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A partial revision of the tribe Massonieae (Hyacinthaceae)

1. Survey, including three novelties from Namibia: a new genus, a second species in the monotypic *Whiteheadia*, and a new combination in *Massonia*[*]

With 11 Figures and 9 Tables

Abstract

The tribe Massonieae with about 150 species in 15 genera is subendemic to southern Africa (Namibia, South Africa, Lesotho, and Swaziland) radiating with two genera into tropical East Africa and one of them to S Asia. Two of these 15 genera, *Periboea* and *Resnova*, are formally resuscitated in the present paper. Four genera are known from Namibia, to which *Namophila urotepala* gen. et sp. novae is added.

The hitherto green-flowered genus *Whiteheadia* is no longer monotypic: the white-flowered *W. etesionamibensis* with distinctly longer perigon-segments and with many other minor differences is described from several localities in Diamond Sperrgebiet no. 1 and surrounding areas eastwards to the Hunsberge.

The only *Massonia* known from Namibia (MERXMÜLLER & ROESSLER 1973) is not *M. echinata* but a species of its own which deserves a new combination: *M. sessiliflora*; it also occurs in the Cape, namely on the southern bank of the Orange River.

Massonieae as a whole are subdivided into three subtribes. A key to the subtribes, keys to the genera within the subtribes, and in several genera with important changes also keys to the species are provided. Fourteen species of southern Africa are resuscitated from synonymy: in *Resnova* (4, incl. one comb. nova), *Drimiopsis* (1), *Massonia* (6, incl. the above species from Namibia), *Periboea* (1, a new combination), and *Polyxena* (2); as two accepted species proved to be younger synonyms (*Drimiopsis maxima* and *Neobakeria heterandra*) the increase in species by reinstatements is reduced to 12. Seven new species are pro-

Zusammenfassung

Die Tribus Massonieae ist mit ca. 150 Arten in 15 Gattungen im südlichen Afrika subendemisch, von wo zwei Gattungen ins tropische Ostafrika ausstrahlen, eine sogar bis Südasien. Zwei dieser 15 Gattungen, *Periboea* und *Resnova*, werden in der vorliegenden Arbeit aus der Synonymie erweckt. Aus Namibia sind vier Gattungen bekannt, zu denen *Namophila urotepala* gen. et sp. novae hinzugefügt wird.

Die bisher grünblütige Gattung *Whiteheadia* ist nicht mehr monotypisch: die weißblütige *W. etesionamibensis* mit deutlich längeren Perigonsegmenten und mit weiteren kleinen Eigenheiten wird von mehreren Fundorten im Diamanten Sperrgebiet Nr. 1 und der Umgebung (östlich bis in die Hunsberge) beschrieben.

Die einzige *Massonia*-Art, die aus Namibia bekannt wurde (MERXMÜLLER & ROESSLER 1973), ist nicht *M. echinata*, sondern eine eigene Art, für die eine neue Kombination erforderlich ist: *M. sessiliflora*; sie kommt auch im Kap vor.

Die Massonieae werden in drei Subtriben untergliedert. Ein Schlüssel zu den Subtriben, sowie Schlüssel zu den Gattungen innerhalb der Subtriben werden gebracht; in einigen Gattungen mit umfangreicheren Änderungen werden auch Artenschlüssel vorgelegt. Vierzehn Arten des südlichen Afrika werden aus der Synonymie erweckt: in *Resnova* (4, davon eine comb. nova), *Drimiopsis* (1), *Massonia* (6, incl. der vorgenannten Art aus Namibia), *Periboea* (1, comb. nova), and *Polyxena* (2); da sich zwei angenommene Arten als jüngere Synonyme erwiesen *(Drimiopsis maxima* and *Neobakeria heterandra)*, geht der Gesamtzuwachs aus Erweckungen und Einziehen auf 12 zurück. Sieben neue Arten werden in folgenden Gattungen zusätzlich zu den zwei namibischen vorgeschlagen: *Periboea (P. oliveri)*, *Polyxena (P. calcicola)*, und *Drimiopsis*

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[*] Nachtrag zu der Herrn Prof. Dr. F. Weberling anläßlich seines 70. Geburtstages von Freunden, Kollegen und Schülern in Feddes Repertorium gewidmeten Festschrift (vgl. Feddes Repertorium 106 (1996) 5-8: 370, Anmerkung).

posed in addition to the two Namibian ones: in *Periboea (P. oliveri)*, in *Polyxena (P. calcicola)*, and in *Drimiopsis (D. comptonii, D. davidsoniae, D. pusilla, D. reilleyana*, and *D. stolonissima)*. For tropical East Africa three new combinations (altogether six) are proposed, *Ledebouria hildebrandtii, L. confertiflora*, and *Drimiopsis fischeri* which are transferred from other genera.

(*D. comptonii, D. davidsoniae, D. pusilla, D. reilleyana*, and *D. stolonissima*). Für das tropische Ostafrika werden *Ledebouria hildebrandtii, L. confertiflora* und *Drimiopsis fischeri* aus anderen Gattungen überführt, womit sich die Anzahl der neuen Kombinationen auf sechs erhöht.

Table of contents (and taxonomic survey of the Massonieae)

1. Introduction

In the last 20 years the tribe Massonieae has undergone considerable changes. Jessop 1975 increased the number of generic members from two to twelve. Two of these genera he had revised earlier: *Ledebouria* (Jessop 1970) and *Drimiopsis* (Jessop 1972); two had been revised by other authors: *Veltheimia* (see Reid 1993: 153; no formal revision of the two spp.) and *Eucomis* (Reyneke 1974, 1980), the largest genus *Lachenalia* comprising more species than all the other genera together, is under revision for several decades in which the number of species was more than doubled (Barker 1930–1989 in 14 papers, see Reid 1993: 153; Müller-Doblies, Nordenstam & Müller-Doblies 1987); and a revision of the remaining seven genera (reduced to six) was already published a year later (Jessop 1976).

In the "Prodromus einer Flora von Südwestafrika" Sölch, Roessler & Merxmüller 1970 listed two genera of Massonieae (*Lachenalia* and *Whiteheadia*) and a third one is *Ledebouria*, still hidden at that time as a subgenus under *Scilla*. Three years later Merxmüller & Roessler 1973 added a fourth genus, *Massonia*, by a careful and surprising analysis of the type material of the amaryllid *Haemanthus sessiliflorus* Dinter. With the advice of Jessop this species was identified as probably *M. echinata* L.f. When checking Merxmüller & Giess' specimens in PRE in 1988 we came to be convinced that the Namibian species has nothing to do with *M. echinata* but is most likely a new species. Thanks to the very generous help of Derek Clark we could investigate the plant a few weeks later at the type locality in the vegetative state.

A bit later on this excursion we came across a second species of *Whiteheadia* at several localities from Dikwillem NW of Aus to Namuskloof in the south. Of course we did not realize its identity immediately in the vegetative state. Furthermore we found a member of Massonieae in fruit which immediately disclosed a new genus: it had the habit of a *Massonia*, the flower similar to *Whiteheadia* and the fruit of neither of them.

These three novelties for the flora of Namibia will be treated with descriptions, figures and the presently known distribution in this first paper of a series of revisional papers on the Massonieae. As a back-ground a historical survey on Massonieae, a subdivision into three subtribes and an assessment of the fifteen genera is provided. From ± well advanced revisions of several genera, resuscitated and new species are extracted.

2. Material and methods

Concerning certain taxonomic methods we refer to Müller-Doblies 1994: 332–333 (in English) and Müller-Doblies 1981: 46 (in German).

A full taxonomic treatment with descriptions is only presented in the case of the two Namibian novelties *Namophila* and *Whiteheadia etesionamibensis*. Like in our earlier publications the Latin description applies only to the type population, and in order to avoid unnecessary redundancy by supplying both a Latin and an English description, the English description, refering to all known populations, is not given if only the type populations is known as in *Namophila*.

In the case of all other new species no descriptions are provided but for the time being of this survey only the Latin diagnoses, which of course, refer to all known populations of the new taxa. Under the heading "Diagnostic characters" the essential differences are discussed for each species. The descriptions are left for the full treatments of this series (Müller-Doblies a, b).

In addition to the usual status abbreviations such as sp. nova we also use:

- syn. novum, if a certain synonymy is proposed here for the first time, even if in a wider sense a synonymy was already previously established, e.g. for *Massonia echinata* s.l. JESSOP cites 25 synonyms among which we recognize three species, each with its own list of synonyms, considered as new synonyms here, and
- sp. restituta = reinstated species, if a species was not recognized in the latest revision and/or the latest species list of southern Africa (REID 1993) but is accepted in the present paper.

A bold face herbarium acronym in the citation of a herbarium specimen means that it is an addition to JESSOP's citation (1972, 1976).

A number immediately behind the herbarium acronym gives the number of herbarium sheets in the respective institution.

As to the measurements the length of leaves and scapes is given excluding the parts below ground.

A useful abbreviation, to which we became accustomed by DAHLGREN is occ. = occasional or occasionally.

3. The tribe Massonieae HUTCH. 1934 emend. JESSOP 1975

3.1 The acceptance of the tribe Massonieae HUTCH. (1934–1975)

The tribe Massonieae was only rather recently recognized as a taxonomic entity: formally installed 60 years ago and filled with adequate taxonomic contents only 20 years ago.

There had already been a much better taxon Eucomeae SALISB. 1866 comprising *Eucomis*, *Massonia*, *Polyxena* (as "*Manlilia*" = *Mauhlia*), *Periboea* (as *Baeoterpe*), and *Ledebouria* (as *Xeodolon* and *Sugillaria*), and the following Lachenaleae add the three modern genera *Lachenalia*, *Veltheimia*, and *Dipcadi* p.p. thus uniting, already in 1829 (when SALISBURY died), seven pertinent genera at a time when only five genera of present day Massonieae had been described (see Table 1). Both tribal names, however, were not validly published since the rank ordo was used.

In BAKER's treatment of Liliaceae in Flora Capensis 1897 the 10 genera recognized at that time were placed in two tribes, Allieae [*Massonia* and *Daubenya*, marked B1 (= BAKER's unit 1) in column 4 (= BAKER 1897) of Table 1] and Scilleae (the other eight genera marked B2 in column 4).

Whereas the name of the tribe Scilleae was already widely used in the 19th century e.g. by BAKER 1873, the names of the two other important tribes of Scilloideae or Hyacinthaceae respectively were only validly proposed in the 20th century: Urgineeae ROUY 1910 and Massonieae HUTCH. 1934. HUTCHINSON's proposal of the last tribe 28 of Liliaceae for the two genera *Massonia* and *Daubenya* was rather provisional as the majority of pertinent genera remained still in tribe 23. Scilleae: eight genera marked H2 in column 5 of Table 1 (in addition the first two genera of Table 1 = non-Massonieae genera also contain Massonieae species; these species are marked with a low case h2 under the respective present-day genera *Ledebouria*, *Resnova*, and *Periboea*).

In the second edition of his Families of Flowering Plants HUTCHINSON 1959 recognized the same 10 genera belonging to Massonieae HUTCH. emend. JESSOP, with the same taxonomic distribution: two in Massonieae (HUTCH. s.str.) and eight in Scilleae. Only two further pertinent genera are mentioned in brackets in addition to those of the first edition, but they are treated explicitely in synonymy: *Polyxena* (incl. *Neobakeria*) and *Androsiphon* (incl. *Amphisiphon*).

As to the acceptance in the botanical world one can sum up that the Massonieae proposed by HUTCHINSON 1934 and 1959 did not fully convince other taxonomists. MELCHIOR 1964 in ENGLER's Syllabus treats Massonieae as one of the three tribes of Scilloideae. He includes "3–4" genera, of which he only cites *Massonia*. Apparently he realized that more than the two genera proposed by HUTCHINSON 1934 and 1959 belong to Massonieae.

For the third edition of his Families of Flowering Plants HUTCHINSON (1884–1972) had only prepared few improvements and he thus did not change 1973 the limits of Massonieae and Scilleae at all.

3.2 The tribe Massonieae HUTCH. emend. JESSOP and its acceptance (1975–1995)

JESSOP 1975 was the first author to undertake an evaluation of Massonieae. He mentions that "Phillips (1951) linked *Massonia* with *Polyxena*, *Neobakeria*, *Whiteheadia*, *Neopatersonia*, *An-*

Table 1
Genera belonging to Massonieae in chronological order with Southern African species numbers in columns 1 to 3 and treatment by different authors in columns 4 to 8 (capital initial of the author = treatment under the respective genus name; lower case initial = treated under a synonym).

1	2	3	4	5	6	7	8	9
			B2,	H2,				*Scilla* L. 1753 [incl. *Ledebouria* and *Resnova* until recently]
			B2,	H2,				*Hyacinthus* L. 1753 [incl. *Periboea* until 1976]
	5 →	12	B1,	H1,	**J**,	R	+ Ma	*Massonia* THUNB. ex. HOUTT. 1780
	10		B2,	H2,	J,	R	+ Ma	*Eucomis* L'HÉRIT. 1788
	2		B2,	H2,	J,	R	+ La	*Veltheimia* GLEDITSCH 1796
	94		B2,	H2,	J,	R	+ La	*Lachenalia* JACQ. f. ex. MURRAY 1784
	16		b2,	h2,	J,	R	+ Le	*Ledebouria* ROTH 1821
3 →	1	1	B1,	H1,	**J**,	R	+ Ma	*Daubenya* LINDL. 1835
1 →	4′ →	4	B2,	H2,	**J**,	R	+ Ma	*Polyxena* KUNTH 1843
1		→ 3	b2,	h2,	**j1**	r	+ Ma	*Periboea* KUNTH 1843
	5^2 →	1	B2,	H2,	J,	R	+ Le	*Drimiopsis* LINDL. 1851/52
1	1 →	2	B2,	H2,	**J**,	R	+ Ma	*Whiteheadia* HARV. 1868
1 –	(2)	(2)	b2,	H2,	j2	r	–	*Brachyscypha* BAKER 1871
	4^0 →	1		h2,	**j3**	R	+ Ma	*Neobakeria* SCHLTR. 1924
1	1	1		H2,	**J**,	R	+ Ma	*Androsiphon* SCHLTR. 1924
1	1	1		h2,	**J**,	R	+ Ma	*Amphisiphon* W.F.BARKER 1936
		5	b2,	h2,	j4	r	+ Le	*Resnova* VAN DER MERWE 1946
		→ 1					+ Ma	*Namophila* U. & D.M-D.
	144 spp.		10	12	11	12	15	total of recognized genera

Explanation of columns:

1 — number of species in temporarily monotypic taxa if there was a change before REID 1993;

2 — number of species according to REID 1993 (the bold-face numbers contain additionally all or some spp. of a second genus: 4′ = 3 *Polyxena* + 1 *Periboea*, 5^2 = 3 *Drimiopsis* + 2 *Resnova*, and 4^0 = 1 *Neobakeria* + 3 *Massonia*; the 2 spp. of *Brachyscypha* are in brackets as they have already been counted in *Lachenalia* and must not be added again);

3 — number of species according to our knowledge;

4 — treatment of pertinent genera and species in BAKER 1897: B1 recognized genus in Allieae, B2 recognized genus in Scilleae, b2 pertinent species treated under *Scilla*, *Hyacinthus* or *Lachenalia*;

5 — treatment of pertinent genera and species in HUTCHINSON 1934, 1959, and 1973: H1 = recognized genus in Massonieae, H2 = pertinent genus recognized by HUTCHINSON 1934–1973 but treated by him as member of Scilleae; h2 = *Hyacinthus* (incl. "S. Afr." = *Periboea*, ed. 1-3) and *Scilla* [incl. *Resnova* (ed. 2-3) and without mention of *Ledebouria*];

6 — J = genera of Massonieae recognized by JESSOP 1976 (bold face **J** = six genera of the *Massonia* group = revised in 1976; bold face **j** = still recognized genus by JESSOP 1975 and in the introduction of JESSOP 1976); **j1** = second sp. of *Polyxena* sensu JESSOP 1976 treated by JESSOP 1975 as "*Hyacinthus* (Cape species only)"; j2 = tacitly a *Lachenalia*, as seen on det.-labels; **j3** = listed as a separate genus by JESSOP 1975 but included into *Massonia* by JESSOP 1976; j4 – *Resnova* sunk into *Drimiopsis* by JESSOP 1972;

7 — R = genera of Massonieae recognized by REID 1984, 1985, 1993; r = not recognized as in JESSOPS's revision;

8 — genera of Massonieae recognized by us are marked by +; + Ma = genera of the Massoninae; + La = genera of Lachenaliinae; + Le = genera of Ledebouriinae;

9 — genus names of Massonieae, authors, and year of publication.

drosiphon and *Amphisiphon* on the basis of their connate stamens, but no attempt has been made at revising tribal groupings". JESSOP 1975: 84 enumerates several features which unite these (excl. *Neopatersonia*) and some other genera. This natural group is not fully finalized: on each of the opposite pages 84 and 85 the whole tribe is enumerated with 12 genera, with a slight difference, however; on page 84 *Veltheimia* is missing and on p. 85 *Whiteheadia* was forgotten. This would result in 13 genera sensu JESSOP, but in his revision of the *Massonia* group a year later, JESSOP 1976 sunk *Neobakeria* into *Massonia*, and the southern African species of *Hyacinthus* into *Polyxena*, reducing the number of genera within Massonieae still recognized by JESSOP 1975 to eleven (see last line of Table 1). JESSOP 1976: 401 himself, however, did not finalize the stock of Massonieae genera: he departed from 12 genera as he thought to have listed in JESSOP 1975, and declared six genera (bold face **J** in column 6 of Table 1) as a natural group within Massonieae, the *Massonia* group, which he then revised in that paper.

All eleven genera were recognized by the PRE working group (REID 1984, 1985, and 1993) and additionally *Neobakeria*, JESSOP's sinking of which was not followed. Who is right? In this case we have a clear answer: both are right and wrong. The PRE list contains four species of *Neobakeria*, three of which belong to *Massonia* as JESSOP 1976 proposed. *N. namaquensis*, however, which JESSOP 1976 did not even recognize as a species but which he sunk into *M. angustifolia*, is a good genus of its own. As SCHLECHTER had not seen a live specimen (*N. namaquensis* is based on a collection of his brother MAX) he did not notice the key character of the genus, the distinct dorsiventral symmetry of the flower. Unlike the other genus with zygomorphic flowers, *Daubenya*, in which the abaxial side is promoted, in *Neobakeria* the adaxial side is developed to a stronger degree.

Neobakeria is a very rarely collected genus. In spite of some intensive search we could not find it in the field up to now. From an Afrikaans speaking farmer we got the clue to this rarity. From a quick sketch by U.M-D. he immediately recognized the 'fosstert' (already SCHLECHTER 1924: 151 used this comparison 'kurze Fuchsschwänze' = short fox-tails for the *N. namaquensis* inflorescence) and showed us the place where he knew it from and where LEISTNER and SCHLIEBEN had collected the plant in 1961 along the old road. In 1988 he reported that he had not seen the plant for 11 or 12 years. It seems that *Neobakeria* appears only if there are good winter rains in this summer rainfall region. The type locality is situated further west on the border of the winter rainfall region. In the rather normal year 1988 we did not find the plant. Perhaps here it is also only triggered in exceptional years.

JESSOP's seven genera of the *Massonia* group (here we add already *Neobakeria* as a genus of its own following PRE practice) all have two foliage leaves and are in fact a very closely allied group. As to the genera *Eucomis* and *Veltheimia* which are much bigger and several-leaved plants, there can be no doubt that they also belong to Massonieae. *Ledebouria*, *Drimiopsis*, and *Resnova*, however, display a considerable morphologic distance with all other genera of Massonieae and we are a bit reluctant to include them. They are the only members which have a tropical growth-form with iterative innovation, whereas all other genera of Massonieae have an annual innovation adapted to a climate with a strong seasonal change. Also the distribution patterns show this dualism: Massonieae s.str. are endemic to Southern Africa, whereas *Ledebouria* and *Drimiopsis* (and perhaps also *Resnova*) occur in East Africa.

SPETA, however, is fully convinced of *Ledebouria* and *Drimiopsis* belonging to Massonieae (oral com.) and thus we are determined to follow him for the time being.

3.3 Further generic members of the tribe Massonieae

3.3.1 *Brachyscypha* BAKER is no convincing genus

The very unusual *Lachenalia pusilla* JACQ. has a rather varied taxonomic fate: BAKER 1871 created for it the monotypic genus *Brachyscypha*, it was sunk to *Lachenalia* sect. *Brachyscypha* (BAKER) BENTH. & HOOK. 1883, raised again a step to *Lachenalia* subgen. *Brachyscypha* (BAKER) BAKER 1897, transferred by SCHLECHTER 1924 into the genus *Polyxena*, and again accepted as genus *Brachyscypha* by HUTCHINSON 1934, 1959, and 1973. MÜLLER-DOBLIES et al. 1987 discussed the taxonomic position on the basis of an elaborate character list and came to the conclusion that BAKER's choice as a subgenus of *Lachenalia* appears to be the best solution.

3.3.2 *Periboea* KUNTH, sister genus to *Polyxena* KUNTH

The taxonomic fates of the two temporarily monotypic genera *Polyxena* and *Periboea*, both created by KUNTH 1843 and named after nymphs of the Greek mythology, were very different from each other. Whereas *Polyxena* was continuously recognized during the 150 years of its existence, in Flora Capensis even comprising 10 species (BAKER 1897), *Periboea* was only rarely accepted as a genus (e.g. SPACH 1846: 297; LINDLEY 1846: 205; PFEIFFER 1874: 634) and in some of MARLOTH's herbarium labels. BAKER 1871 and following him nearly all later authors continued to treat *Periboea* under *Hyacinthus* placed distantly from *Polyxena*. Finally a century later, JESSOP 1976 stressed the close relationship and united both taxa in a single genus of two species under the name of *Polyxena*.

This was an important step ahead in finding this sister group. The rank of two species within one genus, however, is not adequate. In the previously mentioned discussion about *Brachyscypha* (MÜLLER-DOBLIES et al. 1987: 481) we stated "here we also take into consideration the related genus *Periboea* Kunth incorporated into *Polyxena* by Jessop (1976)". From STEARN we heard that he is also in favour of *Periboea* as a genus of its own.

3.3.3 *Resnova* VAN DER MERWE 1946, sister genus to *Drimiopsis* LINDL.

This is the youngest of all hitherto described genera of Massonieae. This year one can celebrate its fiftieth birthday. The oldest pertinent species, however, was already described more than a century ago under *Scilla*, *S. humifusa* BAKER 1881, and several pertinent names followed nearly a century ago: *S. lachenaloides* BAKER 1897, *S. schlechteri* BAKER 1904, *Drimiopsis maxima* BAKER 1897 and *D. saundersiae* BAKER 1897. All these five names are BAKER species, and all but *Scilla lachenalioides* are judged by JESSOP 1972 to be synonymous. This situation points to a close affinity of *Resnova* with *Drimiopsis*.

On the other hand *Drimiopsis* and *Resnova* are so different that no other confusion took place. An adequate comparison is that they are as different as *Albuca* is from *Ornithogalum*: *Albuca* and *Drimiopsis* are the only southern African members of Hyacinthaceae whose inner tepals are permanently connivent, and the filaments show a rather parallel variation, loriform to canaliculate in *Albuca* and also flat and broad, nearly touching each other in *Drimiopsis*, and ± filiform in most *Ornithogalum* species and in *Resnova*, in the latter genus always biseriate.

3.4 Temporarily monotypic genera in the tribe Massonieae

About half the number of the present 15 genera of Massonieae are now or were previously for a long time considered monotypic.

Two genera were monotypic throughout their existence, *Androsiphon* and *Amphisiphon*, to which *Namophila* is to be added as a third genus.

Some genera changed considerably in number of species: *Polyxena* was described as monotypic, was understood to comprise even ten species in Flora Capensis (BAKER 1897), was reduced again to a single species by JESSOP 1975, before *Periboea* = *Hyacinthus* (S. Afr. sp. only) was added as a second species by JESSOP 1976. REID 1984, 1985, and 1993 added *Polyxena odorata* according to PRE herbarium use, and from our det. labels she added in 1993 furthermore *Polyxena pygmaea* thus obtaining four species including *Periboea*. We exclude the latter taxon and do not recognize *P. odorata*, but by the recognition of *Polyxena maughanii* W.F.BARKER 1931 and by the description of a new species we also arrive at four actual species in *Polyxena*.

