2 - 3 mm long, 0.1 - 0.5 mm wide, brown or dark brown, whitish-cobwebby-tomentose with obtuse to rounded membranous, glabrous tip. Inner involucral bracts 6 - 7, unguiculate, 3.5 - 4 mm long; claw narrowly oblong, greenish with a purplish tinge, basally glabrous but distally cobwebby-tomentose; petaloid portion suborbicular to square, c. 1 mm long and wide. Female florets (1 -) 2. Corolla tubular, 2 - 2.2 mm long, apically shortly 5-lobed, glandular; style branches c. 0.5 mm long, little exserted. Cypsela narrowly ellipsoid-oblong, shiny brownish, ribbed, subglabrous with only few and short papillae mainly apically. Ovary wall crystals homomorphic, prismatic, sharply hexagonal. Pappus bristles basally flattened and widened and distinctly connate, barbellate throughout with acute slender teeth also apically. Functionally male florets usually 4; corolla yellow, 2.2 - 2.7 mm long, with a campanulate 5-lobed limb, glandular on the

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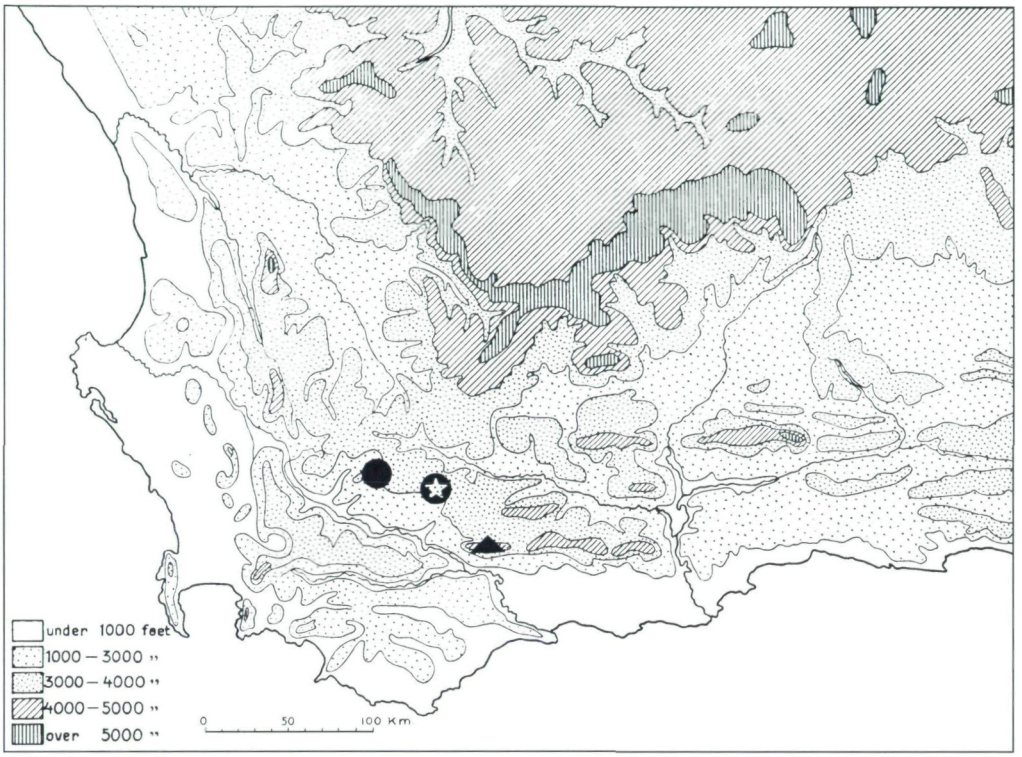

Fig. 6: Distribution of *Anderbergia vlokii* (HILLIARD) B.NORD. (star), *A. fallax* B.NORD. (triangle) and *A. ustulata* B.NORD. (dot).

limb with shortly stalked or subsessile glands. Anthers with a triangular-ovate obtuse apical appendage. Style simple, apically subtruncate, emarginate or slightly bifid. Ovary aborted, glabrous, 2-veined. Pappus bristles basally somewhat flattened and distinctly connate, barbellate throughout with mostly acute teeth, but apical teeth obtuse and closely set.