Periboea was described in the protologue with three species and we also distinguish three species, but both treatments have only a single species in common, the type species. One species was already included by KUNTH 1843 as "P.? BREVIFOLIA" with a question mark: this is *Dipcadi brevifolium* (THUNB.) FOURC.; and the other species is only an exceptional individual on a Bot. Mag. plate belonging to the type species. Again by the recognition of a W.F.BARKER species, *Hyacinthus paucifolius* W.F.BARKER 1941, and by the description of a new species we arrive at the present number.

As we did not follow HUTCHINSON in recognizing *Brachyscypha*, our description of a second species in that subgenus of *Lachenalia* does not concern monotypic genera in Massonieae.

Usually genera only leave the club of the monogeneric genera by the discovery of one or several further species as in most of the previous examples. *Periboea* was already a case in point including also the reverse change. In *Daubenya* LINDLEY recognized two species and BAKER added a third one. JESSOP 1976 considers all three of them together as a single species, hence *Daubenya* as a monotypic genus. Concerning *Neobakeria* we follow JESSOP 1976 in including *N. angustifolia*, *N. comata*, and *N. heterandra* under *Massonia*, but we have to recognize *Neobakeria namaquensis* SCHLTR. 1924 as a monotypic genus.

4. Subtribal classification of the tribe Massonieae HUTCH. emend. JESSOP 1975

Key to the subtribes of Massonieae

1a Seeds two, basal in each locule; leaves one to several, very rarely two, never surrounded by a sheathing cataphyll, with the blade often spotted; often several inflorescences to a tuft of leaves (iteration); distribution inside and outside of southern Africa . . . . **5. subtribe Ledebouriinae**
1b Seeds mostly several in each locule, if two then not basal; leaves one to several, mostly two, mostly surrounded by a sheathing cataphyll, occ. by several non-sheathing cataphylls, with the blade very rarely spotted [in a few two-leaved *Lachenalia* species); only a single inflorescence to a tuft of leaves (annual innovation)]; distribution endemic to southern Africa
  2a Perigon arising obliquely from the pedicel, insertion of the stamens forming an oblique ring in the perigon tube . . . . **6. subtribe Lachenaliinae**
  2b Perigon arising radially from the pedicel; insertion of the stamens at the throat (with or without a filament tube) or above, only in *Amphisiphon* in the perigon tube . . . . **7. subtribe Massoniinae**

5. Ledebouriinae U. & D.M-D. subtrib. nova

A subtribibus Massoniinae et Lachenaliinae ovulis duobus basalibus in quoque loculo (apud alteras subtribus ovula plura in quoque loculo, raro ovula dua non basalia), innovatione plerumque iterativa (a cl. JESSOP 1972: 153 et a cl. MAUVE 1976: 918 racemi terminales errone pro racemis lateralibus explicati sunt, cf. MÜLLER-DOBLIES 1977: 358; haud innovatione annua), absentia cataphylli amplexicauli vel cataphyllorum squamosorum folia laminifera circumdantium, laminis saepe maculatis, et distributione extra- et intra-Africa-australi (non solum endemica in Africa australi) distincte differt. – Typus of the subtribe: *Ledebouria*. Further members: *Drimiopsis, Resnova*.

Key to the genera of Ledebouriinae

1a Ovary shortly conical, ± with a six-lobed disc at the base, stipitate; bulb usually covered by a ± thick coat of papery dead scales (persistent for several years) . . . . **5.1. *Ledebouria***
1b Ovary globose to oblong, sessile; bulb usually ± naked (dead scales quickly decaying)
  2a All perigon-segments ± spreading; filaments subulate (± filiform), biseriate, outer ones inserted at the throat, inner ones 0.5–2 mm above the base of the inner segments; ovary ovoid to oblong; perigon 5–17 mm long, in all but one species more than 9 mm . . . .**5.2. *Resnova***
  2b Inner perigon-segments permanently connivent; filaments flat, deltoid or acuminate, nearly touching each other at the broad insertion (occ. confluent); ovary globose; perigon in southern African species 3–5 mm long . . . . **5.3. *Drimiopsis***

5.1 *Ledebouria* ROTH 1821 (about 40 spp. in southern Africa, not treated here except for two species from eastern tropical Africa)

Generitypus: *Ledebouria hyacinthina* ROTH (= *Scilla indica* BAKER).

STEPHANUS VENTER (UNIN) is revising this difficult genus for Southern Africa. In his M. Sc. thesis he has more than doubled the number of species recognized by JESSOP 1970.

Here we only deal with two species of Tropical East Africa that were up to now hidden under *Drimia*:

5.1.1 *Ledebouria confertiflora* (DAMMER) U. & D.M-D. comb. nova

Basionymum: *Drimia confertiflora* DAMMER 1907, Bot. Jb. Syst. **38**: 62. – Typus: Somalia, Boran, Malkare [?= Malka Rie], Ebene des Daua, Buschwald, 01.05.1901, ELLENBECK *2150a* (B holo.!). – Fig. 1a–b.

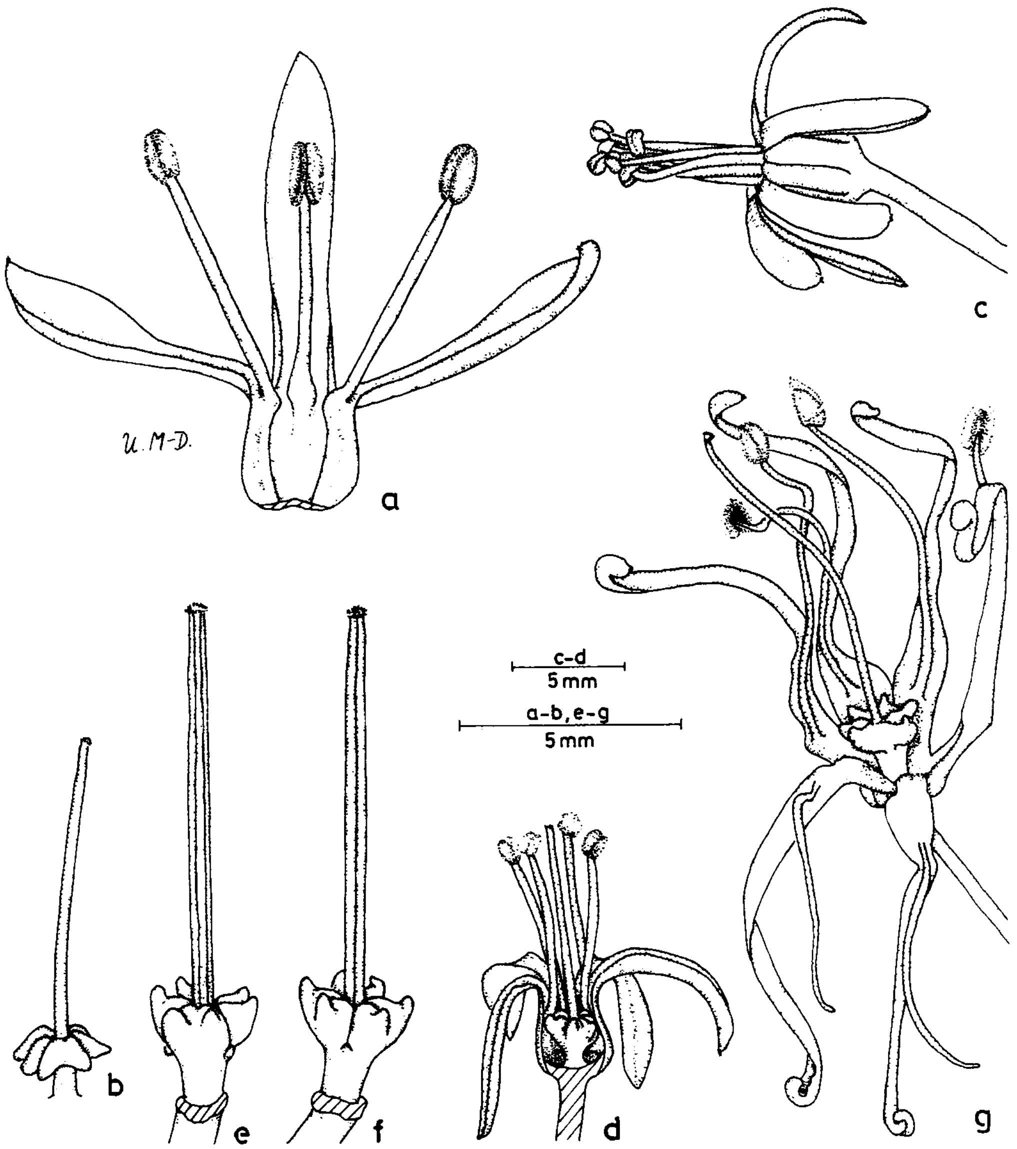


Fig. 1
Floral details of two *Ledebouria* spp. from eastern tropical Africa: *L. confertiflora* (DAMMER) U. & D.M-D. (a–b, from the holotype) and *L. hildebrandtii* (BAKER) U. & D.M-D. (c–g, all from Mombasa, steep coastal slope, Kenya, *M-D. 79154a*, except for g from the Berlin isotype)

a — longitudinal section of a flower; the tubular part of the rotate flower is constructed by the free tepals which are stiffened in their basal parts by the prominently adnate filaments; at the base of their free part the filaments show a distinct geniculate thickening and spread in an erecto-patent way; b — pistil; c — lateral view of a flower, ± free perigon differentiated into a basal tubular and a longer apical part of reflexed tepals; d — longitudinal section of the same flower; e–f — pistil, dorsal and septal view; g — soaked flower from an isotype (B)

Taxonomic note: From the shape of the ovary (Fig. 1b) it is evident, that DAMMER's species is no *Drimia* but a *Ledebouria*: The ovary has a long stipe (gynophore) and is characteristically flat and six-lobed with a long style.

The older name *Drimia brevifolia* BAKER 1898, Fl. Trop. Africa 7: 527, also described from Somalia, near the River Daua (RIVA 1251) cannot be conspecific according to the description since the raceme is lax and the perigon is only 6 mm long.

5.1.2 *Ledebouria hildebrandtii* (BAKER) U. & D.M-D. comb. nova

Basionymum: *Drimia hildebrandtii* BAKER 1893, Bot. Jb. Syst. **15**: 474. – Typus: Kenya.—0439BA: Mombasa, April 1876, HILDEBRANDT 2001 (B lecto.!) [syntype: ibid., May 1876, HILDEBRANDT 2017 (K!)]. – Fig. 1c bis g. Syn.: *Drimia angustitepala* ENGL. 1893, Bot. Jb. Syst. 15: 475, syn. novum. – Typus: Kenya.—0138AC: Kitui in Ukamba, March 1877, HILDEBRANDT 2644 († B holo., G!, K, L!).

Scilla hildebrandtii BAKER 1898, Fl. Trop. Africa 7: 556, syn. novum. – Typus: Kenya.—0138AC: Kitui in Ukamba, March 1877, HILDEBRANDT 2644 (G!, K holo., L!), [same type collection as for *Drimia angustitepala*!].

Scilla tayloriana RENDLE 1895, J. Linn. Soc. **30**: 426, syn. novum ex descr. – Typus: Kenya. —0339DC: on the Rabai hills, TAYLOR *s.n.* (not traced, BAKER notes 1898: "No specimen at Kew").

Nomenclatural note: According to a footnote (p. 467) in connection with the protologue the B syntype HILDEBRANDT *2001* was sent by ENGLER to BAKER in a first lot of 27 specimens of Liliaceae. Later it was among the first ten spp. to be published by BAKER in Berlin, based mainly on Berlin material. As HILDEBRANDT *2001* agrees well with BAKER's description, it seems appropriate in this case to select this Berlin syntype as lectotype.

Taxonomic note: Like in *Ledebouria confertiflora* it is evident from the shape of the ovary (Fig. 1e–f), that the present species is again no *Drimia* but a *Ledebouria*: Unlike *L. confertiflora*, however, and all other *Ledebouria* spp. that we know, the ovary is broadest at the shoulder [and not at the base just above the stipe (gynophore)]. The usual six lobes of the *Ledebouria* ovary which are directed downwards in Fig. 1b of *L. confertiflora* are directed upwards by a certain promoted growth of the basal region of the ovary of *L. hildebrandtii* (Fig. 1e–f) and they look like little horns.

KENYA.—0439BA: Mombasa, between road and ocean, stony slope above sea, 03.04.1979 cofl., MÜLLER-DOBLIES *79154a* (B, BTU, K; ex cult. BTU 1769: BTU, LD, LI, PRE, UNIN).

5.2 *Resnova* VAN DER MERWE 1946, gen. hic restitutum

Generitypus: *Resnova schlechteri* (BAKER) VAN DER MERWE 1946 [= *Resnova humifusa* (BAKER) U. & D.M-D. 1996].

Nomenclatural note: By a lapsus JESSOP 1972: 157 stated: "Type species: not indicated.", but VAN DER MERWE 1946: 46 clearly wrote at the end of his diagnosis: "Typus generis: *R. Schlechteri*"

Taxonomic note: As JESSOP 1970 did not accept the genus *Resnova*, only recognized two out of at least five species, and did not even make use of the oldest available epitheton in one of his new combinations, we feel obliged to make use of this opportunity and extract from our msc. (MÜLLER-DOBLIES b, in prep.) the preliminary key and the accepted species with the nomenclatural details. JESSOP 1972: 152–153 notes: "Fresh material of *Resnova* has not been available for this study" and this explains that he was not aware of certain differences in the filaments and the ovary.

Key to the species of *Resnova* in Southern Africa

1a Perigon-segments (9–)10–12(–18) mm long, pink to purple, without a conspicuous vitta, style 5 mm long . . . . **1. *R. lachenalioides***
1b Perigon-segments (5–)6–8(–9) mm long, "often partly pink" (fide JESSOP), greenish, brownish, often white in bud, with a conspicuous vitta, style up to 2.5 mm long:
  2a Perigon about 9–10 mm long:
    3a 2–3 leaves

4a Style 2–2.5 mm long . . . . **3. *R. pilosa***
4b Style 1.2 mm long . . . . **4. *R. minor***
3b About seven leaves . . . . **5. *R. maxima***
2b Perigon about 5–6 mm long (style 1–2.5 mm long) . . . . **2. *R. humifusa***

5.2.1 *Resnova lachenalioides* (BAKER) VAN DER MERWE 1946: 46

Basionymum: *Scilla lachenalioides* BAKER 1897: 482. - Typus: South Africa, Eastern Cape.—3128CB (Umtata): Bazeia Mountain, 2500-3500′, BAUR 549 (K lecto.! fide anonym. in scheda Kewensi, SAM).
Syn.: *Drimiopsis lachenalioides* (BAKER) JESSOP 1972: 157

5.2.2 *Resnova humifusa* (BAKER) U. & D.M-D. comb. nova et sp. hic restituta

Basionymum: *Scilla humifusa* BAKER 1881, Gard. Chron. **15**: 626. - Typus: South Africa, Natal, without locality, May 1881, ex cult. W.BULL [K apparently not preserved (BAKER 1897: 485 says "No specimen at Kew"]; strange enough JESSOP 1972 "saw" and confirmed the holotype in K!; apparently he only saw BAKER's substitute type specimen which were cognize as Neotypus here: Natal (or Transvaal), cultivated in Bot. Garden Durban, brought by Mrs. SAUNDERS, 26.09.1888 cofl., WOOD 4059 (K neotypus! hic designatus). — Fig. 2f–i.
Syn.: *Drimiopsis maxima* BAKER 1897: 474. — Typus: South Africa, Natal.—2930DC (Pietermaritzburg): valley near Bothas [probably = railway station Botha's Hill], 2000′ s.m., WOOD 4773 (K holo.!, NH).

Drimiopsis saundersiae BAKER 1897: 474. - Typus: South Africa, Natal.—2930DB (Pietermaritzburg): Itafamasi, WOOD 774 (K lecto.! fide anonymus in sched. et fide JESSOP 1972: 158); paratypes: ibidem, WOOD 938 (K!), sine loco, SAUNDERS s.n. (K!).

Scilla schlechteri BAKER 1904, Bull. Herb. Boissier 2: 1002; = *Resnova schlechteri* (BAKER) VAN DER MERWE 1946: 46. - Typus: South Africa, Natal.—2930DD (Pietermaritzburg): Krantzkloof, 1500′ s.m., 12.09.1893 fl., SCHLECHTER 3174 (BOL, GRA, K holo.!, PRE2!).

Resnova transvaalensis VAN DER MERWE 1946: 46. - Typus: South Africa, Transvaal.—2630DA (Carolina): Piet Retief distr., Amsterdam, VAN DER MERWE *s.n. sub PRE 26432* (PRE4 holo.!). — Illustration: VAN DER MERWE 1941, Fl. Pl. Afr. t. 823, sub nomine *Scilla schlechteri*.

Taxonomic note: *Resnova transvaalensis* is the only VAN DER MERWE species which we put into synonymy. This synonymy needs consideration at two levels:

1° VAN DER MERWE did not take the three above *Drimiopsis* species by BAKER into consideration for his studies and thus could not take notice of their identity;

2° As to the differences between *Resnova transvaalensis* and *R. schlechteri* they seem to be unimportant. VAN DER MERWE himself published the plate of *R. transvaalensis* under the name *Scilla schlechteri* and when proposing *R. transvaalensis* as a new species he only gave the following characters (translated from Latin): "Margins of the leaves scarcely undulate, blades without blotches", in the Afrikaans text also somewhat larger flowers are mentioned. Without having seen the plants alive and without more information these differences do not convince us of the specific value.

5.2.3 *Resnova pilosa* VAN DER MERWE 1946: 46, sp. hic restituta

Typus: South Africa, Natal.—2730DD (Vryheid): Vryheid Hill, VAN DER MERWE *2643* (PRE3 holo.!).

5.2.4 *Resnova minor* VAN DER MERWE 1946: 46, sp. hic restituta

Typus: South Africa, Natal.—2730BD (Vryheid): Paulpietersburg, VAN DER MERWE *2780* (PRE holo.!).

5.2.5 *Resnova maxima* VAN DER MERWE 1946: 46, sp. hic restituta

Typus: Southern Africa, Natal.—2731DA (Louwsburg): in collibus prope Magut, VAN DER MERWE *2710* (PRE holo.!).

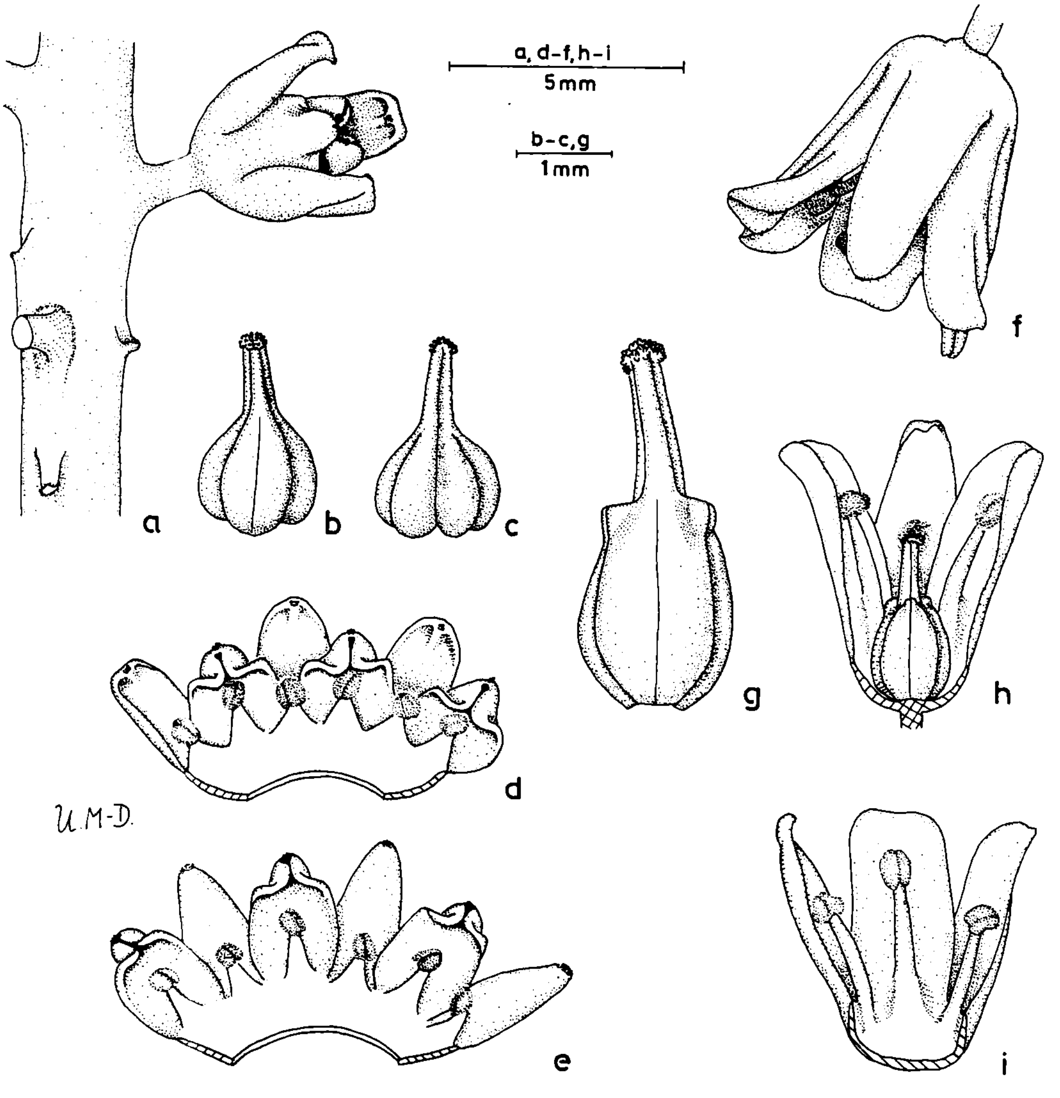


Fig. 2
A floral comparison of *Drimiopsis* Lindl. (left side) and *Resnova* van der Merwe (right side): *Drimiopsis burkei* Baker (a–d from Kruger National Park, *M-D. 82030a*), *D. maculata* Lindl. (e, the generitype, from northern Lebombo Mts., Swaziland, *M-D. 85048a*), and *Resnova humifusa* (Baker) U. & D.M-D. (f–i, the generitype, from Tina Bridge, Transkei, *M-D. 74015c*)

a — inflorescence rhachis with concaulescence (as in *Resnova*) and an erectly spreading flower, tepal segments dimorphic, inner tepal segments connivent; b — dorsal view of ovary (broad insertion); c — septal view of ovary; d — perigon expanded, the filaments mostly confluent at their base; e — perigon of *D. maculata* expanded, the filaments not confluent at their base but very slightly biseriate; f nodding flower of *R. humifusa*, tepal segments isomorphic, all tepal segments spreading; g — septal view of ovary (narrow insertion); h — longitudinal section of a flower with dorsal view of ovary; i — opposite half of flower showing the biseriate filiform filaments.

5.3 *Drimiopsis* Lindl. 1851/52

Generitypus: *Drimiopsis maculata* Lindl.

Taxonomic note: In addition to the three South African species recognized by Jessop 1972 within *Drimiopsis* in the present generic circumscription we here resuscitate one species and extract the diagnoses of one new subsp. and four new South African species from our msc. (Müller-Doblies b, in prep.).

Key to the species and subspecies of *Drimiopsis* in southern Africa

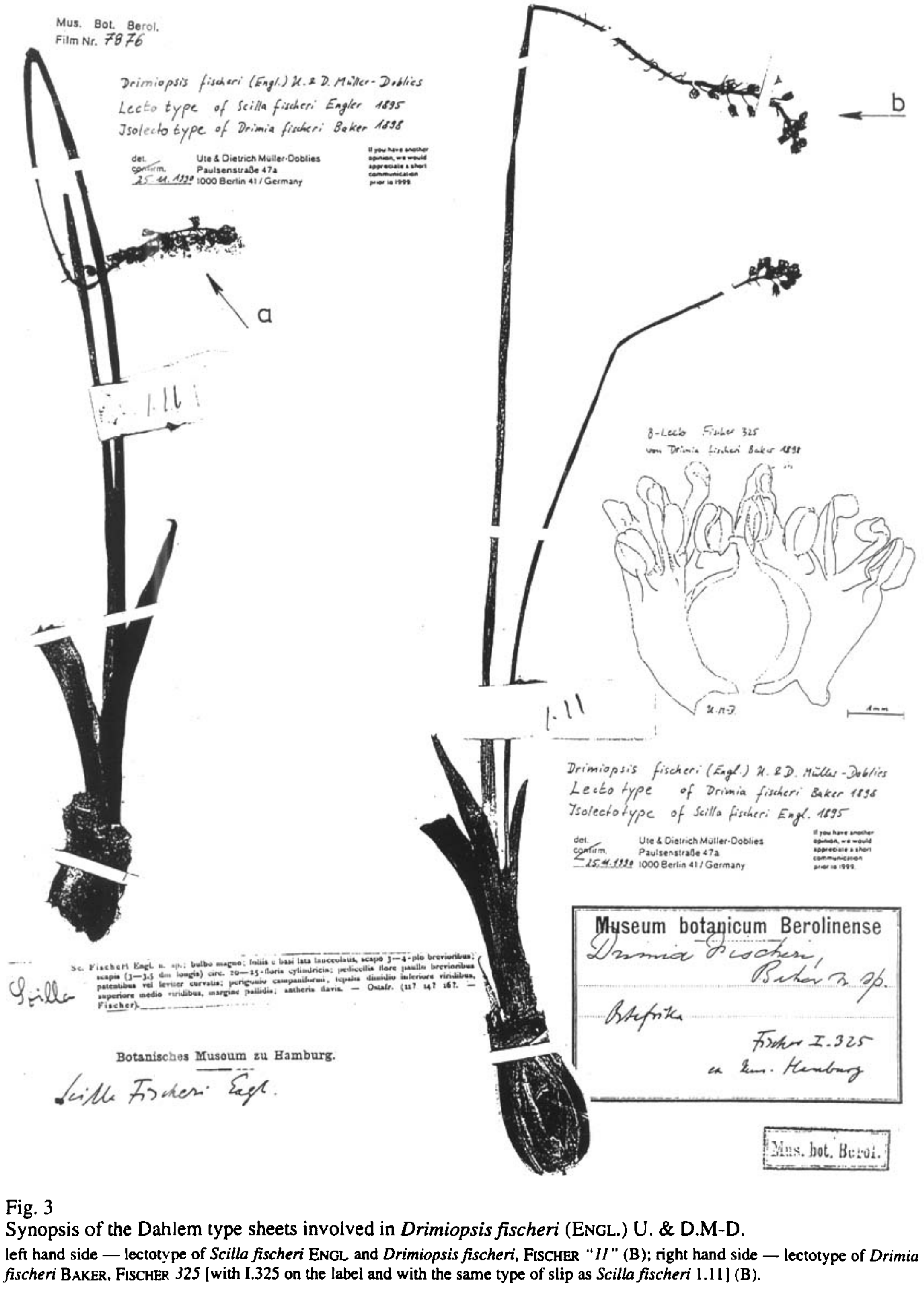
- 1a Raceme with vestigial bracts, basal ones reduced to crescent-shaped gibbosities; spp. of South Africa and Swaziland, only *D. maculata* known to occur outside:
  - 2a Tepal segments predominantly green (inner side of outer segment can be ± wine-red in 3b), inner tepal-tips without yellow honey guides; buds changing from green to white (at least outer segments) for a considerable time before becoming green again just before opening:
    - 3a Leaves 2–4(–6), glabrous, distinctly petiolate; at the base of the blade indistinct rough ridges may occur; stamens of nearly equal length:
      - 4a Perigon 3–5 mm long; leaves 2–4(–6) with a cordate blade, marked mostly with dark green blotches . . . . **1. *D. maculata***
      - 4b Perigon up to 3.5 mm long; leaves 2–3 with a lanceolate blade, without dark green blotches . . . . **2. *D. woodii***
    - 3b Leaf often single, usually two, occ. three, not known to be petiolate except rarely in cultivation; upper side of the blade usually with rough ridges; outer stamens distinctly shorter than inner ones:
      - 5a Leaves and scape glabrous; leaf margin finely papillose and often somewhat crenulate . . . . **3. *D. burkei***
        - 6a Secondary bulbs, if present, placed side by side with the mother bulb; upper side of leaves usually with rows of very fine teeth and uniformly green or marked with brown spots; perigon 3.5–4.5 mm long . . . . **3a. subsp. *burkei***
        - 6b Bulb very stoloniferous, removing secondary bulbs up to more than 100 mm from the mother bulb; upper side of leaves smooth and marked with dark green blotches as in *D. maculata*; perigon 4.5–5.5 mm long . . . . **3b. subsp. *stolonissima***
      - 5b Leaves, scape, and even pedicels hairy; perigon 4–5 mm long; buds not really white but only a vitta of the outer segments becomes whitish; leaf margin smooth and never observed to be crenulate . . . . **4. *D. reilleyana***
  - 2b Tepal segments pink to lilac, at least predominantly, inner tepal-tips with a yellow honey guide; buds scarcely somewhat whitish for a short time before becoming coloured; inflorescence never white before anthesis:
    - 7a Style equal to shorter than the ovary; pedicels up to 2 mm long:
      - 8a Scape glabrous; leaves 2–4, glabrous with a crenulate margin . . . . . **5. *D. davidsoniae***
      - 8b Scape with patent stiff hairs; leaves 1–2, hairy, with an entire margin:
        - 9a Scape 90–310 mm; raceme 25–70 mm . . . . **6. *D. atropurpurea***
        - 9b Scape 10–20 mm; raceme 8 mm . . . . **7. *D. pusilla***
    - 7a Style about 1.5–2 times as long as the ovary; pedicels 3.0–7.5 mm long; leaves hairy on upper surface, but scape glabrous . . . . **8. *D. comptonii***
- 1a Raceme ± without any trace of the bracts (occ. with crescent-shaped gibbosities); spp. of tropical Africa outside South Africa from Tanzania to Ivory coast . . . . **9. *D. fischeri***
  [other spp. of tropical Africa outside Southern Africa not treated here]

5.3.1 *Drimiopsis maculata* Lindl. 1851/52 Paxton's Fl. Gard. 2: 99

Typus: "Cape of Good Hope, introduced by the Horticultural Society", without collector in Herb. J.Lindley (CGE ?holo, K photo cited after Jessop 1972). — Fig. 2e.

Syn.: *Drimia petiolata* G.Koch & C.P.Bouché 1861, Index seminum Berol. - Typus: Species ex horto Kewensi in Berolinensem allata, cult. 1863 (B clono.!).

Drimiopsis minor Baker 1870: t. 192. — Iconotypus: Natal, Cooper, l.c.



Mus. Bot. Berol.
Film Nr. 7876

Drimiopsis fischeri (Engl.) U. & D. Müller-Doblies
Lecto type of Scilla fischeri Engler 1895
Isolecto type of Drimia fischeri Baker 1898

det. ~~confirm.~~ 25. 11. 1990
Ute & Dietrich Müller-Doblies
Paulsenstraße 47a
1000 Berlin 41 / Germany

If you have another opinion, we would appreciate a short communication prior to 1999.

Scilla

Sc. Fischeri Engl. n. sp.; bulbo magno; foliis e basi lata lanceolatis, scapo 3—4-plo brevioribus; scapis (3—3,5 dm longis) circ. 20—25-floris cylindricis; pedicellis flore paullo brevioribus patentibus vel leviter curvatis; perigonio campaniformi, tepalis dimidio inferiore viridibus, superiore medio viridibus, margine pallidis; antheris flavis. — Ostafr. (11? 14? 16?. — Fischer).

Botanisches Museum zu Hamburg.

Scilla Fischeri Engl.

B-Lecto Fischer 325
von Drimia fischeri Baker 1898

Drimiopsis fischeri (Engl.) U. & D. Müller-Doblies
Lecto type of Drimia fischeri Baker 1898
Isolectotype of Scilla fischeri Engl. 1895

det. ~~confirm.~~ 25.11.1990
Ute & Dietrich Müller-Doblies
Paulsenstraße 47a
1000 Berlin 41 / Germany

If you have another opinion, we would appreciate a short communication prior to 1999.

Museum botanicum Berolinense
Drimia Fischeri, Baker n. sp.
Ostafrika
Fischer I. 325
ex Mus. Hamburg

Fig. 3
Synopsis of the Dahlem type sheets involved in *Drimiopsis fischeri* (ENGL.) U. & D.M-D.
left hand side — lectotype of *Scilla fischeri* ENGL. and *Drimiopsis fischeri*, FISCHER *"11"* (B); right hand side — lectotype of *Drimia fischeri* BAKER, FISCHER *325* [with I.325 on the label and with the same type of slip as *Scilla fischeri* 1.11] (B).

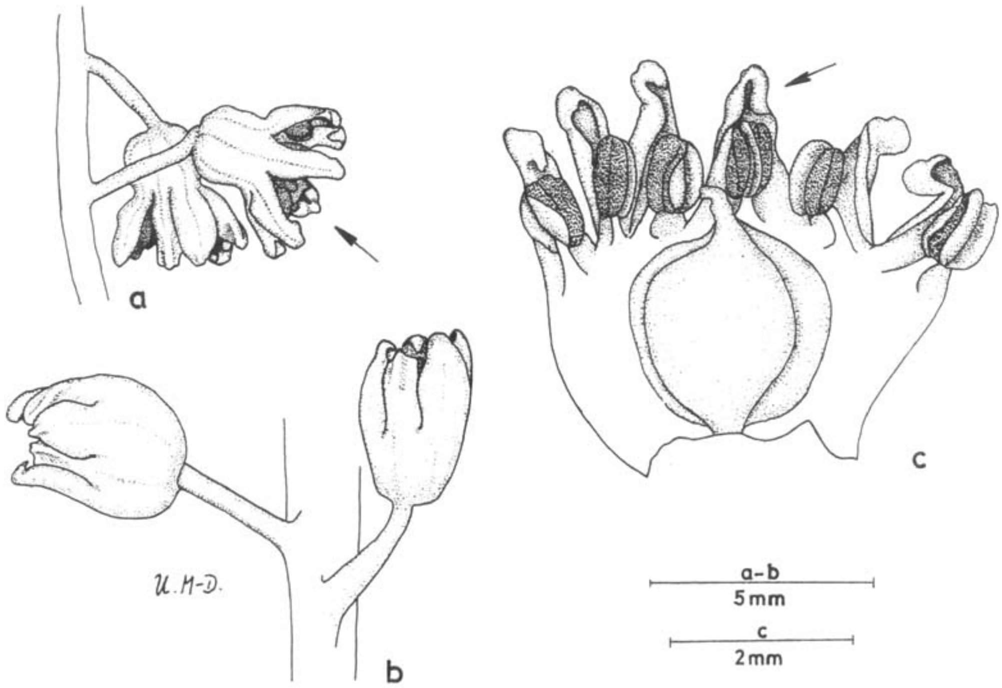


Fig. 4
Drimiopsis fischeri (ENGL.) U. & D.M-D.
a — two flowers from the lectotype specimen of *Scilla fischeri* (see arrow ← a in Fig. 3); b — two flowers from the lectotype specimen of *Drimia fischeri* (see arrow ← b in Fig. 3); c — flower from the same specimen opened. The arrows in Fig. a and c point to well-recognizable typical inner tepal tips.

Bibliographical note: BAKER 1897: 473 cites "Paxt. Flow. Gard. ii. 73, fig. 172" (BAKER 1870: sub t. 192 also "p. 73"). VAN DER MERWE 1944 (Fl. Pl. Afr. t. 957), JESSOP 1972: 157 and MAUVE 1976: 937 follow him. On the photocopy of LINDLEY's protologue which we got the page is 99 and the Fig. 163. Are there several editions or did one copy from the other without seeing an original?

5.3.2 *Drimiopsis woodii* BAKER 1897: 473, sp. hic restituta

Typus: Natal.—2930DB (Pietermaritzburg): Inanda, Sept., WOOD *656* (BOL, **K** lecto.! hic designatus, NH, SAM); paratype: Klip River, 3500–4500′ s.m., Oct. 1858, SUTHERLAND *s.n.* (K!).

Nomenclatural note: Strangely JESSOP 1972: 159 cites the SUTHERLAND but not the WOOD syntype from K.

5.3.3a *Drimiopsis burkei* BAKER 1870b: 17

Typus: Transvaal.—2528AD (Pretoria): Aapages (= Apies) River, Oct., BURKE *s.n.* (K holo.!). — Fig. 2a–d.

5.3.3b *Drimiopsis burkei* BAKER subsp. *stolonissima* U. & D.M-D. subsp. nova

Typus: Transvaal.—2430BC (Pilgrim's Rest): Strydom Tunnel, second parking area S of the tunnel, NW-facing slope with *Euphorbia*-trees, 800–900 m s.m., 29.09.1977, MÜLLER-DOBLIES *77017b* (holotype: PRE; isotypi: B, BOL, BR, BTU, E, G, GRA, J, K, L, LD, LI, M, MO, NBG, P, PE, S, STE, W, WAG, WIND, Z).

A *Drimiopse burkei* subsp. *burkei* foliorum pagina superiore levi (haud plerumque scabra denticulorum minutorum seriebus), maculis atroviridis instructa (haud concolori vel maculis brunneis instructa), perigonio 4.5–5.5 mm (non solum 3.5–4.5 mm) longo, et praesertim stolonibus bulbiferentibus usque plus quam 100 mm longis differt.

5.3.4 *Drimiopsis reilleyana* U. & D.M-D. sp. nova

Typus: Swaziland.—2631DA (Mbabane): Mkhaja, Nature Reserve N of Phuzumoja Station, little waterfall in the tree-savannah, 30.12.1981 veg., MÜLLER-DOBLIES *82013b* (holotype: PRE; isotypi: B, BTU, K, M, MO, S, WIND, Z).

Drimiopsi burkei remote affinis, sed foliis, scapo, quin etiam pedicellis pilosis (haud glabris), perigonio 4–5 mm longo, alabastris paene albis (solum vitta tepalorum exteriorum albescet) differt.

5.3.5 *Drimiopsis davidsoniae* U. & D.M-D. sp. nova

Typus: Transvaal.—2430DB (Pilgrim's Rest): Treurrivier, Blyde River Canyon Nature Reserve, rocky slope, ca. 1400 m s.m., 23.09.1977 veg., MÜLLER-DOBLIES *&* DAVIDSON *77003k* (holotype: PRE; isotypi: B, BOL, BR, BTU, E, G, GRA, J, K, LI, M, MO, NBG, P, PE, S, W, WIND, Z).

Species pumila distincta, quae a ceteribus Africae australis speciebus notis habitu, i.e. praesertim characterum combinatione sequenti differt: foliorum lamina ovoidea vel anguste ovoidea, glabra, subtus vinacea, statu adulto bene petiolata, margine graciliter crenulato, plerumque solum usque 20 mm longa et 8 mm lata. A *Drimiopse burkei* praeterea tepalorum segmentis roseis atque tepalorum interiorum apicibus luteo-auriculatis, a *Drimiopse atropurpurea* scapo glabro et multo minore distinguitur.

5.3.6 *Drimiopsis atropurpurea* N.E.BR. 1921 Kew Bull. 1921: 299

Typus: Transvaal. — 2531CC (Komatipoort): Barberton, at Roses Creek, in shade of bush, 2900′ s.m., Nov. 1920 fl., THORNCROFT *1083* (BOL, GRA, K holo.!, PRE3!)

Syn.: *Drimiopsis purpurea* VAN DER MERWE 1946, Fl. Pl. Afr. **25**: t. 975. – Typus: Natal. — 2730BD (Vryheid): Paulpietersburg district, near Pivaan (not located, quarter degree square of Paulpietersburg), VAN DER MERWE 2781 (PRE holo.!)

5.3.7 *Drimiopsis pusilla* U. & D.M-D. sp. nova

Typus: Swaziland.—2631BD (Mbabane): Red Hill Road. 4 km from Mbabane/Usutu road to Lundsi, N-facing granitic ridges, shady ledge, 08.01.1982, MÜLLER-DOBLIES *82020b* (holotype: PRE; isotypi: B, BTU, K, M, MO, NBG, S, Z).

Drimiopsi atropurpureae affinis, sed statura multo minore distincte differt, praesertim scapo solum 10–20 mm alto (non 90–310 mm longo) et racemo solum 8 mm longo (non 25–70 mm longo).

5.3.8 *Drimiopsis comptonii* U. & D.M-D. sp. nova

Typus: Swaziland.—2631AC (Mbabane): Ukutula, slope below farm house of Prof. Compton, S-facing granitic outcrops, peaty pans, 02.08.1984, MÜLLER-DOBLIES *84008a* (holotype: PRE; isotypi: B, BTU, G, GRA, J, K, LI, M, MO, NBG, S, WIND, Z).

Drimiopsi atropurpureae remote affinis, sed differt bulbis stoloniferis, foliis pluribus (plerumque 3–4, interdum 2–8), scapo glabro, inflorescentia breviracemosa (primo racemus corymbosus, denique 10–15, raro 27 mm longus). Praeterea ab omnibus Africae australis speciebus distincta pedicellis 3.2–7.5 mm longis (non solum 1–2, rarissime 3 mm longis) et stylo ovario duplo longiore (non solum aequilongo). Adhuc nulla species odorata dicitur (an recte?), sed *D. comptonii* odore hyacinthino excellet.

SWAZILAND.—2631AC (Mbabane): Ukutula, slope below farm house of Prof. Compton, S-facing granitic outcrops, peaty pans, 08.01.1982, MÜLLER-DOBLIES *82018g* (B, BOL, BR, BTU, E, K, M, P, PE, PRE, WAG, Z).

5.3.9 *Drimiopsis fischeri* (ENGL.) U. & D.M-D., comb. nova

Basionymum: *Scilla fischeri* ENGL. 1895, Pfl. Ostafr. 142. – Typus: Tanzania, FISCHER "*11? 14? 16?*" *[= 325]* (B lecto.!, hic designatus). — Fig. 3 and 4a.

Syn.: *Drimia fischeri* BAKER 1898, Fl. Trop. Africa 7: 526, syn. novum. – Typus: Tanzania, FISCHER *325* (B lecto.!, hic designatus).

Nomenclatural note: Both above old names *Scilla fischeri* ENGL. and *Drimia fischeri* BAKER are based on different sheets of the same FISCHER collection: on both sheets there is a single plant bearing a slip with a number meaning probably

"1.11", on the label of the *Drimia fischeri* type there is in addition "Fischer I.325" (Fig. 3).

Taxonomic note: From the identic slip numbers on the respective type sheets and the overall similarity of the specimens of *Scilla fischeri* ENGL. and *Drimia fischeri* BAKER it is evident that both names are conspecific. From the tips of the inner tepals they belong beyond doubt to the genus *Drimiopsis*. Within this genus the pedicels are unusually long (2–3.5 mm). The previous species, *D. comptonii*, has even slightly longer pedicels (3.2–7.5 mm), but a much smaller stature.

6. Lachenaliinae U. & D.M-D. subtrib. nova

A subtribu Massoniinae differt tubo perigoniali obliquo = leviter zygomorpho, et scapo plerumque supraterraneo (duobus speciebus *Lachenaliae* subgen. *Brachyscypha* exceptis).
– Type of the subtribe: *Lachenalia*. Further member: *Veltheimia*.
Syn.: Lachenaleae SALISB. 1866: 20 (nom. illeg., quia pro ordine), comprising eight genera: six genera of *Lachenalia* p.p., *Veltheimia*, and *Uropetalum* (= *Dipcadi* p.p.).

A key to the genera of Lachenaliinae is superfluous, and an elegant one is not easy.

7. Massoniinae

Type of the subtribe: *Massonia*. Further members: *Eucomis, Whiteheadia, Namophila, Periboea, Polyxena, Androsiphon, Amphisiphon, Neobakeria, Daubenya*.
Syn.: Eucomeae SALISB. 1866: 16 (nom. illeg., quia pro ordine): comprising seven genera *Eucomis* (= *Eucomis* and *Whiteheadia*), *Podocallis* (= *Massonia nivea* BURCH. ined.= *M. jasminiflora* BURCH. ex BAKER 1871, synonymy of *Podocallis* cited by BAKER 1897 with ?), *Massonia*, *"Manlilia"* THUNB. = *Mauhlia* (= *Polyxena*), *Baeoterpe* (= *Periboea*), *Xeodolon* [= *Ledebouria revoluta* (L.f.) JESSOP], *Sugillaria* [= *Lachenalia lanceaefolia* JACQ. = *Ledebouria revoluta* (L.f.) JESSOP fide JESSOP 1970: 256].

Key to the genera of Massoniinae

1a Flowers actinomorphic
2a Leaves many (5–9), lorate to obovate; inflorescence topped by a conspicuous flat-topped coma of leafy, sterile bracts (hence pine-apple plant) . . . . **1. *Eucomis***
2b Leaves two (rarely three, in *Periboea* exceptionally up to seven, linear), ovate to rarely linear; inflorescence topped by an inconspicuous coma of sterile bracts or not, only in *Whiteheadia bifolia* the coma is considerable:
3a Filaments free or fused to form a very short (up to 3 mm high) and broad filament tube:
4a Filaments fused or occ. free, uniseriate:
5a Inflorescence capitate:
6a Tepal-tips not caudate; tepal segments mostly reflexed with a sigmoid fold; capsule emerging distinctly from the perigon . . . . **2. *Massonia***
6b Tepal-tips caudate for several mm; tepal segments stellately erecto-patent; capsule remaining enclosed in the perigon . . . . **3. *Namophila***
5b Inflorescence spicate . . . . **4. *Whiteheadia***
4b Filaments free, biseriate:
7a Perigon tube shorter than (occ. as long as) the segments, (3.0–) 5–7 mm long; ovary subglobose and style only 1–7(–10.5) mm long; flowers closing at night or during cold weather; south-western Cape . . . . **5. *Periboea***
7b Perigon tube longer than the segments, 6–20(–30) mm long; ovary cylindrical or ovoid, and style 3–32 mm long; flowers remaining open day and night; Cape outside the south-western Cape, radiating into the Orange Free State . . **6. *Polyxena***
3b Filaments fused to form a long (9–15 mm high) and narrowly cylindrical filament tube:
8a Filament tube inserted at the throat, at the upper end with a characteristic disc; perigon-segments 11–13 mm long, about twice as long as the perigon tube; capsule obovate, apically subtruncate with three sharp angles, opening loculicidally . . . . **7. *Androsiphon***
8b Filament tube inserted about the middle of the perigon tube, at the upper end without a disc; perigon-segments 1.5–3.0 mm long, about seven to ten times shorter than the

perigon tube; capsule ovate, tapering into a long beak, opening septicidally after being shed . . . . **8.** ***Amphisiphon***

1 b Flowers zygomorphic:
  - 9 a Adaxial part of perigon tube longer than abaxial one; perigon of lower flowers 22–34 mm long, pale yellow; perigon-segments linear; flowers about 40–60 per spike . . . . **9.** ***Neobakeria***
  - 9 b Abaxial part of perigon tube longer than adaxial one; perigon of lower flowers 40–80 mm long, orange, or bright yellow; perigon-segments obovate to ovate; flowers about 10 per head . . . . **10.** ***Daubenya***

7.1 *Eucomis* L'Hérit. 1789 ("1788"): 17

Generitypus: *Eucomis regia* (L.) L'Hérit. 1789: 17.

7.2 *Massonia* Thunb. ex Houtt. 1780: 424

Generitypus: *Massonia depressa* Houtt. 1780.

Nomenclatural note: The authorship of *Massonia* is not yet fully clarified. Jessop 1978: 406 cites only Houtt. whereas earlier authors cited mostly Thunb. ex L.f. (e.g. Phillips 1951). Merril 1938: 331 proposes "Thunb. in Houtt.", which proposition was taken up by Mauve 1976: 940 as "Thunb. ex Houtt.". The rare Houttuyn publication is not available in Germany and thus we have not yet checked, whether one can say "Thunb. in". For the time being we prefer Mauve's smaller decision.