As now circumscribed this species is only known from the Waboomsberg in Montagu Div. One collection referred to this species by HILLARD (1993), viz. Esterhuysen 24503, is here described as another new species, *A. fallax* B.NORD.

One specific feature of *A. vlokii* is the absence of pubescence basally on the inner involucral bracts (fig. 3m). The female florets are usually two in number, all other species of the genus having mostly a single one. In pappus characters and oxalate crystal morphology, *A. vlokii* resembles *A. rooibergensis*, but differs significantly by the diffuse and slender habit, the leaves lacking a prominent midvein on the lower side, the araneose rather than sericeous tomentum of the outer involucral bracts, the smaller petaloid tips to the inner phyllaries, and the almost glabrous cypselas. Besides, there seems to be a difference in corolla colour, viz. yellow in *A. vlokii* but white in *A. rooibergensis*, as observed by the collector, Mr. J.H.J. Vlok.

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5. *A. fallax* B.NORD., sp.n.

Type: Cape Prov., Montagu - Swellendam Div., Goedgeloof Pk., Langeberg near Swellendam, S slopes, 3500 ft., 3. IX. 1955, Esterhuysen 24503 [holo BOL!, iso BOL (4)!, NU, S (2)!].
Figs. 1d, 4a - g, 6.

Fruticulus erectus ramosus diffusus. Folia anguste oblongo-oblanceolata 5 - 10 mm longa, supra laxe araneoso-tomentosa, subtus dense tomentosa, margine revoluta, apice distincte apiculata. Capitula dense aggregata 3 - 3.5 mm longa. Involucri bracteae praeter apices araneoso-tomentosae, exteriores lineares vel anguste oblongae ad oblanceolatae vel spathulatae apicem versus membranaceae brunneae, interiores unguiculatae, lamina petaloidea nivea oblongo-rotundata ad late obovata. Flosculus femineus (0 -) 1, cypsela brevihirsuta, pappi setae tenues acute barbellatae basi subdiscretae. Flosculi masculi 4, corolla flava valde glandulosa glandulis stipitatis, pappi setae ut in flosculo femineo.

Erect to diffuse shrublet 0.1 - 0.6 m high, repeatedly branching, greyish-tomentose with older branches glabrescent. Leaves evenly distributed along flowering branches and some crowded on brachyblasts, narrowly oblong-oblanceolate, 5 - 10 mm long, 1 - 2 mm wide, cobwebby-tomentose on both sides, more densely so on lower side, margins revolute, apex acutely apiculate with a distinct firm apiculus. Synflorescence compact, rounded, 1 - 2 cm wide. Involucre cup-shaped to campanulate, 3 - 3.5 mm long, 2 - 3 mm wide. Outer involucral bracts 9 - 11, linear to narrowly oblong or oblanceolate or spatulate, 1.5 - 2.5 mm long, 0.2 - 0.7 mm wide, greyish or light brownish cobwebby-tomentose with membranous brown glabrous obtuse to truncate tips. Inner petaloid involucral bracts c. 7, unguiculate, 2.5 - 3 mm long; claw cobwebby-tomentose from the base; petaloid portion rounded-oblong to broadly obovate, c. 1.2 mm long, 1.2 - 1.5 mm wide. Female floret (0 -)1; corolla 2 - 2.5 mm long, apically distinctly glandular with mostly stalked glands. Cypsela (immature) elliptic-oblong, sparsely and shortly hirsute with papilliform obtuse hairs and a few longer and thinner setae. Ovary wall crystals mostly homomorphic, prismatic, bluntly octagonal. Pappus bristles c. 10 - 15, slender, 1.5 - 2 mm long, basally barely connate, barbellate throughout with acute teeth. Functionally male florets 4; corolla 2 - 2.5 mm long, yellow, with campanulate 5-lobed limb, distinctly glandular with stalked glands. Anthers c. 1 mm long excl. tails, appendage triangular-ovate. Style simple, truncate. Ovary aborted, glabrous, 2-veined. Pappus bristles c. 10 - 15, 1.5 - 2 mm long, slender, basally barely connate, barbellate throughout with acute teeth.