Taxonomic note: When describing *Massonia bolusiae* in 1931 Barker noted that there were 38 species, five of them described after Baker 1897 in Flora Capensis. About another five spp. were described up to 1947 without a further addition up to now. In his revision Jessop 1976 brought this number of more than 40 spp. down to eight.

Our knowledge of *Massonia* is far from being satisfactory. We did not yet see the majority of the types and we still miss a few important taxa in the field. For the time being we leave four of Jessop's spp. as they are. One new combination of Jessop had already an old valid name under *Massonia* [*M. pygmaea* Kunth replacing *M. heterandra* (Isaac) Jessop], one of the species recognized by Jessop (*M. grandiflora* Lindl.) is so doubtful that we prefer not to recognize it, and two species are very polymorphic, each containing several species. One of them, *M. angustifolia*, even includes three spp. belonging to two genera (i.e. *M. zeyheri* and *Neobakeria namaquensis* are resuscitated from the synonymy), and from the synonymy of *M. echinata* three species are reinstalled (*M. hirsuta, M. tenella*, and *M. setulosa*), to which *M. sessiliflora* comb. nova can be added, because this taxon, omitted by Jessop 1976, was earlier included in *M. echinata* by Jessop.

The following sequence of species is arbitrary, starting with the four Jessop ones without changes.

Key to the species of *Massonia*

1 a Perigon tube usually less than 15 mm long, if up to 21 mm long then filaments less than 5 mm long:
  - 2 a Largest bracts at base of inflorescence longer than 10 mm long; filaments white, pale green and/ or red; tepal segments ± reflexed, with or without sigmoid curve:
    - 3 a Anthers when open (1.5–)2–5 mm long; diameter of tepal tube at the throat more than 6 mm . . . . **1.** ***M. depressa***
    - 3 b Anthers when open about 1 mm long; diameter of tepal tube at the throat up to 5 mm:
      - 4 a Filaments only 2–5 mm long; tepal segments without a sigmoid curve (fide Jessop it may occur in ***M. jasminiflora***):
        - 5 a Perigon tube 4–6 mm long; segments 3.5–5.0 mm long; style 5–7 mm long, rather stout; leaves 20–25 × 5–18 mm; only known from the Bokkeveld escarpment near Nieuwoudtville . . . . **10.** ***M. tenella* = *M. bokkeveldiana***
        - 5 b Perigon tube (8–)9–18(–20) mm long; segments (4–)5–8 mm long; ovary without a shoulder, tapering very gradually into the stout acuminate style of 7–15 mm in length; leaves (25–)30–60(–90) × 15–30(–77) mm; widely distributed in the

Karoo between Kuruman and Fort Beaufort in the Cape, to Schweizer Reneke in the southern Transvaal, most of the Orange Free State and to Lesotho . . . . **4.** ***M. jasminiflora***

4b Filaments (4–)5–24 mm long; tepal segments with or without a sigmoid curve:

6a Leaves with pustules of about 1 mm in diameter; hyaline tip of pustules hair-like, up to 0.2 mm long; filaments in well developed flowers 16–24 mm long (in weak flowers only 10 mm) . . . . **2.** ***M. pustulata***

6b Leaves with hairs or glabrous; with or without small pustules at the base of the hairs; filaments mostly less than 12 mm long (occ. up to 16.3 mm in *M. sessiliflora*):

7a Filament tube less than 1.5 mm, mostly less than 1 mm long:

8a Tepal base with a sigmoid curve; filaments of equal length:

9a Filaments acuminate, less than 1 mm in diameter; throat with a ± ring-shaped opening around the style; ovary with a distinct shoulder, suddenly contracted into a terete slender style; top of inflorescence without a coma of sterile bracts; flowers not or scarcely scented . . . . **6.** ***M. echinata***

9b Filaments distinctly swollen, even in the dry state more than 1 mm in diameter, their tumid bases closing the throat of the tepal tube; ovary without a shoulder, tapering very gradually into the stout acuminate style; top of inflorescence with a coma of sterile bracts (not seldom somewhat hidden between the flowers); flowers strongly scented . . . . **8.** ***M. hirsuta***

8b Tepal base without a sigmoid curve; inner filaments usually 2–3 mm shorter than outer ones; leaves usually only up to 30 mm long . . . . **5.** ***M. pygmaea***

10a Leaves pustulate or papillate . . . **5a.** ***M. pygmaea*** subsp. ***pygmaea***

10b Leaves glabrous . . . . **5b.** ***M. pygmaea*** subsp. ***kamiesbergensis*** p.p.

7b Filament tube longer than 1.2 mm, often 2.0–3.5 mm long:

11a Inner filaments usually 2–3 mm shorter than outer ones; throat of filament tube with a ring-shaped opening around the style . . . . **5b.** ***M. pygmaea*** subsp. ***kamiesbergensis*** p.p.

11b All six filaments of equal length; throat of filament tube closed by six gibbosities from in between the filaments; the rays of the star-like entry end in front of each filament; leaves usually hairy above:

12a Base of tepal segment without a sigmoid curve; tepal segments 6–10 × 0.5–1.0 mm; southern Namibia and lower Orange River Valley of the Cape . . . . **7.** ***M. sessiliflora***

12b Base of tepal segment with a sigmoid curve; tepal segments 5–8 × 1.7–2.5 mm; between Caledon and Heidelberg . . . . **9.** ***M. setulosa = M. parvifolia***

2b Largest bracts at base of inflorescence usually only up to 5 mm long; filaments orange; tepal segments erect, without sigmoid curve . . . . **11.** ***M. angustifolia***

1b Perigon tube of lower flowers 18–45 mm long:

12a Perigon white or pink; filaments 5–9 mm long, white; pedicels 0–1 mm long; Karoo of the Northern Cape, southern Transvaal, and Orange Free State . . . . **3.** ***M. comata***

12b Perigon bluish white; filaments of lower flowers 15–19 mm long, orange; perigon tube only up to 32 mm; lower pedicels 5–15 mm long; south-western Cape, local around Saldanha . . **12.** ***M. zeyheri***

7.2.1 *Massonia depressa* HOUTT. 1780
Natuurl. Hist. 12: 424, t. 85, fig. 1

Iconotypus: Cape, without locality, l.c.
Syn. novum: *M. grandiflora* LINDL. 1826, Bot. Reg. 12: t. 958. – Iconotypus: idem, "brought from the interior of the Cape by Mr. Synnet" [= WALTER SYNNOT (as to the orthography cp. "*Synnetia*" and *Synnotia*), landdrost in Clanwilliam from 1821 to his return to Ireland in 1825, who according to SWEET introduced "more new and rare bulbs from the Cape of Good Hope at one time than was ever done by any other individual" (GUNN & CODD 1981: 340); thus the type of *M. grandiflora* was probably collected around Clanwilliam, and from

other SYNNOT collections one can possibly work out up to which distance].

Taxonomic note: Following OBERMEYER 1965 JESSOP 1976 recognized with some hesitation *M. grandiflora* LINDL. which BAKER 1871 and 1897 had put into the synonymy of *M. obovata* JACQ. 1804. According to JESSOP the latter name is one of six synonyms belonging to *M. depressa*. JESSOP's key character for *M. grandiflora* is the very short perianth tube (3–5 mm long), whereas OBERMEYER gives about 8 mm, which falls into JESSOP's tube range of *M. depressa*, (5–)10–15(–17) mm. The only measurement given by LINDLEY is "*Flowers*, together with the pedicels, about an inch long"; together with the "*Perianthium* funnel-shaped" and the illustration, one can conclude that JESSOP's idea of *M. grandiflora* has nothing to do with the type.

Thus for the time being it does not make sense to recognize *M. grandiflora*. We are convinced that *M. depressa* comprises several taxa but these still deserve a good deal of research work.

Distribution: Widely distributed in the winter rainfall and all year rainfall areas of the Cape, also at Fauresmith in the Orange Free State (summer rainfall) according to JESSOP 1976 (our plants from near Fauresmith did not yet flower in six years, an unusual behaviour of *M. depressa*).

7.2.2 *Massonia pustulata* JACQ. 1791 COLLECT. 4: 177

Iconotypus: Cape, without locality. JACQ. 1804, Hort. Schoenbr. 4: 454

Taxonomic note: We are not certain about the limits of this species. JESSOP 1976 has a much broader concept.

Diagnostic characters: *M. pustulata* is the only short-tubed (tube <18 mm) *Massonia* with filaments reaching 17–24 mm or the only *Massonia* with densely pustulate leaves in which the pustules bear no trichome.

Distribution: We have typical plants only from a single locality (Arniston flats).

7.2.3 *Massonia comata* BURCH. ex BAKER 1871: 392

Typus: Cape.—3124BB (Hanover): Carolus Poort, BURCHELL *2751* (K holo.), [locality cited after BAKER 1897, JESSOP 1976 only modified the locality of the protologue: "Cap. B. Spei"].

Diagnostic characters: *M. comata* is the only member of *Massonia* with a perigon tube of 23–45 mm except for *M. zeyheri* (the perigon tube of which reaches 32 mm) with orange filaments and a blue filament tube; filaments and filament tube are white in *M. comata* as in most *Massonias*.

In other words one can define *M. comata* as the only *Massonia* species with white (not orange) filaments among the species with bracts of the lower flowers shorter than 10 mm or early deciduous.

Distribution: Karoo, in the north from Griquatown (Northern Cape) to Bloemhof (very south of Transvaal) and Glen, SW of Brandfort (Orange Free State), and to Beaufort-West in the south-west.

7.2.4 *Massonia jasminiflora* BURCH. ex BAKER 1871: 390

Typus: Cape.—2723BB (Kuruman): Pellat Plains, at Jabiru Fontein near Takun [= Takoon], BURCHELL *Bulb No. 7* (K holo.), [locality cited after BAKER 1897, JESSOP 1976 only modified the locality of the protologue: "Cap. B. Spei"].

Diagnostic characters: *M. jasminiflora* is the only member of *Massonia* with short filaments (2–4,5 mm long) and the perigon tube being 8–18(–20 fide JESSOP) mm long.

Distribution: *M. comata* and *M. jasminiflora* are together the only summer rainfall *Massonias* and have a rather similar distribution area with *M. jasminiflora* exceeding the *M. comata* area especially in the south-east to Lesotho and Cathcart in the eastern Cape.

7.2.5 *Massonia pygmaea* KUNTH 1843: 298, sp. hic restituta, not a synonym of *Massonia echinata* L.f., but the correct name for *Neobakeria heterandra* ISAAC

Typus: Cap. B. Spei, (label in B: "Koude Bokkeveld, Geitow" or "Geiter" = Gydo?, "May 17"), MUND & MAIRE *s.n.* (B holo.!, G!, HAL!) – JESSOP 1976 only knew about the Halle isotype without locality.

Syn.: *Polyxena bakeri* DUR. & SCHINZ 1893: 366, nom. novum pro *Massonia pygmaea* KUNTH [nominis pristini *Polyxena pygmaea* (JACQ.) KUNTH causa]. — Type: as above.

Neobakeria heterandra ISAAC 1939, Fl. Pl. Afr. **19**: t.729, syn. novum = *Massonia heterandra* (ISAAC) JESSOP 1976: 426. - Type: Cape.—3319CD (Worcester): Louw's Hoek Villiersdorp, STOKOE *s.n.* sub BOL 22309 (BOL holo., PRE!, SAM).

Taxonomic note: Already KUNTH stated in the protologue of *Massonia pygmaea* "Stamina ... inaequalia; tria alterna longiora". This character state occurs only in one *Massonia* species of the south-western Cape, *Massonia heterandra* which turns out to be a younger synonym. When JESSOP 1976 investigated the Halle isotype of *M. pygmaea*, he apparently did not note the different length of the filaments and thus treated it as a synonym of *M. echinata*.

Occasionally even in fresh flowers the difference between outer and inner filaments is rather faint.

Diagnostic characters: *M. pygmaea* is the only member of the genus *Massonia* with the inner filaments distinctly (mostly 2–3 mm) longer than the outer ones (vs. all six filaments of equal length).

Infraspecific taxonomy: As there is up to now only a single subspecies to be distinguished in *Massonia* we keyed it already out in the key to the species:

7.2.5b *Massonia pygmaea* KUNTH subsp. *kamiesbergensis* U. & D.M-D. subsp. nova

Typus: Cape.—3018AC (Kamiesberg): Koringlandskloof, 1 km on Leliefontein road from Garies/Platbakkies road, loamy ground, ca. 1200 m s.m., 12.08.1980 cosfr., MÜLLER-DOBLIES *80087e* (holotype: PRE; isotypi: B, BTU, GRA, K, LI, M, MO, NBG, S, WIND, Z).

A subspecie typica foliis semper glaberrimis (neque setulosis neque pustulosis) et tubo filamentorum longiore [1–1,5(–2,5) mm non solum 0,3–1,0 mm] differt.

Distribution: *M. pygmaea* has two disjunct distribution areas: subsp. *pygmaea* from Villiersdorp to Cedarberg Tafelberg and Middelberg, and subsp. *kamiesbergensis* in the Kamiesberge with a gap of more than 200 km in between.

7.2.6 *Massonia echinata* L. f. 1782: 193

Typus: Cape.—3118BB (Vanrhynsdorp): "Crescit iuxta margines montis, dictae Bocklands Berg, in interioribus Capitis bonae spei regionibus", probably 03.11.1774 [according to the itinerary in GUNN & CODD], THUNBERG *s.n.* (UPS-THUNB 7988 holo.! fide JESSOP). [locality cited after THUNBERG 1782: 41, a name Bockland or with kk or k does not show up in LEISTNER & MORRIS 1976, but in SKEAD 1973 we read: "Bokkeland can be the Western part of Calvinia dist. below Bokkeveld Mts."; we thus suppose that Bocklands Berg is an old form for Bokkeveldberg as given by LEISTNER & MORRIS 1976 and on the 1 : 500.000 sheet, ed. 2]. — Fig. 5d–h of the present paper.

Taxonomic note: JESSOP 1976: 416 stated that his concept of *M. echinata* includes "approximately 25" BAKER species and continued: "The present author has been unable to correlate any two of these characters or any one morphological character with geographical distribution. Further, it has been found that, in practice, these characters show continuous ranges of gradation." Perhaps 25 is an printing error for 15, because among the 22 or 23 heterotypic synonyms cited by JESSOP, six are post-Bakerian and not all earlier names were recognized by BAKER. One possibly "good" species was evidently omitted from the synonymy by a printing error, namely BAKER's first species, *M. tenella*. The name of *M. huttonii* is followed by the types of *M. tenella*, because the printer jumped into the next citation, omitting the correct type of *M. huttonii* and the following name of *M. tenella*.

As already treated under the previous species, one of the synonyms is the valid name *M. pygmaea*. Another synonym, *M. scabra* THUNB., was thought by THUNBERG to be conspecific with *M. pustulata* and we prefer to follow his suggestion.

It is in fact not easy to tackle the *M. echinata* group. It appears, however, that sufficient discontinuity exists together with geographic evidence to recognize at least three or four further species. Three recuscitated species follow under 8–10. The basionym of the immediately following species was known to JESSOP and proposed as a synonym of *M. echinata* but is not cited as such for unknown reasons.

Diagnostic characters: *M. echinata* has no exceptional characters in the genus and thus can only be circumscribed by a rather long-winded combination of characters: it is the only member of *Massonia* with a sigmoid curve at the base of the tepal segments combined with a ± open throat of the filament tube and with pustulate leaves, bearing one to few short stiff hairs on each pustule.

Distribution: We have found it only at two localities, Vanrhynspas and the Karoo National Park.

7.2.7 *Massonia sessiliflora* (DINTER) U. & D.M-D. comb. nova, the only *Massonia* of Namibia

Basionymum: *Haemanthus sessiliflorus* DINTER 1931: 258. – Typus: Namibia.— 2715DD (Bogenfels): Buchuberge, Glimmerschiefer, 01.07.1929 sfr., DINTER 6471 (B! holo., HBG!, M!). — Illustrations: MERXMÜLLER & ROESSLER 1973: Abb. 1; Fig. 5a–c of the present paper.

Origin of the epitheton: *sessiliflorus* = 'with sessile flowers' is badly chosen, because it is misleading in two respects:

- it is meant for a sessile inflorescence, i.e. that there is no scape unlike in all "other" *Haemanthus* species; in *Massonia*, however, there is never a visible scape
- the flowers are strictly speaking not sessile, but have short pedicels.

Diagnostic characters: *M. sessiliflora* is the only member of the genus *Massonia* having gibbosities on the inner side of the filament tube (Fig. 5c) combined with tepal segments having no sigmoid curve (Fig. 5a–b). According to the present knowledge it is the only *Massonia* species known from Namibia.

Variability: The leaves are hairy or glabrous in the same population. In the protologue DINTER describes the plant as glabrous; the leaves of the holotype, however, are sparsely hairy.

When comparing the measurements of the filament length some caution is required; there is some variation between the populations and between herbarium specimens (MERXMÜLLER & ROESSLER 1973, THUNBERG's type specimen, and JESSOP 1976) and our values from fresh cultivated flowers (s. Table 2).

Table 2
Variation of filament length and the length of the filament tube in several populations of *Massonia sessiliflora* and *M. echinata*

	filament length in mm (incl. tube)	filament tube in mm
M. sessiliflora		
MERXMÜLLER & ROESSLER 1973	7 – 8	(0.5–)1
M-D. from Buchuberge	9.5–16.3	1.3– 3.5
M-D. from Beauvallon	9.5–13.3	1.2– 2.5 (in 1 flower 0.5–1.3)
M. echinata		
JESSOP 1976	4 – 8	free or shortly connate
type UPS-THUNB 7988: Fig. 4h	4 – 5	0.8– 1
M-D. from Vanrhynspas	8 –11.3	0.5– 1.3
M-D. from Karoo Nat. Park	7.3–11.0	0.3– 0.5

Taxonomic note: MERXMÜLLER & ROESSLER 1973 found out that DINTER's *Haemanthus sessiliflorus* is not a member of Amaryllidaceae but is in fact a *Massonia*. From JESSOP, whom they asked because of his unpublished thesis, they got the information that it probably belongs to *M. echinata*. In his revision 1976, however, JESSOP left the question open and did not mention a Namibian *Massonia*.

Unlike the above mentioned combination of floral characters of *M. sessiliflora* we find in typical *M. echinata* the opposite combination, no gibbosities on the inner side of the filament tube (Fig. 5e) combined with tepals having a sigmoid curve (Fig. 5d–h). Furthermore filaments and filament tube are usually shorter and the filaments are slightly more spreading (compare Fig. 5d with 5a).

Concerning the distribution there is a gap of about 300 km between the area of *M. sessiliflora* and the nearest locality of *M. echinata* in the Vanrhynsdorp grid.

Distribution: On both sides of the lower Orange River valley.

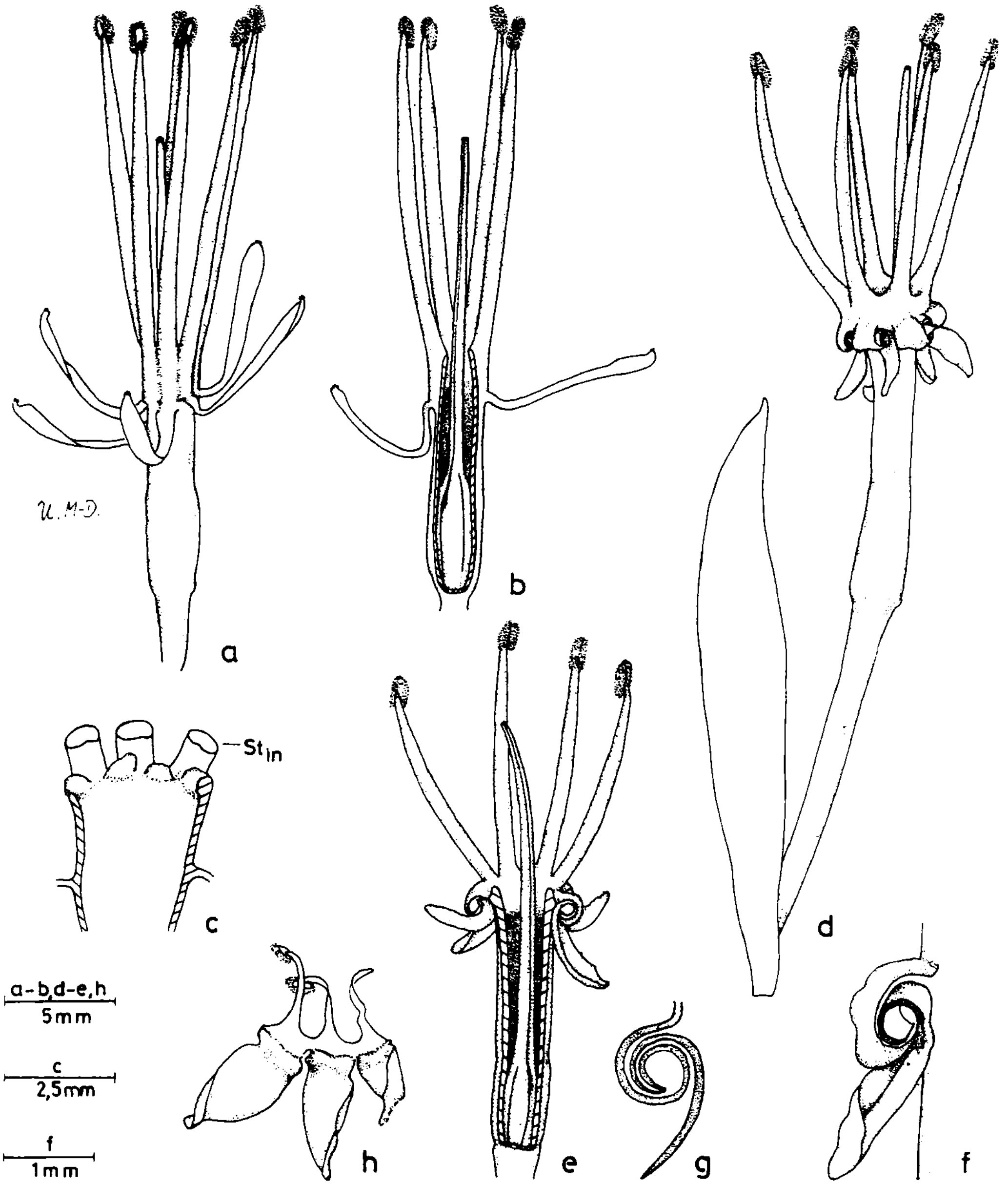


Fig. 5
Massonia sessiliflora (Dinter) U. & D.M-D. (a–c) from the type locality Buchuberge (*M-D. 88037c*) and *M. echinata* L.f. (d–h): d, f — from near the type locality (*M-D. 77060c* from Vanrhynspas); e — from the Karoo National Park (*M-D. 84057c*) and h — from the type UPS-THUNB *7988*

a, d — lateral view of a flower; b, e — longitudinal section of a flower, two tepals removed; c — detail of the filament tube, inner side with a gibbosity at the edge between the filaments; f — tepal with sigmoid curve; g — longitudinal diagram of the sigmoid curve; h — detail of the type specimen.

NAMIBIA.—2715DD (Bogenfels): type locality as above; Buchuberge, obenauf am Südberghang, 10.09.1972 sfr., MERXMÜLLER & GIESS *28324* (M!, WIND); ibid., main summit with radio tower, rocky slope, ca. 500 m s.m., 23.07.1988, MÜLLER-DOBLIES *88036d* (B, BTU, K, PRE, WIND); ibid., Central ridge, rocky slope, ca. 450 m s.m, MÜLLER-DOBLIES *88037c* (B, BTU, K, M, MO, PRE, S, Z); ibid. Glimmerschieferberge, DINTER 6520 (HBG).
CAPE.—2816DA (Oranjemund): Beauvallon, 1 km W of Beauvallon on Oranjemund road, dune slope with stones, ca. 150 m s.m., 28.09.1989, MÜLLER-DOBLIES *89128c* (B, BTU, K, NBG, PRE, WIND); ibidem, JÜRGENS 22602 (cult. BTU 8428: BTU).

7.2.8 *Massonia hirsuta* LINK & OTTO 1828 Ic. Pl. Rar. 1: t. 1.

Iconotypus: Cape, without locality, KREBS s.n., l.c. (B? if a dried specimen was preserved, it was destroyed in 1943).
Syn.: *Massonia angustifolia* KER GAWL. 1804, Bot. Mag. **19**: t. 736, syn. novum ex descr. iconeque, non L.f. 1782. – Typus: Cape, without locality, said to be imported in 1775 by MASSON *s.n.*, cult. at Messrs. Grimwood and Wykes's (BM!).

Massonia orientalis BAKER 1878, J. Bot. **1878**: 321, syn. novum ex descr. – Typus: Cape.—3325DC (Port Elizabeth): Sand-dunes at Port Elizabeth, BOLUS *2239* (voucher not located by JESSOP 1976).

Massonia bolusiae W.F.BARKER 1931, Fl. Pl. Afr. **11**: t. 429, syn. novum ex descr. iconeque. – Typus: Cape.—3125AC (Steynsburg): farm Bangor near Middelburg, PAMELA BOLUS *s.n. sub BOL 19615* (BOL).

Massonia inexpectata POELLN. 1946, Portug. Acta Biol., ser. B, **1**: 384, syn. novum. – Typus: Cape.—3325CD (Port Elizabeth): Zwartkopsrivier, villa Paul Maré to Uitenhage, 50–500′ s.m., ECKLON & ZEYHER *2.11* (BTU photo, WRSL holo.). [As to the collecting details VON POELLNITZ gives nothing but question marks: "Ubi?, leg.? Typus im Herbar Breslau!" (= type in herbarium Breslau = WRSL as akronym in the Index herbariorum, type specimen not located by JESSOP 1976). VON POELLNITZ did not realize, that the printed label "Massonia echinata L. 2.11" contains all information wanted: it is an ECKLON & ZEYHER label, the plant being from locality no. 2, collected in month no. 11 = Nov., see DRÉGE 1847: 584 or GUNN & CODD 1981: 390.]

Taxonomic note: This species comprises an element which was misunderstood for nearly two centuries. KER GAWLER's colour plate of *Massonia angustifolia* in Bot. Mag. 1804 was the first illustration of this species. It was published 22 years after the few-worded description of *M. angustifolia* L.f. and seemed to rely on very authentic material imported already in 1775, i.e. after just having been discovered and collected the previous year by THUNBERG & MASSON in the Roggeveld. This concept was universally accepted, and the true *M. angustifolia* was again described under several names: *M. marginata* WILLD. ex KUNTH 1843, *M. rugulosa* LICHTENST. ex KUNTH 1843, *M. burchellii* BAKER 1871, and *Polyxena haemanthoides* BAKER 1888. Thus e.g. KUNTH 1843 and BAKER 1897 cite Bot. Mag. t. 736 under *M. angustifolia*. JESSOP 1976 does not cite this plate at all; his perianth colour, however, "white, sometimes tinged with reddish brown" etc. is a trace of this 1804 concept of *M. angustifolia*.

The first valid description of a species comprising this element (*M. angustifolia* KER GAWL. non L.f.) is apparently *Massonia hirsuta* LINK & OTTO 1828. A good argument for their identity is KUNTH's remark that the figure of the protologue shows no filament tube. Our concept of *M. hirsuta* comprising the specimen of KER GAWLER's Bot. Mag. t. 736 and several collections from the Eastern Cape is characterized by a very short filament tube, mostly about 0.5 mm occasionally up to 1.0 or even 1.5 mm and by rather thick filaments. LINK & OTTO's plate shows acuminate filaments and the description speaks of a broader basal part and an upper part withering earlier; the filament shape depicted is not in full accordance with our fresh plants and KER GAWLER's plate and the relevant BM voucher, but we are as sure as desirable that the depicted structure means our *M. hirsuta* populations. The missing sigmoid curve of the tepal segments might be considered as a contra argument; if we consider, however, how long it took us to identify this structure on KER GAWLER's "*M. angustifolia*" voucher (BM), a structure which we were looking for (and LINK & OTTO did not know of it), we easily forgive this inaccuracy without having any doubt in our identification. With some fantasy the characteristically stout style can be recognized behind the stamens.

In the descriptions of *M. orientalis* and *M. bolusiae* no filament tube is mentioned and the detail figures of the latter species show free

Table 3
Comparison of three *Massonia* species with bristly leaves and a sigmoid curve at the base of the tepal segments

	M. echinata		*M. hirsuta*			*M. setulosa*			prot.	
	1	2	3	4	5	6	7	8	9	10
M-D. leg. no. →	77060c	84057c	79091e	84010a +84012d	89157w	82171n	82186e	89145c	*M. s.* + *M. parvifolia*	S iso.
leaf length	23 -55	28 -55	70	70 -80	60	(15 -)30-50	33-45	50 -62	25-30	20 -40
leaf width	15 -43	35 -48	80	65 -75	65	(15 -)31-48	27-32	50 -90	6-10	9 -15
leaf indumentum	pustules with a bristle		stiff hairs							stiff h.
outer bracts	13 -28.	18	22	19	17 -21	16 - 17	15	20 -25	12	14 -23
outer pedicels	6 -11	6 - 8	13	11	13 -14.5	6 - 12	8.5	13 -24	4- 6	4
perigon length	14.5-19	21	19	15.5-17	7 - 7.5	12 - 16	15	15 -21	12	11 -12
tube	9 -11	12 -13	10	9 -10.5	6 - 7.5	6.5- 9	9.5	8 -13	6	6 - 8
segments	5.5-8.0	8 - 9	9	5.5-6.5	6 -11	5 - 7	5.5	7 - 8	6	5 - 7
filaments	8 -11	7 -11	10	7.5-11	7.5-12	7.5- 12	7.5-8	10 -13.5	6- 8	5 - 6
filament tube	0.5-1.5	0.3- 0.5	0.5	0.5-1.0	0.5- 1.5	1.5- 3.0	2.5-3.5	1.5- 3.5	[2]	1.5- 2.0
filament throat	± open		± closed			closed by six gibbosities			[six gibbosities]	

All measurements in mm, those of columns 1-8 from fresh plants, those in column 9 are from the protologues of *M. setulosa* and *M. parvifolia* and thus from herbarium specimens. In column 9 the values in square brackets are added from our analysis of the holotype (B) and column 10 contains an analysis of the S isotype.

filaments. As to *M. inexpectata* VON POELLNITZ describes that the filaments are not united at the base. Thus in the specimens of all these three synonyms the filament tube is apparently so short that the authors did not notice it.

Diagnostic characters: *M. hirsuta* is the only member of the genus *Massonia* with tepal segments having a sigmoid curve combined with the ovary having no shoulders but tapering very gradually into an acuminate style.

Distribution: Eastern Cape; we have found it near Grahamstown, Port Elizabeth, and E of Murraysburg.

7.2.9 *Massonia setulosa* BAKER 1871: 389, sp. hic restituta

Typus: Cape, without locality, ECKLON & ZEYHER *s.n.* (TCD holo.).

Syn.: *Massonia parvifolia* BAKER 1892, Englers Bot. Jb. **15** (Beih.3): 8, syn. novum. - Typus: Cape.—3419AB (Caledon): Caledon, Zwarteberg und Umgegend des Bades, 1000 bis 2000′ s.m., ECKLON & ZEYHER *51.8 = Asphod. 25* (B! holo., S!, **WRSL**!).

Taxonomic note: With some hesitation we propose here the resuscitation of *M. setulosa*, before having seen the type. From fieldwork we know that a species different from *M. echinata* and the other 10 species recognized here is involved and this species is identical with *M. parvifolia* according to morphology and geography. Another question is, whether *M. parvifolia* is conspecific with *M. setulosa*.

Both names are cited by JESSOP 1976 as synonyms of *M. echinata* and the types are given without locality as in Flora Capensis. Fortunately there was a "51.8" in addition to "Asphod. 25" on the Berlin holotype label and the Stockholm isotype label of *M. parvifolia*, allowing to get the full locality from DRÈGE 1847: 587 or from GUNN & CODD 1981: 391.

Both species were described by BAKER (1871 and 1897) and are treated in Flora Capensis. They are, however, most likely conspecific and the holotype specimen of *M. parvifolia* can explain why BAKER did not remark his error: BAKER described the leaves of *M. parvifolia* as glabrous, but they are not on the upper side. On the Berlin holotype there is a glabrous leaf surface near the edge of the sheet and this is the most inviting one to be looked at under a dissecting microscope but unfortunately it offers a lower glabrous side. *M. setulosa* has the bristles already in its name. Thus both "species" are already separated into different groups by the first question in BAKER's key. In detail both descriptions are so similar that one can think that the types of both species may turn out to belong to the same ECKLON & ZEYHER collection. The leaves of *M. setulosa* are described in the protologue as 25–30 × 9–10 mm and those of *M. parvifolia* as 25 × 6 mm i.e. they are unusually small; the values of both protologues are combined in the last but one column (no. 9) of Table 3. From a comparison with our three collections of *M. setulosa* (column 6–8) it is evident that such short leaves occur only exceptionally and we do not have such narrow leaves (even not in the wild vouchers). The floral values of the protologues fit better into the variation range of our collections, at the lower end of the range of each character. As the variation between both protologues is very modest, far less than the variation within one of our collections of rather few individuals the assumed identity of both ECKLON & ZEYHER collections seems to be an appropriate working hypothesis.

Diagnostic characters: *M. setulosa* is the only member of the genus *Massonia* having gibbosities on the inner side of the filament tube combined with tepal segments having a sigmoid curve.

Distribution: Only known between Caledon and 31 km W Heidelberg: 3419AB, 3420AA, 3420AB, and 3420BA.

7.2.10 *Massonia tenella* SOLAND. ex BAKER 1871: 389, sp. hic restituta

Typus: Cape, without locality, MASSON *s.n.* (BM lecto. fide JESSOP 1976) [BAKER 1897: 409 mentions that the type plant flowering in England in 1794 was "obtained in Bokkeland" = neighbourhood of Vanrhynspas; this information is not on the type sheet but probably on the drawing (BM); the two flower heads on the type sheet are in fruit, thus MASSON possibly collected them end of Oct. 1774 when THUNBERG collected *M. echinata* on their third common expedition]; paratype: Cape.—3027CA (Lady Grey): Wittbergen, DRÈGE 3509 (K, S!) [the S isotype, annotated as *M. echinata* but not cited by JESSOP, has a unique indumentum of laterally compressed curved bristles and belongs possibly into the *M. jasminiflora* complex].

Syn.: *Massonia bokkeveldiana* POELLN. 1947, Portug. Acta Biol., ser. B, **1**: 384, syn. novum. – Type: Cape.—3119AC (Calvinia): Onder Bokkeveld, Oorlogskloof, 2200′ s.m., 21.08.1897, SCHLECHTER *10935* (BOL, **BR**!, G, GRA, L!, **WRSL! holo.**, **Z**!).

Taxonomic note: With some more hesitation than in the case of *M. setulosa* we propose here the resuscitation of *M. tenella*. Unlike in *M. setulosa* we do not know plants in the field or in cultivation.

M. tenella is the first species in BAKER's treatment of 33 species in Flora Capensis and is something apart according to its dimensions. Formally *M. tenella* is missing from JESSOP's synonymy of *M. echinata* and his index. It was present, however, in JESSOP's manuscript, as one can see from the citation of *Massonia huttonii* (JESSOP 1976: 414), for which the *M. tenella* syntypes MASSON *s.n.* and DRÈGE 3509 are given. The omission by the printer of the *M. huttonii* reference and type and the *M. tenella* name was probably caused by the nearly identical bibliographical references.

No other *Massonia* has such short filaments: "scarcely more than 1 mm" [translated from Latin] in the protologue, less than 2 mm ("under a line long") in Flora Capensis. We have not yet seen, however, such specimens, the BM lectotype has free filaments 2.2 to 2.5 mm long, together with the filament tube they are about 3 mm long. The synonym *M. bokkeveldiana* with filaments 3.5–4.2 mm long seems to be a good match. When including *M. bokkeveldiana* into our considerations, the very short perigon of 8 to 11 mm in the lower flowers is another difference with all other *Massonia* species.

As to the geographic distribution the types of both species are from the same region, possibly from the same quarter degree square or from two adjoining ones along the Bokkeveld escarpment. The paratype of *M. tenella*, DRÈGE *3509* however, is from such a different region that it does not make sense at all to consider it as conspecific. It cannot be a stunted short-tubed form of *M. jasminiflora*, of which we know that even the lower flowers may be as short as 9 mm. Possibly it is a species of its own with a rather different leaf surface.

Diagnostic characters: *M. tenella* is the only member of *Massonia* with short filaments (2–4.2 mm long) and the perigon tube of the lower flowers being only 4–6 mm long.

Distribution: Only known from the Bokkeveld escarpment.

Table 4
Comparison of some characters in the protologue and type specimens of *Massonia tenella* BAKER and its synonym *M. bokkeveldiana* POELLN. All measurements in mm.

	M. tenella			*M. bokkeveldiana*			paratype of *M. tenella* DRÉGE *3509*
	protologue	Fl. Cap.	lectotype	protologue	BR isotype	L isotype	
leaf length	25		20 -25	20 -25	30	42	20 -23
leaf width			4 - 6	6 -10	5 -9	18	15
outer bracts	10–12	8	11	10 -14	18	21	13
outer pedicels				5 - 6	c.8	5	2
perigon	8– 9	8	7.5– 8.0	10 -11		8–11	7.0– 7.5
tube	c.6	c.6	4.0– 4.6	5	5	4– 6	4
segments	3	c.2	3.5	5 - 6	5	4– 5	3.0– 3.5
filament[1]	>1	>2	2.7– 3.3	3.5– 4.0	4 -4.2	4	1.5– 1.8
filament tube			0.5– 0.8		1	1	0.2– 0.3
anthers				2	0.8–1	1	1

[1] with BAKER's measurements of the filaments there is something wrong: in the protologue he writes "vix ultra ½ lin. longa" while in Flora Capensis we read "under a line long", which numbers in itself are not essentially different; it is strange, however, that the improvement differs still considerably from the reality of the type specimen; perhaps BAKER was only relying on MASSON's drawing

7.2.11 *Massonia angustifolia* L. f. 1782 (spring, not "1781"): 193

Typus: Cape.—3119DD?(Calvinia): "Crescit in summo monte Onderste Roggeveldt" [= Roggeveldberge ?], 16.11.1774 [according to the itinerary in GUNN & CODD], THUNBERG *s.n.* (UPS-THUNB 7990 lecto.! hic designatus) [locality cited after THUNBERG 1782: 40 under *M. lanceolata*; our identification of THUNBERG's locality with the Roggeveldberge (—DD) is perhaps wishful thinking and needs confirmation by THUNBERG's travel reports].

Syn.: *Massonia lanceolata* THUNBERG 1782 (July 10): 40. - Type: as above under *M. angustifolia*.

Massonia marginata WILLD. ex KUNTH 1843: 299. = *Polyxena marginata* (WILLD. ex KUNTH) BENTH. & HOOK. ex DUR. & SCHINZ 1893: 366; BAKER 1897: 420. - Typus: Cap. B. Spei (B-WILLD no.6373 holo.!)

Massonia rugulosa LICHTENST. ex KUNTH 1843: 299. - Typus: "*Lichtenst. in herb. reg. Berol. (excl. fragm.)*" = *Lichtenstein 224* (B! holo.), [not destroyed as suggested by JESSOP, but the ms "Specilegium Florae Capensis" mentioned by GUNN & CODD 1981: 229, which might have given a clue to the locality, was apparently destroyed, F.BUTZIN, oral communication; the fragment excluded by KUNTH is *M. zeyheri*].

Polyxena haemanthoides BAKER 1888, HOOKER's Icon.Pl. **18**: t. 1727, syn. novum. - Typus: Cape, Nuweveld Mountains near Fraserburg, BOLUS 5493 (BOL, G, SAM).

Nomenclatural note: JESSOP 1976 does not give a THUNBERG herbarium number for the type specimen of *M. angustifolia* as he does for *M. echinata* and *M. lanceolata*. We designated above the same sheet as lectotype, which was selected by JESSOP as lectotype for *M. lanceolata*. In JESSOP's citations of *M. angustifolia* (1781) and *M. lanceolata* (1794) there are thirteen years in between. In fact, both species were published a few months apart in the same year (1782) and are based on the same collection. [THUNBERG was appointed as demonstrator of botany in 1777 when he was still in Eastern Asia; on his return to Sweden in 1779 after nine years of absence he took up this post under the younger LINNAEUS, who had followed his father in 1778 as Professor at Uppsala and thought to be entitled to publish THUNBERG's new species under his own name.]

Taxonomic note: JESSOP 1976 includes nine heterotypic synonyms under *M. angustifolia*. In our opinion these synonyms comprise three species belonging to the two genera *Massonia* and *Neobakeria*. The decisive differences of *N. namaquensis* are treated under genus 7.9. The major and minor differences between *M. angustifolia* and *M. zeyheri* are given in Table 6 under *M. zeyheri* and mostly only become significant when the dimensions of the lower and the upper flowers are separately treated. Thus these differences remain mostly undetectable in Table 5, in which Jessop's dimensions of the *M. angustifolia* floral organs are taken as a starting point; as to the bracts he treats expressis verbis the lower bracts but for the other organs lower and upper flowers are not distinguished (for the sake of a clear species distinction we inserted two lines from Table 6 into Table 5 concerning lower pedicels and tube length of lower flowers, for which columns 1 remains empty). From this Table 5 it is evident that the variation of column 1 is composed of the variation of the three species in columns 2–4: e.g. the maximum of Jessop's tepal segment length belongs to *N. namaquensis*, the maximum tube length of 17 mm given by Jessop belongs to *M. zeyheri*. Jessop, however, apparently only looked at higher up flowers or included at most the lowest flowers of very stunted plants (in an exceptional plant with only four lowers we found a tube of only 9 mm in the owest flower; the lowest flower of normal inflorescences has a tube of at least 18 mm, see following line; further values are 20, 22, 23, 26, 26,5, and 28 mm).

As to Jessop's pedicel length our single collection of *M. zeyheri* reaches only half of Jessop's value. We are convinced that Jessop found his long pedicels among the three collections cited which belong to *M. zeyheri*.

As to the maximum length of the lower bracts in Table 5 the case is slightly different. The bracts are the only organ of *M. angustifolia* in which Jessop takes care of the position within the inflorescence. We cannot confirm his maximum of 12 mm for the lower bracts but only for coma bracts (type specimen of *M. marginata*). Possibly Jessop considered the lower bracts of the coma as lower bracts.

Diagnostic characters: *M. angustifolia* is the only member of the genus *Massonia* with orange filaments combined with lower pedicels of only 0–2.5 mm in length. Furthermore it is the only species in which we noticed fibres at the bulb neck originating by a regular splitting of the top of the dead tunics.

Distribution: Karoo between Calvinia and Victoria West, and to Sutherland in the south and Carnarvon in the north.

Table 5
Variation in some floral organs (all measurements in mm) to show the "polymorphy" of *Massonia angustifolia* ensu lato of Jessop 1976 (column 1) as compared with *M. angustifolia* s.str. (column 2, based on three populations M-D. 80058a, 88039x, 88043f and the type of *M. marginata*), *M. zeyheri* (column 3, M-D. 88123b from Paternoster), and *Neobakeria namaquensis* (column 4, based on holo- and isotypes). The variation of column 1 is evidently composed of the variation of three species belonging to two genera (see preceding paragraph "Taxonomic note").

	1 *M. angustifolia* sensu Jessop 1976	2 *M. angustifolia*	3 *M. zeyheri*	4 *Neobakeria namaquensis*
ower bracts	(1–)3 – 8(–12)	3 – 9	2 – 9	1.5– 2.5
coma bracts		5 – 12	5 – 15	5 – 8.5
pedicels	(1–)12 – 18(–29)	0 – 2.5	0 – 15	0 – 5
ower ped.		0 – 2.5	5 – 15	1.5– 5
ube length	(4.5–)7 – 12(–17)	3 – 11	6.5– 32	3 – 21
of lower fl.		5 – 11	18 – 32	7 – 21
egments	7 – 11(–15)	5 – 8	6 – 9	4 – 13
ilaments	(8–)10 – 16(–18)	7.5– 17.5	7 – 19	5.5– 14
ilam. tube	0 – 1.5	0.3– 2.5	1 – 2	0 – 0.5
eaf length	(35–)60–140(–180)	60 –150	110 –270	55 –80
eaf width	(13–)20– 60(–100)	20 – 56	22 – 70	15 –40

7.2.12 *Massonia zeyheri* Kunth 1843: 298, sp. hic restituta

Typus: "M.lanceolata. *Zeyh. in herb. reg. Berol.*" († B holo. destroyed; BR!, K lecto. sec. Jessop 1976 (without locality and "a collector's number, but has been treated as type material at Kew"), [possibly: Cape.—3317BB/3318AA (Cape Town): Dünen an der Saldanhabai, Ecklon & Zeyher 65 (STR!)].

Syn.: *Polyxena zeyheri* (Kunth) Benth. & Hook. ex Dur. & Schinz 1893: 367; Baker 1897: 420. – Typus: as above.

Massonia pedunculata Baker 1892: 8, syn. novum. – Typus: Malmesbury prope Hopefield, Schaapplaatsfontein, Juni 1887, Bachmann 2043 (B!, K lecto).

Nomenclatural note: *Massonia nervosa* Hornem. 1819 might be an older name, if the type (not located by Jessop 1976) is found and the description concerning the tube length ("2 lin. longus" = 4 mm) is proved as a mistake. For the time being *M. nervosa* is best considered as a nomen dubium as proposed by Jessop 1976.

Morphographic note: In *Massonia zeyheri* the range of floral dimensions within the inflorescence is extremely variable. If one describes the whole variation observed, the diagnostic character of several organs disappears (see Table 5 and 6): pedicel length 0–15 mm comprises entirely 0–5 mm of the nearest relative *M. angustifolia*, tube length 6.5–32 mm shows an overlap for most of the tube range of *M. angustifolia* (3–11), filament length 7–17 mm comprises half the filament range of *M. comata* (5–9 mm), whereas the respective values of the lower flowers show no overlap but a considerable gap (see Table 6 for the differences with *M. angustifolia* and key position 12 for *M. comata*).

Diagnostic characters: *M. zeyheri* is the only member of the genus *Massonia* with a blue filament tube, or with orange filaments combined with a perigon tube of the lower flowers of 18–32 mm.

Distribution: West coast from Saldanha to Paternoster, and inland to Hopefield.

7.3 *Namophila urotepala* U. & D.M-D. gen. et sp. novae

Typus: Namibia.—2716DC (Witputz): farm Spitskop, valley with waterfall, 6 km from Rosh Pinah road, kloof around the seasonal waterfall, ca. 700 m s.m., 06.08.1988 pfl., Müller-Doblies *88064 g* (holotypus: WIND; isotypi: B, BOL, BR, BTU, E, G, K, LI, M, MO, NBG, PRE, S, Z). – Fig. 6.