This taxon is known from a single, but rich collection of eight sheets. It was first identified as *Petalacte epaleata* by HILLIARD & BURTT (1989), and more recently referred to *P. vlokii* (now *Anderbergia vlokii*) by HILLIARD (1993). It differs from both these taxa in a number of vegetative and floral characters, however. *A. fallax* resembles *A. vlokii* in habit, although the leaves are generally longer and narrower and more distinctly apiculate, and with slightly less revolute margins. The involucre offers the most readily observed distinguishing characters. The outer phyllaries are shorter and broader than in related species, and the petaloid inner bracts are woolly from the base, not basally glabrous as in *A. vlokii*, while the white petaloid portion is rather larger. The pappus bristles are also characteristic, with slender and thin bases, and rather thin and acute teeth, even apically in the male florets (fig. 4g). An unusual feature is that some capitula are entirely male, lacking the female floret.

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6. *A. ustulata* B.NORD., sp.n.

Type: Cape Prov., Worcester Div., Sawedge Pk. (E of Keeromsberg), S side of rocky E ridge, 4000 ft., 6. IX. 1965, Esterhuysen 31150 [holo BOL!, iso S!].
Figs. 1f, 4h - n, 6.

Fruticulus diffusus repetite ramosus, ramis floriferis tenuibus, brachyblastis foliosis numerosis. Folia oblonga vel elliptico-oblonga 5 - 8 mm longa tomentosa margine valde revoluta apice obtusa apiculata. Capitula dense aggregata c. 4 mm longa. Involucri bracteae praeter apices tomentosae, exteriores filiformes vel lineares ad anguste oblongae vel spathulatae, apice membranaceae fuscae vel ustulatae; interiores unguiculatae, lamina petaloidea nivea quadrata ad rotundata. Flosculus femineus 1; corolla glandulosa; cypsela subglabra setis paucis instructa; pappi setae barbellatae dentibus apicalibus tenuibus acutis. Flosculi masculi 4; corolla flava glandulosa; pappi setae barbellatae dentibus apicibus obtusis.

A diffuse shrublet 0.1 - 0.5 m high with slender, repeatedly branching leafy stems and numerous brachyblasts in older leaf-axils, greyish-tomentose throughout, but partly glabrescent with age. Leaves evenly distributed along the stems and branches, and crowded on the brachyblasts, suberect to erecto-patent, becoming spreading to somewhat reflexed with age, oblong to elliptic-oblong, 5 - 8 mm long, 1 - 2 mm wide, margins much revolute (to 1/4 of the lower side), apex obtuse and apiculate; greyish-tomentose especially on the lower side. Capitulescence compact, rounded to semiglobose, 1 - 1.7 cm in diam., consisting of 15 - 25 densely crowded capitula. Involucre cup-shaped, c. 4 mm long and 2.5 mm wide; outer involucral bracts 9 - 14, filiform or linear to narrowly oblong-oblanceolate to spatulate, 2.5 - 3.5 mm long, 0.2 - 1 mm wide, basally yellowish to straw-coloured with copious cobwebby wool, distally membranous, dark brown, with rounded to truncate or emarginate glabrous apex; inner involucral bracts unguiculate, 6 - 8, c. 3 mm long, petaloid apical portion ± square, c. 1 mm long and wide, truncate or slightly emarginate. Female floret 1; corolla tubular, c. 2.5 mm long, glandular; cypsela (immature) subglabrous with only a few papilliform short hairs or setae; ovary wall crystals heteromorphic, some needle-like, some flat, in different sizes, some subrectangular, others bluntly hexa- or octagonal; pappus bristles barbellate with slender acute teeth throughout, basally connate. Male florets 4; corolla yellow, 2.5 - 3 mm long, limb 5-lobed, glandular. Anthers c. 1 mm long excl. tails; appendage triangular-ovate, subobtuse. Style simple, truncate. Pappus bristles c. 2 mm long (± equalling florets), barbellate throughout, with subobtuse to rounded apical cells.

The specific epithet refers to the dark outer involucral bracts. *A. elsiae* is undoubtedly very closely related, and is also geographically close, being known from the adjacent Keeromsberg. The differences observed in capitulum size, colour of phyllaries, cypsela pubescence, pappus and crystal morphology, etc. may seem convincing, but future further collections from these mountain areas will be needed to cast light on the taxonomic distinction.

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