Diagnosis generico-specifica: Ab omnibus ceteris generibus Massoniearum tepalis caudatis et

Table 6
Major and minor differences between *M. angustifolia* and *M. zeyheri*. All measurements in mm

	M. angustifolia	*M. zeyheri*
lower inflorescence pedicels	0 - 2.5	5 - 15
perigon colour	greenish yellow	bluish white
colour of filament tube	orange	blue
tepal tube of lower flowers	5 - 11	18 - 32
tepal tube of upper flowers	3 - 6.5	6.5- 19
less distinctive characters:		
upper inflorescence pedicels	0 - 2	0 - 5
filament length of lower flowers	13 - 17.5	15 - 19
perigon length of lower flowers	9.5- 19	26 - 40.5
tepal segments	5 - 8	6 - 9
no. of flowers/per inflorescence	7 - 23	4 - 44
leaf	60 -150 × 20-56	110 -270 × 22-70
bulb neck	with fibres	without fibres
distribution	Calvinia → Victoria W	Saldanha → Hopefield

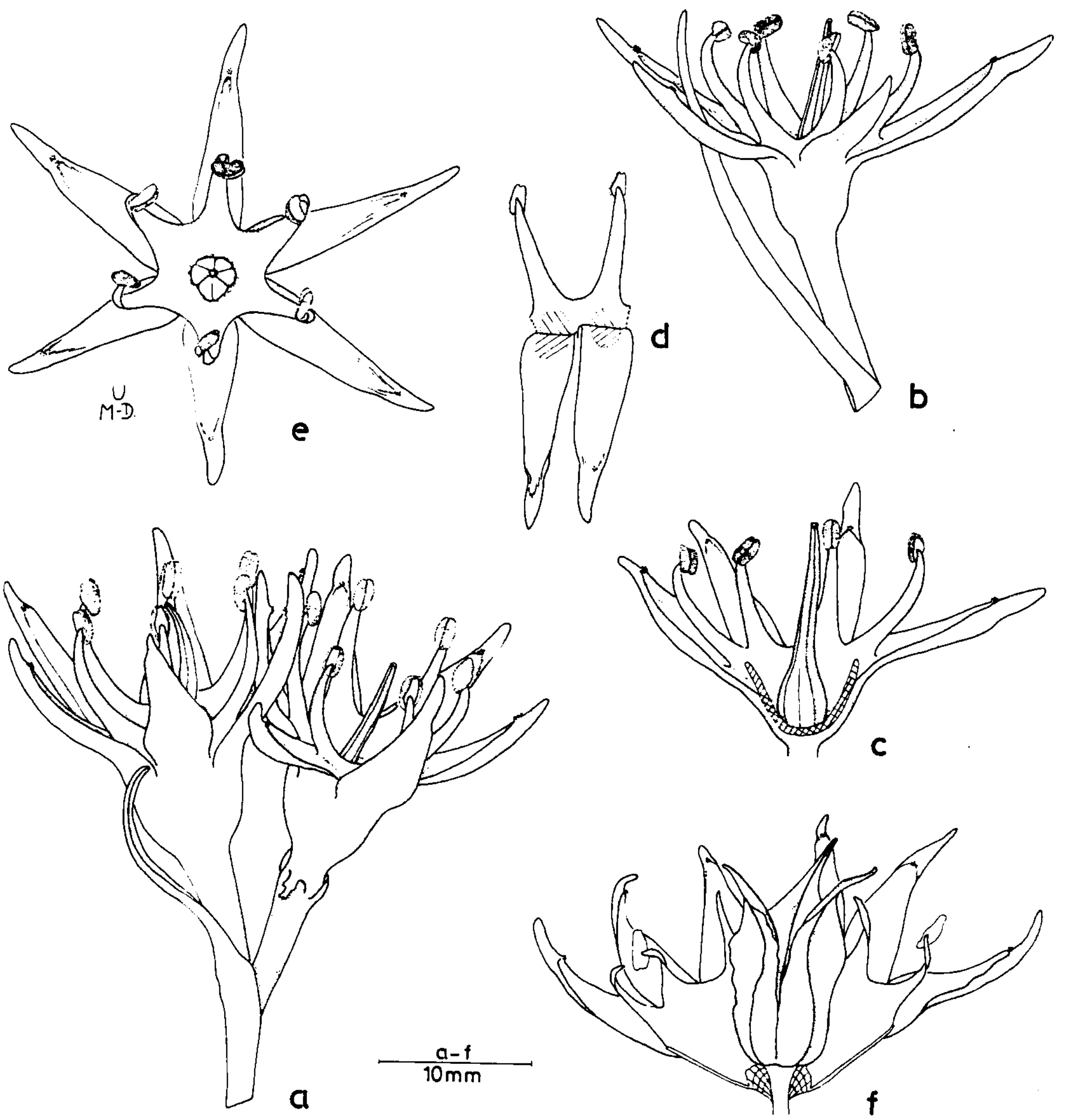


Fig. 6
Namophila urotepala U. & D.M-D. gen. et sp. novae
a — two-flowered inflorescence; b — flower with a longer bract; c — longitudinal section of a flower showing the perigon tube, the filament tube, and the adnation of a perigon-segment to the filament tube; d — detail of the filament tube showing an outer and an inner filament and the two perigon-segments pulled down: scars of the adnation hatched; e — top view of a flower; f — ripe capsule, still surrounded by a turgescent flower.

capsula pusilla in perigonio persistenter inclusa differt.

Bulbus plerumque solitarius, globosus, ca. 15–23 mm in diametro. *Folia* bina, ovata, 110 ad 160 x 80–117 mm, succulenta, humo prostrata. *Inflorescentia* solitaria, subcapitata (accuratior: corymbosa), pauciflora, in plantis feris 2–3flora, usque 19flora apud plantas cultas, racemo 6 ad 28(–40) mm longo [rhachis 28 mm longa cum 19 floribus, 40 mm cum solum 12 floribus], bracteis linearibus, inconspicuis, bractea infima 17–36 mm longa et (1.3–)2.5–3.5 mm lata, pedicello infimo 7–18 mm longo, sine ulla coma terminali bractearum sterilium. *Flos* stellatus, viridis, usque 33 mm in diametro. *Perigonium* 19–23 mm longum, usque ad seminum maturitatem vivum persistens, tubo 4–6 mm longo et ca. aequilato, segmentis anguste triangularibus, exterioribus (12–)15–17 mm longis, interioribus aequilongis vel 1 mm brevioribus, basi 3.5 ad 4.5 mm latis, apice 1.0–4.7 mm caudatis. *Stamina* in tubum brevissimum album, 1.0–2.0 mm altum, 7–8 mm in diam., connata; filamenta libera, 6–8 mm longa, acuminata, alba; antherae dorsifixae, in statu aperto 2.0–2.5 mm longae, virides, polline luteo. Ovarium obclavatum, sensim in stylum transiens, viride, 3.5–5.0 mm longum, 3.0–3.7 mm in diam., stylo 8–10 mm longo, viridi, stigmate punctiformi. Capsula dorsicida, 10 mm longa. Semina globosa, nitida, nigra 2.0 × 1.2–1.8 mm.

Diagnostic characters of the genus: According to its vegetative habit with the two large leaves flat on the ground *Namophila* belongs to the group of *Massonia* and *Whiteheadia*. It is different from the zygomorphic monotypic genera *Daubenya* and *Neobakeria* by its actinomorphic flowers. From the monotypic genera *Androsiphon* and *Amphisiphon* with long thin staminal tubes *Namophila* differs by a short broad staminal tube similar to that of *Whiteheadia* and some *Massonia* species. One can simplify the situation by saying that *Namophila* unites the green persistent perigon of *Whiteheadia bifolia* with the ± capitate (shortly corymbose) inflorescence of *Massonia*.

7.4 *Whiteheadia* HARV. 1868

Generitypus: *Whiteheadia latifolia* HARV. = *W. bifolia* (JACQ.) BAKER.

Key to the species of *Whiteheadia*

1a Inflorescence green, conical, with prominent succulent, 16–36 mm broad bracts, which are smooth on both sides; pedicels indistinct, gradually broadening into the broad perigon tube, 3–4 mm long; perigon subrotate with a broad saucer-shaped tube; segments 6–8 mm long; open anthers 1.7–3.0 mm long . . . . **1. *W. bifolia***

1b Inflorescence white, subglobose to cylindrical, with inconspicuous, membranous, 4–8 mm broad bracts, which are strongly papillose on both sides; pedicels distinct, very short, only about 1(–3) mm long; perigon subcampanulate with a cup-shaped tube; segments 9.5–14.0 mm long; open anthers 0.5–1.0 mm long . . . . **2. *W. etesionamibensis***

Table 7
Comparison of several characters in *Massonia*, *Namophila*, and *Whiteheadia*

	Massonia	*Namophila*	*Whiteheadia*
perigon green	–	+	±
perigon succulent	±	+	+
fruit ripening in a fresh perigon	–	+	+
perigon segments shortly adnate to the filament tube	–	+	+
inflorescence	± capitate	± capitate	spicate
subterranean scape club-shaped	±	–	+
coma of sterile bracts present	±	–	+
bracts	broad	narrow	broad
width of first bract > 20 mm long	5–21 mm	1.3–3.5 mm	16–36 mm
width of first bract < 20 mm long	3–21 mm	<2.5 mm	4– 8 mm

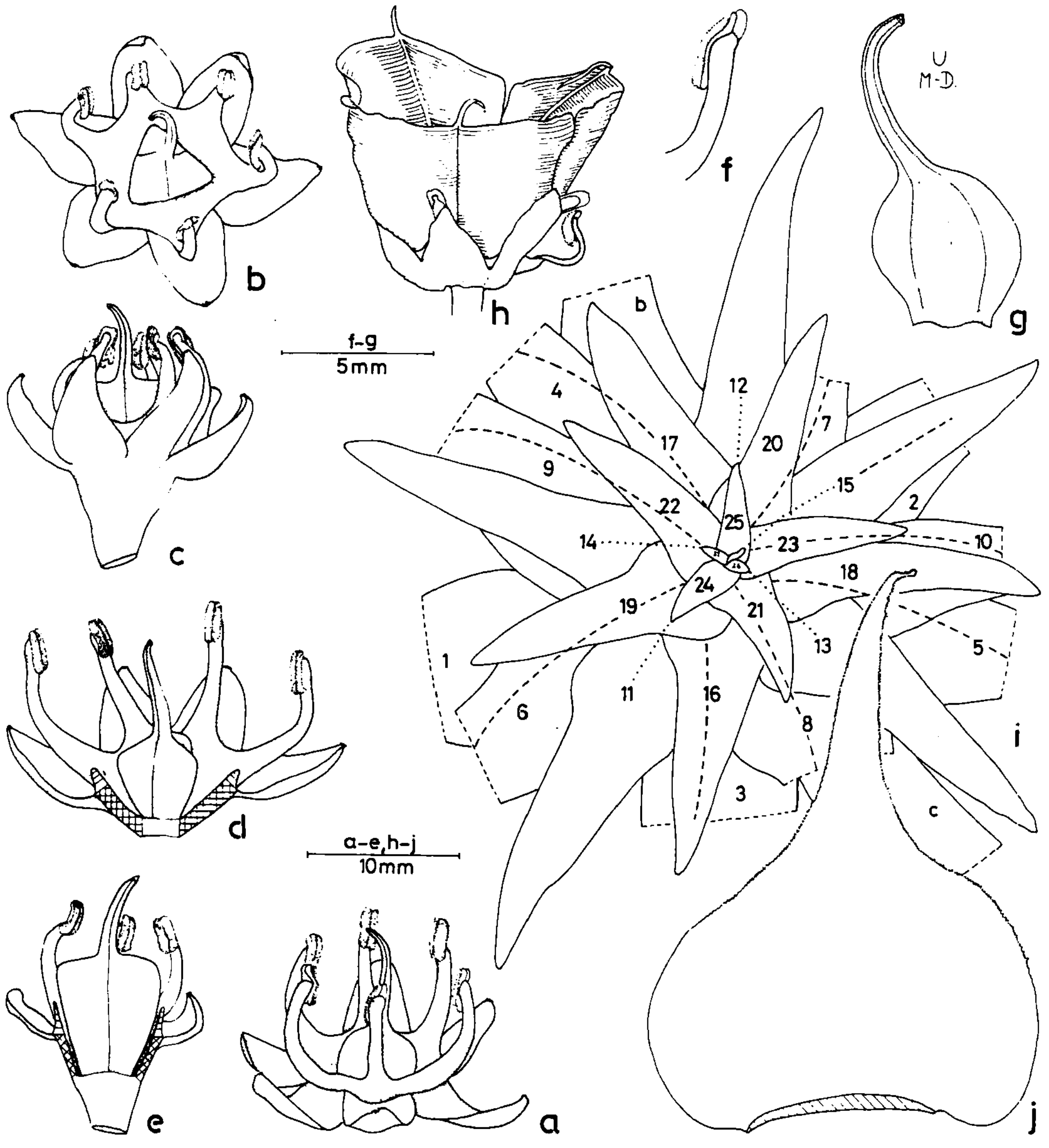


Fig. 7

Whiteheadia bifolia (Jacq.) Baker (a, b, f, g, from Steinkopf, *M-D. 79167e*; other localities contribute a single floral part and are given behind it)

a–e — flowers: a — habit (between lateral and top view); b — top view; c — lateral view of a postfloral flower (from Ratelpoort, *M-D. 79163f*); d — longitudinal section of an anthetic flower (from Steinkopf, *M-D. 88078e*), two tepals and stamens removed, showing on the left hand side an outer tepal and stamen and on the right hand side an inner tepal, the inner segment slightly higher fused to the filament tube than the outer one; e — longitudinal section of (c), three tepals and stamens removed, showing on both sides inner tepals and stamens and in the middle the ovary (well advanced as compared with c) in a septal view; f — stamen with open anther; g — pistil; h — capsule (36 km ENE of Springbok, *M-D. 88163a*); i — coma of 18 sterile bracts (nos. 11–28; Doringriver bridge on old Klawer road, *MD. 79124c*), five straight orthostichies within the coma are marked by a dotted line; for orientation purposes some fertile bracts lower down (b, c, 1–10) are also drawn but their tips are resected (see text), bent orthostichies including these fertile bracts are given by a bold-face broken line; j — lowest bract (same provenance as d).

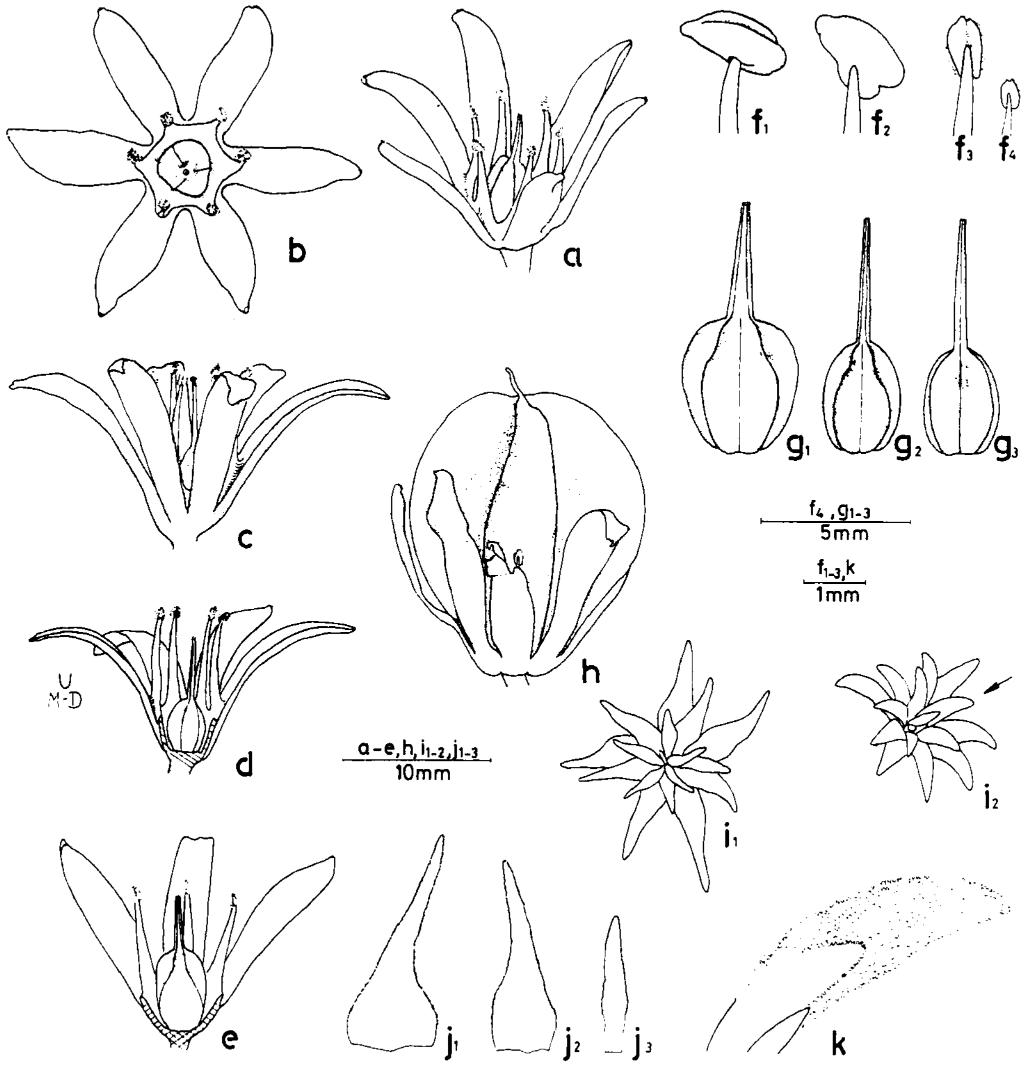


Fig. 8
Whiteheadia etesionamibensis U. & D.M-D. sp. nova (a, b, e, f, g_1, i_1, h, j from the type collection; c, d, g_2–g_3, i_2, k, from Rooiberg, *M-D. 88141k*).

a–e — flowers: a — habit (between lateral and top view); b — top view; c — lateral view; d — longitudinal section of (c), two tepals and stamens removed, showing on the left hand side an outer tepal and stamen and on the right hand side an inner tepal and stamen, the segments being as well fused to the filament tube as to the adjacent free part of the stamens; e — longitudinal section of a flower from the type collection, three tepals and stamens removed, showing on both sides outer tepals and stamens and in the middle the ovary in a dorsal view; f_1, f_2 — stamen with a closed anther; f_3 — stamen with an open anther; f_4 — idem, drawn with the same magnification as the stamen of *W. bifolia* in Fig. 7f; g_1–g_2 — dorsal views of pistil, g_3 — ventral view; h — young capsule; i_1–i_2 — coma of sterile bracts; j_1 — lowest bract of inflorescence, j_2 10th bract, j_3 last but one bract of the coma; k — orthostichy of bracts from the Rooiberg coma in Fig. $8i_2$ (see arrow).

7.4.1 *Whiteheadia bifolia* (JACQ.) BAKER 1873: 226

> Basionymum: *Eucomis bifolia* JACQ. 1791, Collect. **4**: 215. – Iconotypus: JACQ. 1795, Icones 2(16): t. 449. – Illustr.: Fig. 7, iconotype, Bot. Rep. **6**: t. 368 (1804), Bot. Mag. **22**: t. 840 (1805), Fl. Pl. Afr. **37**: t. 1450 (1965).

Distribution: Cape Province and Namibia. The Namibian distribution remains to be evaluated: we have it from a single locality.

Morphologic note regarding the coma in Fig. 7i: Concerning the coma of 18 sterile bracts (no. 11–28) in Fig. 7i one can notice a 5/13 leaf arrangement with five orthostichies within the 18 bracts (dotted line): bract 24 above 11, 25 above 12 etc. until 28 above 15. In order to allow an orientation about the other eight orthostichies some fertile bracts lower down (b, c, 1–10) are also drawn but their tips are resected. Orthostichies uniting a sterile and one to two fertile bracts are marked by a broken line (continuation of a dotted line in the case of bract 15 as they are still in line) —.

NAMIBIA.—2817AD (Vioolsdrif): Gamkarivier, 5 km above river mouth, S-facing steep rocky slope, 200 m s.m., 09.08.1988, MÜLLER-DOBLIES *88073c* (BTU).

CAPE.—2917BA (Springbok): at turn off 8,5 km W of Steinkopf, 5 km on road to Kosies, stony ground, ca. 1000 m s.m., 08.08.1979, MÜLLER-DOBLIES *79167e* (B, BTU, LI, PRE, WIND); **—BB**: Steinkopf, ca. 4 km NE of new petrol station, gravelly ground, 11.08.1988, MÜLLER-DOBLIES *88078e* (B, BTU, M, MO, NBG, S, Z); **—BD**: Ratelpoort, 25 km N of Springbok on road N7, quartzite ridge, 800–900 m s.m., 08.08.1979, MÜLLER-DOBLIES *79163f* (BR, BTU, E, G, K, PE, W); **—DD**: Mesklip (fJ: SAM).

—2918CA (Gamoep): Ou Areb se Berge, 36 km ENE of Springbok on Pofadder road, quartzite ridge, ca. 1000 m s.m., 18.08.1988, MÜLLER-DOBLIES *88109b* (BTU); ibid., MÜLLER-DOBLIES *88163b* (B, BTU, K, LI, MO, WIND).

—3017BB (Hondeklipbaai): Kersboschfontein, SW-slopes of Brandberg, 02.10.1989, C.BAYER & MÜLLER-DOBLIES *89140y* (BTU); Kamieskroon (fJ: SAM); **—BD**: Brakdam, (fJ: BOL); **—DB**: 11 miles WSW of Garies, (fJ: PRE).

—3018AC (Kamiesberg): Studer's Pass (fJ: PRE, NBG-ste); **—CB**: Giftberg (fJ: NBG); **—DB**: area of Rooimuskop, hill N of Loeriesfontein/Kliprand road, 12 km E of Vanrhynsdorp/Pofadder road, 11.08.1980, MÜLLER-DOBLIES *80079b* (B, BTU, LI).

—3118DC (Vanrhynsdorp): Heerenlogement, rocky slopes, 400–500 m s.m., 05.11.1978, VERA MÜLLER-DOBLIES *78063m* (BOL, BR, BTU, G, J, K, L, M, PE); Doringriver bridge, on the old Klawer/Clanwilliam road, rock crevices, 14.03.1979, MÜLLER-DOBLIES *79124c* (B, BTU, GRA).

—3119AC (Calvinia): near Niewoudtville (fJ: PRE); **—CC**: Doringbos, S-facing rock ledges at the Doring river, 01.09.1980, MÜLLER-DOBLIES *80130w* (BTU); **—CD**: Botterkloof, top of pass, TMS rock crevices, 01.09.1980, MÜLLER-DOBLIES *80127ab* (BTU).

—3218BB (Clanwilliam): Kransvleiberge (fJ: SAM).

—3219AA (Wuppertal): Pakhuisberg, in saxosis, 2000′ s.m., 10.08.1897, SCHLECHTER 10801 (Z!).

7.4.2 A second species of *Whiteheadia* HARV.: *Whiteheadia etesionamibensis* U. & D.M-D. sp. nova

> Typus: Namibia.—2716CB (Witputz): Aurus Mts., E of summit (Diamond area no.1), S-facing slope, ca. 800 m s.m., 18.09.1988, MÜLLER-DOBLIES *88144n* (holotypus: WIND; isotypi: B, BTU, G, K, LI, M, MO, NBG, PRE, S, Z). – Fig. 8.

Ab altera specie generis *Whiteheadia*, *W. bifolia*, distincte differt bracteis angustis (infimo solum 4–8 mm non 16–36 mm lato) membranaceis (non succulentis), margine (tertio basali levi excepto) minus papilloso-ciliato, utrinque papillosis (non levissimis), pedicellis brevissimis distinctis (non sensim in tubum perigoniale transeuntibus), perigonio subcampanulato albo (non subrotato viridi), tubo poculiformi (non catilliformi), segmentis 10–13 mm longis (non solum 6–8 mm longis) et basaliter filamentis lateraliter liberis brevissime adnatis (non solum tubo filamentorum breviter adnatis), filamentis acuminatis (non crassiusculis), antheris clausis solum 1,7–2,0 mm longis, statu aperto 0,5–1,0 mm longis, vinaceis (non in statu aperto 1,7–3,0 mm longis, viridibus).

Origin of the epitheton: *etesionamibensis* means growing in winter rainfall Namibia; the *etesiai* were winds in ancient Greece, which brought winter rainfall and are still used by climatologists to name the climate in the five Mediterranean regions of the globe.

Bulbus plerumque solitarius, globosus, e.g. 24 mm in diametro. *Folia* bina, ovata, primum 95–150 × 80–103 mm, secundum 90–135 × 65 to 85 mm, succulenta, humo prostrata. *Inflorescentia* solitaria, spicata, in plantis feris 9–60 flora, 20–60 flora apud plantas cultas, scapo supraterraneo c. 5–10 mm longo et 8–11 mm in diam., racemo 40–65 mm (apud plantas cultas usque 100 mm) longo, bracteis lanceolatis, bractea infima 10–17 mm longa et 5–8 mm lata, pedicello brevissimo, usque 1(–3) mm longo, cum coma terminali bractearum sterilium 8–11 mm longarum. *Flos* subcampanulatus, mellite odorus, ± albus. *Perigonium* 12–16 mm longum, usque ad seminum maturitatem non vivum persistens, tubo 2–3 mm longo, segmentis lanceolatis, exterioribus 10–14 mm longis, internis aequilongis vel 0.5 mm brevioribus, 2.5–4.0 mm latis, apice non caudatis. *Stamina* in tubum brevissimum album, 0.5–1.5 mm altum, 3 ad 5 mm in diam., connata; filamenta lateraliter libera 4.5–6.0 mm longa, acuminata, dorso basaliter et breviter tepalis adnata, alba; antherae dorsifixae, in statu aperto 0.7–1.0 mm longae, vinaceae, polline luteo. Ovarium ovoideum, viride, 4–5 mm longum, 3.5–4.0 mm in diam., 6–8 cum ovulis in quoque loculo, subito in stylum album 3.5–4.5 mm longum contractum, stigmate punctiformi. Capsula dorsicida, obovoidea, 18–25 mm × 14–25 mm. Semina globosa, non nitida, superficie reticulata, nigra, 2 × 2 mm.

Bulb usually solitary, globose, 18–24 mm in diameter. *Leaves* two, ovata, first one 65–150 × 45–105 mm, second one 55–135 × 37–85 mm, succulent, prostrate on the ground. *Inflorescence* solitary, spicate, 5–80-flowered in cultivated plants; scape 0–20 mm long above ground and 6.5–11.0 mm in diameter; raceme 40–65 mm (in cultivated plants up to 120 mm) long, with lanceolate bracts, lowest bract 10–17 mm × 4 to 8 mm, pedicels very short, up to 1(–3) mm long; with a terminal tuft of sterile bracts 5–11 mm long. *Flower* subcampanulate, honey-scented, ± white. *Perigon* 12–16 mm long, not remaining alive until maturity of seeds, tube 2–3 mm long, segments lanceolate, outer ones 9.5–14.0 mm long, inner ones as long or 0.5 mm shorter, 2.5–4.0 mm broad, not caudate at the tip. *Stamens* connate into a very short white filament tube, 0.5–1.5 mm high, 3–5 mm in diam.; free portion of filaments white, 4.0–6.5 mm long, acuminate, basally on the dorsal side very shortly adnate to the tepal segments; anthers dorsifixed, in the open state 0.5–1.0 mm long, vine-coloured, with yellow pollen. Ovary ovoid, green, 2.5–5 mm long, 2.5–4.0 mm in diam., with 6–8 ovules in each locule, suddenly contracted into the white 3.5–5.5 mm long style, stigma punctiform. Capsule dorsicidal, obovoid, 18–25 mm × 14 to 25 mm. Seeds globose, black, 2 × 2 mm, not shiny, with a reticulate surface.

NAMIBIA.—2616AC (Aus): Dikwillem, ca. 20 km NW of Aus, rock crevices, ca. 900–1150 m s.m., 27.07.1988, Müller-Doblies *88042c* (B, BTU, K, LI, PRE, WIND).

—2716CB (Witputz): Rooiberg, top and upper S slope (Diamond area no.1), stony ground and crevices, ca. 1050 m s.m., 16.09.1988, Müller-Doblies *88141k* (BTU, WIND); type locality as above; **—DC:** Numaeis, südl. Witputz, Sept. 1957, Rusch f. *4688* (M); Spitskop, valley with waterfall, 6 km from Rosh Pinah road, kloof around the seasonal waterfall, ca. 700 m s.m., 06.08.1988 in bud, Müller-Doblies *88064b* (BTU); farm Spitskop, valley entry 1.2 km S of farm house, rocky S facing slope, ca. 650 m s.m., 27.09.1989 nearly fl., Müller-Doblies *89123g* (B, BTU, NBG, WIND, S, Z); **—DD:** Namuskloof, 7 km N of farm house, S facing slope with quartzite, ca. 450 m s.m., 06.08.1988, Müller-Doblies *88062e* (BTU, WIND).

—2717CA (Chamaites): Nuobrivier, unweit Apollogrotte, Hunsberge, am Berghang im Gestein, 09.06.1976 fl., Giess & M.Müller *14305* (M, WIND).

—2816BA (Oranjemund): Diamond Area No. 1, Obib Mountain Peak, rocky S facing slope, 03.09.1989, A.E. van Wyk 9005 (PRE, PRU, WIND).

Key to the genera *Periboea* and *Polyxena*

(more detailed than in the above key to the ten genera of Massoniinae)

1 a Leaves linear, 1–4 (in one species narrowly lanceolate, larger one 5–10) mm broad; perigon tube shorter than (occasionally as long as) the segments, (3.0–)5–7 mm long; ovary subglobose and style only 1–7(–10.5) mm long; stigma punctiform or trifid; scape at flowering time usually exserted above groundlevel for 10–80 mm; flowers closing at night or during cold weather; south-western Cape . . . . ***Periboea***

1 b Leaves lanceolate to suborbicular, (3–)8–25(–47) mm broad; perigon tube longer than the segments, 6–20(–30) mm long; ovary cylindrical or ovoid, and style 3–32 mm long; stigma punctiform; scape

at flowering time in the wild never exserted above groundlevel, becoming exserted only at fruiting time; flowers remaining open day and night; Cape outside the south-western Cape, radiating into the Orange Free State . . . . *Polyxena*

7.5 *Periboea* KUNTH 1843, gen. hic restitutum

Key to the species of *Periboea*

1a Style 1–2.5 mm long; stigma trifid; all six anthers or 3 outer ones included within the tube, with filaments of 1–2 mm in length; leaves 2:
  2a Larger leaf 5–9 mm broad; outer segments 3.5–4 mm broad, inner anthers distinctly exserted beyond the throat, inner filaments 1.3–2 mm long, inserted 0.5–1 mm below the throat; style 1.7–2.5 mm long; growing in limestone rock pockets . . . . **1.** ***P. oliveri***
  2b Larger leaf 2–3(–6.0) mm broad; outer segments 2.0–2.8 mm broad, inner anthers just reaching the throat, inner filaments 1–1.5 mm long, inserted 1.5–2 mm below the throat; style 1–1.5 mm long; growing in granite rock crevices . . . . **2.** ***P. paucifolia***
1b Style about 7 mm long; stigma punctiform; all 6 anthers exserted beyond the tube, with filaments of (3.5–)4–6 mm in length; leaves 2–4(–7) . . . . **3.** ***P. corymbosa***

7.5.1 *Periboea oliveri* U. & D.M-D. sp. nova

Typus: Cape, open ground near to the hotel at Paternoster, FAY ANDERSON *s.n. sub BTU cultno. 6390* (holotypus: PRE; isotypi: B, BTU, K, M, MO, NBG, Z). – Icones: MASON et al. t.6, Fig.3 as *Hyacinthus paucifolius* (1972).

Periboeae paucifoliae affinis, sed differt multis characteribus minoribus quantitativis, praesertim foliis latioribus (5–10 mm latis in folio maiore non solum usque 3.0 raro 5.5 mm), segmentis exterioribus 3.5–4 mm latis (non solum usque 2.8 mm latis), antheris interioribus distincte exsertis, filamentis interioribus longioribus (1.3 ad 2.0 mm, non solum 1.0–1.5 mm longis), solum 0.5–1.0 mm (non 1.5–2 mm) sub fauce insertis, stylo longiore (1.7–2.0 mm non solum 1.0 to 1.5 mm longo), seminibus minoribus. Calcicola (non graniticola).

7.5.2 *Periboea paucifolia* (W.F.BARKER) U. & D.M-D. comb. nova & sp. hic restituta

Basionymum: *Hyacinthus paucifolius* W.F.BARKER 1941, in J. S. Afr. Bot. **7**: 198–200. – Typus: Cape.—3217DD (Vredenburg): Vredenburg, J.W.MATHEWS *sub NBG cultno. 689/30* (K!, NBG! holo, PRE!). – Icones: BARKER 1941: Fig.5.

7.5.3 *Periboea corymbosa* (L.) KUNTH 1843, Enum.Pl.4: 293

Typus: "Cap.b.spei", KOENIG *s.n.* not located see JESSOP 1976: 429.

Syn.: *Hyacinthus corymbosus* L. 1771: 223 = *Massonia corymbosa* (L.) KER GAWL. 1807: t. 991 = *Scilla corymbosa* (L.) KER GAWL. 1812: sub t.1468 = *Baeoterpe corymbosa* (L.) SALISB. 1866: 18, nom. inval. = *Polyxena corymbosa* (L.) JESSOP 1976: 429.

Scilla brevifolia sensu KER GAWL.1812: t. 1468, non THUNB. 1794: 63 [= *Dipcadi brevifolium* (THUNB.) FOURC. 1941] = *Scilla brachyphylla* SCHULT. & SCHULT. f. 1829: 573 nom. nov. for *S. brevifolia* = *Periboea gawleri* KUNTH 1843: 293, nom. nov. for *S. brevifolia* = *Hyacinthus gawleri* (KUNTH) BAKER 1897: 472. – Iconotypus: KER GAWL. in CURTIS's bot. Mag. **36**: t. 1468.

7.6 *Polyxena* KUNTH 1843

Generitypus: *Polyxena pygmaea* (JACQ.) KUNTH.

Key to the species of *Polyxena*

1a Outer anthers included or merely reaching the throat, inner anthers shortly exserted beyond the throat on free filaments of 0.5–1.5 mm; inner filaments inserted at the throat or very shortly adnate to the segments; style less than 12 mm long:

2a Style about as long as the ovary, included in the tube or finally exserted for 1.5 mm; perigon less than 13 mm long; tepal segments nearly as long as the tube, never only half as long; open anthers globose, about 0.5 mm in diameter; leaf margin erosely crenulate; seeds globose . . . **1. *P. calcicola***

2b Style 2–3 times as long as the ovary, always included in the tube; perigon (17–)20–25(–35) mm long; tepal segments a third of the length of the tube; open anthers ellipsoidal, more than 1 mm long; leaf margin ciliolate; seeds pear-shaped . . . . **2. *P. maughanii***

1b All 6 anthers distinctly exserted beyond the throat, with free filaments of 3–8 mm in length; inner filaments adnate to the segments for (0.5–)1–3 mm; style (12–)18–32 mm long in normal flowers, exserted beyond the tube:

3a Tepal segments nearly upright to spreading or slightly recurved, outer ones usually about 3 mm, at least 2.2 mm broad (Verlaatekloof only 2–3 mm broad); inner filaments usually one third shorter than the segments; stamens distinctly biseriate (difference in height of insertion 1.5 to 4.5 mm); ovary tapering into the style . . . . **3. *P. ensifolia***
. . . . syn. *P. odorata*

3b Tepal segments spreading beyond the throat and circinately recurved, outer ones up to 1.8 (–2.2) mm broad; inner filaments about as long as the segments; stamens less distinctly biseriate (difference in height of insertion 1–2.5 mm); ovary abruptly continued by the style . . **4. *P. pygmaea***

7.6.1 *Polyxena calcicola* U. & D.M-D. sp. nova

Typus: Cape, De Hoop Nature Reserve, calcareous rocks, 18.08.1984 sfr., MÜLLER-DOBLIES *84026a* (holotypus: PRE; isotypi: B, BOL, BTU, G, GRA, K, M, MO, NBG, P, S, STE, UPS, Z).

A ceteris *Polyxenis* valde differt perigonio solum 10–12.5 mm longo (non 15–37 mm), tubo vix longiore quam segmenta, antheris apertis subglobosis solum 0.5–0.7 mm longis (non ellipsoideis, 1 mm longis), stylo ovario aequilongo solum usque 4.5 mm longo, capsula late patente (non cylindrica vix patente), demum chromosomatum numero tetraploideo.

7.6.2 *Polyxena maughanii* W.F.BARKER 1931 Fl. Pl. S. Afr. 11: t. 420, sp. hic restituta

Typus: Cape.—3118AC (Calvinia): Nieuwoudtville, L.BOLUS *s.n. sub BOL 19613* (BOL holo., K!).

7.6.3 *Polyxena ensifolia* (THUNB.) SCHÖNL. 1910 Trans. Roy. Soc. S. Afr. 1: 443

Typus: Cape, inter Sondags et Visch-river (cf. THUNBERG 1820: 278), THUNBERG *s.n.* (UPS-THUNB 8002 holo.!).

Syn.: *Mauhlia ensifolia* THUNB. 1794: 60, t.1 = *Agapanthus ensifolius* (THUNB.) WILLD. 1799: 48 = *Massonia ensifolia* (THUNB.) KER GAWL. 1802: t. 554 = *Manlilia ensifolia* (THUNB.) SALISB. 1866: 18, nom. inval. et illeg. – Type as above.

Massonia odorata HOOK. f. 1871: t.5891 = *Polyxena odorata* (HOOK. f.) W.A.NICHOLSON 1886: 196, comb. inval. fide JESSOP 1976: 428 = *Polyxena odorata* (HOOK. f.) BAKER 1897: 420. – Typus: Cape, Colesberg, D.ARNOT *s.n.* (K! holo.).

Massonia uniflora SOL. ex BAKER 1871: 393 = *Polyxena uniflora* (SOL. ex BAKER) BENTH. & HOOK. ex DUR. & SCHINZ 1893: 367 (1893); BAKER 1897: 421. – Typus: Cap. B. Spei, MASSON *s.n.* (BM holo.!, not located by JESSOP 1976: 435, but simply overlooked among the normal specimens).

Icones: THUNBERG 1794: t.1 (1794); KER GAWLER 1802: Bot.Mag. t. 554; HOOKER f. 1871: Bot.Mag. t. 5891 (type of *P. odorata*); SCHÖNLAND 1910: Fig. 2; PHILLIPS 1924: FPSA T. 129 (FROM MATJESFONTEIN, DIFFERENT FROM *P. ensifolia* and *P. pygmaea* fide SCHÖNLAND, oral com. ibid.).

7.6.4 *Polyxena pygmaea* (JACQ.) KUNTH 1843 Enum. Pl. 4: 294, sp. hic restituta

Basionymum: *Polyanthes pygmaea* JACQ. 1795, Icones 2(16): t. 380 & text list 15 (1795); Collectanea 5: 56 ("1796", 1797). – Iconotypum: JACQUIN 1795: t. 380, uno cum epitypo adiuvante: Cape.—3420AD (Bredasdorp): Melkkamer near de Hoop, sandy flat with calcareous outcrops, 18.08.1984 fr. together with *P. calcicola*, MÜLLER-DOBLIES *84021r* (epitypus hic designatus: PRE; iso-epitypi: B, BOL, BR, BTU, G, GRA, K, M, MO, NBG, S, Z).

Syn.: *Hyacinthus bifolius* BOUTELOU ex CAV. 1802: 14. – Typus ?.

Massonia violacea ANDR. 1797: Bot. Rep. t. 46. – Iconotype: sine loco, cult. G.HIBBERT, l.c.; an idem?: REDOUTÉ, 7: t. 386 (1813).

Nomenclatural note: As in most Monocot species described by JACQUIN from southern Africa the iconotype is the only type element available. *P. pygmaea* is not easily separated from *P. ensifolia* and was first distinguished by SCHÖNLAND 1910, when he created the new combination *Polyxena ensifolia*. SCHÖNLAND based his concept of *P. pygmaea* on the protologue, on some further illustrations, and on the specimen ZEYHER *1716* from Lieslap (—3018DA, Kamiesberg). From our analysis of a ZEYHER *1716* specimen (MÜLLER-DOBLIES a, in prep.) we know that it is somewhat intermediate but still nearer to *P. ensifolia* than to *P. pygmaea*. Only by the designation of an epitype joining JACQUIN's name to populations with a given distribution the meaning of *P. pygmaea* can be satisfactorily fixed.

We propose as epitypus a somewhat better match with the protologue of JACQUIN's *P. pygmaea* and SCHÖNLAND's definition than ZEYHER *1716*: our epitype applies to a calcicolous taxon of the Bredasdorp (—3420) and Riversdale (—3421) degree squares, situated more than 400 km SSE of the Lieslap collection.

Taxonomic note: *Polyxena pygmaea* is already listed in REID 1993 (REID 1984, 1985) following several det.-labels which we added in 1988. Apparently it was intended by REID 1993 to add the symbol # (explained as "PRE herbarium practice following Müller-Doblies") behind *P. pygmaea*. The arguments will be given as in the other cases of non-Namibian reinstatements in one of the continuations of this series (MÜLLER-DOBLIES a, in prep.).

7.7 *Androsiphon* SCHLTR. 1924: 147–148 [JESSOP "148"]

Generitypus: *Androsiphon capense* SCHLTR.

"The plant belongs to the most characteristic types of the group Allieae, that I ever got to know." (SCHLECHTER 1924: 149, translated from German).

7.7.1 *Androsiphon capense* SCHLTR. 1924: 148–149

Typus: Cape.—3118AC (Calvinia): Onder-Bokkeveld, Oorlogskloof, in collibus, 2500′ s.m., July 1897, R.SCHLECHTER *10969* (**B**! **holotypus** quia "typ. auctoris" designatus; si argumentum non satis habetur: lectotypus hic designatus, et 2 isotypi: BOL, G, GRA, PRE!, **Z**!). – Illustr.: SCHLECHTER 1924: Fig. 4, BARKER 1936: Fig. 10A.

7.8 *Amphisiphon* W.F.BARKER 1936: 19

Generitypus: *Amphisiphon stylosum* W.F. BARKER

7.8.1 *Amphisiphon stylosum ["stylosa"]* W.F.BARKER 1936: 19

Typus: Cape.—3118AC (Calvinia): 3 miles north of Nieuwoudtville, 21.06.1934 fl., SALTER 4552 (BOL holo.). – Illustr.: BARKER 1936: Fig. 9.

Nomenclatural note: Concerning the gender of *Amphisiphon* BARKER used it as female. Traditional botanical use in the case of names ending in -siphon is either the neutral form as in *Androsiphon capense*, *Geosiphon pyriforme*; or the male form: *Brachysiphon*, e.g. with *B. petraeus* W.F.BARKER, *Gymnosiphon aphyllus*, *G. papuanus* etc., *Kentrosiphon saccatus*, and *Orthosiphon aristatus*, etc. The male use is a rather intricate problem as there exists a latinized noun sipho, siphonis, m., which probably induced the male use of the unambiguously neutral Greek compounds.

Red Data status: Concerning the holotype JESSOP 1976: 433 gives the heading "ONLY SPECIMEN KNOWN". Fortunately *Amphisiphon* is not so rare. Already in the protologue BARKER cites a cultivated collection of 1921. We collected it in 1977 and 1990 on Glen Lyon SE of Nieuwoudtville, and there is also a collection PERRY & SNIJMAN 2132 of *Amphisiphon* from the Wild Flower Reserve 2 km E of Nieuwoudtville (SNIJMAN & PERRY 1987: 451).

7.9 *Neobakeria* SCHLTR. 1924 and its unusual taxonomic fate: after 70 years a genus becomes monotypic

Generitypus: *Neobakeria namaquensis* SCHLTR.

Inflorescence subspicate with the spike axis about 45–85 mm long, the lower pedicels 1.5 to 5.0 mm, and the upper pedicels 0–1.5 mm long. Perigon of all flowers distinctly zygomorphic, except for the uppermost actinomorphic ones with a tube of only 1.5–6.0 mm and segments of 4–10 mm, tube on the short abaxial side 8–15 mm and on the longer adaxial side 9–21 mm long, segments 5–13 mm long on the abaxial and the adaxial side. Stamens actinomorphic in length or very slightly longer on the abaxial side, filaments 6.5–14.0 mm long, the three adaxial filaments basally connate to form a sector of a very short staminal tube, the three abaxial filaments clearly free from each other.

Historical outline: When SCHLECHTER 1924 published the genus *Neobakeria* (the type specimens of which he had already distributed under this name in 1898) he included seven species. Soon his colleague at the Dahlem Botanical Museum KRAUSE 1930 in E/P^2 incorporated *Neobakeria* into *Polyxena* [providing a new combination *P. namaquensis* (SCHLTR.) KRAUSE], and HUTCHINSON 1934, who even recognized *Brachyscypha* as a genus of its own through all three editions of his handbook, followed him in this respect. PHILLIPS 1951, however, accepted *Neobakeria* with eight spp., and so did OBERMEYER 1976. Following PHILLIPS 1951 JESSOP 1975 still handled *Neobakeria* as a genus, but in his revision 1976 he sunk it into *Massonia*, and he even sunk the type species into *M. angustifolia*. The petaloid monocot crew of PRE did not follow him in this case, but accepted *Neobakeria* with four species through all three editions of the species lists of southern Africa (REID 1984, 1985, and 1993).

Generic characters: SCHLECHTER 1924 stated that the two subgenera of *Polyxena* in BAKER's treatment in Flora Capensis deserve a separation as different genera (uniseriate stamens with a short basal filament tube vs. biseriate free stamens in *Polyxena* s.str.) and that *Neobakeria namaquensis* has longer, foxtail-like inflorescences, but otherwise corresponds in its generic characters to BAKER's subgenus *Astemma* of *Polyxena*. As a difference with *Massonia* the following words of the generic description deserve attention: "racemo . . . exinvolucrato [without an involucre]; bracteis tenuibus, quam flores manifeste brevioribus;" and can be summed up: "bracts tender, distinctly shorter than the flowers, not forming an involucre".

OBERMEYER 1976 separated in her key *Neobakeria* by "Inflorescence a corymb; bracts small" from *Massonia* with "Inflorescence a capitulum, surrounded at base by large bracts forming an involucre". If checked critically, these differences are reduced to the size of the bracts, and above all the simple length does not make a clear difference.

As already mentioned in paragraph 3.2 and the key, the essential generic character of *Neobakeria* is the zygomorphy of the flowers. Unlike the zygomorphy in *Daubenya*, the only other genus of Massoniinae with zygomorphic flowers, the adaxial side of the flower is promoted (Fig. 10 and 11). In *Neobakeria* zygomorphy was overlooked up to now, because very few botanists had the opportunity to see live flowers. SCHLECHTER 1924, who had received the dry specimens from his brother MAX, only analyzed by figures on the type sheet the uppermost flowers which are actinomorphic (Fig. 10 and 11d). When checking SCHLECHTER's protologue JESSOP 1976 also only looked at upper flowers as one can see from his tube data (Table 5).

Size of the genus: SCHLECHTER 1924 included seven species, i.e. in addition to *Neobakeria namaquensis* six species. Already from the authorship "(Bak.) Schltr." given for all six of them one can conclude that SCHLECHTER was not very familiar with the species (three names have other authors than BAKER, namely *N. angustifolia*, *N. marginata*, and *N. rugulosa*, see under *Massonia angustifolia*). Furthermore *N. burchellii* and *N. haemanthoides* are according to JESSOP 1976 (and accepted by us) synonyms of *M. angustifolia*. The only valid species in addition is *N.* (= *M.*) *comata*. Thus SCHLECHTER's seven names refer only to three species from an updated point of view.

OBERMEYER 1976 speaks of "Species 8" in *Neobakeria*, of course without listing them. Apparently she added *N. heterandra*, which was described later, to SCHLECHTER's seven names. In the lists of REID 1984, 1985, and 1993, which are based on OBERMEYER's decision as in most cases, we find the same four species. It is evident that JESSOP's specific synonymy was applied to OBERMEYER's eight species of 1976, except for *Neobakeria namaquensis*, being correctly recognized as a species of its own by OBERMEYER.

Within Massoniinae zygomorphic flowers are confined to the very different *Daubenya aurea* and *Neobakeria namaquensis*. Thus *Neobakeria* is best treated as a monotypic genus.

Fig. 9
Holotype sheet of *Neobakeria namaquensis* SCHLTR. with SCHLECHTER's floral analysis

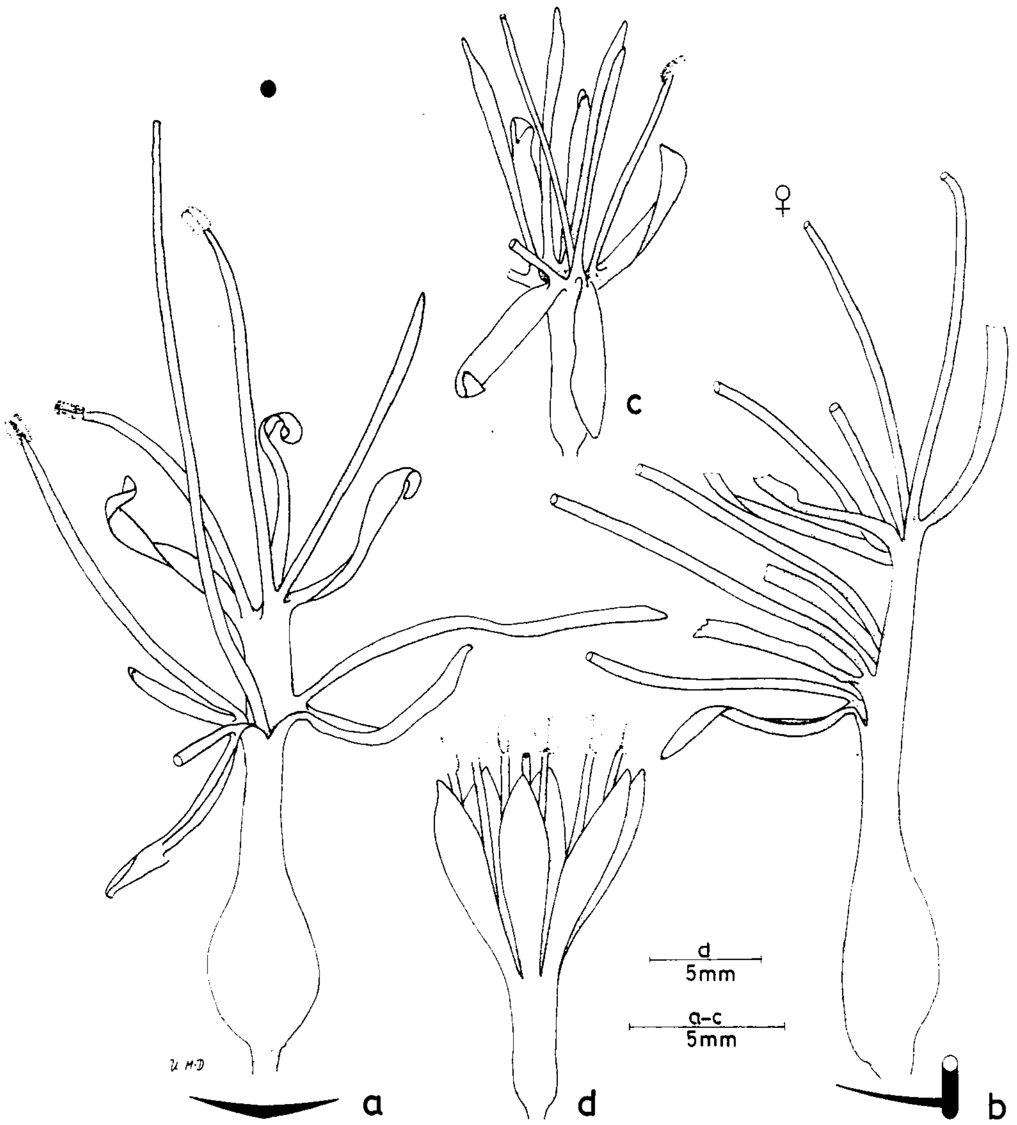


Fig. 10
Floral symmetry of *Neobakeria namaquensis* SCHLTR.
a — longitudinal top view of a basal flower; the black dot in (a) marks the axis and thus the adaxial = longer side of the perigon tube, the black diagram of a bract marks the abaxial side of the perigon tube; b — lateral view of a basal flower; the black diagrammatic axis with bract gives the orientation; c — lateral view of an actinomorphic apical flower; d — reproduction of an actinomorphic apical flower from the holotype sheet (cf. Fig. 9).

Nomenclatural note: Strange enough PHILLIPS 1951: 193 states "Type: *N. angustifolia* (L.fil.) Schltr." Apparently he did not notice that SCHLECHTER 1924: 149 says explicitely under the genus: "Der von mir damals [referring to the labels of *N. namaquensis* distributed in 1898] aufgestellte Typus der Gattung ist allerdings besonders charakteristisch durch die ...". Instead he chose the first name of SCHLECHTER's new combinations as type. Such a formal choice of generitypes is prohibited by the ICBN. In accordance JESSOP did not even cite PHILLIPS' choice. Thus in itself PHILLIPS' choice is here without any importance but this case throws light on other lectotypes proposed by PHILLIPS, e.g. *Strumaria truncata* JACQ.

Morphographic note: In the literature there are equivocal statements about the basal connation of the stamens. In SCHLECHTER's description of the genus *Neobakeria* he writes: "Stamina aequilonga, ima basi breviter connata, in fauce perianthii inserta". In the key of OBERMEYER 1976: 918, on the contrary, *Neobakeria* and *Massonia* key out under "Stamens with free filaments arising from throat of tube".

In this case OBERMEYER's statement is an inaccurate wording of the antithesis to "Stamens with filaments fused into a [cylindrical] tube" and might run "Stamens with filaments basally fused into a short ring-shaped tube or ± free, arising from throat of tube".

SCHLECHTER's description of the *Neobakeria* stamens, too, needs a comment. It only applies to the actinomorphic flowers near the top of the inflorescence. The majority of the flowers are zygomorphic and they have only the three adaxial filaments basally connate to form a sector of a very short staminal tube.

It seems noteworthy to compare the symmetry of the two zygomorphic genera of Massoniinae:

The main differences in the floral symmetry of *Neobakeria* and *Daubenya* are:

- in *Neobakeria* the adaxial side of the perigon tube is longer, in *Daubenya* the abaxial side
- in *Neobakeria* the tepal segments are ± equal, in *Daubenya* they are very unequal according to the zygomorphic pattern, the three abaxial segments are much larger and of equal size, the three adaxial ones are ± unequal with the median one being the smallest. In the bottom flowers the abaxial tepal segment may be eight times longer than the adaxial one (Fig.11a), in a higher up flower only four times (Fig.11b), in a still zygomorphic flower near the top only two times (Fig.11c), and in an actinomorphic flower at the top they may be of equal length.

The just mentioned main differences in the floral symmetry of *Neobakeria* and *Daubenya* show convincingly that zygomorphy in this case is no synapomorphy but occurred by convergence. Zygomorphy occurred, however, in two rather allied taxa, which have still the same structural potentials. A list of similarities which are connected with symmetry is noteworthy:

- in the inflorescence of both genera there is a gradient from strongly zygomorphic flowers at the base to less zygomorphic flowers higher up and to actinomorphic flowers at the top
- in zygomorphic flowers of both genera the three adaxial filaments show a distinct connation at their bases, whereas the three abaxial filaments are free from each other
- in the actinomorphic flowers of both genera all six filaments are basally fused to form a short ring-shaped filament tube
- the stamens do not follow the pattern of promotion shown by the perigon tube but, on the contrary, are a little longer on the reduced side, i.e. on the abaxial side in *Neobakeria*, and on the adaxial side in *Daubenya*.

7.9.1 *Neobakeria namaquensis* SCHLTR. 1924: 150

Typus: South Africa, Cape.—2917BD (Springbok): Zabies [= Sabies; SCHLECHTER gives Great Namaqualand but JESSOP 1976: 421 has also chosen the Springbok degree], 04.06.1896 fl., M.SCHLECHTER *90* (**B**! **holotypus** quia "typ. auctoris" designatus; si argumentum non satis habetur: lectotypus hic designatus, and 2 isotypi: BOL!, GRA, PRE!, **Z**!). — Fig. 9–10.

Taxonomic note: *Neobakeria namaquensis* was sunk into synonymy of *Massonia angustifolia* by JESSOP 1976.

In one respect JESSOP did not understand the protologue correctly. He writes: "*M.Schlechter 90*, from Zabies, Namaqualand, the type of *Neobakeria namaquensis*, has a tube 'usque supra medium 6-fido' according to SCHLECHTER (1924). But in a specimen in the Bolus Herbarium flowers examined had very short tubes (4.5–6 mm long) and longer segments (8.5–10 mm long). In all other respects this specimen matches other material placed in this species."

In fact there is no contradiction at all. SCHLECHTER described the perigon, not the tube: "perigonis [sic!, printing error for perigonio] c. 1.5 cm longo, usque supra medium 6-fido" [= split beyond the middle], meaning clearly that the

Table 8
Variation of some floral data of *Neobakeria namaquensis* from the holotype and two isotypes according to different authors. All measurements in mm. Measurements in square brackets are taken from a drawing on the holotype sheet (Fig. 9); the perigon length in round brackets was calculated arbitrarily by the addition of JESSOP's extreme values of segments and tube.

	SCHLTR. B	JESSOP BOL	M-D.			
Neobakeria namaquensis	upper flowers only		lower	upper	lower	upper
			flowers PRE		flowers B	
perigon	c. 15	(13 –16)	34		14 –25.5	10.4
segments	[9]	8.5–10	10–13		5 –10	4 –5.2
tube adax.	[6]	4.5– 5	21	4	9 –17	3 –5.2
abax.			14–15		7 –14	
filaments	[10–11, 5]		10–12		9.5–13	5.5–8.0
abax.			14			
pedicels					1.5– 5.0	0 –1.5

lobes are longer than the tube. In the generic description SCHLECHTER worded these proportions as follows: "segmentis ... tubum cylindraceum ... plus minusve excedentibus." From a sketch on the holotype sheet we can get the length of segments and tube as given in the last column of Table 5. These values are within the observations of JESSOP (Table 8, second column).

As mentioned above under generic characters, SCHLECHTER and JESSOP only looked at the uppermost (= actinomorphic) flowers of the specimens. Thus they missed the main character and the associated details. According to JESSOP's *Massonia* key the identification of the uppermost flowers is very simple: small bracts combined with a tube under 10 mm lead to *M. angustifolia* [even if *M. angustifolia* sensu JESSOP includes *M. zeyheri* with a tube up to 32 mm; JESSOP's description of *M. angustifolia* gives for the tube (4.5–)7–12(–17) mm]. The absence of the sigmoid fold on the segments and the elongate inflorescence were probably "all [the significant] other respects [in which] this specimen matches other material placed in this species". If one knows the plant, the linear segments of the flowers are sufficient to recognize *Neobakeria* within Massoniinae.

This lengthy discussion is not meant to dissect JESSOP's errors into bits and pieces as "l'art pour l'art" but is an attempt to understand in detail the argumentation behind JESSOP's taxonomy.

CAPE.—2917BD (Springbok): type locality as above; **–DB:** Okiep, June 1923, GOOD *s.n. sub NBG 505/23* (BOL!).
—2918BC (Gamoep): 53 miles WSW of Pofadder, flat of coarse red sand, ca. 2800' s.m., 25.05.1961 fl., LEISTNER *2508* (KMG!, M!, PRE!); ibidem ("60 miles W") et eodem tempore, SCHLIEBEN *9017* (**BM**!, **BR**!, **M**!, PRE!, **Z**!); **–CA:** 20 miles NE of Springbok, 09.09.1950 fr., BARKER *6703* (NBG!).

7.10 *Daubenya* LINDL. 1835
Bot. Reg. 21: t. 1813

Generitypus: *Daubenya aurea* LINDL.

Inflorescence subcapitate with about 10 flowers, the lower pedicels 5–6 mm long, the upper pedicels shorter. Perigon of all flowers distinctly zygomorphic, except for the uppermost actinomorphic ones; tube on the short adaxial side 13–30 mm and on the longer abaxial side 18 to 40 mm long, adaxial segment 3–10 mm long, abaxial segment 6–40 mm long. Stamens of normal flowers slightly zygomorphic in length and longer on the adaxial side (with the shorter perigon tube), the three adaxial filaments 3.8–7.0 mm long, basally connate to form a sector of a very short staminal tube, the three abaxial filaments 2.5–5.3 mm long and clearly free from each other; stamens of the upper flowers actinomorphic, even when the perigon is still zygomorphic (Fig. 11c), filaments 3 mm long, all filaments basally connate to form a very short staminal tube.

Morphographic note: In the key to the genera by KRAUSE 1930: 251 *Daubenya* keys out with "Stamens at the base connate into a ring. Perigon-segments nearly equal" (translated from German). In the key by JESSOP 1976: 406, on the contrary, *Daubenya* keys out under "Filaments free at the base". Strange enough both authors are right and wrong: the three adaxial stamens are basally connate and the three abaxial ones are distinctly free from each other. In the uppermost zygomorphic and the actinomorphic flowers, however, all six stamens are basally connate. (By the way KRAUSE's key alternative is not meant for *Daubenya*, but for *Massonia*, as one can see from the equal perigon-segments.)

7.10.1 *Daubenya aurea* LINDL. 1835 Bot. Reg. 21: t. 1813

Iconotypus: South Africa, Cape, without locality or collector, cultivated by Messrs. Young of Epsom. – Illustr.: Fig. 11; Iconotype; Bot. Reg. **25**: t. 53 (1839); Fl. Pl. Afr. **2**: plate 71 (1922).

Two varieties can be distinguished:

Daubenya aurea LINDL. var. *aurea*, known from one pure (HALL loc. 2) and one mixed population (Fransplaas, see locality list) and

Daubenya aurea var. *coccinea* (HARV.) MARLOTH in E.PHILLIPS 1922, Fl. Pl. S. Afr. **2**: 71.

Note on illustrations: All three colour forms of *Daubenya aurea* were depicted by colour plates from live plants. On each plate we find floral details including an enlarged zygomorphic flower. Nowhere, however, one can get confirmation or falsification about the androecial fusions treated above under the genus. Thus it was necessary to prepare Fig. 11 on the basis of herbarium material.

Morphographic note: In Table 9 we compare some floral measurements of the three flowers depicted in Fig. 11 with the values given by the description of JESSOP 1976: nearly all our values fall into the respective ranges of JESSOP's description, only the tube length in column 6 is shorter than the range of column 5. Our intermediate flower of column 4, however, does not match JESSOP's lower or upper flowers of columns 1 and 5, thus showing that there is no discontinuity between lower = outer and upper = inner flowers, as perhaps suggested to the reader by JESSOP's description. It is, however, a decent practical distinction for descriptive purposes.

On the *Daubenya* plate published by PHILLIPS 1922 the abaxial filaments are distinctly longer than the adaxial ones (unlike our above description) and in the side view they seem to be nearly half as long as the abaxial lobes, i.e. more than 10 mm long. In the description, however, the range of the filaments is given with 3–6 mm and thus the plate is possibly not very accurate in its proportions (the abaxial filaments seem to be inserted near the adaxial throat).

Taxonomic note: Between 1835 and 1871 three species of *Daubenya* were described and named according to different flower colours: *D. aurea* (yellow), *D. fulva* (dull orange), and *D. coccinea* (scarlet). When preparing the plate for Flowering Plants of South Africa 1922 PHILLIPS came to the conclusion that there is only a single species and he was confirmed by the independent observations of MARLOTH, which ended in the clear sentence: "There is, however, no structural difference between *D. aurea* Lindl., *D. coccinea* Harv., and *D. fulva* Lindl." (PHILLIPS 1922), and he reduced *D. coccinea* to *D. aurea* var. *coccinea* (HARV. ex BAKER)) MARLOTH in E.PHILLIPS.

According to JESSOP 1976 also HALL 1970 "concluded that only a single species should be recognized", but we did not find any relevant considerations in this article. HALL accepts the monotypic genus as proposed by PHILLIPS and MARLOTH and uses on p. 15 "*Daubenya aurea* var. *coccinea*" for his first sight of a red-flowered population of *Daubenya*. Later (p. 16), he speaks as a horticulturist pragmatically of two subjects instead of two varieties. On the other hand JESSOP did not mention PHILLIPS' decision to recognize only a single species (see above). That is why, for the sake of historical correctness, the preceding explanations seemed appropriate. Concerning his own position JESSOP 1976 stated: "Examination of the limited herbarium material has confirmed this opinion" [of a single species], without even mentioning MARLOTH's combination of a variety.

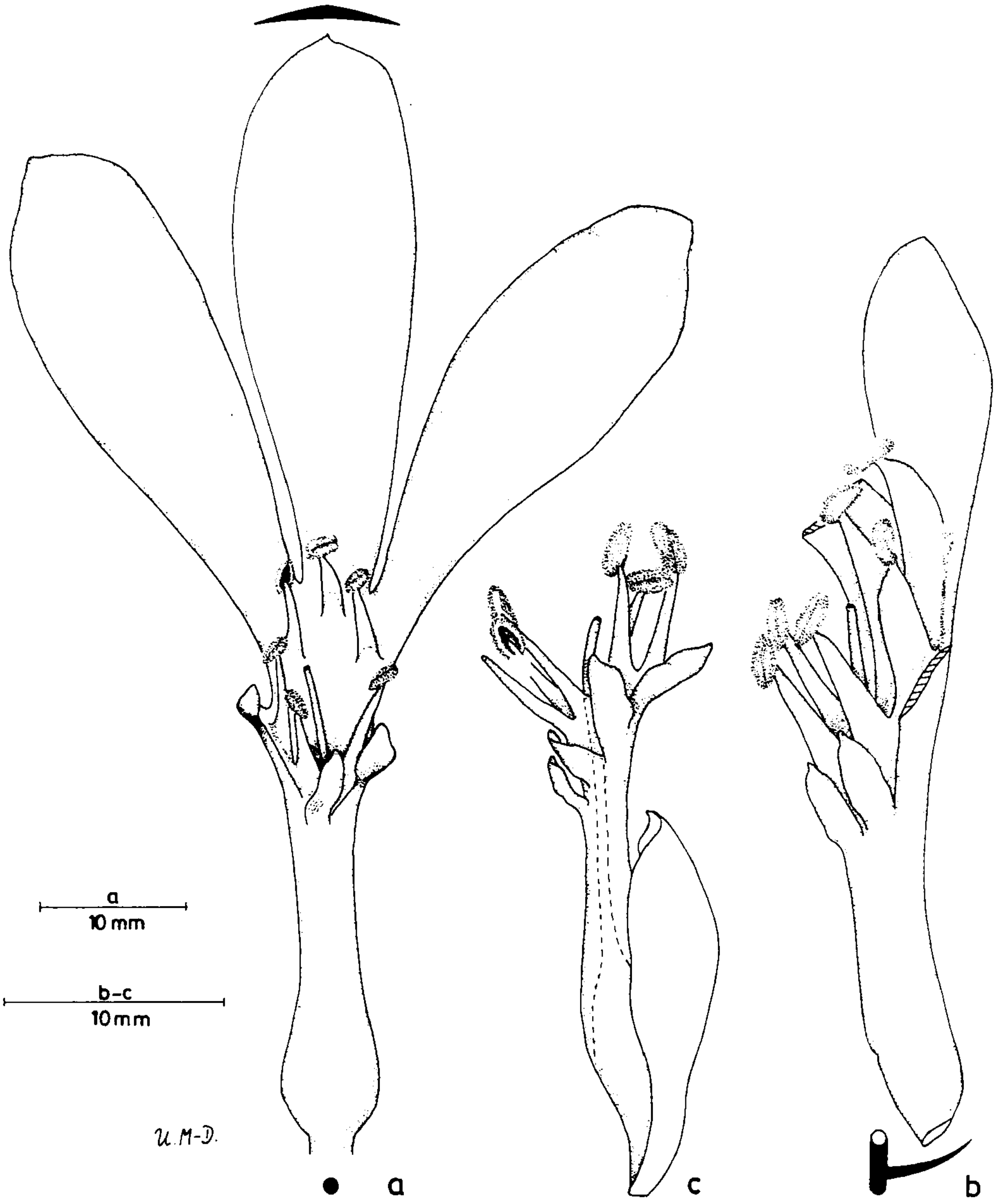


Fig. 11
Floral symmetry of *Daubenya aurea* LINDL. from HALL *3276* (a) and E.G.H.OLIVER *4412* (b-c)

a — longitudinal top view of a basal flower, the three abaxial tepal segments are more than eight times longer than the adaxial tepal segment; the black dot in (a) marks the axis and thus the adaxial = shorter side of the perigon tube, the black diagram of a bract marks the abaxial side of the perigon tube, the dotted line above the filament base indicates behind the filament the adnation to the perigon; b — lateral view of an upper flower, with the abaxial tepal segment only four times longer than the adaxial one; the black diagrammatic axis with bract gives the orientation; c — lateral view of a flower with bract from near the top; the zygomorphic symmetry is little pronounced, the abaxial tepal segment being only twice as long as the adaxial one.

Table 9
Variation of some floral data of *Daubenya aurea*. All measurements in mm. The values of columns 1 and 5 are taken from Jessop's revision (1976), the values of columns 2, 4 and 6 belong to the three herbarium flowers illustrated in Fig. 11. In the last two columns we compare Jessop's actinomorphic flower (column 5) with our zygomorphic one (column 6) from the top of the inflorescence.

Daubenya aurea	lower flowers		half way up flowers		upper flowers	
	Jessop 1	M-D. 2	Jessop 3	M-D. 4	Jessop 5	M-D. 6
perigon	80	76		40	33	24
abax. segment	19–40	40		18	3–6	5.5
adax. segment	7–10	5		4		3.0
abax. tube	35–40	36		21	25–30	18
adax. tube	20–30	21		13		14.5
abax. filament	3– 7	4.5		3.7		6.3
adax. filament	5–10			8.3		8.3

Distribution: All three species of *Daubenya* were described without locality and even in Flora Capensis (Baker 1897) not a single locality was known. Jessop 1976 cites four localities from three degree squares without giving quarter degree squares. Unfortunately two degree squares (Williston and Calvinia) are most likely wrong: all four localities as well as the additional ones of the locality list are probably situated in a single quarter degree square, 3220AB (Sutherland).

This assumption of a far more restricted distribution than thought before deserves a conclusive explanation. Our argumentation is a bit lengthy and clumsy and should be checked with Hall's collecting book (probably NBG). In the report about his field observations Hall 1970 does not give directions or farm names except for the Marloth locality Franzplaas; he visited three places, which we distinguish as locality 1–3 in chronological order (Franzplaas = 3; a return to the first place = 1b).

As to the two Hall localities cited by Jessop for the Williston degree square (3120) Hall showed us on a map where to find Voelfontein farmhouses (3220AD very near the northern border, the farmland stretching onto —AB) and we added it to our 1 : 500.000 map, thus knowing which Voelfontein is meant; "near Voelfontein Farm" is probably in —AB, because this locality 1 is situated "several miles from 'Franzplaas'" (Hall 1970: 15, the farm houses Franzplaas and Voelfontein are nearly seven km apart as the crow flies). Hall's locality 2 with the yellow *Daubenya* "40 miles NW. of Sutherland" would fall into the Williston degree as the crow flies but probably not as the road winds; for two reasons it is very likely situated in 3220AB: (1) Another label for Hall's locality 1 at the southern limit of —AB runs "35 miles NW. of Sutherland"; even if both localities are more than five miles apart by the use of different roads, they will not be more than 27 km (= latitude of one quarter degree square) apart as the crow flies, and (2) Phillips 1922 gives for Marloth's locality "farm Fransplaas, about 40 miles N of Sutherland", about which Hall mentions that it is several miles from his locality 1. Somewhat strange is the use of the direction N instead of NW and even stranger is the fact that Jessop cites simply "Fransplaas, about 40 miles W. of Sutherland". Only if measured just as the crow flies the Calvinia degree square, which is cited by Jessop, is reached.

In the PRE data-base PRECIS for some collections 3220BC is given; this refers only to the town of Sutherland mentioned on the label, not to the precise locality.

CAPE.—3220AB (Sutherland): Modderfontein, Meiring *s.n. sub NBG 2775/15* (BOL); Fransplaas (= Franzplaas), Sept. 1920, I. Muller sub Marloth *9550* (PRE!); ibid. Sept. 1921, Marloth *10346* (PRE!); ibid. Sept. 1921, Marloth *10415* (PRE!); revisited by H.Hall (loc. 3) on 04.09.1968 fl. but eaten off by sheep; (loc. 1a:) near Voelfontein farm, 21.08.1968 fl., Hall *3240* (NBG); (loc. 1b:) ibidem "35 miles NW. Sutherland", 05.09.1968, Hall *3276* (PRE); (loc. 2:)

40 miles NW. of Sutherland, 04.09.1968, Hall *3269* (PRE); junction of Quaggasfontein and Visrivier rds. NW. of Sutherland, 02.09.1973, E.G.H.Oliver *4412* (PRE); without loc.??, 16.09.1975. E.G.H.Oliver *s.n.* sub PRE 51838 and PRE garden no. 20362).

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